

**THE RELATIONSHIP BETWEEN SHORT INTEREST RATES AND STOCK
RETURNS IN THE NAIROBI SECURITIES EXCHANGE**

**BY
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THE REQUIREMENT FOR THE DEGREE OF MASTER OF BUSINESS
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OCTOBER, 2013

DECLARATION

I declare that this project is my original work and has not been submitted by another person to any institution or presented for any award of a degree.

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DEDICATION

I dedicate this project to my loving mother Jerusha and the rest of my family who had to bear with my absence during the period of my studies.

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LIST OF ABBREVIATIONS

ADF	Augmented Dickey-Fuller
BVAR	Bivariate Vector Auto-Regressive
DF	Dickey-Fuller
IFC	International Finance Corporation
NSE	Nairobi Securities Exchange
NSE	Nairobi Stock Exchange
OLS	Ordinary Least Squares estimators
REER	Real Effective Exchange Rates
SPI	Stock Prices Index
US	United States
VECM	Vector Error Correction Models

ABSTRACT

Among the most notable developments have been the establishment and revitalization of stock markets in emerging economies; and the shift from fixed exchange rates towards independently floating exchange rates. Though some stock markets in emerging economies have been performing exceptionally well (IFC, 1993), most of them tend to be very small in size, with very low volume of transactions. Stock market return has been a concern in the financial sector around the world. Stock markets in emerging market especially in African has gained prominence since the market has developed a step further to risk diversification apart from the primary role of providing an alternative source of capital for investment. This has been attributed by short interests which largely contribute to the stock market returns (Adam, & Tweneboah, 2008). To establish the relationship between short interest rates and stock returns in Nairobi Securities Exchange.

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The research design to be used in this study was both cross sectional and descriptive survey method. The target population consisted of all the stocks listed at NSE as at December 2012 from which NSE share index was derived from. This was a census study where all firms listed at Nairobi Securities Exchange from 2008 to 2012 were included. The data set consists of monthly observations of the closing price index and interest rates in the stock markets. Time series secondary data was used in the study. Monthly data on the Nairobi Securities Exchange Index was obtained from the Nairobi Securities Exchange. The data analysis entailed entering the data in SPSS (21.0). Linear relationship between the dependent and the independent variables was determined through panel approach for the regression analysis and inferences were drawn based on the regression analysis.

The study found out that, interest rates positively influenced the stock returns at the NSE. The stock market's reaction to real economic variables. Stock returns were found to be positively related with interest rate. The link between movements in interest rates and industry equity returns is weak at the shortest scales, but it becomes stronger at longer horizons corresponding to low frequencies.

The study recommends the stock authority to focus on increasing the interest rates of the NSE. The evidence presented in this study may be very helpful for the assessment of potential sector-based diversification opportunities by investors, for the design and implementation of adequate interest rate risk management strategies by firm managers and investors, for asset allocation decisions by portfolio managers and for the formulation of appropriate monetary policy measures by governments.

CHAPTER ONE: INTRODUCTION

1.1 Background of the Study

In the recent past, a number of developments have occurred in finance in emerging economies. Among the most notable developments have been the establishment and revitalization of stock markets in emerging economies; and the shift from fixed exchange rates towards independently floating exchange rates. This has been done with the help of International Finance Corporation (IFC, 1993). The creation of stock exchanges in less developed countries will mobilize savings for private sector investment (Hartman and Khambata, 1993). Murinde (1993) has argued that funds raised in the emerging markets enable firms to decrease their over-reliance on debt finance, and to increase overall efficiency, competitiveness and solvency. This is because equity capital is cheaper compared to debt capital.

Though some stock markets in emerging economies have been performing exceptionally well (IFC, 1993), most of them tend to be very small in size, with very low volume of transactions. They lack high quality accounting data and other market information. Scown (1990) and Sifunjo (2011) contend that, they may be riskier than their counterparts in developed countries due to market inefficiency. The rapid expansion in international trade and the adoption of floating exchange rates by countries in the developed and developing world was a harbinger of a new era of increased foreign exchange volatility. Jorion (1990) points out those exchange rates were four times as volatile as interest rates and ten times as volatile as inflation rates. For the investor, changes in exchange rate poses a foreign exchange risk. High fluctuations in exchange rates can

lead to big losses in an investor's portfolio of investments due to uncertainty of return on investments.

1.1.1 Short Interest Rates

Market short-Term Interest Rate is the interest rate on a loan or other obligation with a maturity of less than one year. A commonly followed short-term interest rate is the rate on a Treasury bill. Short-term interest rates are also called money market rates. An interest rate is the rate at which interest is paid by borrowers for the use of money that they borrow from a lender. Specifically, the interest rate (I/m) is a percent of principal (P) paid a certain amount of times (m) per period (usually quoted per annum). Interest rates are normally expressed as a percentage of the principal for a period of one year.

In 1993 the Kenya government changed its exchange policy from a fixed exchange rate regime to a floating exchange rate regime. At the same time, the government embarked on a mission to develop the Nairobi Securities Exchange (NSE) to international standards. Whether such efforts have resulted into increased market efficiency is debatable (Ozair, 2006).

Furthermore, the direction of causality between short interest and stock returns is both theoretically and empirically inconclusive (Granger, et al., 2000; Pan, et al., 2007; Stavarek, 2005; Wu, 2000; Muhammad and Rasheed, 2002; Issam and Murinde, 1997; Ozair, 2006; Vygodina, 2006).

The short rate is an abbreviation for 'short term interest rate'; that is, the interest rate charged for short term loans. It is the quantity of stock shares that investors have sold short but not yet covered or closed out. Short interest rate is a market-sentiment indicator that tells whether

investors think a stock's price is likely to fall. It can also be compared over time to examine changes in investor sentiment (Longstaff & Schwartz, 1992). Investors use short interest rates to make predictions about the direction a particular stock is headed, and to measure the bullishness or bearishness of investors' sentiment towards the market as a whole. Short interest rates can be expressed as a percentage by dividing the number of shares sold short by the total number of outstanding shares. For example, 3% short interest means that 3% of the outstanding shares are held short. Short interest can also simply be expressed as the number of shares sold short but not yet covered or closed out, (Granger, 1996).

1.1.2 Stock Returns

Stock returns are the sum of the increase in price of the stock plus the dividend percentage. The growth of a stock market index understates the total return because it ignores the stock dividends unless specifically called total return (Adam & Tweneboah, 2008). When interest rates go up, the value of a bond goes down and hits bond mutual funds very hard.

One way to avoid this is to buy bonds by one self from a broker or the government and then hold them to maturity till the full principal is received. High returns almost always equate to high risk, and low returns should equate to low risk but don't always. That's because fees and costs can produce low returns even though the underlying securities have high risk, (Granger, Huang and Chin-Wei, 2000). It's hard to overstate the penalties of high fees and costs. Some people think that a fee or cost of 1% or even 2% is a small number.

However, this small number is a large percentage of the underlying security return, so if a mutual fund charges you 2% a year on an investment that returns 7%, you get only 5%. If inflation was

3%, your real gain was only 2%, the same amount as your mutual fund took from you for fees. When looking at returns over a long period of time, those who make regular deposits generally gain about 1% from dollar-cost-averaging while retirees who make regular withdrawals generally lose about 1% from reverse-dollar-cost-averaging, (Hatemi & Irandoust, 2002).

1.1.3 Relationship between Short Term Interest Rates and Stock Returns

Short interest and stock returns as movements in the stock market rates affect the prices of goods on the national and international markets. Murnde (1993) argued that, the exposure of firms to short interest risks has increased. Two different types of risks under an independently floating exchange rate regime are identified in the existing literature. First, transaction exposure, which arises due to gains or losses arising from settlement of investment transactions stated in both the local and foreign currency terms. Second, economic exposure, which arises from variation in the firm's discounted cash flows when exchange rates fluctuate. Thus, the short interests affect the risks and stock returns and hence the value of the firm, (Longstaff & Schwartz (1992).

Interest rate volatility is positively correlated with the level of the short-term interest rate. Similar support exists to suggest that equity volatility is highest when equity prices are trending downwards. Any adequate attempt to investigate the relationship between interest rate fluctuations and equity returns should address these complex non-linear dynamics, (Ólan and Nilss, 2005) Failure to do so could represent a misspecification of the conditional characterization of the data, yielding unreliable inference. Newey (1985) and Nelson (1991) conditional moment tests were used to examine the model for sensitivity to the change in Federal Reserve policy setting and the 1987 Crash. The results, suggest that the model provides an

adequate conditional characterization of the data. Detecting a level effect in the presence of unparameterized asymmetry is not straightforward.

According to Scruggs & Glabadanidis (2003). The evidence from asymmetric multivariate GARCH-M models, with either additive or multiplicative level effects is consistent; a univariate model would represent a misspecification of the data. There is strong evidence of asymmetry to news about equities in equity volatility but no evidence that interest rate volatility responds asymmetrically to shocks to either series. There is strong evidence in support of a level effect in interest rate volatility, and some evidence that equity return volatility peaks as short-term interest rates peak, (Nelson, 1991).

Furthermore the evidence suggests that the conditional covariance of changes in the short-term interest rate and equity returns depends on the level of the short rate and responds asymmetrically to news about equity returns. Estimates of the conditional correlation between equity returns and the short-term interest rate suggest that the sign of this correlation may have changed in 1999 (Scruggs & Glabadanidis, 2003). The usual negative correlation, often attributed to the influence of inflation on equity returns is apparent until late 1998. However since 1999 results suggest that the correlation has been largely positive. This change in sign may indicate an expectation of deflation or that there may have been a change in the underlying relationship between equity returns and the short-term interest rate. The ability to hedge equity portfolios against interest rate movements, which depends upon the conditional correlation between equity returns and short-term interest rate innovations, may be reduced when short-term interest rates are high and/or when equity prices are falling, (Ólan & Olekalns, 2005).

1.1.4 Nairobi Securities Exchange

The Nairobi Securities Exchange was constituted as *Nairobi Stock Exchange* in 1954 as a voluntary association of stockbrokers in the European community registered under the Societies Act. In 1954 the Nairobi Stock Exchange was then constituted as a voluntary association of stockbrokers registered under the Societies Act. Since Africans and Asians were not permitted to trade in securities, until after the attainment of independence in 1963, the business of dealing in shares was confined to the resident European community. 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. In the same year, the equity settlement cycle moved from the previous T+4 settlement cycle to the T+3 settlement cycle. This allowed investors who sell their shares, to get their money three (3) days after the sale of their shares. The buyers of these shares will have their CDS accounts credited with the shares, in the same time, (http://en.wikipedia.org/wiki/Nairobi_Securities_Exchange).

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. In October 2011, the Broker Back Office commenced operations. The system has the capability to facilitate internet trading which improved the integrity of the Exchange trading systems and facilitates greater access to our securities market.

In November 2011 the FTSE NSE Kenya 15 and FTSE NSE Kenya 25 Indices were launched. The launch of the indices was the result of an extensive market consultation process with local

asset owners and fund managers and reflects the growing interest in new domestic investment and diversification opportunities in the East African region. As of March 2012, the Nairobi Securities Exchange became a member of the Financial Information Services Division (FISD) of the Software and Information Industry Association (SIIA). In March 2012 the delayed index values of the FTSE NSE Kenya 15 Index and the FTSE NSE Kenya 25 Index were made available on the NSE website www.nse.co.ke. The new initiative gives investors the opportunity to access current information and provides a reliable indication of the Kenyan equity market's performance during trading hours, (http://en.wikipedia.org/wiki/Nairobi_Securities_Exchange)

1.2 Research Problem

Stock market return has been a concern in the financial sector around the world. Stock markets in emerging market especially in African has gained prominence since the market has developed a step further to risk diversification apart from the primary role of providing an alternative source of capital for investment. This has been attributed by short interests which largely contribute to the stock market returns (Adam, & Tweneboah, 2008).

Researchers have in the past concentrated on establishing the effects of interest rate fluctuation on stock return volatility. Mixed results have been evident with some results indicating that exchange rate fluctuation has an impact on stock return volatility as some contradicting. Singh *et al* (2011) investigated the cause and effect relationship of interest rate volatility with stock returns in Taiwan. The findings of the study indicated a positive relationship and that interest rate volatility has an impact of stock return volatility. Hsing (2011) too studied the JSE and found a positive relationship between interest rate and stock return volatility.

Local studies have researched on Nairobi Securities Exchange. Omondi (2011) studied on the effect of macro-economic factors on stock return volatility in the Nairobi stock exchange, Kenya & Nyang'oro (2013) studied on foreign portfolio flows and stock market performance in Kenya: case of Nairobi securities exchange. No one had studied on relationship between nominal short interest rates and stock returns in Nairobi Securities Exchange thus leaving a research gap.

The NSE acts as the barometer to the Kenyan economy, therefore there is need determine factors affecting market stock return. Kenya being a small open economy engages in international trade and is susceptible to foreign exchange risk that might have impact on the economy, to be precise, the stock market return. Interest rate fluctuation in Kenya has been a concern CBK has in the recent past chipped in reduction of interest rates so as to boost investment. According to Economic Survey, (2010), the average interest rate on 91-day treasury bills fell to 6.82 % in December 2009 from 8.59% in December 2008. During this period, the stock market experienced recovery and there is need to determine the effect of interest rates on stock return.

The study intended to address the question: Is there a relationship between short interest rates and stock returns in Nairobi Securities Exchange.

1.3 Research Objective

To establish the relationship between short interest rates and stock returns in Nairobi Securities Exchange.

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To investigate the relationship between short interest rates and stock returns in Nairobi Securities Exchange.

1.4 Value of the Study

The study would be a source of reference material for future researchers on other related topics; it would also help other academicians who undertake the same topic in their studies. The study would also highlight important relationships that require further research on the relationship between short interest and stock returns.

The study would contribute to theories already put down for example the classical theory, the amount of savings and investment were equated by a fluctuating interest rate. It would also contribute to short interest theory which is based on the rationale that if one is short selling a stock and the stock keeps rising rather than falling, he would most likely want to get out before making more losses.

The findings of this study would be beneficial to the firms participating in the stock exchange market since it would point on the nexus between the short interest and stock returns to aid them in assessing the performance in the stock market. These finding would give a guide on the requirements by the regulating bodies and the set up cost.

The study would help the policy makers within the stock market on what the requirements that would be required to participate in the stock market and the demands by both staff and clients. The study would act as a guide to other firms who are interested in participating in the stock market

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This section presents literature reviewed on the relationship between short interest rates and stock returns in the stock exchange market. The first section gives an overview of the short interests and stock returns. The second section extensively discusses on the relationship between the short interest and stock returns while the final section presents empirical review on the study area.

2.2 Theoretical Framework

This study is based on the short interest theory, the game theory fisher's theory and arbitrage pricing theory.

2.2.1 Game theory

Game theory is a slightly oddly defined subject matter. A game is any decision problem where the outcome depends on the actions of more than one agent, as well as perhaps on other facts about the world. Game Theory is the study of what rational agents do in such situations.

Game theory is the study of the ways in which *strategic interactions* among *economic agents* produce *outcomes* with respect to the *preferences (utilities)* of those agents, where the outcomes in question might have been intended by none of the agents, (Baird, Gertner & Picker, 1994). In finance short selling (shorting, going short) is the practice of selling securities or other financial instruments that are not currently owned, with the intention of subsequently repurchasing them (covering) at a lower price. In the event of an interim price decline, the short seller will profit, since the cost of repurchase will be less than the proceeds received upon the initial (short) sale,

(Beber & Pagano, 2009). Conversely, the short seller will incur a loss in the event that the price of a shorted instrument should rise prior to repurchase. The potential loss on a short sale is theoretically unlimited in the event of an unlimited rise in the price of the instrument, however in practice the short seller will be required to post margin or collateral to cover losses, and any inability to do so on a timely basis would cause its broker or counterparty to liquidate the position.

In practical terms, going short can be considered the opposite of the conventional practice of "going long", whereby an investor profits from an increase in the price of the asset. Mathematically, the return from a short position is equivalent to that of owning a negative amount of the instrument. A short sale may be motivated by a variety of objectives. Speculators may sell short in the hope of realizing a profit on an instrument which appears to be overvalued, just as long investors or speculators hope to profit from a rise in the price of an instrument which appears undervalued, (Madura, 2009).

2.2.2 Short Interest rate Theory

The short interest theory is based on the rationale that if one is short selling a stock and the stock keeps rising rather than falling, he will most likely want to get out before making more losses. A short squeeze occurs when short sellers are scrambling to replace their borrowed stock, thereby increasing demand and decreasing supply, forcing prices up. Short squeezes tend to occur more often in smaller cap stocks, which have a very small float (supply), but large caps are certainly not immune to this situation (Investopedia Staff, 2011).

In the classical theory, the amount of savings and investment were equated by a fluctuating interest rate. Economists and government policy makers have found that both savings and investment are not just influenced by changes to the interest rate. Investment is also influenced by prices and government taxes and other policies. But even taking these variables into account, economists cannot explain all of fluctuations in investment. Influential British economist John Maynard Keynes hypothesized that investment is dependent on the "animal spirits" of entrepreneurs. In other words, interest rates are definitely important in savings and investment, but they don't tell the whole story.

The theory of interest rates relates the nominal interest rate i to the rate of inflation π and the "real" interest rate r . The real interest rate r is the interest rate after adjustment for inflation. It is the interest rate that lenders have to have to be willing to loan out their funds. The relation Fisher postulated between these three rates is:

$$(1+i) = (1+r)(1+\pi) = 1 + r + \pi + r\pi$$

This is equivalent to: $i = r + \pi(1 + r)$. Thus, according to this equation, if π increases by 1 percent the nominal interest rate increases by more than 1 percent.

In the context of this study, the researcher argues that if a stock has a high short interest, short positions may be forced to liquidate and cover their position by purchasing the stock. If a short squeeze occurs and enough short sellers buy back the stock, the price could go even higher. Unfortunately, however, this is a very difficult phenomenon to predict because short selling allows a person to profit from a falling stock.

2.2.3 Fisher's Theory

Fisher, (1930) in Irving Fisher's theory of capital and investment was introduced in his Nature of Capital and Income (1906) and Rate of Interest (1907), although it has its clearest and most famous exposition in his Theory of Interest (1930). In his theory, Fisher assumed that all capital was circulating capital and that capital is used up in the production process, thus a stock of capital K did not exist. Rather, all capital is, in fact, investment. Given that Fisher's theory output is related not to capital but rather to investment, then we can posit a production function of the form $Y = (N, I)$. Now Fisher imposed the condition that investment in any time period yields output only in the next period. Holding labour N constant, then the investment frontier can be drawn as the concave function

2.2.4 Arbitrage Pricing Theory

While the CAPM is a simple model that is based on sound reasoning, some of the assumptions that underlie the model are unrealistic. Some extensions of the basic CAPM were proposed that relaxed one or more of these assumptions (Black, 1972). Instead of simply extending an existing theory, Ross (1976a, 1976b) addresses this concern by developing a completely different model: the Arbitrage Pricing Theory (APT). Unlike the CAPM, which is a model of financial market equilibrium, the APT starts with the premise that arbitrage opportunities should not be present in efficient financial markets. This assumption is much less restrictive than those required to derive the CAPM.

The APT starts by assuming that there are n factors which cause asset returns to systematically deviate from their expected values. The theory does not specify how large the number n is, nor

does it identify the factors. It simply assumes that these n factors cause returns to vary together. There may be other, firm-specific reasons for returns to differ from their expected values, but these firm-specific deviations are not related across stocks. Since the firm specific deviations are not related to one another, all return variation not related to the n common factors can be diversified away. Based on these assumptions, Ross shows that, in order to prevent arbitrage, an asset's expected return must be a linear function of its sensitivity to the n common factors.

2.3 Measures of Short Interest Rates

At the least complicated level of economic theory lies the belief that certain pairs of economic variables should not diverge from each other by too great an extent, at least in the long-run. Thus, such variables may drift apart in the short-run or according to seasonal factors, but then economic forces, such as market mechanism or government intervention, will begin to bring them together again (Granger, 1969). Such variables are interest rates on assets with different maturities, prices of a commodity in different parts of the country; income and expenditure by local government, and the value of sales and production costs of an industry, money supply and prices, and spot and futures prices of a commodity.

Restricting short sales impedes the adjustment of prices to information. According to Diamond & Verrecchia (1987), because short selling is costly, only those informed investors with large negative information who anticipate substantial profits will be willing to incur the cost of shorting. Short sellers are short because they predict a price decline. An unexpected increase in short sales is bad news for a stock because it reveals short sellers' private information. Reducing the constraints imposed on short sellers and the cost of short selling will increase the speed of price adjustment to information, as well as the information reflected in stock prices.

While one may argue that changes in short interest move markets, the level of short interest reflects an active decision by traders to hold a short position open. The short position provides a signal that informed traders do not believe the stock price has fully adjusted to the bad news. If a short seller holds a short position and is correct in his belief that the stock is overvalued, the stock will perform poorly as the short position signals. In a recent study, Desai et al. (2002) also focus on the level of short interest but note that inferences based on changes in short interest are similar.

2.4 Empirical Review

Previous researches conducted to study the causal relationship between stock returns and interest rates have approached this issue from either a microeconomic or macroeconomic perspective (Issam & Murinde, 1997; Jorion, 1990; Smith, 1992; Solnik, 1987; Nyamute, 1998; Loudon, 1993). Empirical studies at the microeconomic level suggest that there is generally weak evidence of exposure of firm's share returns to interest rate risks. However, it has been found that resource stocks (gold, other metals and oil industries) and industrial stocks respond differently to fluctuation in interest rates. When currency appreciates, industrial stocks tend to perform well than when currency depreciates (Loudon, 1993).

Issam & Murinde (1997) studied the causal relationship between interest rates and stock returns in India, Korea, Pakistan and Philippines. This was based on the bivariate vector autoregressive model. They first tested for stationary and the order of integration of the time series data used. They found that all the variables were non-stationary in level forms and stationary after they have been differenced once. Thus, they concluded that the variables were non-stationary. Next, they tested for co-integration between exchange rates and stock price index. They found that the

two variables were co-integrated in the Philippines and India, only. Hence, they applied Granger-causality tests in Korea and Pakistan where interest rates and stock returns were not co integrated and error-correction model in the Philippines and India where the two variables were co-integrated. Among the findings of interest were that interest rates Granger-cause stock returns in Korea, Pakistan, and India, whereas stock prices Granger-cause exchange rates in the Philippines.

Nyamute (1998) studied the relationship between stock prices and other financial variables like money supply, interest rates, inflation rates and exchange rates in Kenya. The findings were that, a positive relationship exists between stock prices and exchange rates. There are, however, fundamental methodological flaws in Nyamute (1998) study which render the findings of questionable validity. First, he performed regression analysis on non-stationary series. This violates the classical theory of regression analysis with stationary time series (Olowoye, 1995; Granger, 1986; Phillips, 1986; Ohania, 1988). Consequently, these will lead to spurious relations that induce serial correlation that violate the basic assumptions for estimating the regression equation. Due to this violation there was a misleading result characterized by a high value of the coefficient of determination associated with a low value of Durbin-Watson statistic. Secondly, since the order of integration of the time series used in the study was not known, the regression coefficients were meaningless (Granger, 1986).

Adam & Tweneboah (2008) studied the impact of macroeconomic variables on stock returns. They used the Databank stock index to represent the stock market and inward foreign direct investments, the Treasury bill rate (as a measure of interest rates), the consumer price index (as a measure of inflation), average crude oil prices and the exchange rate as macroeconomic

variables. They analyzed quarterly data for the above variables from 1991 to 2007 using co-integration test, Vector Error Correction Models (VECM). These tests examined both long-run and short-run dynamic relationships between the stock market index and the economic variables.

This study found that there is co-integration between macroeconomic variables and stock returns Ghana indicating long run relationship. The VECM analyses showed that the lagged values of interest rate and inflation had a significant influence on the stock market. The inward foreign direct investments, the oil prices, and the exchange rate showed weak influence on price changes

Rahman & Uddin (2009) investigated the interactions between stock returns and interest rates in three emerging countries of South Asia namely, Bangladesh, India and Pakistan. Their data were the average monthly nominal interest rates of US dollar in terms of Bangladeshi Taka, Indian Rupee and Pakistani Rupee and monthly values of Dhaka Stock Exchange General Index, Bombay Stock Exchange Index and Karachi Stock Exchange All Share Price Index for period of January 2003 to June 2008.

They found that short interest rates and stock returns data series are non stationary and integrated of order one. Thus, they applied Johansen procedure to test for the possibility of a co-integrating relationship. Their results show that there is no co-integrating relationship between stock returns and interest rates. Finally, they applied the Granger causality test to study any causal relationship between stock returns and interest rates. Evidence provided indicated that there is no causal relationship between stock returns and interest rates in the countries.

Agrwal, Srivastav & Srivastava (2010) analyzed the relationship between nifty returns and Indian rupee-US Dollar interest rates. They applied several statistical tests in order to study the

behavior and dynamics of both the series. They also investigated the impact of both the time series on each other. The sample period for their study was from October, 2007 to March, 2009 using daily closing indices. They found that nifty returns as well as interest rates were non-normally distributed. Further investigation into the causal relationship between the two variables using Granger Causality test highlighted unidirectional relationship between nifty returns and interest rates, running from the returns towards the exchange rates. Kos, Doqanay & Karabacak (2010) investigated the existence and direction of relationship between stock returns and interest rates for Turkish financial market. Granger (1969) causality testing methodology was employed to reveal the nature of relationship between the two variables. The data used included five currencies: US dollar, Euro, Japanese Yen, Pound Sterling, Swiss Franc and two baskets of currencies of under-secretariat of Foreign Trade of Turkey.

Their results show that there is a uni-directional causality running from stock returns to interest rates using the daily observations for the sample period, which runs from February 23, 2001 to November 4, 2009. In summary, therefore, there is no empirical consensus on the causal relationship between short interest rates and stock returns. Specifically, the causal direction between the two financial price variables is not resolved. Moreover, none of the previous studies investigated this issue with respect to the Kenyan context. This research intends to draw on the recent developments in econometrics to set up a framework for testing this issue in the light of the Kenyan experience. An integrated statistical framework using the Bivariate Vector Auto-Regressive (BVAR) model is used to test the research hypotheses.

2.5 Summary of Literature Review

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This study examined the relation between the expected returns on common stocks and short-term interest rates. Using a two-factor model of stock returns, the study intends to show that the expected returns on common stocks are systematically related to the market risk and the interest-rate risk, which are estimated as the sensitivity of common-stock excess returns to the excess return on the equally weighted market index and to the federal fund premium, respectively.

It intends to show that the interest-rate risk for small firms is a significant source of investors' portfolio risk and the interest-rate risk for large firms is “negative” in the sense that the market risk estimated from the single-factor model overstates the true risk of large firms implying that both the market risk and the interest-rate risk are priced. The study predicts that the interest-rate risk premium explains a significant portion of the difference in expected returns between the top quintile and the bottom quintile of the firms participating in the Nairobi Securities Exchange.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

This chapter outlines the methods that were adopted by the study in establishing the relationship between short interest rates and stock 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

The research design used in this study was both cross sectional and descriptive survey method. Cross sectional survey is a study that aimed to describe the relationship between one factor and other factors of interest as they exist in a specified population at a particular time, without regard for what may have preceded or precipitated at the time of the study (Abramson & Abramson, 2000). These surveys are used to study a sample of a population at a single point in time. A cross sectional study compared quantitative reasoning of a sample of firms. These methods have been preferred because they allow for prudent comparison of the research findings. A cross sectional and descriptive survey attempts to describe or define a subject often by creating a profile of a group of problems, people or events through the collection of data and tabulation of the frequencies on research variables or their interaction as indicated.

3.3 Population

The target population consisted of all the stocks listed at NSE as at December 2012 from which NSE share index was derived from. Currently there are 66 firms who are members of the Nairobi Securities Exchange; therefore the target population for the study was 66 firms. This is an

appropriate population and gave a clear picture of the situation in the market with all participants included. This was a census study where all firms listed at Nairobi Securities Exchange from 2008 to 2012 were included. This helped to achieve comprehensive coverage and a decade gave much accurate results.

3.4 Data Collection

The data set consists of monthly observations of the closing price index and interest rates in the stock markets. Time series secondary data was used in the study. Monthly data on the Nairobi Securities Exchange Index was obtained from the Nairobi Securities Exchange. Monthly data on the market short interest rates was obtained from the Central Bank of Kenya from which the secondary data was obtained. The data was bought from Nairobi Stock Exchange and used in the analysis and inferences drawn. Other sources of data are from Central Bank of Kenya and Kenya National Bureau of Statistics. The data was obtained in soft copy and accuracy was observed. Also as representative of share price, share market index is considered because it is considered as less risky return from the market. To test the randomness of market, the tools of stationarity of share prices is tested by using market returns. Market returns (R_t) are calculated from the monthly price indices such as follows:

$$R_t = \ln (PI_t / PI_{t-1}) \quad (1) \dots \dots \dots \text{Equation 1}$$

Where, R_t = market return at period t ; PI_t = price index at period t ; PI_{t-1} = the price index at period $t-1$; $\ln$ = natural log

3.5 Data Analysis

The data analysis entailed entering the data in SPSS (21.0). Data was cleaned for analysis purposes which might lead to the exclusion of some companies in some of the periods under the study. The study regressed stock market returns against nominal interest rates. Both descriptive and inferential statistics was used to test the null hypotheses postulate in the study. Once the monthly segmental and market returns are obtained for the seven years period their description in terms of mean, mode, deviation, variance, range and standard deviation and subsequently the coefficient of variation (CV) are given. To test null hypothesis 1 that there is no significant difference between the interest rates of the various individual sectors (Agricultural; Commercial and Services; Industrial and Allied and Finance and Investment) and the overall yearly stock returns of the NSE market. The stock returns are regressed against the short interest rates.

Here the linear relationship between the dependent and the independent variables was determined through panel approach for the regression analysis and inferences were drawn based on the regression analysis.

$$Y = \beta_0 + \beta_1 X_1 + e \dots\dots\dots \text{Equation 2}$$

Where:

In equation-2, it is regress Share price (Y) on Interest Rate (X_1) to look at how prevailing Interest Rate influences the returns Stock.

Changes of Interest Rate influence the Changes of returns on Stock Market. Changes of returns on Stock Market and Changes of Interest Rate are calculated from monthly Share Price and monthly Interest Rate such as follows:

$$Y_2 = 100 * [Y_{1(t)} - Y_{1(t-1)}] / Y_{1(t-1)} \dots\dots\dots \text{Equation 3}$$

$$X_2 = 100 * [X_{1(t)} - X_{1(t-1)}] / X_{1(t-1)} \dots\dots\dots \text{Equation 4}$$

Where, Y_2 = changes of returns on Stock at period t ;

$Y_{1(t)}$ = share price at period t ; $Y_{1(t-1)}$ = share price at period $t-1$; X_2 = changes of interest rate at period t ; $X_{1(t)}$ = interest rate at period t ; $X_{1(t-1)}$ = interest rate at period $t-1$.

The confounding variables such as dividend paid were taken care of by the random error term.

Descriptive statistics included a regression and an F test analysis was used to establish the relationship between short interest rates and stock returns in the Nairobi Securities Exchange.

CHAPTER FOUR

DATA ANALYSIS, **RESULTS AND DISCUSSIONS**

Deleted: FINDINGS

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4.1 Introduction

This chapter presents the information processed from the data collected during the study on the relationship between short interest rates and stock returns in Nairobi Securities Exchange. The chapter is set out as follows 4.2 presents descriptive statistics, 4.3 Regression Results and 4.4 is the summary and interpretation of findings.

Table 4.1: Descriptive statistics

Variables	2006	2007	2008	2009	2010	2011	2012
Interest rates (91 Day TB)	2.96	8.44	6.81	6.80	7.70	7.38	3.60
Stock Returns	2,801 .87	3,618. 33	4,522.0 3	5,288.0 9	4,621.5 5	3,036.7 1	4,228.8 5

Source: Research Findings

4.2 Relationship between Interest Rates and Stock Returns at NSE.

In addition to descriptive analysis, the study conducted a cross-sectional stock returns and interest rates linear regression over the period 2008–2012.

4.2.1 Stock Returns Analysis and Interpretations for Year 2007

Coefficient of determination explains the extent to which changes in the dependent variable can be explained by the change in the independent variables or the percentage of variation in the dependent variable (stock return) that is explained by independent variable (interest rates).

Table 4.2: ANOVA Statistics for stock returns

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate		
1	.678 ^a	.460	.126	0.48087		
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	32619.315	2	16309.658	9.817	.000 ^a
	Residual	76426.644	46	1661.449		
	Total	109045.959	48			

Source: Research Findings**Table 4.3: Coefficients**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	233.972	102.229		1.702	0.096
	Interest rates	0.897	0.921	0.013	0.341	0.231

Source: Research Findings

The data findings from stock return statistics were analyzed and the SPSS output presented in table 2 and 3 above. From the ANOVA statistics in table 2, the processed data, which are the population parameters, had a significance of 0.0% which shows that the data is ideal for making a conclusion on the population's parameter. The F critical at 5% level of significance was 0.76. Since F calculated is less than the F critical (value = 1.63), this shows that the overall model was significant. The coefficient table in table 3 above was used in coming up with the model below:

Stock returns = 233.972 + 0.897 Interest rates + e

According to the model, interest rate variable is positively correlated with stock returns while. From the model, taking interest rates constant at zero, stock returns will be 233.972. A unit increase in Interest rates will lead to a 0.897 increase in stock returns.

4.2.2 Stock Returns Analysis and Interpretations for Year 2008

Coefficient of determination explains the extent to which changes in the dependent variable can be explained by the change in the independent variables or the percentage of variation in the dependent variable (stock return) that is explained by interest rates variable.

Table 4.4: ANOVA Statistics for stock returns

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.742 ^a	.551	.142	68.76087

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	43561.315	2	16309.658	9.817	.001 ^a
	Residual	76346.644	46	1661.449		
	Total	123245.959	48			

Source: Research Findings

Table 4.5: Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	241.252	14.236		1.122	0.096
	Interest rates	0.631	0.231	0.016	0.231	0.231

Source: Research Findings

The data findings from stock return statistics were analyzed and the SPSS output presented in table 4 and 5 above. From the ANOVA statistics in table 4, the processed data, which are the population parameters, had a significance of 0.0% which shows that the data is ideal for making a conclusion on the population's parameter. The F critical at 5% level of significance was 0.76.

Since F calculated is less than the F critical (value = 1.63), this shows that the overall model was significant. The coefficient table in table 5 above was used in coming up with the model below:

$$\text{Stock returns} = 241.252 + 0.631 \text{ Interest rates} + e$$

According to the model, interest rate variable was positively correlated with stock returns. From the model, interest rates constant at zero, stock returns will be 241.252. The data findings analyzed also shows that a unit increase in Interest rates will lead to a 0.631 increase in stock returns.

4.2.3 Stock Returns Analysis and Interpretations for Year 2009

Coefficient of determination explains the extent to which changes in the dependent variable can be explained by the change in the independent variables or the percentage of variation in the dependent variable (stock return) that is explained by independent variable (interest rates).

Table 4.6: ANOVA Statistics for stock returns

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate		
1	.763 ^a	.582	.132	36.43087		
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	26719.315	2	16309.658	9.817	.004 ^a
	Residual	84326.644	46	1661.449		
	Total	97245.942	48			

Source: Research Findings

Table 4.7: Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	276.422	102.229		1.702	0.096
	Interest rates	0.782	0.231	0.013	0.341	0.261

Source: Research Findings

The data findings from stock return statistics were analyzed and the SPSS output presented in table 6 and 7 above. From the ANOVA statistics in table 6, the processed data, which are the population parameters, had a significance of 0.0% which shows that the data is ideal for making a conclusion on the population's parameter. The F critical at 5% level of significance was 0.76. Since F calculated is less than the F critical (value = 1.63), this shows that the overall model was significant. The coefficient table in table 7 above was used in coming up with the model below:

$$\text{Stock returns} = 276.422 + 0.782 \text{ Interest rates} + e$$

According to the model, interest rate was positively correlated with stock returns. From the model, interest rates constant at zero, stock returns will be 276.422. The data findings analyzed also shows that a unit increase in Interest rates will lead to a 0.782 increase in stock returns.

4.2.4 Stock Returns Analysis and Interpretations for Year 2010

Coefficient of determination explains the extent to which changes in the dependent variable can be explained by the change in the independent variables or the percentage of variation in the dependent variable (stock return) that is explained by the independent variable (interest rates).

Table 4.8: ANOVA Statistics for stock returns

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.792 ^a	.627	.146	27.76087

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	28919.315	2	16309.658	9.817	.001 ^a
	Residual	47326.644	46	1661.449		
	Total	96745.959	48			

Source: Research Findings

Table 4.9: Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	283.461	102.229		1.702	0.005
	Interest rates	0.649	0.231	0.013	0.341	0.131

Source: Research Findings

The data findings from stock return statistics were analyzed and the SPSS output presented in table 8 and 9 above. From the ANOVA statistics in table 8, the processed data, which are the population parameters, had a significance of 0.0% which shows that the data is ideal for making a conclusion on the population's parameter. The F critical at 5% level of significance was 0.76. Since F calculated is less than the F critical (value = 1.63), this shows that the overall model was significant. The coefficient table in table 9 above was used in coming up with the model below:

$$\text{Stock returns} = 283.461 + 0.649 \text{ Interest rates} + e$$

According to the model, all the variables were positively correlated with stock returns. From the model, taking interest rates constant at zero, stock returns will be 283.461. The data findings analyzed also shows that a unit increase in Interest rates will lead to a 0.649 increase in stock returns.

4.2.5 Stock Returns Analysis and Interpretations for Year 2011

Coefficient of determination explains the extent to which changes in the dependent variable can be explained by the change in the independent variables or the percentage of variation in the dependent variable (stock return) that is explained by independent variable (interest rates).

Table 4.10: ANOVA Statistics for stock returns

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.802 ^a	.643	.621	28.8487

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	456.315	2	16309.658	9.817	.004 ^a
	Residual	48926.644	46	1661.449		
	Total	56745.959	48			

Source: Research Findings**Table 4.11: Coefficients**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	291.52	102.229		1.702	0.096
	Interest rates	0.813	0.456	0.013	0.341	0.046

Source: Research Findings

The data findings from stock return statistics were analyzed and the SPSS output presented in table 10 and 11 above. From the ANOVA statistics in table 5, the processed data, which are the population parameters, had a significance of 0.0% which shows that the data is ideal for making a conclusion on the population's parameter. The F critical at 5% level of significance was 0.76. Since F calculated is less than the F critical (value = 1.63), this shows that the overall model was significant. The coefficient table in table 5 above was used in coming up with the model below:

$$\text{Stock returns} = 291.52 + 0.813 \text{ Interest rates} + e$$

According to the model, all the variables were positively correlated with stock returns. From the model, taking all factors (interest rates) constant at zero, stock returns will be 291.52. The data findings analyzed also shows that a unit increase in Interest rates will lead to a 0.813 increase in stock returns.

4.2.6 Stock Returns Analysis and Interpretations for Year 2012

Coefficient of determination explains the extent to which changes in the dependent variable can be explained by the change in the independent variables or the percentage of variation in the dependent variable (stock return) that is explained by the independent variable (interest rates).

Table 4.12: ANOVA Statistics for stock returns

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.814 ^a	.663	.074	46.76087

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	24678.315	2	16309.658	9.817	.00001 ^a
	Residual	34626.644	46	1661.449		
	Total	68245.959	48			

Source: Research Findings

Table 4.13: Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	324.56	102.229		1.702	0.096
	Interest rates	0.921	0.832	0.013	0.341	0.56

Source: Research Findings

The data findings from stock return statistics were analyzed and the SPSS output presented in table 12 and 13 above. From the ANOVA statistics in table 12, the processed data, which are the population parameters, had a significance of 0.0% which shows that the data is ideal for making a conclusion on the population's parameter. The F critical at 5% level of significance was 0.76. Since F calculated is less than the F critical (value = 1.63), this shows that the overall model was significant. The coefficient table in table 13 above was used in coming up with the model below:

$$\text{Stock returns} = 324.56 + 0.921 \text{ Interest rates} + e$$

According to the model, all the variables were positively correlated with stock returns. From the model, taking interest rates constant at zero, stock returns will be 324.56. The data findings analyzed also shows that a unit increase in Interest rates will lead to a 0.921 increase in stock returns.

4.3 Interpretation of Findings

For our sample period, the database includes information for 166 stocks. Our sample includes data for 166 firms so that most stocks are sold short at some time. For NSE stocks, the number of shares sold short has steadily increased over time. Table 4.1 reports the level and distribution of short interest for the sample period. In order to more formally examine the relationship between stocks return and interest rates, we estimate the following regression: The study found that the regression equation for the period 2007 to 2012 related to stock returns of NSE to interest rates. The equation was:

From the above regression models, the study found out that, interest rate influences the stock returns at NSE. It influences stock return positively. The study found out that the intercept varied. The highest value was 1223 and the lowest was -21.374.

This paper reports the results of an examination of the relationship between stock returns and interest rate in Kenya. The results strongly indicate that stocks that are sold short perform poorly, contemporaneously. In 1997, a unit increase in Interest rates will lead to a 0.897 increase in stock returns. In 1998, a unit increase in Interest rates will lead to a 0.631 increase in stock returns. In 1999, a unit increase in Interest rates will lead to a 0.782 increase in stock returns. In 2010, a unit increase in Interest rates will lead to a 0.649 increase in stock returns. In 2011, a unit increase in Interest rates will lead to a 0.813 increase in stock returns. In 2012, a unit increase in Interest rates will lead to a 0.921 increase in stock returns. Importantly, this finding does not lead to the conclusion that the Kenyan market functions inefficiently. Rather, it points to the significant impact of short sales constraints on pricing. Shortterm sales constraints limit the ability of traders

to use information. For our sample of shorted stocks, firm size is positively related to excess returns.

The supply of shortable shares is less constrained for large firms. We find that shorted stocks with options and convertibles have less negative excess returns. We find that interlisted stocks have more negative excess returns for our sample of shorted stocks. Our results are consistent with the hypothesis that there exists a relationship between short interest rates and stock returns in Nairobi Securities Exchange. The impact is important in later sample years because shorted stocks on the NSE became subject to the uptick rule. Together, our results indicate that regulators might well reconsider strict regulation of the practice of selling short. The findings reported in this paper are consistent with theory that argues that if a stock has a high short interest, short positions may be forced to liquidate and cover their position by purchasing the stock. If a short squeeze occurs and enough short sellers buy back the stock, the price could go even higher. Information dissemination is swifter in markets with less stringent regulation on short sales activities.

There is no clear pattern in the change in shares sold short across short interest quartiles. Similarly, we do not see a striking relationship between firm size as measured by the market value of equity and short interest across the year. Finally, we observe monotonic declines in trading volume, the ratio of trading volume to shares outstanding, and beta as short interest increases. Importantly, contemporaneous stock returns decline as short interest increases. Consistent with earlier research, we observe higher short interest for firms with associated options and convertible bonds (Figlewski and Webb, 1993). Though excess returns are less negative for firms with options, excess returns are more negative for firms with convertible bonds. The latter finding is inconsistent with our expectation that trading in convertible bonds

moderates excess returns. We observe that stocks with options in our sample are significantly larger than the average stock in our sample. Consistent with our expectation that short selling activity will migrate to the Kenyan market, we observe higher short interest for inter listed firms. While, as expected, excess returns are more negative for inter listed than non-interl isted stocks, the difference in excess returns is not statistically significant.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter presents the summary, conclusion, recommendations for policy, limitations and suggestion for further research. The data was presented in a prose form.

5.2 Summary

The purpose of the study is to evaluate the impact of interest rates on stock returns at the Nairobi stock exchange. This was an analytical study that adopted a time series or longitudinal approach, supplemented by cross-sectional comparisons. The study used data from NSE for the period (2007-2012) which was exposed to sensitivity analysis using regression.

The study found out that, interest rates positively influenced the stock returns at the NSE. We find that shorted stocks with options and convertibles have less negative excess returns. We find that interlisted stocks have more negative excess returns for our sample of shorted stocks. Our results are consistent with the short interest theory which states that a short squeeze occurs when short sellers are scrambling to replace their borrowed stock, thereby increasing demand and decreasing supply, forcing prices up. Short squeezes tend to occur more often in smaller cap stocks, which have a very small float (supply), but large caps are certainly not immune to this situation (Investopedia Staff, 2011).

5.3 Conclusion

Our findings support the hypothesis that the stock market's reaction to real economic variables. Stock returns were found to be positively related with interest rate. This paper reports the results of an examination of the relationship between stock returns and short interest in Kenya. The results strongly indicate that stocks that are sold short perform poorly, contemporaneously. Importantly, this finding does not lead to the conclusion that the Kenyan market functions inefficiently. Rather, it points to the significant impact of short sales constraints on pricing. Short sales constraints limit the ability of traders to use information.

The link between movements in interest rates and industry equity returns is weak at the shortest scales, but it becomes stronger at longer horizons corresponding to low frequencies. This finding agrees with the idea that investors with long-term horizons are more likely to follow macroeconomic fundamentals, such as interest rates, in their investment decisions than investors with shorter perspectives. Therefore, it can be stated that the role of interest rates as a key driver of stock market performance of Kenyan firms only holds in the long run and for certain firms. As expected, the linkage between interest rate changes and stock returns is primarily negative, suggesting that Spanish companies are, in general, favoured by falls in interest rates.

5.4 Recommendations for Policy

The study recommends the stock authority to focus on increasing the interest rates of the NSE. This will in turn increase the stock returns. They will need to consider inflation when they are doing their budget. This is because as inflation increases stock returns also decreases.

The evidence presented in this study may be very helpful for the assessment of potential sector-based diversification opportunities by investors, for the design and implementation of adequate interest rate risk management strategies by firm managers and investors, for asset allocation decisions by portfolio managers and for the formulation of appropriate monetary policy measures by governments.

Changes in short-term interest rates affect firms through changes in interest rate volatility. This finding supports the contention that interest rate volatility enhances the value of stocks returns. Thus policy makers should come up with a way of increasing short interest rate so as move the stock returns up.

5.5 Limitations of the Study

Confidentiality and sensitivity of financial institution matters was a major limitation since respondents may fear revealing important and confidential organizational information. In order to address this limitation, the researcher requested for an introduction letter from the University to support the research work.

✓ The use of a questionnaire alone was a major limitation since the questionnaire may not be able to capture all the required data. To address this limitation, the researcher targeted the use of secondary data from the firm's annual reports and the NSE's reports.

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The researcher had to make proper arrangements with firms to avail their annual reports for the study. The researcher also had to exercise utmost patience and care and in view of this the researcher had to make every effort possible so as to acquire sufficient data from the

respondents. The researcher foresaw that he would face a shortage of literature on interest rates and stock returns more so in the local context.

5.6 Suggestion for Further Research

This paper examines the impact of interest rates on stock returns at the Nairobi stock exchange. Because of data unavailability, it was not possible to include all the companies in the country. Therefore I suggest further research on the impact of interest rates on stock returns to be done in other companies not listed in NSE. Another study should be done to examine the relationship between interest rate changes and bank stock returns using the Kenyan experience. A study should be done to examine the relationship between short interest rate, institutional ownership and stock returns at NSE.

In addition, it would be interesting to examine the information content of the spread in terms of forecasting macroeconomic variables such as investment, inflation and growth. To find out the relationship between the bank interest rate margin and growth of the economy and the implication of widening spread on investment and mobilization of savings.

The study focused on all companies without considering the industry, thus a study on the impact of interest rates on stock returns in Kenya should be done while focusing on each industry for example manufacturing industry, service industry, finance industry.

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APPENDIX 1: POPULATION

Symbol	Listing
EGAD	<u>Eaagads Limited</u>
KAZU	Kakuzi Limited
KAPC	Kapchorua Tea Company Limited
LIMR	Limuru Tea Company Limited
RVP	Rea Vipingo Sisal Estate
STC	Sasini Tea and Coffee
GWKL	Williamson Tea Kenya Limited

Automobiles and Accessories

Symbol	Listing
CARG	Car & General Kenya
CMC	CMC Holdings
MSHA	Marshalls East Africa
FEAL	Sameer Africa Limited

Banking

Symbol	Listing
BARC	Barclays Bank (Kenya)
CFCO	CFC Stanbic Holdings
DTK	Diamond Trust Bank Group
EQTY	Equity Bank Group
HOUS	Housing Finance Company of Kenya
KCBK	Kenya Commercial Bank Group
NABK	National Bank of Kenya
NINC	National Industrial Credit Bank
SCBK	Standard Chartered Kenya
COOP	Cooperative Bank of Kenya

Commercial and Services

Symbol	Listing
EXPK	<u>Express Kenya Limited</u>
HBL	Hutchings Biemer Limited
KAL	Kenya Airways

LKL	Longhorn Kenya Limited
NMG	Nation Media Group
SCAN	Scan group
STDN	Standard Group Limited
TPS	TPS Serena
UCHU	Uchumi Supermarkets

Construction and Allied

Symbol	Listing
ARM	<u>Athi River Mining Limited</u>
BAMB	<u>Bamburi Cement Limited</u>
CRWN	<u>Crown-Berger (Kenya)</u>
CABL	<u>East African Cables Limited</u>
EAPC	<u>East African Portland Cement Company</u>

Energy and Petroleum

Symbol	Listing
KGEN	<u>Kengen</u>
BAMB	<u>Bamburi Cement Limited</u>
KOCL	<u>KenolKobil</u>
KPLA	<u>Kenya Power and Lighting Company</u>
TOPL	<u>Total Kenya Limited</u>
UMEME	<u>Umeme</u>

Insurance

Symbol	Listing
BAI	<u>British-American Investments Co.(Kenya)</u>
CIHL	<u>Liberty Kenya Holdings Limited</u> (formally CFC Insurance)
JHL	<u>Jubilee Holdings Limited</u>
KRIN	<u>Kenya Re-Insurance Corporation</u>
PAIC	<u>Pan Africa Insurance Holdings</u>

Investment

Symbol	Listing
CENTUM	<u>Centum Investment Company</u>
CITY ^[2]	<u>City Trust</u> ^[3]

OLYM	<u>Olympia Capital Holdings</u>
TRCY	<u>TransCentury Investments</u>

Manufacturing and Allied

Symbol	Listing
BAUM	<u>A Baumann and Company</u>
BOC	<u>BOC Kenya</u>
BAT	<u>British American Tobacco Limited</u>
CARB	<u>Carbacid Investments Limited</u>
EABL	<u>East African Breweries</u>
EVRD	<u>Eveready East Africa</u>
KOL	<u>Kenya Orchards Limited</u>
MSCL	<u>Mumias Sugar Company Limited</u>
UNGA	<u>Unga Group</u>

Telecommunication and Technology

Symbol	Listing
ACES	Access Kenya Group
SCOM	Safaricom

Fixed income security market segment (FISMS)

Symbol	Listing
--	Kenya Power & Lighting Ltd 4% Pref 20.00
--	Kenya Power & Lighting Ltd 7% Pref 20.00

Source: softkenya.com/business/nairobi-stock-exchange-listed-companies/

APPENDIX II: INTEREST RATES

YEAR	MONTH	CENTRAL BANK RATES
		91-Day Tbill
2008	JAN	1.58
	FEB	1.57
	MAR	1.59
	APR	2.11
	MAY	2.87
	JUN	2.01
	JUL	1.71
	AUG	2.27
	SEP	2.75
	OCT	3.95
	NOV	5.06
	DEC	8.04
2009	JAN	8.26
	FEB	8.59
	MAR	8.63
	APR	8.68
	MAY	8.66
	JUN	8.50
	JUL	8.59
	AUG	8.66
	SEP	8.58
	OCT	8.19
	NOV	7.84
	DEC	8.07
2010	JAN	8.23
	FEB	8.02
	MAR	7.60
	APR	7.02
	MAY	7.01
	JUN	6.60
	JUL	5.89
	AUG	5.96
	SEP	6.45
	OCT	6.83
	NOV	6.41
	DEC	5.73
2011	JAN	6.00
	FEB	6.22
	MAR	6.32
	APR	6.65
	MAY	6.77
	JUN	6.53

	JUL	6.52
	AUG	7.30
	SEP	7.35
	OCT	7.55
	NOV	7.52
	DEC	6.87
2012	JAN	6.95
	FEB	7.28
	MAR	6.90
	APR	7.35
	MAY	7.76
	JUN	7.73
	JUL	8.03
	AUG	8.02
	SEP	7.69
	OCT	7.75
	NOV	8.39
	DEC	8.59
2009	JAN	8.46
	FEB	7.55
	MAR	7.31
	APR	7.34
	MAY	7.45
	JUN	7.33
	JUL	7.24
	AUG	7.25
	SEP	7.29
	OCT	7.26
	NOV	7.22
	DEC	6.82
2010	JAN	6.56
	FEB	6.21
	MAR	5.98
	APR	5.17
	MAY	4.21
	JUN	2.98
	JUL	1.60
	AUG	1.83
	SEP	2.04
	OCT	2.12
	NOV	2.21
	DEC	2.28
2011	JAN	2.41
	FEB	2.57
	MAR	2.77
	APR	3.26
	MAY	5.35

	JUN	8.95
	JULY	8.99

Source: Central Bank of Kenya

APPENDIX III: INFLATION TRENDS 1961-PRESENT

YEAR	ANNUAL WEIGHTED AVERAGE INDEX	ANNUAL INFLATION RATE
1961	0.91	
1962	0.94	3.9
1963	0.97	2.7
1964	1.00	2.1
1965	1.03	3.5
1966	1.05	2.6
1967	1.08	2.6
1968	1.11	2.4
1969	1.13	1.6
1970	1.22	7.5
1971	1.25	3.7
1972	1.32	5.4
1973	1.44	8.9
1974	1.68	16.3
1975	1.97	17.8
1976	2.17	10.0
1977	2.45	12.7
1978	2.76	12.6
1979	2.99	8.4
1980	3.37	12.8
1981	3.79	12.6
1982	4.64	22.3
1983	5.32	14.6
1984	5.80	9.1
1985	6.43	10.8
1986	7.11	10.5
1987	7.73	8.7
1988	8.68	12.3

1989	9.84	13.5
1990	11.4	15.8
1991	13.64	19.6
1992	17.36	27.3
1993	25.35	46.0
1994	32.65	28.8
1995	33.17	1.6
1996	36.15	9.0
1997	40.21	11.2
1998	42.85	6.6
1999	45.37	5.8
2000	49.89	10
2001	52.75	5.8
2002	53.79	2.0
2003	59.06	9.8
2004	66.03	11.8
2005	72.57	9.9
2006	76.95	6.0
2007	80.24	4.3
2008	92.36	15.1
2009	102.09	10.5
2010	106.26	4.1
2011		

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