# THE EFFECT OF INFLATION ON STOCK MARKET RETURNS AT THE NAIROBI SECURITIES EXCHANGE

BY

GLADYS MOGIRE

D63/74490/2014

A RESEARCH PROJECT SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF THE DEGREE OF MASTER OF SCIENCE IN FINANCE, SCHOOL OF BUSINESS, UNIVERSITY OF NAIROBI

2016

# DECLARATION

This research project is my original work and has not been presented for a degree at any other university for examination.

Signature _____          Date _____

**Gladys Mogire**

**D63/74490/2014**


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

Signature _____          Date _____

**Mr. Herick Ondigo**

Lecturer

Department of Finance and Accounting

School of Business

University of Nairobi

# ACKNOWLEDGEMENTS

I would like to express my gratitude to God Almighty above for making it possible for me to finish the project without any problem.

I would also like to thank my supervisor Mr. Ondigo and moderator Dr. Nyamute for offering me guidance and correcting my mistakes hence ensuring my project was written successfully.

The lecturers of the University of Nairobi finance and accounting department who helped me to acquire knowledge along the way on various units that I was undertaking I appreciate you for making me gain more academic knowledge.

Lastly but not least, to my family for the Moral support during this time that I was writing my project.

# DEDICATION

I dedicate this project to my Family, my father Mr. Zablon Obungu who is my mentor and pillar in all that I have been doing. My mother Madam Alice Magoma for providing every necessity that I required all through this time. My siblings Edna, Lillianna, Grayce, Rachel, James, Wycliffe, Moses and Alex for the endless calls ensuring that I was on toes to finish my project. My Nephews and nieces Nathan, Al, Kayla and Ella for cheering me up even when the going was tough.

My best friends Liz Kimita and Marcy Kemunto you pushed me really hard and ensured that all this was a success.

God, bless you all. My love for you cannot be quantified.

# TABLE OF CONTENTS

# LIST OF TABLES

# LIST OF FIGURES

# LIST OF ABBREVIATIONS

**ADF** - Augmented Dickey Fuller Test

**CPI** - Consumer Price Index

**EMH** - Efficient Market Hypothesis

**GDP** - Gross Domestic Product

**IFC** - International Finance Corporation

**NSE** - Nairobi Securities Exchange

**OLS** - Ordinary Least Squares

# ABSTRACT

Inflation has probably been a characteristic of human history since money was adopted as a means of payment. The relationship between stock market performance and inflation is imperative for investors because stocks are expected to provide protection from the effects of inflation. However, various theoretical foundations provide mixed findings on the connection between inflation and stock market returns. This study therefore sought to determine the effect of inflation on stock market returns at the Nairobi securities exchange. The independent variable for this study was inflation measured using the consumer price index while the dependent variable was stock market returns measured using share index. Interest rates, money supply and exchange rates formed the control variables. The study employed a descriptive research design and carried out a census of the 65 firms listed at the Nairobi Securities Exchange, as at December 2015. The study used secondary data, which was analyzed using the augmented dickey fuller model, the granger causality test and finally the regression analysis. The results of the Augmented Dickey Fuller test (ADF) found that the time series had a unit root. The granger causality test found that there was a causal relationship between inflation and stock market returns but there was no causal relationship between stock market returns and inflation. The regression results found a significant positive relationship between inflation and stock market returns and a significant negative relationship between interest rates and stock market returns at the Nairobi Securities Exchange. The findings also found an insignificant negative relationship between money supply and exchange rates at the Nairobi Securities Exchange. The study concluded that inflation positively affects stock market returns while interest rates, money supply and exchanges rates negatively stock market returns at the Nairobi Securities Exchange. The study recommended the government of Kenya should formulate policies on inflation, interest rates, money supply and exchange rates to ensure that they do not have adverse effects on stock market returns.

# CHAPTER ONE: INTRODUCTION

## 1.1 Background of the Study

Inflation has probably been a characteristic of human history since money was adopted as a means of payment. Inflation presupposes the existence of money, which evolved as an unplanned social institution by a number of inventions and innovations (Bemholz, 2003). On the other hand, a stock market is an important financial institution in a country and is major concern to investors, business owners and the government (Osagie & Emeni, 2015). Inflation is a factor that affects the investor's risk averse and consequently, reflects on expected high-required return on capital and the real discount rate (Kullaporn & Lalita, 2010). As such, stock prices are the reflector of various variables such as inflation, exchange rate, interest rate and industrial production (Aliyu, 2011). Thus, a predictable increase in the rate of inflation slows down financial market development (Owolabi & Adegbite, 2013). According to Azar (2014), stock returns are negatively related to actual inflation, and to expected and unexpected inflation.

The foundation of discourse on the relationship between stock market returns and inflation is the Fisher (1930) hypothesis (Osagie & Emeni, 2015). The Fishers hypothesis presuppose that shares can act as a hedge against inflation during the period of high inflation, investors acquire more of real than financial assets (Mbulawa, 2015). However, the Fama's (1981) hypothesis states that correlation between inflation and stock market returns is not a causal one; rather, it is a spurious relationship of dual effect (Owolabi & Adegbite, 2013). In addition, the proxy hypothesis, stock returns are influenced by inflation through real activities, which are essential determinants of the equity values.

The real activities are, for instance capital expenditures, as well as the average real rate of return on capital and output (Kullaporn & Lalita, 2010). Further, the Efficient Market Hypothesis, states that stock markets fully reflect all available information, hence stock prices are affected by changes in inflation.

Stock markets are said to reflect the health of the country's economy (Sireesha, 2013). The emergence and expansion of stock markets in African countries in recent decades has been an important step for them towards attracting investment that is more private and becoming more integrated into the global financial markets (Balparda, Caporale & Gil-Alana, 2015). The Kenyan stock market is one of the emerging economies in Africa; its stock market performance is highly dependent on the nature of the macroeconomic variables. The Nairobi security market is significant for economic growth as it enables unutilized funds to be invested in productive economic activities (Olweny and Omondi, 2011). The NSE acts as the barometer for the Kenyan economy. As such, the exchange has continuously lobbied the government to create a conducive policy framework to facilitate growth of the economy and the private sector to enhance growth of the stock market (Ngugi, 2005).

## 1.1.1 Inflation

Inflation is a rise in the general level of prices of goods and services in an economy over a period of time (Ariss, 2012). According to Shiblee (2009), inflation is defined as a sustained increase in the general level of prices for goods, and services. Thus, inflation is a persistent rise in the overall (or average) level of prices of all goods and services. Inflation occurs when prices of goods increase or when it needs more money to purchase

the same items (Saleem, Zafar & Rafique, 2013). Inflation pressure can be largely attributed to structural factors such as; real income reduction caused by fluctuation in oil revenue, high nominal wages and debt obligation in the form of expansionary fiscal deficit (Taofik & Omosola, 2013). Other causes of inflation are attributed to fluctuations in the demand of goods and service, as well as changes in available supplies of a product (Ariss, 2012).

Inflation gradually reduces the purchasing power of money, hence a loss of the real value of money. As inflation increases over the period, then the value of money decreases and return is also decreased (Ahmad & Naseem, 2011). Higher inflation uncertainty increases the required risk premium, leads to a higher discount rate, and lowers the discounted present value of expected future cash flows, thus resulting in a fall in stock prices. In addition, economic activity is adversely affected by inflation uncertainty and since stock returns lead economic activity, there is a negative relation between stock returns and inflation uncertainty (Azar, 2014). High rates of inflation erode the purchasing power of an economy's currency (Mugambi & Okech, 2016). However, low and stable inflation rates allow the private sector to plan for the future, lead to a lower need for costly price adjustments, prevent tax distortion and thus create a stable business environment (Alimi, 2014).

Inflation considered one of the economic phenomena that still polarized attention of both developed and developing countries. In addition, it is considered a complex economic subject because it represents a tangible phenomenon and not only a macroeconomic variable such as gross domestic product and investment (Shukairi, 2012). Inflation is widely measured by calculating the movement in the Consumer Price Index (CPI)

(Mohan & Chitradevi, 2014). According to Ahmad and Naseem (2011), price inflation is measured by the inflation rate, which is calculated from the annual percentage change in the general price index (Consumer price Index) over the period of time. Saleem, Zafar and Rafique (2013) explains that the inflation rate is represented by the consumer price index (CPI) which is actually signified an overall increase in prices of goods and services.

## 1.1.2 Stock Market Returns

Stock market return is the yield an investor obtains over a specified period. It is sometimes considered synonymous to stock prices. A strong market can be seen as one that incorporates new information on stock prices and hence making the stock prices for the firms stable and accurately valued (Mwangi & Mwiti, 2015). Stock market returns have predictive power for investment and output because stock market returns are a forward-looking variable that incorporates expectations about future cash flows and discount rates. Stock market returns serve as an index to investors or governments in making their investment decisions. Investors of different financial capacity are able to invest in the stock market as long as they are able to get a return that is higher than their cost of capital (Wang, 2012).

Stock returns determine how effective and efficient the stock market allocates shares and equities based on preference and availability of market information. Increase or decrease in price of stock create uncertainty for the investors and in turn affect the demand and supply of stocks (Taofik and Omosola, 2013). Shares and stock markets are extremely sensitive to any prize-shaping information, relevant for future trends and market

development (Širucek, 2013). Higher stock returns imply higher profitability by firms and other corporate bodies and thus overall growth/prosperity of an economy and vice versa (Aliyu, 2011). Therefore, uncertainty of return in stock markets is seen as an important aspect of the aggregate economy as an unstable growth trend in an economy makes it difficult to invest and consume (Erdugan, 2012).

Stock return is the gain or loss of the value of a share in a particular period usually quoted as a percentage. It consists of capital gains as well as any income received by the investor from the stock (Mugambi & Okech, 2016). Stock market indexing is one of the most widely used measures of stock performance. The measures of stock market performance include market capitalization; which measures stock market size, stock market liquidity that refers to the ability of investors to buy and sell securities easily. Others are All Share Index; which reflects the performance and the condition of the stock market, and the turnover ratio; which is an index of comparison for the market liquidity rating and level of transaction costs (Daferighe & Sunday, 2012). In Kenya, stock returns are normally calculated by from NSE 20 share index as, long since the index is usually the benchmark in measuring stock market performance.

## 1.1.3 Effect of Inflation on Stock Market Returns

The relationship between inflation and stock returns has received substantial consideration in the available literature. As such, the connection between stock prices and inflation is based upon the Fisher (1930) which states that equity stocks, which represent claims against the real assets of a business, may serve as a hedge against inflation. Thus, investors would sell financial assets in exchange for real assets when expected inflation is

pronounced (Ioannides, Katrakilidis & Andreas, 2005). Additionally, the efficient market hypothesis (EMH) states that stock markets gradually integrate into the world market, and prices react to world information like inflation and other macroeconomic variables. According to Mahedi (2012), based on market efficiency inflation influences stock indices, where; when the inflation rate is higher than expected, which is economically bad news, implies meaningful impact of stock returns.

A study by Alimi (2014) also examined the long run and short run relationships between inflation and the financial sector development in Nigeria over the period between 1970 and 2012. The findings of the study found that that inflation presented deleterious effects on financial development over the study period. Taofik and Omosola (2013) explored the relationships and dynamic interactions between stock returns and inflation in Nigeria and revealed the existence of a long run relationship between stock returns and inflation. Ahmad and Naseem (2011) examined the impact of high inflation on stock market returns in Pakistan using monthly data of inflation and stock returns and found that there is negative and significant impact of inflation on stock returns.

In their study, Kullaporn and Lalita (2010) investigated the relationship between inflation and stock prices in Thailand and also explored the impact of specific events and revealed that that movement of stock prices is irrelevant to inflation. Magnus, Krylova & Vahamaa (2004) also examined the impact of inflation and economic growth expectations and perceived stock market uncertainty and established that stock and bond prices move in the same direction during periods of high inflation expectations, while epochs of negative stock-bond return correlation seem to coincide with the lowest levels of inflation expectations.

## 1.1.4 Nairobi Securities Exchange

The NSE, an emerging market is the self regulating organization in Kenya dealing with listed instruments and draws its membership from stock brokers, dealers and investment banks (Muituri, 2014). Securities traded at NSE are bonds and shares that constitute the markets two broad segments, i.e. the Main Investments Market Segment and the Alternative Investments Market Segment characterized by its liquidity, market capitalization and turnover, the NSE may be classified as both emerging market and frontier market (Wabwire et al., 2013). The exchange comprises of over 60 active listed companies with a daily trading volume of over US $5 million and a total market capitalization of approximately US $15 billion. Apart from equities, government and corporate bonds are also traded on the exchange with an average of daily bond trading of US $60 million (Rono, 2013).

The NSE is the oldest and largest securities exchange in East Africa and most of the shares that are traded in the Tanzanian and Ugandan exchanges are cross-listed on the Kenyan exchange (Njuguna, 2015). The Nairobi securities exchange (NSE) has over the years gone through many reforms to become the most advanced stock exchange in the Eastern region of Africa and one of the most profitable markets in the world (Adjei, 2015). The NSE is currently one of the most attractive and promising markets in Africa and many investors want to benefit from the high growth and promising economic outlook and therefore invest in the NSE (Muituri, 2014). In Sub Saharan Africa, the NSE is currently ranked fifth in terms of equity market capitalization (Aduda, Masila & Onsongo, 2012).

According to Vena (2014) stock market returns for the firms quoted at the NSE and the rate of inflation were positively correlated hence an indication that high level of inflation influences investments. A study by Muriuki (2014) investigates the effect of inflation and interest rates on market returns at the Nairobi Securities Exchange and found a negative and significant relationship between inflation rates and market returns but a positive and significant relationship between interest rates and market returns. According to Olweny and Omondi (2010), the NSE 20 Share Index fell by 7.8% to stand at 3,247 points in December 2009 compared to 3,531 points December 2008. The Nairobi Stock Exchange (NSE) 20 share index rose steadily over the first three quarters of 2010 to reach a peak of 4,630 points during the third quarter.

## 1.2 Research Problem

The relationship between stock market performance and inflation is imperative for investors because stocks are expected to provide protection from the effects of inflation (Mbulawa, 2015). However, various theoretical foundations provide mixed findings on the connection between inflation and stock market returns. For instance, the proxy hypothesis illustrate that there is a negative relationship between inflation rate and stock market returns and also stock prices (Kullaporn and Lalita, 2010). The Fama (1981) hypothesis on the other hand, supports that the relationship between inflation and stock market performance is inverse (Mbulawa, 2015). However, the fisher theory presupposes that equity stocks presents claims against real assets of a business and as such, may serve as a hedge against inflation (Osagie & Emeni, 2015).

The Kenyan economy has witnessed some significant changes in inflation over time. In November to December 2012, the consumer price index (CPI) increased by 0.69 per cent from 133.33 points and the overall rate of inflation declined to 3.20 per cent from 3.25 per cent (Osoro & Ogeto, 2014). Further, the consumer price index increased by 0.95 percent from 137.96 to 139.28 in April 2013 and during the same time there was a subsequent effect on stock returns because of the changes in inflation rates (Kirui, Wawire & Perez, 2014). In addition, the Nairobi Stock Exchange (NSE) 20 share index rising and falling steadily over the years due to inflationary tendencies. Thus, the need to analyze the effect of inflation on stock market returns of firms listed at the Nairobi securities exchange.

A number of researches have been conducted to examine the effect of inflation on stock returns in both developed and developing economies around the world. A study by, Mahmood et al (2014) examined the connection between inflation and stock prices in Pakistan and found that inflation is influenced negatively by pressure on stock prices. Mahonye and Mandishara (2014) examined the long-run relationship of stock returns and its determinants in Zimbabwe and established that inflation, real income, money supply and exchange rate are the main determinants of stock market returns. Daferighe and Sunday (2012) also investigated the impact of inflation on stock market performance in Nigeria and revealed that low level of influence is regarded as a good hedge against inflation in Nigeria. However, the above international studies obtained varied results.

In Kenya, Kimani and Mutuku (2013) investigated the impact of inflation, Central Depository System and other macroeconomic variables on the Nairobi stock market performance and revealed a negative relationship between inflation and stock market

performance in Kenya. In addition, Mwai (2013) analyzed the relationship between macroeconomic variables and share prices of companies listed at the Nairobi Securities Exchange and established that share prices were affected by various macroeconomic variables including the gross domestic product, interest rates, inflation and exchange rates. However, most of the studies carried out in Kenya combine inflation with other macroeconomic variables to determine their effect on stock market returns. Therefore, the need for this study, which aims to establish, what is the effect of inflation on stock market returns at the Nairobi securities exchange?

## 1.3 Research Objective

To determine the effect of inflation on stock market returns at the Nairobi securities exchange

## 1.4 Value of the Study

This study will help investors enhance the understanding of inflation and its effects on stock market returns and also help them make optimal asset allocation decisions during inflationary times. The study will also be of significance to various policy making institutions like the Capital Market Authority and the Nairobi Securities Exchange in Kenya as may use its findings and recommendation to generate effective policies to mitigate the effects of inflation on stock market returns. Finally, the findings of this study will be of benefit to researchers and academic scholars since the study will contribute to the available literature and knowledge on inflation and stock market returns.

# CHAPTER TWO: LITERATURE REVIEW

## 2.1 Introduction

This chapter explores the available literature on inflation and stock market returns as studied by various scholars across the globe. The section outlines the theoretical framework, the determinants of stock market returns, the empirical literature review and a summary of the literature reviewed.

## 2.2 Theoretical Literature Review

To investigate the relationship between inflation and stock market returns at the Nairobi Securities Exchange the study will explore the Fisher's theory, the inflation illusion hypothesis and the Efficient Market Hypothesis.

## 2.2.1 Fisher Effect Theory

The Fisher effect theory was formulated by Fisher (1930), and the theory presupposes that nominal interest rates fully reflect available information concerning the expectations of inflation. The theory is the basis for the idea that monetary policy should mainly focus on managing expectations of inflation in an attempt to keep real interest rate stable. This aims at promoting savings and investment (Laichena &Obwogi, 2015). The Fisher effect theory also states that the expected rate of return on common stocks comprises a real return and the expected rate of inflation. The real return on common stocks is assumed to be constant over time. It is assumed the negative returns will exactly outweigh the positive real return, the rate of the common stock are therefore expected to move one-on-one with the rate of inflation (Mahonye & Mandishara, 2014).

The Fisher effect presupposes that nominal rates of interest on financial assets should move one-to-one with expected inflation. Moreover, changes in both short-term and long-term rates are expected to affect the discount rate in the same direction through their effect on the nominal risk-free rate (Kuwornu, 2012). The Fisher hypothesis assumes that there is no relationship between real rates and monetary sector (Floros, 2004). However, the Fisher hypothesis, when studied using more real rather than nominal stock returns, suggests that real stock returns should be independent of inflation (Shanmugam &Misra, 2008). Generally, the Fisher theory presumes the nominal returns on financial assets should increase with the rate of inflation, whereas real rates of return are independent of the inflation rate. Thus, the Fisher effect theory as applied to stock returns presupposes an inverse relationship between stock returns to expected and unexpected inflation.

## 2.2.2 Inflation Illusion Hypothesis

The inflation illusion hypothesis of Modigliani and Cohn (1970) point's out, that the real effect of inflation is caused by money illusion (Omotor, 2011). The inflation illusion suggests that when expected inflation rises, bond yields duly increase, but because equity investors incorrectly discount real cash flows using nominal rates, the increase in nominal yields leads to equity under-pricing and vice versa (Owolabi & Adegbite, 2013). Accordingly, the Modigliani-Cohn (1970) hypothesis suggests that disinflation may itself generate mispricing by confusing stock market investors who are subject to inflation illusion. It also implies that a successful stabilization of inflation will reduce the volatility of mispricing and thereby contribute to the efficiency of the stock market (Campbell & Vuolteenaho, 2004).

The inflation illusion hypothesis also claims that stock market investors suffer from money illusion is a particularly intriguing and controversial proposition, as the stakes in the stock market are obviously very high. Thus, when inflation is high (low), the rational equity-premium expectation is higher (lower) than the market's subjective expectation, and the stock market is undervalued (overvalued) (Cohen, Polk & Vuolteenaho, 2005). Under the inflation hypothesis, an overly strong (weak) nominal discounting of future real cash flows in times of higher (lower) inflation expectations depresses (raises) current stock prices and thus leads to an undervaluation (overvaluation) of equity markets (Schmeling & Schrimpf, 2008). The Inflation illusion theory generally makes identical predictions about the forecasting power of inflation for asset returns in the stock market.

### 2.2.3 Efficient Market Hypothesis

The Efficient Market Hypothesis (EMH) was formulated by Fama (1970). The Efficient Market Hypothesis (EMH) is a financial theory that explains that information is quickly reflected in share prices such that investors are not able to earn excess risk adjusted returns (Njuguna, 2015). The core idea behind the EMH is that stock prices should fully reflect all new and available information in an unbiased manner to the market participants. Such markets deliver accurate signals for resource apportionment as market prices represent each security's basic worth, although deviations can occur (Rono, 2013). The efficient market hypothesis and rational expectations hypothesis are based on the idea of a perfect capital market.

The Efficient Market Hypothesis outlines three main dimensions of capital market efficiency: weak form, semi-strong and strong market efficiency, with each depending on

13

the information set available. The weak-form efficiency is based on the random walk hypothesis, where future price changes are independent of price changes in the past. Similarly, semi-strong form efficiency occurs when the information set is publicly available information while strong form efficiency occurs when the information set is all information, including insider information (Osei, 2015). According to Fama (1970), the theory of the EMH of financial markets holds that the security prices tend to fluctuate randomly around their intrinsic values, return quickly towards equilibrium, and fully reflect the latest information available.

The Efficient Market Hypothesis (EMH) is the most widely accepted model underlying the efficiency of capital markets (Mensaha, Adom & Berko, 2014). Market efficiency also ensures the efficient allocation of resources, in the sense that a firm's performance is reflected in its stock prices, which inform potential investors when to take optimal investment decisions (Mensaha, Adom & Berko, 2014). As such, events with a positive (negative) change in firm's future cash flows will have a positive (negative) impact on the stock price because investors will buy (sell) stocks (Scholer, Skiera & Tellis, 2013). According to the EMH stock market, return is the percentage change in stock price due to the arrival of new information. Thus, when new information on inflation becomes public, the market rapidly assimilates the new information's on inflation, which affects stock prices hence market returns.

## 2.3 Determinants of Stock Market Returns

The section examines interest rates, money supply, exchange rates and economic growth as the main determinants of stock market returns.

## 2.3.1 Interest Rates

The interest rate is defined as the price of savings determined by demand and supply of loanable funds (Obura & Anyango, 2016). The interest rate is a function of income. Its primary role is to help mobilize financial resources and ensure the efficient utilization of resources in the promotion of economic growth and development (Osoro & Ogeto, 2014). The interest rate can also be defined as the annual price charged by a lender to a borrower in order for the borrower to obtain a loan and is usually expressed as a percentage of the total amount loaned. The neoclassical theory of interest rate states that, the cost of loans for investment by entrepreneurs becomes costly when there is an upshot in interest rates, therefore, investment activities in an economy shrinks as a result (Barnor, 2014).

The interest rate is considered the cost of capital and an increase or a decrease in interest rate may affect the investment decision of the investors (Olweny & Omondi, 2010). Accordingly, Rehman, Sidek and Fauziah (2009) argue that higher interest rates or discount rates would reduce the present value of cash flows, hence a rise in the rate of interest increases the opportunity cost of holding cash, which later on leads to a substitution effect between stocks and other interest bearing securities like bonds. According to Barnor (2014), a rise in interest rate influences investing decisions, thus investors make changes in their investment structure, generally from capital market to fixed income securities

## 2.3.2 Money Supply

Money supply or money stock is the total amount of monetary assets available in an economy at a specific time. Money supply changes are a superior indicator and an

important source of information about the future of stock market returns or variability (Barnor, 2014). An increase in money supply leads to economic growth, stock prices would benefit from expansionary monetary policy. In another way, with the increase in money supply, the availability of liquidity at a lower interest rate increases, which can flow into the stock market (Rehman, Sidek & Fauziah, 2009). Humpe and Macmillan (2007) states that stock prices are influenced positively by industrial production and negatively by the money supply.

Sirucek (2013) explains that the most important factor influencing the development of stock prices in the long term is the amount of money in the economy since money supply can affect stock prices directly, when there is more money in the economy than can be utilized so they are allocated to investments. Additionally, Shiblee (2009) posits that changes in stock prices are predominantly set by changes in money supply thus an increase in the rate of growth of money supply strengthens the rate of increase in stock prices. Conversely, a fall in the rate of growth of money supply should slow down the growth momentum of stock prices.

### 2.3.3 Exchange Rates

Exchange rate is the rate at which one currency is being converted into another currency (Mohan & Chitradevi, 2014). Exchange rate changes can affect the relative prices, thereby the competitiveness of domestic and foreign producers. A significant appreciation of the domestic currency makes domestic goods expensive relative to foreign goods resulting in a shift of demand away from domestic to foreign goods. When currency appreciates, in a situation where the country is export-oriented, it is expected

that there will be a reduction in the competitiveness of her exports, and would therefore have a negative impact on the domestic stock market (Kirui, Wawire & Perez, 2014).

The appreciation of a country's currency lowers the cost of imported goods, which in most cases constitute a large part of the production inputs for emerging market countries (Kuwornu, 2012). Accordingly, when the domestic currency depreciates against foreign currencies, export product prices will decrease and, consequently, the volume of the country's export will increase, assuming that the demand for this product is elastic (Kuwornu, 2012). From a macro perspective, foreign exchange rate has an effect on the country's economy whereas from a micro perspective it affects the firms. As such, exchange rate volatility has implications on a country's financial sector, the stock market to be precise (Obura & Anyango, 2016).

## 2.4 Empirical Literature Review

This section present published and unpublished studies on inflation and stock market returns by various authors and scholars around the globe and also in Kenya.

### 2.4.1 Global Studies

Pinjaman and Aralas (2015) analyzed the impact of selected macroeconomic factors, namely Gross Domestic Product, exchange rate, interest rate, inflation rate, money supply, economic crisis and economic liberalization towards stock return volatility in Malaysia. The dynamic stock returns, volatility estimation established that stock return volatility is persistent in nature where previous shock will influence the current stock performance. The findings of the cross-sectional time series model revealed significant relationships of between Gross Domestic Product, exchange rate, interest rate, inflation

rate, money supply, economic crisis and economic liberalization and stock return volatility.

Saleem, Zafar and Rafique (2013) investigated the long run relationship between KSE 100 index return and inflation rate in Pakistani economy. The study used quarterly data from January 1996 to December 2011 and the Augmented Dickey Fuller (ADF) unit root test to find out the stationarity of the data at level or at first differences, the Johansen Cointegration Technique was used to determine the long term equilibrium relationship between inflation rate and stock prices. The study also used Granger Causality Test to find out the causal relationship between said variables. The evidence from cointegration test found a negative relationship between KSE 100 index return and inflation rate while the Granger causality tests established that there was no causality between KSE 100 index return and inflation rate in any direction.

Reddy (2012) explored the impact of real gross domestic product, interest rate and inflation rate on stock prices of quoted companies from 1997 – 2009. Using regression analysis the study established that real gross domestic product, interest rate and inflation rate accounted for 95.6% of the variation in stock prices. The study also revealed that a reduction in interest and inflation rate resulted in increased stock prices, increased real gross domestic product had a positive impact. The study recommended that the government should therefore implement policies that will reduce inflation rate and improve the standard of living of its citizens and interest rate should be made moderate to encourage investment and transactions in stock.

Kuwornu (2012) explored the effect of macroeconomic variables on the Ghanaian stock market returns using monthly data over the period January 1992 to December 2008. The

study employed the Johansen Multivariate Co-integration Procedure. The empirical results reveal that there is co-integration between the inflation, crude oil price, exchange rate and 91-day Treasury bill rate and stock returns in Ghana indicating long run equilibrium relationship. Further, the results revealed that; in the short run, Treasury Bill Rate and inflation rate significantly influences the stock returns. In addition, the study found out that in the end the stock returns are significantly influenced by inflation rate, crude oil prices, exchange rate, and the Treasury bill rate.

Floros (2004) examined the relationship between stock returns and inflation in Greece, The study focused on various econometric techniques to test the relationship, using monthly values of the Athens Stock Exchange Price index and the Greek Consumer Price index over the period 1988-2002. The results from a simple OLS model revealed a positive, but not significant relationship, however, using a system of equations including lagged values of inflation the study found a negative but not significant effect of lagged inflation to stock returns. In addition, using the Johansen cointegration test, the study found that there is no long-run relationship between stock returns and inflation in Greece and that the inflation rate is not correlated with stock returns.

## 2.4.2 Local Studies

Mugambi and Okech (2016) explored the impact of macroeconomic variables on stock returns of listed banks in the Nairobi Securities Exchange. The study employed secondary from the Central Bank of Kenya for a period 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, exchange rate and inflation

have significant impact on bank stock return, while GDP had an insignificant impact on bank stock returns. The study recommended that the government should ensure a stable macroeconomic environment and moderate its monetary policy interventions.

Laichena and Obwogi (2015) analyzed the effects of macroeconomic variables on stock returns in East Africa. The study examined the effects of interest rates, inflation rate, currency exchange rate, GDP and their impacts on stock returns in East Africa. The study used a panel data of 3 East African countries, Kenya, Uganda and Tanzania from 2005 to 2014. The findings of the study revealed that there was a significant relationship between the macroeconomic variables in the study and stock returns in East Africa. The study recommended that policymakers in East Africa should make efforts towards improving the macroeconomic conditions of the region to improve stock returns.

Barasa (2014) studied the the determinants of stock market performance at the Nairobi Securities Exchange. The study employed a descriptive research design and used secondary data for a period 2000 and 2013. The study findings revealed that the NSE 20-Share Index as well as CPI, money supply and GDP per Capita deteriorated just before, during and immediately after the general elections. The study also established that the relationship between inflation as measured using CPI and stock market performance was inverse. The study concluded that the relationship between inflation and stock market performance is inverse and insignificant.

Kirui, Wawire and Onono (2014) evaluated the relationship between gross domestic product, Treasury bill rate, exchange rate, inflation and stock market return in the Nairobi Securities Exchange. The study used the Engle-Granger two-step method was used to establish the Co integrating relationship between stock returns and the macroeconomic

variables and Threshold Generalized Autoregressive Conditional Heteroscedasticity model to capture the leverage effects and volatility persistence at the NSE. The study findings revealed that gross domestic product, inflation and the Treasury bill rate had insignificant relationships while exchange rate showed a significant relationship with stock returns.

Olweny and Omondi (2012) investigated the effect of macroeconomic factors on the stock return volatility on the Nairobi Securities Exchange. The study focused on the effect of foreign exchange rate, interest rate and inflation rate fluctuation on stock return volatility and used monthly time series data for 10 years from 2001 - 2010. The study employed Exponential Generalized Autoregressive Conditional Heteroscedasticity and Threshold Generalized Conditional Heteroscedasticity. The findings of the research revealed that foreign exchange rate, interest rate and inflation rate, affect stock return volatility.

## 2.5 Conceptual Framework

A conceptual framework is a graphical or diagrammatic representation of the relationship between variables in a study. The connection between inflation and stock market performance has been explained theoretical and empirically studies by several authors. Theoretically, the Fisher theory explains that equity stocks, which represent claims against the real assets of a business, may serve as a hedge against inflation thus investors would sell financial assets in exchange for real assets when expected inflation is pronounced. On the hand, the efficient market hypothesis explains that a market is efficient when it adjusts instantaneously to take account of all available information thus

information on changes in inflation may be reflected in stock prices, which may affect the stock market performance.

In addition, various empirical studies explain that stock market is responsive to changes in exchange rate, inflation rate, money supply, and real output and that there is a causal relationship between stock market returns and inflation. Thus, the independent variable for this study was inflation measured using the consumer price index while the dependent variable was stock market returns measured using share index. Interest rates, money supply and exchange rates formed the control variables. Figure 2.1 shows the conceptual framework for the study

**Figure 2.1 Conceptual Model**

**Independent variable**                          **Dependent variable**

| **Inflation** | **Stock market Returns** |
|---|---|
| Consumer price index | Market share index |

- Interest rates
- Money supply
- Exchange rates

**Control Variables**
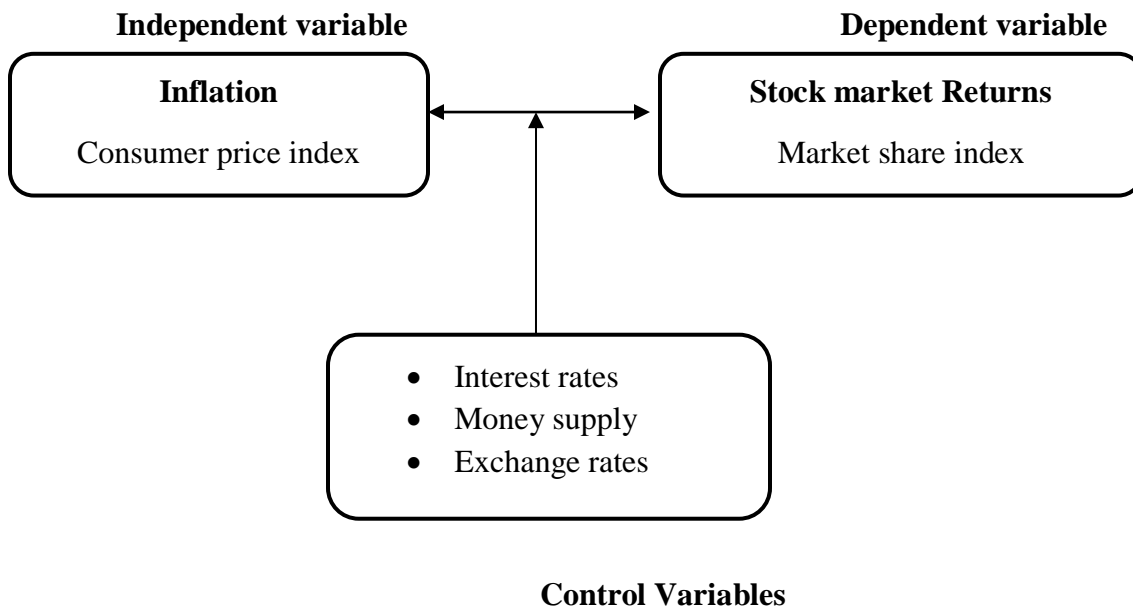
**Source: Researcher**

## 2.6 Summary of the Literature Review

The chapter has reviewed the Fisher theory, the inflation illusion hypothesis and the efficient market hypothesis. The Fisher effect theory presupposes that the general price level through corresponding increases in the nominal stock market returns and thus the real returns remain unaffected. However, the inflation illusion theory presupposes that if the market suffers from inflation illusion, then holders of rationally priced securities will liquidate their positions and tilt toward underpriced assets while the efficient market hypothesis postulates that stock markets gradually integrate into the world market, and prices react to world information and events like inflation. Thus, the reviewed theoretical explanations provide conflicting views on the effect of inflation on stock market returns

Additionally, most of the reviewed studies show that there is a connection between inflation and stock returns. International studies by Pinjaman and Aralas (2015), Barnor (2014), Reddy (2012) and Kuwornu (2012) investigated the relationship between inflation on stock market retuns. However, majority of the reviewed global studies examine the effect of inflation in combination with other macro-economic factors. In Kenya, studies by Mugambi and Okech (2016), Olweny and Omondi (2012), Laichena and Obwogi (2015) and Barasa (2014) also explored the relationship between various macroeconomic factors, inflation included on stock market performance. The reviewed local studies acknowledge that inflation is a major determinant of stock market performance, however the studies examine the effect of inflation in combination with other macro variables thus, the need to explore the effect of inflation on stock market returns independently in Kenya.

# CHAPTER THREE: RESEARCH METHODOLOGY

## 3.1 Introduction

This chapter reviews the procedures that will be used to carry out the study. The chapter previews the research design, study population, data collection and data analysis.

## 3.2 Research Design

A research design is defined as the blueprint through which a study is conducted while ensuring maximum control over the factors that may have an influence on the validity of the findings (Burns & Grove, 2003). According to Yin (2003), research design guides the researcher in the process of collecting, analyzing and interpreting observations, allowing them to draw inferences concerning causal relations among the variables under investigation. A research design is used to structure the research, display the functions of the major parts of the research project and explain the contribution of each part in addressing the central research questions (Troachim, 2008).

This study sought to analyze the effect of inflation on stock market returns at the Nairobi securities exchange. Thus, the study employed a descriptive research design. A descriptive research is concerned with the present and attempts to determine the status of the phenomenon under investigation. Sekaran and Bougie (2011) explains that descriptive study is undertaken in order to ascertain and be able to describe the characteristics of the variable of interest in a situation. Therefore, a descriptive research design helped in determining the causal relationship between inflation and stock market returns of firms listed at the NSE

## 3.3 Population of the Study

A population is a well defined or set of people, services, elements, events, a group of things or households that are being investigated (Kothari, 2004). The population of the study comprised the 65 firms listed at the Nairobi Securities Exchange, as at December 2015 thus a census of the 65 firms was undertaken (See appendix I).

## 3.4 Data Collection

This study used secondary data. Data on stock market returns and performance measured using the NSE 20 share index was obtained from the Nairobi securities exchange while data on inflation rates measured using the consumer price index, interest rates, money supply and exchange rates was obtained from the Central Bank of Kenya and the Kenya National Bureau of Statistics. The data covered a period of 10 years from January 2006 to December 2015.

## 3.5 Data Analysis

The data collected was analyzed using quantitatively using descriptive and inferential statistics using E-views version 8.0. Descriptive statistics of the study variables was computed and presented in the form of the mean, maximum, minimum and standard deviation whereas several inferential statistical models were used to draw conclusions.

## 3.6.1 Analytical Models

To analyze the relationship between study variables the study employed the augmented dickey fuller model, the granger causality test and finally the regression analysis

### 3.6.1.1 Augmented Dickey Fuller Model

The Augmented Dickey Fuller (ADF) test was applied to estimate the unit root. ADF tests normally check the stationarity series where; if the ADF statistics exceeded the critical value, the null hypothesis of unit root in the series was rejected.

### 3.6.1.2 Granger Causality Test

The Granger causality test was used to determine the relationship between two (or more) variables in order to observe the direction of causality. The Granger causality test was applied to test the causal relationship between inflation and stock market returns of the firms listed at the NSE.

### 3.6.1.3 Regression Analysis

Regression analysis was used to establish the relationship between the independent and dependent variable. The regression equation took the following form

$$Y = \beta_o + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + B_5 X_5 + \varepsilon$$

Where,

$Y$ = Stock market returns measured using the monthly NSE 20 share index

$X_1$ = Inflation measured using the monthly consumer price index

$X_2$ = Interest rates measured using monthly weighted average lending rate by commercial banks

$X_3$ = Money supply measured using monthly broad money supply (M3)

$X_4$ = Exchange rate measured using monthly average Kenya shilling per unit of US dollar

$\beta_o$ = Constant

$B_i$ = Coefficient

$\beta_1$ - $\beta_5$ = Regression Coefficients

$\varepsilon$ = Error term

## 3.6.2 Test of Significance

The study used the t and F-test to determine the statistical significance. The F-test was used to test the overall significance of the model, i.e. the goodness of fit while the t –test was used to test the significance of the regression coefficients at 5% level of significance.

# CHAPTER FOUR: DATA ANALYSIS, RESULTS AND INTERPRETATION

## 4.1 Introduction

This chapter outlines the analysis and presentation of the study findings. The chapter contains the descriptive statistics, the graphical analysis of the considered variables and the correlations. The chapter also presents the findings of the Augmented Dickey Fuller Test, ganger causality test, regression analysis and the interpretation of the findings.

## 4.2 Descriptive Statistics

Descriptive statistics comprises of the minimum and maximum values, the mean, the standard deviation and the graphical analysis of the findings.

## 4.2.1 Summary Descriptive Statistics

## Table 4.1 Summary Descriptive Statistics

|                      | Minimum | Maximum | Mean      | Std. Deviation |
|----------------------|---------|---------|-----------|----------------|
| Stock Market Returns | 8.100   | 8.600   | 8.39250   | .165464        |
| Inflation (CPI)      | 76.300  | 163.300 | 116.11000 | 28.005987      |
| Interest Rates       | 12.900  | 20.300  | 15.50250  | 2.081233       |
| Money supply         | 13.100  | 14.800  | 13.95000  | .518875        |
| Exchange rates       | 62.600  | 103.900 | 80.85500  | 10.270444      |

**Source: Research Findings**

Table 4.2 indicates that the mean value of the stock market returns was 8.39 whereas them average consumer price index was 116.11 while the average interest rates was 15.50 respectively. The findings also show that the average value of money supply was 13.95 and the average value of exchange rates was 80.8558 respectively.

## 4.2.2 Graphical Analysis

This part presents the graphical analysis of the study variables and comprises the graphs for NSE 20 share index, inflation, interest rates, money supply and exchange rates.

## 4.2.2.1 NSE 20 Share Index

The figure below shows the results :

**Figure 4.1 NSE 20 Share Index Trend**
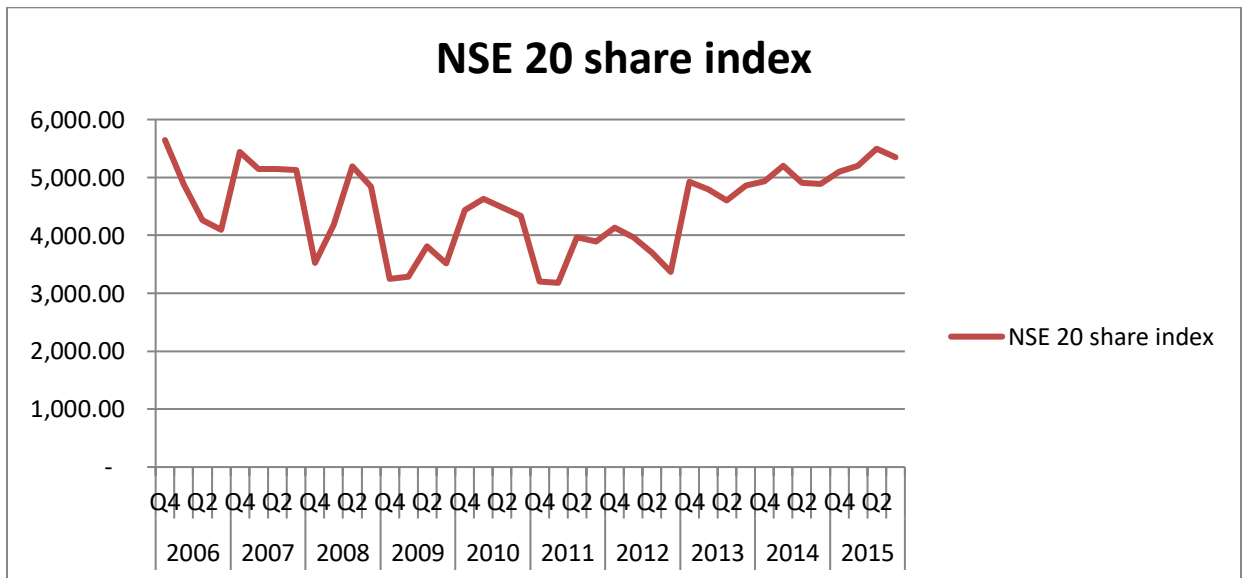


**Source: Research Findings**

Figure 4.1 shows the quarterly NSE 20 share index trend. The figure indicates that there have been fluctuations on the NSE 20 share index over the study period as from 2006 to 2015.

## 4.2.2.2 Consumer Price Index

The figure below illustrates the graphical analysis of the consumer price index from 2006 to 2015

## Figure 4.2: Consumer Price Index Trend
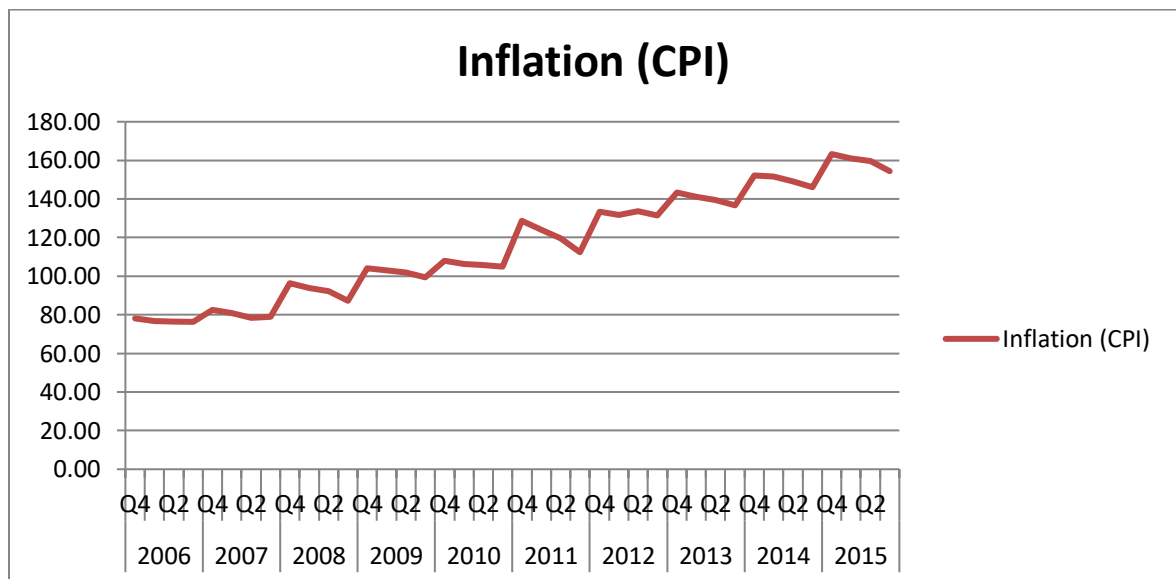


**Source: Research Findings**

The results on figure 4.2 shows that inflation had been increasing gradually from 2006 to 2015 but rising and falling fluctuations have also been witnessed.

## 4.2.2.3 Interest Rates

The figure below shows the trend of interest rates from 2006 to 2015

## Figure 4.3 Interest rates trend
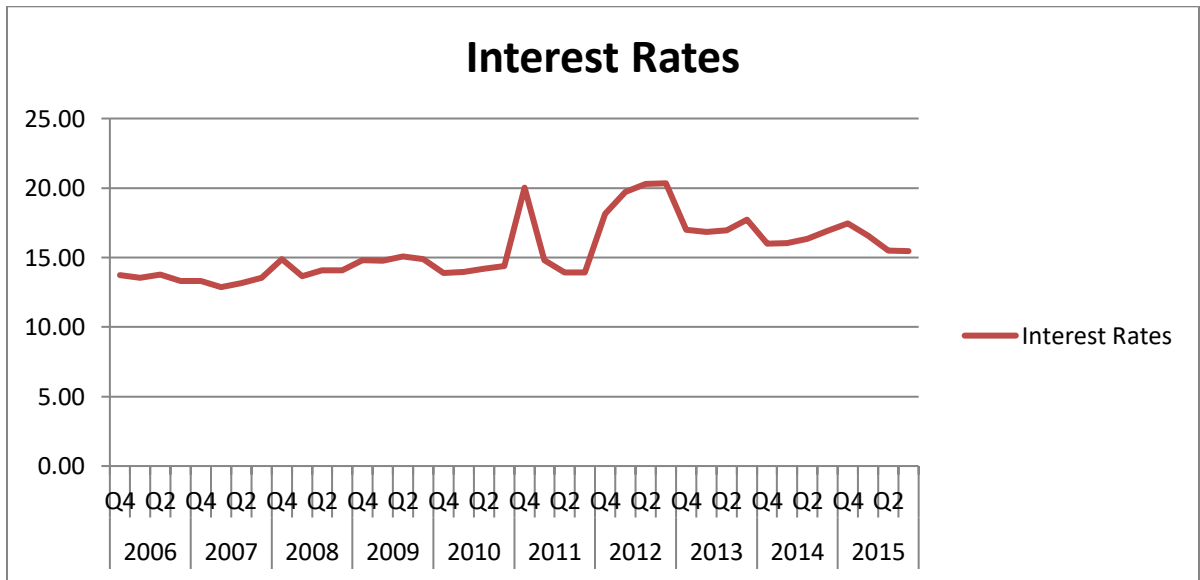


**Source: Research Findings**

Figure 4.3 indicates that the level of interest rates over the period 2006 to 2015 had been rising and falling with the highest increase being witnessed in 2010, 2012 and 2013 respectively.

## 4.2.2.4 Money Supply

Figure 4.4 shows the results obtained

**Figure 4.4 Money supply trends**
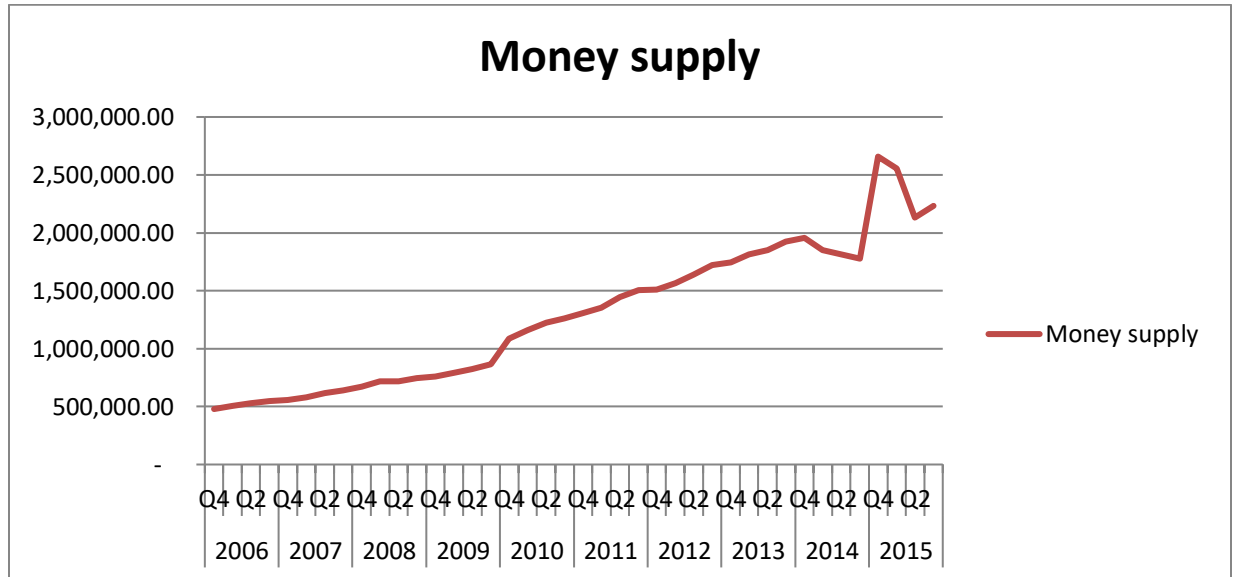


**Money supply**

**Source: Research Findings**

The results on figure 4.4 illustrates that trend of money supply has been steadily increasing from 2006 to 2015 but a decline had been witnessed in the fourth quarter of 2014 and sharp increase in the 2 quarter of 2015.

## 4.2.2.5 Exchange Rates

Figure 4.5 shows the graphical trend of exchanges rates from 2006 to 2015

**Figure 4.5 Exchange rates trend**
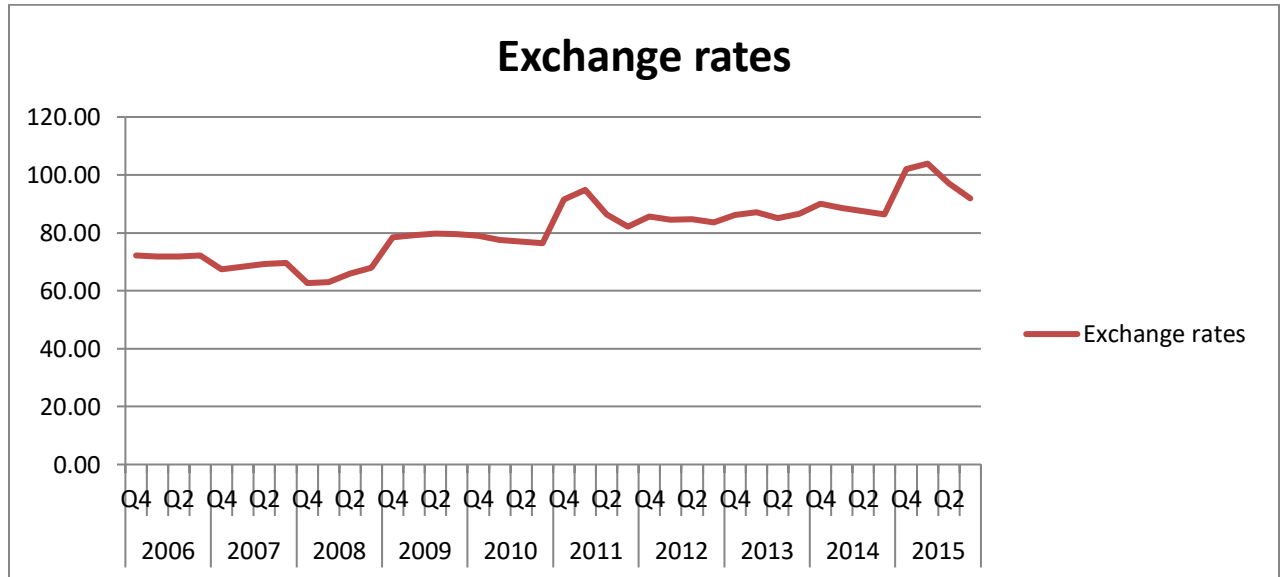


**Source: Research findings**

The results on figure 4.5 indicate that there had been fluctuations in exchange rates over the period. The figure also shows exchange rates had been rising steadily with the highest rise being in 2015.

## 4.3 Inferential Statistics

This section contains the correlations, the the Augmented Dickey Fuller Test, ganger causality test and regression analysis

## 4.3.1 Correlations

Correlation analysis was carried to establish the the nature and the strength of the relationship between the variable of the research. Table 4.2 shows the obtained correlation analysis results

## Table 4.2 Correlations

|  | Stock Market Returns | Inflation (CPI) | Interest Rates | Money supply | Exchange rates |
|---|---|---|---|---|---|
| Stock Market Returns | 1 |  |  |  |  |
| Inflation (CPI) | .132 | 1 |  |  |  |
| Interest Rates | -.267 | .688$^{**}$ | 1 |  |  |
| Money supply | .106 | .966$^{**}$ | .671$^{**}$ | 1 |  |
| Exchange rates | .028 | .893$^{**}$ | .593$^{**}$ | .879$^{**}$ | 1 |

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

**Source: Research Findings**

The results on table 4.2 indicate a positive correlation between stock market returns and inflation (CPI), money supply and exchange rates. The results also show that there is a negative correlation between stock market returns interest rates. This finding indicate that there is a positive correlation between inflation, money supply, exchange rates and stock market returns but a negative correlation between interest rates and stock market returns.

## 4.3.2 Augmented Dickey-Fuller (ADF) Unit Root Test

The Augmented Dickey-Fuller tests was employed to check the stationarity time series. Table 4.3 shows the results obtained.

## Table 4.3: Augmented Dickey-Fuller Test

| Null hypothesis: the time series has a unit root | | |
|---|---|---|
| **Augmented Dickey-Fuller test statistic** | **Stock market Returns** | **Inflation** |
| t-statistic | -3.37122 | -6.67233 |
| Prob.* | 0.007013 | 2.091e-008 |

*MacKinnon (1996) one-sided p-values

**Source: Research findings**

The findings on table 4.3 shows that the P values of stock market returns and inflation were 0.0070 and 2.091e-008, which are less than the significance value 0.05. This leads to the acceptance of the null hypothesis that the time series has a unit root.

## 4.3.3 Granger Causality Test

The Granger causality test was applied to test the causal relationship between inflation and stock market returns of the firms listed at the NSE. Table 4.5 illustrates the results obtained

## Table 4.4 Granger Causality Test

| Null hypothesis | F-statistic | Prob. | Casual inference |
|---|---|---|---|
| Inflation does not granger cause stock market returns | 19.373 | 0.0001 | Causality |
| Stock market returns does not granger cause inflation | 0.0038528 | 0.9508 | No causality |

**Source: Research Findings**

The results on table 4.4 indicates that there is a causal relationship between inflation and stock market returns since the P-value (0.0001<0.05). On the other hand, the results indicate that there is no causal relationship between stock market returns and inflation since the p-value (0.9508>0.05).

## 4.3.4 Regression Analysis

Regression analysis was used to establish the relationship between the independent variable, the control variables and the dependent variable. Table 4.6 shows the regression results

## Table 4.5 Regression Results

Model 1: OLS, using observations 1-40
Dependent variable: Stock Market Returns
Heteroskedasticity-robust standard errors, variant HC1

| | Coefficient | Std. Error | t-ratio | p-value | |
|---|---|---|---|---|---|
| const | 10.162 | 2.47431 | 4.1070 | 0.00023 | *** |
| Inflation (CPI) | 0.0075396 | 0.00386775 | 1.9494 | 0.05930 | * |
| Interest Rates | -0.053589 | 0.00873391 | -6.1357 | <0.00001 | *** |

| | | | | |
|---|---|---|---|---|
| Money supply | -0.081251 | 0.203267 | -0.3997 | 0.69179 |
| Exchange rates | -0.00842539 | 0.00749283 | -1.1245 | 0.26847 |
| Mean dependent var | 8.392253 | S.D. dependent var | | 0.169210 |
| Sum squared resid | 0.794612 | S.E. of regression | | 0.150676 |
| R-squared | 0.288398 | Adjusted R-squared | | 0.207073 |
| F(4, 35) | 12.18119 | P-value(F) | | 2.63e-06 |
| Log-likelihood | 21.61807 | Akaike criterion | | -33.23615 |
| Schwarz criterion | -24.79175 | Hannan-Quinn | | -30.18292 |

**Source: Research Findings**

The results on table 4.5 indicate that there is a significant positive relationship (B=0.0075) between inflation and stock market returns at the Nairobi Securities Exchange. The results also show that there is a significant negative relationship (B= -0.0536) between interest rates and stock market returns at the Nairobi Securities Exchange. Further, the results indicate that that there is an insignificant negative relationship (B = -0.0813 & -0.0084) between money supply and exchange rates at the Nairobi Securities Exchange.

## 4.4 Interpretation of the Findings

The study found that inflation significantly and positively influences stock market returns at the Nairobi Securities Exchange. This means that a unit increase in inflation positively affects stock market returns at the NSE by 0.0075 units, hence there is a direct relationship between inflation and stock market returns at the NSE. Similarly, Floros (2004) revealed a positive effect of lagged inflation on stock returns. Mugambi and Okech (2016) revealed that interest rate and inflation had a significant impact on stock returns. Olweny and Omondi (2012) revealed that inflation rate affects stock return volatility of firms listed at the NSE.

The study also found that interest rates significantly and negatively influences stock market returns at the Nairobi Securities Exchange. This means that a unit increase in interest rates negatively affects stock market returns at the NSE by 0.0536 units, hence there is an inverse relationship between interest rates and stock market returns at the NSE. Similarly, Rehman, Sidek and Fauziah (2009) argue that higher interest rates or discount rates would reduce the present value of cash flows, hence a rise in the rate of interest increases the opportunity cost of holding cash, which later on leads to a substitution effect between stocks and other interest bearing securities like bonds.

Further, the study established a negative and insignificant relationship between money supply and stock market returns at the Nairobi Securities Exchange. This means that a unit increase in money supply negatively affects stock market returns at the NSE by 0.0813 units, hence there is an inverse relationship between money supply and stock market returns at the NSE. Similarly, Humpe and Macmillan (2007) established that stock prices are influenced positively by industrial production and negatively by the money supply. Rehman, Sidek and Fauziah (2009) posit that the increase in money supply increases the availability of liquidity at lower interest rate increases, which can flow into the stock market.

The study also established a negative and insignificant relationship between exchange rates and stock market returns at the Nairobi Securities Exchange. This means that a unit increase in exchange rates negatively affects stock market returns at the NSE by 0.0084 units, hence there is an inverse relationship between exchange rates and stock market returns at the NSE. Similarly, Kirui, Wawire & Perez (2014) argue that when the currency appreciates, in a situation where the country is export-oriented, it is expected

that there will be a reduction in the competitiveness of her exports, and would therefore

have a negative impact on the domestic stock market.

# CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATIONS

## 5.1 Introduction

This chapter summarizes the research findings, provides the study conclusions and recommendations, presents the study limitations and suggests areas, which require further research.

## 5.2 Summary

The objective of this research was to determine the effect of inflation on stock market returns at the Nairobi Securities Exchange. The independent variable for this study was inflation measured using the consumer price index while the dependent variable was stock market returns measured using share index. Interest rates, money supply and exchange rates will formed the control variables. To investigate the relationship between inflation and stock market returns at the Nairobi Securities Exchange the study explored the Fisher's theory, the inflation illusion hypothesis and the Efficient Market Hypothesis.

The results of descriptive statistics established that mean value of the stock market returns was 8.39 whereas the average consumer price index was 116.11 while the average interest rates was 15.50 respectively. The findings also established that the average value of money supply was 13.95 and the average value of exchange rates was 80.8558 respectively. The trend analysis of the study variables established that there have been fluctuations on the NSE 20 share index over and that inflation had been increasing gradually while the level of interest rates had been rising and falling over the study

period. The study further revealed that the trend of money supply has been steadily increasing and there have been fluctuations in exchange rates over the period.

The correlation findings revealed a positive correlation between inflation, money supply, exchange rates and stock market returns but a negative correlation between interest rates and stock market returns. The results of the Augmented Dickey Fuller test (ADF) found that the time series had a unit root. The granger causality test found that there was a causal relationship between inflation and stock market returns but there was no causal relationship between stock market returns and inflation. The regression results found a significant positive relationship between inflation and stock market returns and a significant negative relationship between interest rates and stock market returns at the Nairobi Securities Exchange. The findings also found an insignificant negative relationship between money supply and exchange rates at the Nairobi Securities Exchange.

## 5.3 Conclusions

The findings of the study established that inflation significantly and positively influences stock market returns at the Nairobi Securities Exchange. This leads to the conclusion that inflation positively affects stock market returns hence, there is a direct relationship between inflation and stock market returns at the NSE. The findings also revealed that interest rates significantly and negatively influences stock market returns at the Nairobi Securities Exchange. This leads to the conclusion that interest rates negatively affects stock market returns hence there is an inverse relationship between interest rates and stock market returns at the NSE.

The findings of the study revealed a negative and insignificant relationship between money supply and stock market returns at the Nairobi Securities Exchange. This leads to the conclusion that an increase in money supply negatively affects stock market returns hence there is an inverse relationship between money supply and stock market returns at the NSE. The study further found a negative and insignificant relationship between exchange rates and stock market returns at the Nairobi Securities Exchange. This leads to the conclusion that an increase in exchange rates negatively affects stock market returns hence there is an inverse relationship between exchange rates and stock market returns at the NSE.

## 5.4 Recommendations for Policy and practice

The study concluded that inflation positively affects stock market returns. Based on this conclusion the study recommends that the government of Kenya should formulate policies on inflation to ensure that the rise of inflation does not affect stock market returns.

The study concluded that interest rates negatively affect stock market returns. As per this conclusion, the study recommends that the Central Bank of Kenya should formulate prudential guidelines to ensure the rise and fall of interest rates does not have adverse effect of stock market returns.

The study concluded that an increase in money supply and exchange rates negatively affects stock market returns. As per this conclusion, the study recommends that the Central Bank of Kenya should ensure that formulate policy mechanisms to ensure

increase in money supply and fluctuation in exchange rates have a minimal negative impact on stock market returns.

## 5.5 Limitations of the Study

The focus of this study was the relationship between inflation and stock market returns at the Nairobi Securities Exchange. Thus, the findings of this study are limited to stock returns of firms listed at the NSE and they may not be replicated in other stock exchanges. Additionally, the findings are limited to Kenya since the effects of inflation are different in various countries.

The study also used secondary data for a period of 10 years from 2006 to 2015 and consumer price index to measure inflation. However, data for such a long time is historic in nature and may not be representative of the current situation. In addition, inflation can also be measured using the inflation rate but this study used the consumer price index.

## 5.6 Suggestions for Further Research

This study used the regression model and the granger causality test to establish the effect of inflation on stock market returns at the Nairobi securities exchange. Thus, this study suggest an examination of the relationship between inflation and stock returns using other econometric models like the Johansen Cointegration Technique, Threshold Generalized Autoregressive Conditional Heteroscedasticity model (TGARCH) and Generalized Autoregressive Conditional Heteroscedasticity model (GARCH) to capture the effects of inflation persistence.

The study also was limited to stock market returns thus the study recommends an additional study on the effect of inflation on share price volatility to establish whether inflation causes share price volatility. An addition, study is also suggested on the effect of inflation on stock market returns of firms listed at the East Africa Securities Exchanges.

# REFERENCES

Adjei, B. (2015). Return and Volatility Spillovers among Stock and Foreign Exchange Markets: Empirical Evidence from selected African Markets. *Unpublished Thesis.* Lappeenranta University of Technology.

Aduda, J., Masila, J. M. & Onsongo, E. Y. (2012). The Determinants of Stock Market Development: The Case for the Nairobi Stock Exchange. *International Journal of Humanities and Social Science,* 2 (9), 214-230

Ahmad, M. I. & Naseem, M. A. (2011). Does Inflation Hurt the Stock Market Returns? Accessed online from https://www.researchgate.net/publication/228311038 on 27/6/2016

Alimi, R. S. (2014). Inflation and Financial Sector Performance: the Case of Nigeria. *Timisoara Journal of Economics and Business,* 7 (1), 55-69

Aliyu, S. U. R. (2011). Does inflation has an impact on Stock Returns and Volatility. Evidence from Nigeria and Ghana. Bayero University, Kano-Nigeria

Ariss, R. T. (2012). Understanding Inflation and Revising National Price Data. Lebanese Economic Association, Beirut- Lebanon.

Azar, S. A. (2014). The Determinants of US Stock Market Returns. *Open Economics and Management Journal,* 1, 1-13

Balparda, B., Caporale, G. M. & Gil-Alana, L. A. (2015). The Kenyan Stock Market: Inefficiency, Long Memory, Persistence and Anomalies in the NSE-20. *Working Paper No. 15-11.* Economics and Finance Working Paper Series

Barasa, J. W. (2014). Macroeconomic Determinants of Stock Market Performance in Kenya: Case of Nairobi Securities Exchange. *Unpublished MSc Project.* University of Nairobi

Barnor, C. (2014). The Effect of Macroeconomic Variables on Stock Market Returns in Ghana (2000-2013). Unpublished Dissertation. Walden University. Available at http://scholarworks.waldenu.edu/dissertations

Bemholz, P. (2003). Monetary Regimes and Inflation: History, Economic and Political Relationships. Cheltenham. Edward Elgar

Burns, R. B. & Grove, A. (2003). Business Research Methods and Statistics using SPSS. London. Sage Publications Limited.

Campbell, J. Y. & Vuolteenaho, T. (2004). Inflation illusion and stock prices. *American Economic Review,* 94 (2), 19-23.

Cohen, R. B., Polk, C. & Vuolteenaho, T. (2005). Money Illusion in the Stock Market: The Modigliani-Cohn Hypothesis. *The Quarterly Journal of Economics*, 639-668

Daferighe, E. & Sunday, C. S. (2012). The Impact of Inflation on Stock Market Performance in Nigeria. *American Journal of Social and Management Sciences,* 3 (2), 76-82

Erdugan, R. (2012). The Effect of Economic Factors on the Performance of the Australian Stock Market. *Unpublished Dissertation.* Victoria University, Melbourne

Floros, C. (2004). Stock Returns and Inflation in Greece. University of Portsmouth, UK

Humpe, A. & Macmillan, P. (2007). Can Macroeconomic Variables Explain Long-Term Stock Market Movements? A Comparison of the US and Japan. University of St Andrews

Ioannides, D., Katrakilidis, C. & Andreas, L. (2005). The relationship between Stock Market Returns and Inflation: An econometric investigation using Greek data. University of Macedonia

Kimani, D. K. & Mutuku, C. M. (2013). Inflation Dynamics on the Overall Stock Market Performance: The Case of Nairobi Securities Exchange in Kenya. *Economics and Finance Review,* 2 (11), 01 – 11

Kirui, E., Wawire, H. W. & Onono, P. (2014). Macroeconomic Variables, Volatility and Stock Market Returns: A Case of Nairobi Securities Exchange, Kenya. *International Journal of Economics and Finance,* 6 (8), 214-228

Kothari, C. R. (2004). Research Methodology: Methods and Techniques. New Age International (P) Limited, Publishers New Delhi

Kullaporn, L. & Lalita, R. (2010). Relationship between Inflation and Stock Prices in Thailand. *Unpublished Thesis*. Umea School of Business, Thailand

Kuwornu, J. K. M. (2012). Effect of Macroeconomic Variables on the Ghanaian Stock Market Returns: A Co-integration Analysis. *Agris on-line Papers in Economics and Informatics,* 4 (2), 1-12

Laichena, K. E. & Obwogi, T. N. (2015). Effects of Macroeconomic Variables on Stock Returns in the East African Community Stock Exchange Market. *International Journal of Education and Research,* 3 (10), 305-320

MacDonald, S. & Headlam, N. (2008). Research Methods Handbook: Introductory Guide to Research Methods for Social Research. Express Networks, Manchester.

Magnus, A., Krylova, E. & Vähämaa, S. (2004). Why does the Correlation between Stock and Bond Returns Vary over Time? European Central Bank

Mahedi, M. (2013). Impact of the Macroeconomic Variables on the Stock Market Returns: The Case of Germany and the United Kingdom. *Global Journal of Management and Business Research,* 12 (16), 1-13

Mahmood, I., Nazir, F., Junid, M. & Javed, Z. H. (2014). Stock Prices and Inflation: A Case Study of Pakistan. *Journal of Asian Business Strategy,* 4 (12), 217-223

Mahonye, N. & Mandishara, L. (2012). Stock Market Returns and Hyperinflation in Zimbabwe. *Investment Management and Financial Innovations,* 11 (4), 223 – 232

Mbulawa, S. (2015). The Impact of Inflation on Stock Market Performance in Zimbabwe between 1980 and 2008: An Empirical Investigation. *European Journal of Business, Economics and Accountancy,* 3 (4), 62-70

Mensaha, T., Adom, P. K. & Berko, M. P. (2014). Does Automation Improve Stock Market Efficiency in Ghana? *African Review of Economics and Finance,* 6 (1), 69–101

Mohan, C. & Chitradevi, N. (2014). Impact of Inflation and Exchange Rate on Stock Market Performance in India. *Indian Journal of Applied Research,* 4 (3), 230- 232

Mugambi, M. & Okech, T. C. (2016). Effect of Macroeconomic Variables on Stock Returns of Listed Commercial Banks in Kenya. *International Journal of Economics, Commerce and Management,* 4 (6), 390-418

Muiruri, P. N. (2014). Effects of Estimating Systematic Risk in Equity Stocks in the Nairobi Securities Exchange (NSE) (An Empirical Review of Systematic Risks Estimation). *International Journal of Academic Research in Accounting, Finance and Management Sciences,* 4 (4), 228–248

Muriuki, P. K. (2014). The Effect of Inflation and Interest Rates on Stock Market Returns of Firms Listed at the Nairobi Securities Exchange. Unpublished MBA Project. University of Nairobi.

Mwai, A. M. (2013). The Relationship between Macroeconomic Variables and Share Prices of Companies Listed at the Nairobi Securities Exchange. *Unpublished MBA Project.* University of Nairobi

Mwangi, M. & Mwiti, J. K. (2015). The Effect of Voluntary Disclosure on Stock Market Returns of Companies Listed at the Nairobi Securities Exchange. *International Journal of Business and Social Science,* 6 (1), 99-105

Njuguna, J. M. (2015). An Investigation of the Market Efficiency of the Nairobi Securities Exchange. *Unpublished Project.* University of South Africa

Obura, J. M. & Anyango, C. (2016). Moderating Effect of Interest Rates on Relationship between Foreign Exchange Rate Fluctuation and Performance of Nairobi Securities Exchange Market. *Universal Journal of Accounting and Finance,* 4 (2), 27-34

Olowoniyi A. O and Ojenike J.O. (2012). Determinants of Stock Return of Nigerian-Listed Firms. *Journal of Emerging Trends in Economics and Management Sciences,* 3 (4), 389-392

Olweny, T. & Omondi, K. (2011). The Effect of Macroeconomic Factors on Stock Return Volatility in the Nairobi Stock Exchange, Kenya. *Economics and Finance Review,* 1 (10), 34 – 48

Omotor, D. G. (2011). Relationship between Inflation and Stock Market Returns: Evidence from Nigeria. *Journal of Applied Statistics,* 1 (1), 1 – 15

Osagie, E.I. & Emeni, F. K. (2015). Inflation Rates, Financial Openness, Exchange Rates and Stock Markets Volatility in Nigeria. *ICAN Journal of Accounting and Finance,* 4 (1), 125-140

Osei, K. A. (2002). Asset pricing and information efficiency of the Ghana Stock Market. AERC Research Paper 115. African Economic Research Consortium, Nairobi, Kenya

Osoro, C. & Ogeto, W. (2014). Macro Economic Fluctuations Effects on the Financial Performance of Listed Manufacturing Firms in Kenya. *The International Journal of Social Sciences,* 20 (1), 26-40

Owidi, O. H. & Waweru, F. M. (2016). Analysis of Asymmetric and Persistence in Stock Return Volatility in the Nairobi Securities Exchange Market Phases. *Journal of Finance and Economics,* 4 (3), 63-73.

Owolabi, A. U. & Adegbite, T. A. (2013). Inflation and Capital Market Performance: The Nigerian Outlook. *Journal of Emerging Trends in Economics and Management Sciences,* 5 (1), 93-99

Phiri, A. (2016). Long run equilibrium adjustment between inflation and stock market returns in South Africa: A nonlinear perspective. Munich Personal RePEc Archive Available online at https://mpra.ub.uni-muenchen.de/70260/

Pinjaman, S. B. & Aralas, S. B. (2015). The Dynamic Stock Returns Volatility and Macroeconomic Factors in Malaysia: A Sectoral Study. *South East Asia Journal of Contemporary Business, Economics and Law*, 8 (3), 33 – 40

Rahman, A. A., Sidek, N. Z. M. & Fauziah, H. T. (2009). Macroeconomic Determinants of Malaysian Stock Market. *African Journal of Business Management,* 3 (3), 95-106.

Ritter, J. R. (2005). Economic Growth and Equity Returns. *Pacific-Basin Finance Journal*, 13, 489 – 503

Reddy, D. V. L. (2012). Impact of Inflation and GDP on Stock Market Returns in India. *International Journal of Advanced Research in Management and Social Sciences,* 1 (6), 120 - 136

Rono, C. H. (2013). Stock Price Reaction to Earnings Announcements: A Comparative Test of Market Efficiency between NSE Securities Exchange and JSE Securities Exchange. *Unpublished Thesis*. University of the Witwatersrand

Saleem, F. Zafar, L. & Rafique, B. (2013). Long Run Relationship between Inflation and Stock Return: Evidence from Pakistan. *Social Sciences and Humanities,* 4 (2), 407 – 415

Schmeling, M. & Schrimpf, A. (2008). Expected Inflation, Expected Stock Returns, And Money Illusion: What Can We Learn From Survey Expectations? Discussion Paper 2008-036. Center for European Economic Research, Mannheim, Germany

Schöler, L., Skiera, B. & Tellis, G. J. (2013). Stock Market Returns to Financial Innovations before and during the Financial Crisis in US and Europe. Goethe University

Shanmugam, K. R. & Misra, B. S. (2008). Stock Returns- Inflation Relation in India. Working Paper 38/2008. Madras School of Economics, India

Shiblee, L. (2009). The Impact of Inflation, GDP, Unemployment, and Money Supply on Stock Prices. Arab Bank – Syria

Shukairi, N.M., Waleed, A., AbdulBaset, H. & Marwan M. A. (2012). The Relationship between Inflation and Stock Prices (A Case of Jordan). *IJRRAS*, 10 (1), 46-52

Sireesha, P. B. (2013). Effect of Select Macro Economic Variables on Stock Returns in India. *International Journal of Marketing, Financial Services & Management Research,* 2 (6), 197-207

Širucek, M. (2013). The Impact of the Money Supply on Stock Prices and Stock Bubbles. Mendel University

Taofik, M. I. & Omosola, M. A. (2013). The Relationship between Stock Return and Inflation in Nigeria. *European Scientific Journal,* 9 (4), 146 – 157

Troachim, W. M. K. (2008). Research Methods: Knowledge Base. Mason OH.

Vena, H. (2014). The Effect of Inflation on the Stock Market Performance of the Nairobi Securities Exchange. *Unpublished MBA Project.* University of Nairobi

Wabwire, J. M., Owuor, G., Onyuma, S. & Njuguna, A. (2013). The Effect of Initial Public Offer Announcements on Market Returns of Listed Stocks at the Nairobi Stock Exchange. *International Journal of Research in Management*, 3 (2), 84-119

Wang F. (2012). Determinants of Chinese Stock Market Returns. *Unpublished MSc Thesis*. Universiti Utara Malaysia

Yin, R. K. (2003). Case Study Research Design and Methods. (3rd Ed.) Applied Social Methods Research Series

# APPENDICES

## Appendix I: Firms Listed at the Nairobi Securities Exchange

1. A.Baumann CO Ltd
2. Athi River Mining
3. Atlas Development and Support Services
4. B.O.C Kenya Ltd
5. Bamburi Cement Ltd
6. Barclays Bank Ltd
7. British American Tobacco Kenya Ltd
8. British-American Investments Company (Kenya) Ltd
9. Car and General (K) Ltd
10. Carbacid Investments Ltd
11. Centum Investment Co Ltd
12. CFC Stanbic Holdings Ltd
13. CIC Insurance Group Ltd
14. Crown Berger Ltd
15. Diamond Trust Bank Kenya Ltd
16. E.A.Cables Ltd
17. E.A.Portland Cement Ltd
18. Eaagads Ltd
19. East African Breweries Ltd
20. Equity Bank Ltd
21. Eveready East Africa Ltd
22. Express Ltd
23. Flame Tree Group Holdings Ltd
24. Home Afrika Ltd
25. Housing Finance Co Ltd
26. Hutchings Biemer Ltd
27. I&M Holdings Ltd
28. Jubilee Holdings Ltd
29. Kakuzi
30. Kapchorua Tea Co. Ltd
31. KenGen Ltd
32. KenolKobil Ltd
33. Kenya Airways Ltd
34. Kenya Commercial Bank Ltd
35. Kenya Orchards Ltd
36. Kenya Power & Lighting Co Ltd
37. Kenya Re-Insurance Corporation Ltd
38. Kurwitu Ventures
39. Liberty Kenya Holdings Ltd

40. Limuru Tea Co. Ltd

41. Longhorn Kenya Ltd

42. Marshalls (E.A.) Ltd

43. Mumias Sugar Co. Ltd

44. Nairobi Securities Exchange Ltd

45. Nation Media Group

46. National Bank of Kenya Ltd

47. NIC Bank Ltd

48. Olympia Capital Holdings ltd

49. Pan Africa Insurance Holdings Ltd

50. Rea Vipingo Plantations Ltd

51. Safaricom Ltd

52. Sameer Africa Ltd

53. Sasini Ltd

54. Scangroup Ltd

55. Standard Chartered Bank Ltd

56. Standard Group Ltd

57. Stanlib Fahari I-REIT

58. The Co-operative Bank of Kenya Ltd

59. Total Kenya Ltd

60. TPS Eastern Africa (Serena) Ltd

61. Trans-Century Ltd

62. Uchumi Supermarket Ltd

63. Umeme Ltd

64. Unga Group Ltd

65. Williamson Tea Kenya Ltd

**Source: Nairobi Securities Exchange**

# Appendix II: Research Data

| Year | Quarter | NSE 20 share index | Ln NSE 20 share index | Inflation (CPI) | Interest Rates | Money supply | Ln Money supply | Exchange rates |
|------|---------|--------------------|-----------------------|-----------------|----------------|--------------|-----------------|----------------|
| 2006 | Q4 | 5,646 | 8.64 | 78.27 | 13.74 | 478,763 | 13.08 | 72.16 |
|      | Q3 | 4,880 | 8.49 | 76.80 | 13.54 | 504,457 | 13.13 | 71.78 |
|      | Q2 | 4,260 | 8.36 | 76.39 | 13.79 | 528,507 | 13.18 | 71.80 |
|      | Q1 | 4,100 | 8.32 | 76.35 | 13.33 | 545,783 | 13.21 | 72.10 |
| 2007 | Q4 | 5,445 | 8.60 | 82.68 | 13.32 | 557,650 | 13.23 | 67.45 |
|      | Q3 | 5,150 | 8.55 | 80.90 | 12.87 | 581,440 | 13.27 | 68.35 |
|      | Q2 | 5,150 | 8.55 | 78.46 | 13.14 | 615,595 | 13.33 | 69.16 |
|      | Q1 | 5,130 | 8.54 | 78.90 | 13.56 | 638,440 | 13.37 | 69.60 |
| 2008 | Q4 | 3,521 | 8.17 | 96.38 | 14.87 | 673,720 | 13.42 | 62.65 |
|      | Q3 | 4,180 | 8.34 | 93.75 | 13.66 | 716,890 | 13.48 | 63.03 |
|      | Q2 | 5,190 | 8.55 | 92.14 | 14.06 | 719,543 | 13.49 | 65.93 |
|      | Q1 | 4,840 | 8.48 | 87.18 | 14.06 | 747,127 | 13.52 | 67.88 |
| 2009 | Q4 | 3,247 | 8.09 | 104.07 | 14.8 | 761,007 | 13.54 | 78.45 |
|      | Q3 | 3,290 | 8.10 | 102.90 | 14.76 | 789,807 | 13.58 | 79.25 |
|      | Q2 | 3,810 | 8.25 | 101.91 | 15.09 | 824,550 | 13.62 | 79.81 |
|      | Q1 | 3,520 | 8.17 | 99.50 | 14.87 | 866,800 | 13.67 | 79.58 |
| 2010 | Q4 | 4,433 | 8.40 | 108.07 | 13.87 | 1,086,504 | 13.90 | 78.94 |
|      | Q3 | 4,630 | 8.44 | 106.32 | 13.98 | 1,160,438 | 13.96 | 77.58 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Q2 | 4,480 | 8.41 | 105.65 | 14.19 | 1,224,547 | 14.02 | 76.98 |
| | Q1 | 4,340 | 8.38 | 105.01 | 14.39 | 1,261,646 | 14.05 | 76.49 |
| 2011 | Q4 | 3,205 | 8.07 | 128.81 | 20.04 | 1,305,511 | 14.08 | 91.52 |
| | Q3 | 3,180 | 8.06 | 123.88 | 14.79 | 1,355,670 | 14.12 | 94.85 |
| | Q2 | 3,970 | 8.29 | 119.56 | 13.91 | 1,444,592 | 14.18 | 86.33 |
| | Q1 | 3,890 | 8.27 | 112.41 | 13.92 | 1,505,853 | 14.22 | 82.21 |
| 2012 | Q4 | 4,133 | 8.33 | 133.35 | 18.15 | 1,509,222 | 14.23 | 85.71 |
| | Q3 | 3,970 | 8.29 | 131.78 | 19.73 | 1,564,173 | 14.26 | 84.61 |
| | Q2 | 3,700 | 8.22 | 133.63 | 20.3 | 1,640,561 | 14.31 | 84.76 |
| | Q1 | 3,370 | 8.12 | 131.36 | 20.34 | 1,723,349 | 14.36 | 83.54 |
| 2013 | Q4 | 4,927 | 8.50 | 143.25 | 16.99 | 1,744,233 | 14.37 | 86.15 |
| | Q3 | 4,793 | 8.47 | 140.99 | 16.86 | 1,815,433 | 14.41 | 87.17 |
| | Q2 | 4,598 | 8.43 | 139.46 | 16.97 | 1,849,167 | 14.43 | 84.98 |
| | Q1 | 4,861 | 8.49 | 136.72 | 17.73 | 1,924,700 | 14.47 | 86.50 |
| 2014 | Q4 | 4,936 | 8.50 | 152.09 | 15.99 | 1,957,492 | 14.49 | 90.04 |
| | Q3 | 5,199 | 8.56 | 151.62 | 16.04 | 1,850,994 | 14.43 | 88.49 |
| | Q2 | 4,906 | 8.50 | 149.27 | 16.36 | 1,814,700 | 14.41 | 87.43 |
| | Q1 | 4,885 | 8.49 | 145.99 | 16.91 | 1,779,118 | 14.39 | 86.33 |
| 2015 | Q4 | 5,100 | 8.54 | 163.27 | 17.45 | 2,658,200 | 14.79 | 102.08 |
| | Q3 | 5,200 | 8.56 | 160.93 | 16.57 | 2,556,000 | 14.75 | 103.89 |
| | Q2 | 5,500 | 8.61 | 159.71 | 15.48 | 2,133,400 | 14.57 | 97.01 |
| | Q1 | 5,346 | 8.58 | 154.48 | 15.46 | 2,234,800 | 14.62 | 91.81 |

**Source: Research Findings**