THE EFFECT OF INFLATION AND INTEREST RATES ON STOCK MARKET RETURNS OF FIRMS LISTED AT THE NAIROBI SECURITIES EXCHANGE

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DECLARATION

The research project is my original work and has not been submitted for the award of a degree at any other university.

Purity Kairuthi Muriuki ….....D61//**P/8557/2005** SIGNATURE……

The Research Project has been submitted for the examination with my approval as the University supervisor

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DEDICATION

This project is dedicated to my darling husband Silas Aduda, my children Sonia, Nathan and Shem.

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LIST OFABBREVIATIONS

ATS- Automated Trading System

BV- Book Value

CBK- Central Bank of Kenya

CPI- Consumer Price Index

GDP- Gross Domestic Product

NSE- Nairobi Securities Exchange

OLS- Ordinary Least Squares

ABSTRACT

Stock markets promote savings and investments by encouraging investors with surplus funds to invest them in additional financial instruments that better matches their liquidity preferences and risk appetite. The equity markets form a major component in the financial sectors of developing countries such as Kenya, which underlines their potency in contributing to economic growth and development. For investors, the bottom line is the returns they earn from their investments in the equity markets. This study thus sought to investigate the effect of inflation and interest rates on market returns at the Nairobi Securities Exchange. Applying secondary data from the Nairobi Securities Exchange and Central Bank of Kenya, this descriptive time series correlation study models monthly market returns as the dependent variable and monthly inflation rates, monthly interest rates, monthly spot exchange rates and month end market liquidity as the independent variables in an ordinary least squares (OLS) regression model. The study suggests that 66.9% of variations in markets returns are explained by variations in the dependent variables. The study establishes weak positive relationship between market liquidity and market returns. Statistically significant negative relationship is found between Inflation rates and market returns. There are also statistically significant positive relationship between interest rates and market returns as well as between spot exchange rates and market returns. The study thus recommends that policy makers should address any policy gaps that exist on the exchange rate, interest rate and inflation rate management which affects market returns and discourages investments at the bourse.

CHAPTER ONE: INTRODUCTION

1.1 Background of the study

Stock markets promote savings and investments by providing an avenue for portfolio diversification to both individual and corporate investors. These markets fuel economic growth through diversification, mobilizing and pooling of savings from different parties and availing them to companies for optimal utilization. The equity markets create a forum for trading in financial assets, whereby business firms are able to acquire investment funds through the issuance of shares; and thus facilitating them to meet their investment objectives. Stock markets, as Olweny and Kimani (2011) observed, encourage investors with surplus funds to invest them in additional financial instruments that better matches their liquidity preferences and risk appetite. In that respect, better savings mobilizations increases the savings rate, thereby stimulating investments and subsequently earning investment income to the owners of those funds. In addition, the liquid nature of these markets makes it possible for the investors to exchange ownership of securities, and reap capital gains in the process.

The effects of inflation on the stock market performance greatly influences the prices of financial assets which are essentially determined by the net earnings of a corporation, and are thence directly proportional to the performance of the company. A Highly inflationary environment therefore adversely affects the prices of stocks and the eventual returns. For instance, when inflation escalates interest rates also increase forcing the creditors to hike their lending rates in order to compensate for the stinging inflation. This eventually, plays a significant role in barricading accessibility to funds for investment purposes eventually negating the prosperity and growth of the stock markets (Kimani and Mutuku 2013).

The equity markets indeed form a major component in the financial sectors of developing countries such as Kenya, which underlines their potency in contributing to economic growth and development. Substantial evidence in support of stock markets as drivers of economic growth has been stipulated in economic literature (Bagehot 1873; Hicks 1969; Shaw 1973; King and Levine 1993). The importance of stock market

according to Falkena *et al*. (1988) can be justified by the following functions it performs namely to (1) channel savings in to investments, (2) to convert investments into cash thus supplying market liquidity, (3) to evaluate and manage securities. Nevertheless, evidence has shown that equities in industrialized countries have failed to maintain their value during periods of high inflation, and as Geetha *et al*. (2011) notes that during the rapid inflation years of 1970s, U.S. stocks prices did not keep pace with general price levels. This therefore gives this study the impetus to check whether the same case applies to a developing economy such as Kenya.

1.1.1 Inflation

Tucker (2007) refers inflation as an increase in the general price level of goods and services in the economy. Inflation is an increase in the overall average level of prices and not an increase in any specific product. The most widely reported measure of inflation is the consumer price index (CPI) which measures the changes of the average prices of consumer goods and services. Sloman and Kevin (2007) explain that inflation may be either demand pull inflation or cost push inflation. Demand pull inflation is caused by persistent rises in aggregate demand thus the firms responding by raising prices and partly by increasing output.

Cost push inflation is associated by persistent increase in the costs experienced by firms. Firms respond by raising prices and passing the costs on to the consumer and partly cutting back on production. Hendry (2006) agrees that inflation is the resultant of many excess demands and supplies in the economy. Tucker (2007) observed that there are many measures of inflation, because there are many different price indices relating to different sectors of the economy. Two widely known indices for which inflation rates are reported in many countries are the CPI, which measures prices that affect typical consumers, and the GDP deflator, which measures prices of locally-produced goods and services.

1.1.2 Interest Rates

An interest rate is described as the price a borrower pays for the use of money he does not own, and has to return to the lender who receives for deferring his consumption, by

lending to the borrower. Interest can also be expressed as a percentage of money taken over the period of one year (Devereux and Yetman 2002). An interest rate is very well stated as the rate of increase over time of a bank deposit. An Interest, which is charged or paid for the use of money, is often expressed as an annual percentage of the principal. It is calculated by dividing the amount of interest by the amount of principal.

Interest rates often change as a result of the inflation and Government policies. The real interest rate shows the nominal interest rate inflation. A negative real interest rate means that the nominal interest rate is less than the inflation rate (Gagnon and Ihrig 2004). Interest rate is the tool used by the central bank of a country to keep a check on any major currency fluctuation. An increase in interest rate is necessary to stabilize the exchange rate depreciation and to curb the inflationary pressure and thereby helps to avoid many adverse economic consequences.

1.1.3 Market Returns

The use of stock market indicator for the prediction of future economic growth or vice versa has been a debatable issue in finance and economics. It is commonly believed that large decreases in stock prices are reflective of future recession, and increasing stock prices are leading indicators of future economic growth (Mun, Siong & Thing 2008). For instance, the uncertainty embedded in the recession of 2009 triggered a large-scale drop in stock prices that was reflected in the Dow Jones and the S&P 500 (Fuentes 2010).

Stock market plays a major role in the growth and development of any economy. It provides companies with facility to raise capital for expansion and growth through the selling off of shares to the public or offering additional shares to shareholders through a rights issue. This is very crucial for the business as it offers them a cheaper and a competitive way of raising additional capital. The market also assist in the mobilization of resources especially savings and redirecting the same to productive activities in the economy thereby facilitating growth and development.

For the Government, the market plays a twofold role; it provides the Government with an avenue through which it can raise the much needed resources especially for the long term projects such as infrastructure development through the sale of bonds, and also act

as an economic barometer in that by looking at the movement in share prices and the stock market index, the Government can be able to gauge the performance of the economy at large and thereby initiate either monetary or fiscal measures that can assist in facilitating growth and development (Munga 2004).

1.1.4 Effects of Interest Rates and Inflation on Stock Market Returns

An interest rate is the rate at which interest is paid by a borrower for the use of money that they borrow from a lender (Bleaney *et al*, 2001). The interest rates and price changes are important variables in the macro-economy that are often monitored by economists and policy makers. The relationship between these variables has been subject to substantial research. Most of this research has focused on the influence of prices on the interest rate (Wilcox, 1983). Only a few studies have considered the impact of changes in the interest rate on price (Barsky and DeLong 1991). Despite intensive empirical studies and an extensive literature, the results of these studies have been contradictory and confusing. This contradiction is attributed, in part, to the complexity of the theoretical channels that explain the impact of the interest rate on price (Kandil 2005).

Inflation rate is defined as the rate at which prices generally increase (Bleaney *et al*. 2001). Inflation is intensely undesired. A high rate of inflation is considered as one of the most important problems facing a country. The basic reason for adopting price stability as the primary object of monetary policy is to create a stable and non-inflationary environment for resource allocation and to stabilize price expectations. Maintaining low inflation is seen as a necessary part of an effective anti-poverty strategy. The influence mechanism of interest rate on inflation can be explained in various ways. One method is to apply user cost of capital. The increased interest rate raises the user cost of capital (Branson 1979) that results in higher production costs. This changes raise inflation by shifting the aggregate supply curve to the left side. In addition, the changing interest rate affects inflation through influencing the money volume.

In the endogenous money models which money supply is a function of interest rate, the money supply is increased when interest rate goes up. Therefore, according to quantity theory of money, the more money supply results in inflation in the short- and long-run.

Although money supply has not significant effect on inflation in the recession period, however the impact of money supply on inflation is positive and significant in the medium– and long– run in normal conditions. The relationship between nominal and real interest rates indicates a positive relationship between inflation rate and nominal interest rate. This debate has presented by Douglas (before 1840s). Then, Thornton used this idea for explaining the nominal and real interest rates relationship. Marshal (1890) has introduced the relationship between nominal interest rate and inflation rate.

Clark (1895) believes in fixed real interest rate. In his view, nominal interest rate should be changed proportional with inflation rate. Irving Fisher (1896) explained theory of inflation and interest systematically. Booth and Ciner (2001) have studied the relationship between interest rate and inflation rate using co integration in 9 European countries and U.S. The conclusion supports the long-run relationship except for one case. Brazoza and Brzezina (2001); and Fave and Auray (2002) have confirmed a relationship between interest rate and inflation rate in the long run.

The early studies on the Fisher hypothesis mentioned above were mainly concerned with documenting and describing the nature of the relationship between stock returns and inflation, and not with any explanation of the results. Several alternative explanations have emerged. The Tax-Effect Hypothesis proposed by Feldstein (1980) argues that inflation generates artificial capital gains due to the valuation of depreciation and inventories (usually nominally fixed) subject to taxation. This increase corporate tax liabilities and thus reduces real after-tax earnings. Rational investors would take into account this effect of inflation by reducing common stock valuation. In this sense, inflation "causes" movement in stock prices. Although appealing, the Tax-Effect Hypothesis depends mainly on the United States tax regime, and there is evidence of negative stock returns and inflation relationships in countries with different tax laws, in which adjusted values of inventories and depreciation are considered for tax purposes (for example, Brazil and Israel).

Fama (1981) hypothesized that the anomalous relationship observed between real stock returns and inflation in the United States is a consequence of a "spurious" relationship:

negative stock returns-inflation relations are induced by the positive correlation between stock returns and real activity and the negative correlation between inflation and real activity –the Proxy Hypothesis. The argument hinges on the money demand behaviour of rational agents who perceive a fall in economic activity and therefore a decrease in money demand. This causes an excess money stock and thus inflation. In this sense, measures of real activity –such as output and capital expenditure –should dominate measures of inflation when both are used as explanatory variables for real stock returns in testing the Fisher Hypothesis. Fama (1981) provided some, but not definite, evidence on the validity of the Proxy Hypothesis.

1.1.5 Nairobi Securities Exchange

Nairobi Securities Exchange (formerly Nairobi Stock Exchange) history can be traced back to has a long history that can be traced to the 1920's when it started trading in shares while Kenya was still a British colony (IFC/CBK, 1984). In addition, while share trading was initially conducted in an informal market, there was a growing desire to have a formal market that would facilitate access to long-term capital by private enterprises and also allow commencement of floating of local registered Government loans. The NSE was constituted in 1954 as a voluntary association of stockbrokers registered under the Societies Act (NSE, 1997a).

Presently, the NSE comprises approximately 55 listed companies with a daily trading volume of over USD 5 million and a total market capitalization of approximately USD 15 billion. In addition, aside from equities, Government and corporate bonds are also traded on the Nairobi Securities Exchange and automated bond trading started in November 2009 with the KES 25 billion KenGen bond (Kestrel Capital (East Africa) Ltd, 2006; NSE, 2013). The average bond daily trading is USD 60m. Also, trading hours are from 09:00 to 15:00 and delivery and settlement is done scripless via an electronic Central Depository System (CDS) which was installed in 2005. Settlement is T+3, on a delivery-vs-payment basis and the daily price movement for any security in a single trading session shall not be more than 10% except during major corporate announcements.

Furthermore, the NSE in 2006 introduced an Automated Trading System (ATS) which ensures that orders are matched automatically and are executed on a first come/first serve basis. The ATS has now been linked to the Central Bank of Kenya and the CDS thereby allowing electronic trading of Government bonds. In addition, the aggregate foreign ownership limit of NSE listed companies is 75% and almost all NSE listed companies are open to additional foreign investment, including multinational subsidiaries. There are no foreign exchange controls in Kenya and also no capital gains tax with dividend withholding tax for foreigners is at 10% (Kestrel Capital (East Africa) Ltd, 2006)

In July 2011, the Nairobi Stock Exchange Limited changed its name to the Nairobi Securities Exchange Limited. The change of name reflected the strategic plan of the Nairobi Securities Exchange to evolve into a full service securities exchange which supports trading, clearing and settlement of equities, debt, derivatives and other associated instruments (www.nse.co.ke). In September 2011 the Nairobi Securities Exchange converted from a company limited by guarantee to a company limited by shares and adopted a new Memorandum and Articles of Association reflecting the change (www.nse.co.ke).

In Kenya, sixty (60) companies are listed in the NSE, which is the only stock exchange firm in the country. Listed companies fall into two main segments, the main market segment and the alternative investment market segment. The NSE has classified these companies into ten sectors: Agriculture, commercial and services, telecommunication and technology, automobiles and accessories, banking, insurance, investment, manufacturing and allied, construction and allied, energy and petroleum. (www.nse.com).

1.2 Research Problem

Undoubtedly, the changes in interest rates do have a diverse effect across the economic spectrum in any country. For instance, interest rates will impact the cost of doing business. The sectorial and economy wide effects of interest rates may ultimately be reflected in the stock prices. On the converse, performance of companies and businesses in Kenya may impact on economic growth. The economic growth may eventually affect levels of interest rates. Policy makers, scholars, economists, business owners, regulators

and the general Kenyan public are grappling with figuring out the relationship of stock prices and interest rates. Since the changes in interest rate have considerable effects on decision making of economic agents, it has been one of the main policy variables in macroeconomics; and it has attracted the attention of economic agents and participants to itself. On the other hand, various factors have influence on interest rate. One of the basic macroeconomic variables related with interest rate is inflation rate. Based on theoretic issues and empirical studies, there is bidirectional causality relationship between interest rate and inflation rate. Asgharpur *et al*. (2007) reported that some studies have rejected a strong bidirectional relationship between two-mentioned variables. The economic theories indicate that increased inflation rate gives rise to higher interest rate.

It is argued that inflation and stock prices are inversely related (Jaffe and Mandelker 1976; Bodie 1976; Nelson 1976; Fama and Schwert 1977). This is contrary to prior expectations by the Fisher hypothesis of a one to one increasing relationship between stock returns and inflation. Further empirical tests on the response of stock returns to inflation in the 1980s by Fama (1981), Gertler and Grinols (1982), and Solnik (1983), amongst others yielded similar results of negative relationship.

It is argued that there is an inverse relationship between interest rates and stock returns. Thorbecke (1997) and Smal and de Jager (2001) observe that a reduction in interest rates induces an injection of liquidity into the economy. This extra liquidity could be channeled to the stock market, driving up the demand and prices of stocks. Patelis (1997) notes that interest rate changes are helpful in predicting stock market returns over a long period. Thus, there is evidence to conclude that interest rate policies should also target stock market price movements.

There are, however, counterarguments that seek to show that interest rate changes may not be enough to influence stock-price misalignments. Bernanke and Gertler (1999, 2001) observe that the volatile nature of asset prices makes them hard to predict and that monetary authorities should only change interest rates in reaction to stock-price movements, when they expect such movements to affect inflation.

In Kenya, Sifunjo (1999) sought to establish the causal relationship between exchange rate and stock prices at NSE between 1993 and May 1999. The results showed a unidirectional causality from exchange rate to stock prices. Nyamute (1998) studied the relationship between stock prices and other financial variables like money supply, interest rates, inflation rates and exchange rates in Kenya. He found a positive relationship between stock prices and exchange rates However results from Sifunjo and Nyamute could have been obsolesced by passage of time owing to stock automation at NSE and introduction of the Central Depository System. In addition, Seile (2009) studied the relationship between stock market and selected macroeconomic variables in the NSE which included GDP growth rate, inflation, interest and Treasury bill rates. Results of the study reveal that market share index is positively related to inflation rate, Treasury bill rate and gross domestic product while it is negatively related to interest rate. However Siele (2009) used quarterly time series data this study will use monthly data.

Moreover, Kimani and Mutuku (2013) carried out a study on Inflation dynamics on the overall stock market performance, the Case of Nairobi Securities Exchange in Kenya and found out that the cointegrating model showed a negative relationship between inflation and stock market performance in Kenya. In addition the CDS was shown to have a positive and significant impact on the stock market performance. Waweru (2012) did a study analysis of the determinants of Stock Price Volatility at Nairobi Securities Exchange and concluded that a unit change in inflation rate leads to an increase in stock price. In addition a unit change in Interest rates leads to a decrease in stock price, while unit change in exchange rate results to a decrease in stock price.

There is a gap in studying Inflation, Interest rates and Stock returns in Kenya which this research seeks to fill. Hence the study seeks to answer the following research question: What is the effect of inflation and interest rates on returns at the NSE?

1.3 Research Objective

To establish the effect of inflation and interest rates on market returns at the Nairobi Securities Exchange.

1.4 Value of the Study

The study contributes to existing literature in several ways;

Financial Analysts**:** The findings of this research assist the fund managers to be able to offer sound advice to their clients on the current available investment opportunities available. The fund managers are able to establish what works more efficiently. An understanding of how inflation affects equity prices both in theory and in practice assists financial analysts in thinking about their strategic and tactical asset allocations. From a strategic standpoint, analysts may wish to consider an allocation to assets that preserves purchasing power during inflationary periods. From a tactical standpoint, the rise of inflation provides additional incentive for investors to diversify by region and by asset class, and to compare countries in terms of their inflation fighting capability.

Academicians: The study adds invaluable literature which forms a basis for future research in the academic world especially with respect to the factors that influence share returns.

Investors: The study findings may be useful to investors so that they are not misinformed on the investment decisions that they undertake. The study findings are insightful to investors on making better investment decisions.

Governments and Policy Makers: The study assists the policy makers to effectively understand the relationships between interest rates, inflation rates and investment returns. It assists policy makers in monitoring the levels of inflation as a macroeconomic policy tool and its direct effect on the shareholders wealth.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This chapter discusses other studies that have been conducted in the area of study. The areas covered include the theoretical framework empirical literature and summary.

2.2 Theoretical Review

There are different theories in this area of study each identifying own paradigm and concept about the exchange rates. The study is greatly interested in theories that identify its relationship between stock returns, interest rates and inflation. Highlighted below are some of such theories which include;

2.2.1 Inflation Illusion Hypothesis

Modigliani and Cohn (1979) money illusion hypothesis requires equity returns to decline in periods of inflation because investors use nominal rates of return to discount real future cash flows. In a landmark paper, "Inflation, Rational Valuation and the Market," they argued that investors fundamentally undervalued stocks in the 1970s because of two important cognitive errors: 1) they use nominal interest rates to discount real cash flows; and 2) they do not take into account the capital gain that accrues to equity holders of firms with fixed rate debt liabilities. The authors maintain that, "One should capitalize the current level of adjusted profits at the very same real rate that prevailed before the inflation, even though the nominal interest rate will have increased".

Modigliani and Cohn (1979) claim that stock market investors (but not bond market investors) are subject to inflation illusion. Stock market investors fail to understand the effect of inflation on nominal dividend growth rates and extrapolate historical nominal growth rates even in period of changing inflation. Thus when inflation rises, bond market participants increase nominal interest rates which are used by stock market participants to discount unchanged expectations of future nominal dividends. The dividend-price ratio moves with the nominal bond yield because stock market investors irrationally fail to adjust the nominal growth rate to match the nominal discount rate. From the perspective of a rational investor, this implies that stock prices are undervalued when inflation is high, and may become overvalued when inflation falls. The dividend yield that emerges

from the interaction of national and irrational investors is positively correlated with inflation and the long term nominal interest rate.

2.2.2 The Proxy Hypothesis

Fama (1965) comes up with a proxy hypothesis further explaining the negative relationship between stock prices and inflation. The negative relationship reflects the deterrious effects of inflation on the real economic activity. As evidenced during the rapid inflation yeas of 1970's, the US stock price levels thus indicating that equities in the industrialized economies have failed to maintain their value during periods of high inflation.

Fama (1981) further argues that the relationship between high rates of inflation and future real economic growth rates is negative. He claims that the negative stock return inflation relation is spurious as a result of a negative relation between inflation and real activity. By contrast, there is a positive relationship between stock returns and anticipated growth rates of real economic activity. As inflation accelerates, investors anticipate slower and more volatile economic growth and require a higher risk premium.

Investor expectations of more volatile macro-economic performance help to shape their perceptions of long term earnings growth. Fama *et al* (1983) concluded that there is a negative relationships between the stock returns and inflation and refer to this as the 'proxy effect'. They explained the proxy effect in the sense that a reduction in the economic activity negatively affects the future corporate profits and stock prices. Fama, argues that the proxy effect vanishes when real economic activity does not fail because of inflation.

2.3 Determinants of Market Returns

The stock market is all about dynamics and that is why investors and fund managers have been time and again confronted with the problem of accurately predicting the stock prices so as to earn decent returns (Malhotra & Tandon 2013). They further posit that Investment in shares offers the benefit of liquidity as well as the opportunity to beat the market and earn high returns. But the task of predicting share prices is far from simple.

Share price movement is not independent in nature and both intrinsic as well as extrinsic factors have been established to exercise influence over stock price movements.

2.3.1 Market liquidity and Stability

When the market is less liquid, there are no funds to buy shares and hence share prices go down especially when supply is high. During financial crises, stock market information is very sensitive and hence share prices are volatile. Stock prices normally decline during the subscription period and when companies announce rights issues.

Also, stock markets include laws that govern insider trading because this can also lead to share price volatility. Insider dealing is trading of stocks by people within the company who have important information about the direction the company is taking (Shauna 2003). The public may deduce that when the insiders are buying or selling shares of their own companies, they have some important information about the companies that drive them to do so (Sunde & Sanderson 2009).

2.3.2 Investor Sentiments

Share price movements are also explained by the perceptions of the investors. For example in a bull market share prices are expected to rise and in a bear market they are expected to fall. Investor sentiments may be demonstrated through the seasonality of stock markets. For instance, share prices are usually anticipated to fall during the festive season. This compels some investors to redeem their shares just before the beginning of the festive season so as not to experience capital losses (Sunde & Sanderson 2009).

The level of confidence of the investors in the general economy and economic policies of the country also impact on the share prices. For example, the land reform program, social unrest and policy reversals that were experienced between 1997 and 2001 negatively affected the stock market, as investors were uncertain about the direction the economy was taking (Shauna 2003). Uncertainties of this nature may also affect the global markets, for example, just after the 11th of September 2001 attack on the USA major world stock markets recorded their lowest volumes of trade.

2.4 Empirical Literature Review

Studies have been conducted on the relationships between interest rates, inflation and stock market returns both in Kenya and internationally. This section provides a review of these studies.

2.4.1 International evidence

In Africa, Jefferis and Okeahalam (2000) examine the effect of macroeconomic factors on stock markets in South Africa, Zimbabwe, and Botswana. They found that stock prices have a positive long-run relationship with real GDP, and real exchange rate in South Africa and Zimbabwe and a short-run relationship with exchange rate and interest rates in Botswana. Stock prices are also negatively related to interest rates in South Africa. Mok (1993) by ARIMA approach and verified by Granger causality test examined the causality of daily interest rate, exchange rate and stock prices in Hong Kong for the period 1986 to 1991. The result concluded that the HIBOR (Hong Kong Interbank offered rate) and the price indices are independent series. As a further extension to the study the relationship between exchange rate and stock price was examined, the research concluded that those series are independent.

Chen and Jin (2004) conducted a multivariate analysis on twenty portfolios of the New York Stock Exchange (NYSE) using a set of economic variables. Chen and Jin (2004) applied conditional mean encompassing test for model specification with the assumption that it is robust to heteroscedasticity. The specific economic variables that were included in the model were term structure of interest rates, the change in expected inflation, contemporaneous unexpected inflation, and monthly growth rate in industrial production, lags of the above six economic variables. The dependent variable was the lag of excess rate of returns. The authors concluded that the conditional excess rates of returns are explained by lagged expected inflation, lagged unexpected premium for default, lagged unexpected change in term structure, a seasonal dummy, and lagged market returns.

The study by Chen and Jin (2004) is similar to our study to the extent that both studies attempt to establish the determinants of stock returns a. However, the two studies differ because the current study focuses on a developing economy and the economic variables in developing economies may affect stock returns differently. In addition, the current study uses a panel data analysis and in particular a random effect generalized least squares (GLS) while the study by Chen and Jin (2004) used a simple multivariate regression analysis.

Abugri (2006) performed a study to determine whether selected macroeconomic indicators like exchange rates, interest rates, industrial production and money supply in four Latin American countries significantly explain market returns. His research results indicated that the global factors are consistently significant in explaining returns in all the markets. The country macroeconomic variables are found to impact the markets at varying significance and magnitudes.

Robert (2008) while conducting a study on the effect of macroeconomic variables on stock market returns for four emerging economies of Brazil, Russia, India and China affirmed that there was no significant relationship between present and past market returns with macroeconomic variables, suggesting that the markets of Brazil, Russia, India and China exhibit weak form of market efficiency. Also, no significant relationship was found between respective exchange rate and oil price on the stock market index prices of the four countries studied. Coleman and Tettey (2008) while examining the impact of macroeconomic variables on Ghana Stock Exchange using quarterly data for the period 1991 to 2005 concluded that market lending rates from deposit money banks have adverse effect on stock market performance. The study also found inflation to be negatively related to stock market performance and this effect takes time because of the presence of a lag period.

Bai and Green (2008) used data from 13 emerging stock markets (ESM's) for the period 1984 to 2004 to investigate the determinants of cross sectional stock returns variations in emerging markets. The random effects regression was used in the analysis. According to

the results, the exchange rate changes had a negative relationship with country effects. An increase in exchange rate changes by 1 unit led to a decline in stock returns by 52.8%. Inflation had a positive association with country effects with a 1 unit in inflation leading to a 1.8% rise in stock returns. A 1 unit increase in activities of financial intermediary led to 0.6% decrease in stock returns. The activity of the stock market appeared to be positively related to stock returns and a one-unit increase in it led to 2.2% increase in stock returns.

Koubi (2008) studied the determinants of financial development and stock returns using a sample of 49 countries for the period 1980 to 1999. The study found that both high transactions and legal uncertainty have a negative effect on stock market stability. The effect of transaction costs was economically more significant (about twice the size of the effect of the latter). Finally, while exchange rate and general economic volatility also destabilized stock returns, capital controls and the degree of openness had little influence.

Jiranyakul (2009) did a study on the relationship between macro-economic variables and the Thai stock market Index. The study used quarterly data covering the period 1993 q1 and 2007q4. The study adopted Multivariate Time series regression analysis using unit roots tests; co-integration test using a two-step Engle and Granger (EG) co-integration test; and the Johansen Co-integration test. Additionally, a vector error correction method was used to determine the relationship between the long run and short run relationships between macro variables and stock returns. The results revealed that the variables are co-integrated, and this implied that there exists a long-run relationship between the stock market index and a set of four macroeconomic variables. Additionally, real GDP, money supply, and nominal effective exchange rate had a significant positive impact on the stock market index. The price level had an insignificantly negative impact. The 1997 financial crisis had no influence on stock prices.

Using large sample evidence, Artmann, Fitner and Kempf (2010) studied the determinants of stock market returns in the German market. The sample considered in the study consisted of 955 German stocks for the period 1963 to 2006. The study adopted the

Fama and French 3 factor model, the Alternative 3 factor model and the Cahart four factor models. The results obtained using Fama and French 3 factor model revealed a significant positive relation between average returns and book-to-market equity, earnings-to-price, and momentum.

Siddiqui (2010) modeled uncertainties and investments as determinants of stock returns in Pakistan insurance firms. This study was based on unbalanced panel data for the period 1996 to 2008, obtained from a sample of 13 insurance firms listed at the Karachi Stock Exchange. The methodology used in the analysis included Engle-Granger causality tests and panel data fixed and random effects regression. Panel data results indicated that there exists a statistically significant positive effect of uncertainty on returns both in the short and the long runs.

Wang, *et al.* (2010) investigated the factors that determined stock returns in the 1987 and 2008 US stock market meltdowns using multivariate regression analysis. The study focused on the contribution of technical insolvency risk and the bankruptcy risk to stock returns. The results indicated that stocks with higher betas, larger market capitalization, and greater return volatility lost more value in both meltdowns. They also found that the market-to-book ratio was a significant determinant of stock returns in the 2008 meltdown but not in the 1987 meltdown. Additionally, stock illiquidity was found to be a significant determinant of stock returns in the 1987 meltdown but not in the 2008 meltdown.

Using quarterly data for the period 1998 to 2009, Eita (2011) investigated the factors that determine stock market prices in Namibia. The results indicated that the main determinants of stock prices were economic activity, exchange rate, inflation, interest rate, money supply. A positive relationship was found between stock market prices, money supply, and economic activity. An increase in inflation led to a decrease in stock market prices. Similarly, a rise in interest rates led to a decline in stock prices.

2.4.2 Local Evidence

In addition, Nyamute (1998) studied the relationship between stock prices and other financial variables like money supply, interest rates, inflation rates and exchange rates in Kenya. He found a positive relationship between stock prices and exchange rates. However, his research performed data analysis on non-stationary series which may adversely affect the validity of the results. Also, Sifunjo and Mwasaru (2012) analyzed the casual relationship between NSE stock prices and foreign exchange rate using monthly data from November 1993 to May 1999. Johansen consideration procedure and error correction model were used for analysis. The empirical results indicate that in Kenya, nominal exchange rate of shillings per dollar Granger causes stock price. The study also found out a unidirectional causality from exchange rates to stock prices. 19 Therefore, the movements in exchange rates exert significant influence on stock price determination in Kenya.

In addition, Waweru (2012) carried out analysis of the determinants of stock price volatility at Nairobi Securities Exchange. From the findings, the coefficients on Interest rate were -34.818, exchange rate was -119.475 and the coeficient for inflation was 32.204. These findings mean that a unit change in inflation rate leads to an increase in stock price. In addition a unit change in Interest rates leads to a decrease in stock price, while a unit change in exchange rate results to a decrease in stock price

A study done by Kimani and Mutuku (2013) to investigate the impact of inflation, Central Depository System (CDS) and other macroeconomic variables (including deposit rate, gross domestic product terms of trade and the net effective exchange rate) on the Nairobi stock market performance using quarterly data from the Central Bank of Kenya (CBK) and the Nairobi Stock Exchange (NSE) for the period December 1998 to June 2010. The Unit root test based on the formal ADF test procedure revealed that the set of variables was a I (1) process while the Johansen-Juselius VAR based cointegration test procedure revealed more than 4 cointegrating relationships. Consequently, an error correction model was estimated revealing that 27 percent of the departure from equilibrium is cleared quarterly. The cointegrating model indeed showed that there is a

negative relationship between inflation and stock market performance in Kenya. In addition the CDS was shown to have a positive and significant impact on the stock market performance.

2.5 Summary of Literature Review

The linkage between stock market returns and inflation if any has drawn the attention of researchers and practitioners alike. The foundation of the discourse is the Fisher (1930) equity stocks proclamation. According to the generalized Fisher (1930) hypothesis, equity may serve as a hedge against inflation. If this holds, then investors could sell their financial assets in exchange for real assets when expected inflation is pronounced. In such a situation, stock prices in nominal terms should fully reflect expected inflation and the relationship between these two variables should be positively correlated. This argument of stock market serving as a hedge against inflation may also imply that investors are fully compensated for the rise in the general price level through corresponding increases in nominal stock market returns and thus, the real returns remain unaltered. The appropriate direction of the relationship or the neutrality between inflation and stock market returns relationship have equally generated a large body of evidence in the empirical literature and until now consensus has not been met.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

This chapter outlines the methods adopted by the study in establishing the effects of interest rates and inflation on market returns in the Kenyan stock exchange market. The chapter also describes and explains the research instruments that were used in the study.

3.2 Research Design

This investigation is a descriptive time series correlation study with monthly market returns as the dependent variable while the independent variables are: the monthly inflation rates, monthly interest rates, monthly spot exchange rates and month end market liquidity. Webb, Campbell, Schwartz, and Sechrest (1966) posit that a time series study is descriptive in nature. This descriptive nature is particularly imperative when a variable being studied extends over a considerable time period. It is the only research design that considers a continuous record of fluctuations in study variables over an entire period in which the variables are being studied.

3.3 Data Collection

The data set consisted of monthly observations of the closing share price index, inflation rates, interest rates, exchange rates and market liquidity. Time series secondary data is used in the study. Monthly data on the Nairobi Securities Exchange Index is obtained from the Nairobi Securities Exchange. Monthly data on interest rates, inflation rates and exchange rates are obtained from the Central Bank of Kenya and the Kenya National Bureau of Statistics.

3.4 Data Analysis

The data analysis entailed entering the data in SPSS (21.0). Data was cleaned for analysis purposes. Both descriptive and inferential statistics were used to test the effects of inflation and interest rates on market returns.

3.4.1 Analytical Model

The market returns were derived from the end of month share indices as:

$$Market\ \ \text{Re}\ turn_{t} = \left(\frac{Index_{t} - Index_{t-1}}{Index_{t-1}} \right) \text{.....Equation 3.1}$$

The returns are then regressed against the monthly interest rates, inflation rates, exchange rates volatility and liquidity. Here the linear relationship between the dependent and the independent variables is determined through panel approach for the regression analysis and inferences will be drawn based on the regression analysis.

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + e \text{.....Equation 3.2}$$

Where:

Y = Stock Returns, measured standard deviation/variance

X_1 = Interest Rates, measured by nominal interest rate

X_2 = Inflation, measured by consumer price index

X_3 = Market Liquidity

X_4 = Exchange rate volatility

β_0 = Constant variable

e = error/term or variable which represents all the factors that affects the dependent variable but were not included in the model either because they were difficult to measure or not known.

βi , β_2 = Coefficients of the independent variables, define the amount by which Y (response variable) is changed for every unit of change in the predictor variable.

β_0 is estimated by OLS (Ordinary Least Squares) method.

3.4.2 Test of Significance

T-tests are used to test the significance of the relationship between stock price or returns and the determinant variables. Also, the researcher's interest was to determine if an increase or decrease in stock returns is considerably related to a decrease or increase in independent variables i.e. Interest rates, Inflation rates, market liquidity and exchange rate volatility.

CHAPTER FOUR: DATA ANALYSIS, RESULTS AND DISCUSSION

4.1 Introduction

This chapter discusses the results of the analysis and findings of the study with reference to the study objectives. The first section of the chapter discusses a description of the data used in the analysis. The second section discusses the findings of the study as presented in tables and figures that help to explain the results of the data analysis. The third section of the chapter is a summary of findings and interpretation of the results of the study. The objective of the study was to establish the effect of inflation and interest rates on stock market returns at the Nairobi Securities Exchange. The researcher intended to establish the causal relationship among the variables under study i.e. dependent variable as stock market returns and independent variables as interest rates, inflation rates, spot exchange rates and market liquidity. Secondary data obtained from the Nairobi Securities Exchange, Central Bank of Kenya and the Kenya National Bureau of Statistics was compiled and analyzed in the Statistical Package for Social Sciences (SPSS).

Hence, the statistical techniques discussed in chapter three were used to analysis the data of this study. The results of the various statistical tests which are presented in detail in this chapter, provide answers to the research questions raised in chapter one.

4.2 Descriptive Statistics

Descriptive statistics was used to reduce the data to a manageable size and to provide insights into the pattern of the trend of the data. The descriptive statistics techniques used in the study include range, sum, mean and standard deviations.

Table 4.1: Descriptive Statistics

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
MARKET RETURNS	60	2474.75	5100.88	3912.3143	668.76706
INTEREST RATES	60	.47	3.02	1.9496	.62178
INFLATION RATES	60	3.18	19.72	8.8113	4.95427
SPOT EXCHANGE RATE	60	76.23	105.75	88.3205	7.26118
MARKET LIQUIDUTY	60	20240.00	87454.00	46857.6667	19923.05159
Valid N (listwise)	60				

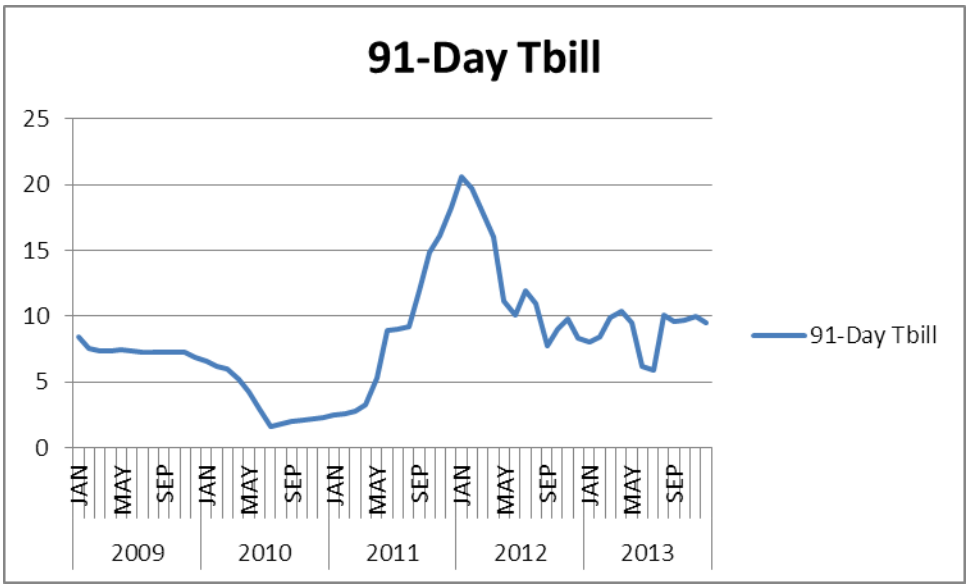
Source: Research Findings

Note: Std. Dev = Standard Deviation

Table 4.1 above shows the descriptive statistics for the variables under study with 60 observations each form the time series data and industry. As indicated in table 4.1 above, the market returns ranged from 2474.75 to 5100.88 with an average of 3912.3143 and a standard deviation of 668.76706. The mean interest rate was 1.9496, mean inflation rate was 8.8113 and the mean spot exchange rate was 88.3205. The mean market liquidity measured in terms of bond turnover was Kshs 46,857,666.70 during the period under study.

The trend in interest rates, inflation rates and spot exchange rates over the years is presented in figure 4.1, 4.2 and 4.3 below.

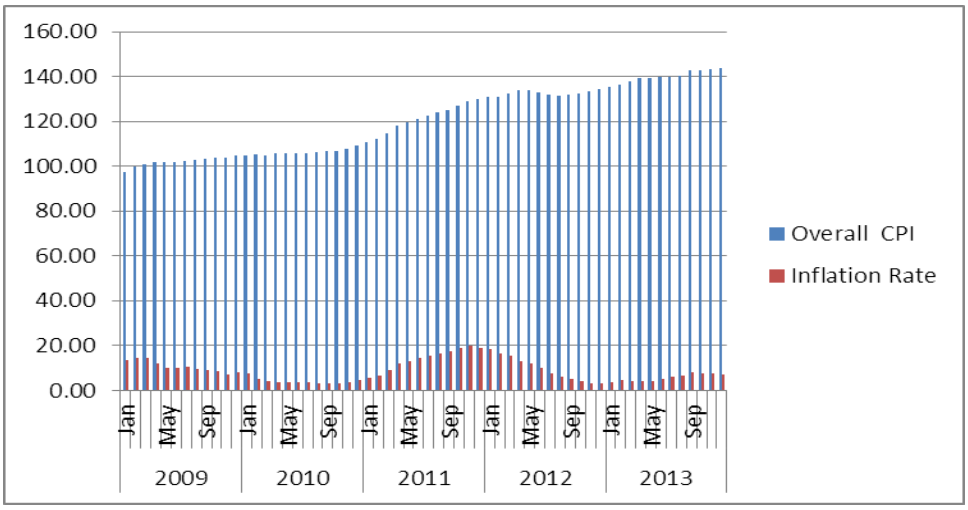
Figure 4.1: Interest Rate Movements (2009-2013)



Source: Research Findings

Figure 4.1 above shows the movement or trend of interest rates in Kenya shown by the 91-Day T-bill rate. It shows that the interest rate in Kenya have not had a consistent growth or decline pattern over the years with the highest rates experienced in 2011 and part of 2012 probably attributed to the rise in the exchange rates between the Kenya shillings and major foreign currencies. Interest rates were standardized for ease of comparison.

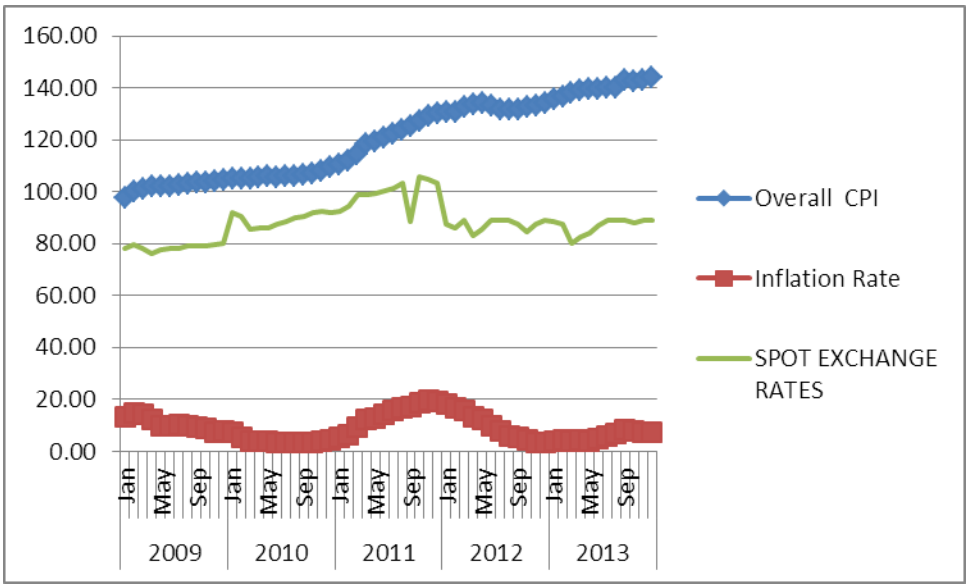
Figure 4.2: Inflation Rate Movements (2009-2013)



Source: Research Findings

Figure 4.2 above shows the movement or trend of inflation rates in Kenya. It reveals that the inflation rate in Kenya have not had a consistent growth or decline pattern over the years with the highest rates experienced still in 2011 and part of 2012 probably attributed to the rise in the exchange rates between the Kenya shillings and major foreign currencies. This implies that there is also a close relationship between interest rate and inflation rate. Year 2013 experienced a considerable decline in the inflation rates especially at the beginning of year 2013 (January) and end of 2013.

Figure 4.3: Spot Exchange Rate Movements (2009-2013)



Source: Research Findings

Figure 4.3 above shows the movement or trend of spot exchange rates in Kenya. The exchange rates in Kenya have not had a consistent growth or decline pattern over the years with the highest rates experienced still in 2011 and part of 2012 probably attributed to the rise in the exchange rates between the Kenya shillings and major foreign currencies. The same declined in 2013. This implies that there is also a close relationship between exchange rates, interest rates and inflation rates. There was a sharp increase in spot exchange rates in 2011 with year 2013 experiencing a considerable decline in the spot exchange rates. Year 2009 had the lowest exchange rates reaching a low of Shs. 77 per dollar.

4.3 Relationship Between Market Returns and Its Determinants

The determinants of market returns are spot exchange rates, market liquidity, interest rates and inflation rates with each independent variable showing different level of relationship. The OLS technique was applied in estimating the models of this study as indicated in table 4.2 below.

Table 4.2: Relationship between Market rates and its Determinants

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.818[a]	.669	.645	398.35400

a. Predictors: (Constant), MARKET LIQUIDUTY, INFLATION RATES, SPOT EXCHANGE RATE, INTEREST RATES

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	17659988.636	4	4414997.159	27.822	.000[b]
	Residual	8727724.882	55	158685.907		
	Total	26387713.517	59			

a. Dependent Variable: MARKET RETURNS

b. Predictors: (Constant), MARKET LIQUIDUTY, INFLATION RATES, SPOT EXCHANGE RATE, INTEREST RATES

Table 4.4:Coefficient[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	498.382	754.286		.661	.512
	INTEREST RATES	297.894	118.641	.277	2.511	.015
	INFLATION RATES	-132.117	14.762	-.979	-8.950	.000
	SPOT EXCHANGE RATE	43.824	9.334	.476	4.695	.000
	MARKET LIQUIDUTY	.003	.004	.081	.734	.466

Source: Research Findings

a. Dependent Variable: MARKET RETURNS

Table 4.2 above establish the values of the F ratios as being significant for the model which suggests the model is statistically fit to predict the performance of the market represented by market returns. With R square of 0.669 for the model, this means that all the variables in the model could offer about 66.9% explanation of the variance in the dependent variable (market returns) respectively. But, the conservative explanation offered by adjusted R square was 64.5%.

The model shows a statistically significant negative relationship between Inflation rates (β = -132.117, t= -8.950, $p<0.05$) and market returns. There are also statistically significant positive relationship between Interest rates (β = 0. 297894, t= 2.511, $p<0.05$), Spot exchange rate (β = 43.824, t= 4.695, $p<0.05$). There are also statistically insignificant positive relationships between market liquidity (β=0.003, t=-0.734, $p>0.05$). On the overall, the consistency of regression coefficients on interest rates, inflation rates, spot exchange rates and market liquidity in the model suggest that these variables are important factors influencing market returns.

From the model, the following regression equation is derived:

$$\text{Market Returns} = 498.382 + 297.894\ X_1 - 132.117X_2 + 43.824X_3 + .003X_4 + \varepsilon$$

Where:

X_1= Interest Rates

X_2= Inflation Rates

X_3= Spot Exchange Rates

X_4= Market Liquidity

ε = Error term

4.4 Interpretation of the Findings

From the multiple regression model, 66.9% of variations in market returns in Kenya are explained by variations in independent variables i.e. interest rates, inflation rates, spot exchange rates and market liquidity. The study establishes a positive relationship between interest rate spreads, market liquidity, spot exchange rates and market returns. The study also finds a negative relationship between inflation rates and market returns. In addition, market returns shown by the stock market index has improved significantly over the years albeit with minimal variations. The findings reveal that market returns derived as a percentage of change in Kenya is established to have not been constant and has been fluctuating over the years.

In addition, Kenya's exchange rates have experienced great fluctuations in the recent past with the highest fluctuations seen in 2011 whereby the exchange rates hit a high of 105.75 against the USD. Such great fluctuations affect the stock market prices which in turn affects stock market returns. High inflation rates were experienced in the years 2011 and part of 2012 reaching a high of 19.715 and this can be explained by the increase in spot exchange rates and interest rates during the same period. The inflation rates reduced drastically in 2013 through the CBK's intervention policies like reduction in the CBR and curbing increase in interest rates. Also, the study establishes gradual increase in market liquidity in the period from year 2009 to year 2013, with sharp increases in 2010, 2011 and 2012.

In summary, this study concurs with observations by Fisher (1930) hypothesis who posits that equity may serve as a hedge against inflation. If this holds, then investors could sell their financial assets in exchange for real assets when expected inflation is pronounced. Inflation erodes investments and the study finds a negative relationship between inflation and market returns. Other studies in Kenya and Africa which confirms these findings are (Eita, 2011; Artmann, Fitner and Kempf 2010; Kimani and Mutuku (2013 among others)

CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter presents discussions of the key findings presented in chapter four, conclusions drawn based on such findings and recommendations. This chapter is thus structured into sections namely: summary, conclusion, recommendations, limitation of the study and suggestions for further research.

5.2 Summary

Based on its objectives, this study provides answer to research questions in chapter one. The answers to the research questions are based on regression results. The objective of the study was to establish the effect of inflation, interest rates, spot exchange rates and market liquidity on market returns at the Nairobi Securities Exchange for a period of 5 years from 2009 through to 2013. Based on past studies in Kenya (see Sifunjo 1999; Nyamute 1998; Seile 2009; Kimani & Mutuku 2013 among others), the study established that there was a gap in studying Inflation, Interest rates and Stock returns in Kenya which this research seeks to fill. Hence the study seeks to answer the following research question: What is the effect of inflation and interest rates on returns at the NSE?

The key determinants of market returns as observed by Malhotra and Tandon (2013), are market liquidity, spot exchange rates, interest rates and inflation rates and this study supports the findings albeit to a lesser extent in some instances like inflation rates i.e. negative relationship between inflation rate and stock market returns. Moreover, besides using share prices and volume of shares traded to determine market liquidity ads observed by Sunde and Sanderson (2009) and Shauna (2003), this study incorporated the use of bond trading/turnover over the years under study to determine the market liquidity.

Based on the Proxy Hypothesis theory and Inflation Illusion Hypothesis theory, this study collected secondary data on market returns and its determinants namely interest rates, inflation rates, spot exchange rates and market liquidity in the Kenyan economy for the period 2009 to 2013 to establish their correlations using OLS regression model.

All the independent variables namely inflation rates, interest rates, spot exchange rates and market liquidity increasing over the years with the spot exchange rates hitting as a high as 105 exchange rate against the USD. Although, the rates of market returns do not correspondingly increase as there are instances of increase in market returns and other instances of decline in the market returns.

5.3 Conclusions

From the study findings, it is concluded that the market returns continues to expand with the levels of NSE 20 Share Index increasing over the years under study with minor fluctuations. All the independent variables namely inflation rates, interest rates, spot exchange rates and market liquidity increasing over the years with the spot exchange rates hitting as a high as 105 exchange rate against the USD. Although, the rates of market returns do not correspondingly increase as there are instances of increase in market returns and other instances of decline in the market returns.

In addition, the study establishes weak positive relationship between market liquidity (β=0.003, t=-0.734, p>0.05) and market returns. Also, statistically significant negative relationship was found to exist between Inflation rates (β = -132.117, t= -8.950, p<0.05) and market returns showing that there is no relationship between inflation rates and market returns. There are also statistically significant positive relationship between Interest rates (β = 0. 297894, t= 2.511, p<0.05), Spot exchange rate (β = 43.824, t= 4.695, p<0.05). This leads to the conclusion that market returns are determined by interest rates and spot exchange rates with market liquidity determining albeit to a lesser extent. This conclusion is in line with study findings by (Eita, 2011; Wang, Meric, Liu & Meric, 2010; Jiranyakul, 2009; Robert, 2008; Coleman and Tettey, 2008 among others).

Furthermore, with an R^2 of 0.669, it implies that 66.9% of the variations independent variable (market returns) is explained by variations in independents variables (interest rates, inflation rates, spot exchange rates and market liquidity). It is evident that a negative relationship existing between inflation rates and market returns implies that when there are higher levels of inflation in an economy, there is the likelihood of

attaining undesirable levels of market returns. Inflation rates are not good for an economy and erode returns on investments.

5.4 Policy Recommendations

The Inflation rate plays an important role in determining the economic growth and market returns in Kenya's such that there exist a negative relationship between inflation rate and stock market returns. The Central Bank should endeavor to reduce the inflation rate as a way of promoting economic growth and stock market returns. High inflation rates erode investments especially real interest rates.

Government policy makers should develop strategies for attaining optimum levels of broad money growth which do not encourage undesirable consequences like inflation. The Central Bank should continue to reduce the interest rates charged on loans as this has a positive relationship with market returns.

In addition, the positive relationship between interest rate and market returns is not consistent with the literature on finance, development and growth. Government policy makers should develop policies that manage the interest rates at acceptable levels that encourage borrowing for private investments. This should be attained through legislation and availing cheaper sources of deposits for lenders. Market return is synonymous with economic growth.

Finally, since movements in exchange rates exert significant influence on stock price determination in Kenya. Policy makers must strive to maintain exchange rates at low levels against major foreign currencies to improve stock prices.

5.5 Limitations of Study

The study uses a linear regression model to establish the relationships between financial market returns and independent variables (interest rates, market liquidity, spot exchange rates and inflation rates) in Kenya. The study does not address the issue of dual causality amongst the market return indicators themselves and market returns.

The study findings are as accurate as the data used and the regression analysis. This research has not been able to establish the accuracy of the data used beyond the authenticity of the source. This means it cannot be deduced whether the records are accurate and if so, to what extent.

The research findings are applicable to Kenya and within the period of study. The study has not established whether the results are same outside Kenya or not. Further, since finance is in part a behavioral issue, the study has only given findings applicable within the context of the historical data. As to whether the findings are applicable after 2013 or before 2009, the study has not expressly investigated that.

The study assumed that the relationship between market returns and market return indicators is linear. This assumption led to the use of the multivariate linear regression model. There is a possibility that the relationship is not linear like used in the analysis among all the variables of market returns or stock market performance and that could be why some of the variables weakly explained the variation in market returns. This study is unable to categorically state whether the relationship is linear or otherwise. The findings are therefore limited to the linearity assumption.

5.6 Suggestion for Further Research

Further investigations could be conducted on this topic in a country specific case but perhaps using a different methodology. VAR and GARCH methodology could be applied to this topic to establish how the lagged variables influence market returns. In addition, mixed methodologies could be employed including use of primary data.

In addition, further studies in this area should investigate other factors that influence the market returns in Kenya other than interest rates, inflation rates, spot exchange rates and market liquidity as the model explains 66.9% of variations in market returns which suggests that 33.1% of the variations in market returns are possibly explained by other factors not considered in this study.

Moreover, further studies should be conducted in this area looking at the independent variables (determinants) in isolation. Interest rate, inflation rates, market liquidity and

spot exchange rate and their influence on market returns should be considered in isolation.

In this study, market returns determinants or indicators were the independent variables. These indicators are affected by various other factors. There is therefore the need to further investigate the characteristics that affect the independent variables (interest rates, market liquidity, spot exchange rates and inflation rates) especially the annual macro-economic variables.

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APPENDICES

Appendix I: NSE Share Index from 2009 to 2013

Jan-09	3198.90
Feb-09	2474.75
Mar-09	2805.03
Apr-09	2800.10
May-09	2852.57
Jun-09	3294.56
Jul-09	3273.10
Aug-09	3102.68
Sep-09	3005.41
Oct-09	3083.63
Nov-09	3189.55
Dec-09	3247.44
Jan-10	3565.28
Feb-10	3629.41
Mar-10	4072.93
Apr-10	4233.24
May-10	4241.81
Jun-10	4339.28
Jul-10	4438.58
Aug-10	4454.59
Sep-10	4629.80
Oct-10	4659.56
Nov-10	4395.17
Dec-10	4432.60
Jan-11	4464.92
Feb-11	4240.18
Mar-11	3887.07
Apr-11	4029.23
May-11	4078.1
Jun-11	3968.12
Jul-11	3738.46
Aug-11	3465.02
Sep-11	3284.06
Oct-11	3507.34
Nov-11	3155.46
Dec-11	3205.02

Jan-12	3224.18
Feb-12	3303.75
Mar-12	3366.89
Apr-12	3546.66
May-12	3650.85
Jun-12	3703.94
Jul-12	3832.42
Aug-12	3865.76
Sep-12	3972.03
Oct-12	4147.28
Nov-12	4083.52
Dec-12	4133.02
Jan-13	4416.6
Feb-13	4518.59
Mar-13	4860.83
Apr-13	4765.23
May-13	5006.96
Jun-13	4598.16
Jul-13	4787.56
Aug-13	4697.75
Sep-13	4793.2
Oct-13	4992.88
Nov-13	5100.88
Dec-13	4926.97

Source: Nairobi Securities Exchange

Appendix II: Interest Rate from 2009 to 2013

YEAR	MONTH	91-Day Tbill	182-days Tbill	364-days Tbill
2009	JAN	8.46	8.93	-
	FEB	7.55	7.89	-
	MAR	7.31	7.91	-
	APR	7.34	8.34	-
	MAY	7.45	8.77	-
	JUN	7.33	8.28	-
	JUL	7.24	8.14	-
	AUG	7.25	8.12	8.71
	SEP	7.29	8.09	
	OCT	7.26	7.98	8.44
	NOV	7.22	8.02	
	DEC	6.82	7.38	8.01
2010	JAN	6.56	7.02	
	FEB	6.21	6.61	7.38
	MAR	5.98	6.34	
	APR	5.17	5.58	6.01
	MAY	4.21	4.41	-
	JUN	2.98	2.86	4.14
	JUL	1.6	1.72	-
	AUG	1.83	2.03	2.96
	SEP	2.04	2.14	-
	OCT	2.12	2.1	3.06
	NOV	2.21	2.28	-
	DEC	2.28	2.59	3.36
2011	JAN	2.46	2.7	3.69
	FEB	2.59	2.76	3.72
	MAR	2.77	3.06	4
	APR	3.26	3.51	5
	MAY	5.35	4.57	6.77
	JUN	8.95	9.93	-
	JULY	8.99	9.85	10.22
	AUG	9.23	10.15	11.07
	SEP	11.93	11.28	12.54
	OCT	14.8	14.68	14.5
	NOV	16.14	15.9	16.62
	DEC	18.3	18.3	20.96
2012	JAN	20.56	20.69	21.96

	FEB	19.7	19.88	20.96
	MAR	17.8	18.24	17.04
	APR	16.01	16.92	16.92
	MAY	11.18	12.71	12.43
	JUN	10.09	10.67	12.43
	JULY	11.95	12.21	13
	AUG	10.93	11.77	12.85
	SEP	7.77	9.36	10.34
	OCT	8.98	10.33	10.57
	NOV	9.8	10.47	11.94
	DEC	8.3	9.25	11.71
2013	JAN	8.08	8.09	11.67
	FEB	8.38	8.4	11.66
	MAR	9.88	9.89	12.54
	APR	10.38	10.75	12.49
	MAY	9.46	10.04	11.29
	JUNE	6.21	7.12	8.57
	JULY	5.92	6.23	8.81
	AUG	10.03	9.57	11.35
	SEP	9.58	10.15	10.91
	OCT	9.72	10.28	10.75
	NOV	9.94	10.54	10.97
	DEC	9.52	10.41	10.69

Source: Central Bank of Kenya

Appendix III: Inflation Rate from 2009 to 2013

Year	Month	Overall CPI	Inflation rate
2009	Jan	97.55	13.33
	Feb	100.00	14.62
	Mar	100.96	14.44
	Apr	101.84	12.10
	May	101.84	9.88
	Jun	102.05	9.86
	Jul	102.33	10.33
	Aug	102.94	9.76
	Sep	103.42	9.19
	Oct	103.68	8.80
	Nov	103.87	7.14
	Dec	104.66	8.02
2010	Jan	104.89	7.52
	Feb	105.18	5.18
	Mar	104.97	3.97
	Apr	105.56	3.66
	May	105.79	3.88
	Jun	105.61	3.49
	Jul	105.98	3.57
	Aug	106.25	3.22
	Sep	106.74	3.21
	Oct	106.97	3.18
	Nov	107.86	3.84
	Dec	109.38	4.51
2011	Jan	110.57	5.42
	Feb	112.05	6.54
	Mar	114.62	9.19
	Apr	118.29	12.05
	May	119.48	12.95
	Jun	120.91	14.48
	Jul	122.44	15.53
	Aug	123.97	16.67
	Sep	125.23	17.32
	Oct	127.20	18.91
	Nov	129.13	19.72
	Dec	130.09	18.93
2012	Jan	130.82	18.31

	Feb	130.76	16.70
	Mar	132.51	15.61
	Apr	133.74	13.06
	May	134.09	12.22
	Jun	133.06	10.05
	Jul	131.92	7.74
	Aug	131.51	6.09
	Sep	131.89	5.32
	Oct	132.46	4.14
	Nov	133.33	3.25
	Dec	134.25	3.20
2013	Jan	135.62	3.67
	Feb	136.59	4.45
	Mar	137.96	4.11
	Apr	139.28	4.14
	May	139.52	4.05
	Jun	139.59	4.91
	Jul	139.87	6.02
	Aug	140.29	6.67
	Sep	142.82	8.29
	Oct	142.75	7.76
	Nov	143.14	7.36
	Dec	143.85	7.15

Source: Kenya Bureau of Statistics