

**THE RELATIONSHIP BETWEEN FOREIGN EXCHANGE
RATES AND STOCK MARKET RETURNS IN NAIROBI
SECURITIES EXCHANGE**

BY

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DECLARATION

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

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

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DEDICATION

I dedicate this project to Mum and Dad for their tireless effort to educate me.

ABSTRACT

There are number of reasons to believe that foreign exchange rates should be a contributing factor in determining the stock market returns. Significant value of a nation's capital is tied up in the stock market and investors' wealth is at stake depending on how the market performs. There are cost implications on all economic agents as a result of foreign exchange market occurrences. Internationalization of capital markets has led to greater flows of money between market exchanges and in the cross-listing of firms. The appreciation of a currency reduces its ability to compete for exports; thereby hurting the domestic stock market. This study sought to determine the effect of foreign exchange rates on stock market returns at the NSE. The independent variable was exchange rates as measured by monthly exchange rate between Ksh and USD. The control variables were inflation rates as measured by monthly CPI and interest rates as measured by monthly CBK lending rate. Stock market return was the dependent variable which the study sought to explain and it was measured by monthly returns computed from the 20 share index. Secondary data was collected for a period of 10 years (January 2007 to December 2017) on a monthly basis. The study employed a descriptive research design and a multiple linear regression model was used to analyze the association between the variables. Statistical package for social sciences version 21 was used for data analysis purposes. The results of the study produced R-square value of 0.113 which means that about 11.3 percent of the variation in stock market returns at the NSE can be explained by the three selected independent variables while 88.7 percent in the variation was associated with other factors not covered in this research. The study also found that the independent variables had a weak correlation with stock market returns ($R=0.337$). ANOVA results show that the F statistic was significant at 5% level with an F statistic of 4.949. Therefore the model was fit to explain stock market returns at the NSE. The results further revealed that individually, exchange rates and inflation are statistically significant determinants of stock market returns at the NSE while interest rate is not a significant determiner of stock market returns. This study recommended that policy makers should pay attention to the prevailing foreign exchange rates as they can negatively affect stock market returns recorded at the Nairobi Securities Exchange.

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LIST OF ABBREVIATIONS

ANOVA	Analysis of variance
ARCH	AutoRegressive Conditional Heteroskedasticity
CBK	Central Bank of Kenya
CEO	Chief Executive Officer
CMA	Capital Market Authority
GARCH	Generalized AutoRegressive Conditional Heteroskedasticity
GDP	Gross Domestic Product
NAV	Net Asset Value
NSE	Nairobi Securities Exchange
SPSS	Statistical Package for Social Sciences
UK	United Kingdom
US	United States

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

The relationship between exchange rates and the stock returns is a symbiotic one, which is also integrated into the international financial markets. Stock returns are usually presented as the current value of the cash flow in relation to specific entities and enterprises that are within a functional economy. Exchange rates within a specific economy have an effect on its international competitiveness; as they affect imports and exports (Joseph, 2002). Therefore the state of the currency in a country will directly relate to the shift of the share market index. For example if the Kenyan currency is appreciating it will relatively end up stimulating the market share quite positively in relation to being import dominated (Pan, Fok & Liu, 2007).

Inter-temporal link between returns in stock and exchange rates has become a major concern to economists for varied reasons, as both contribute immensely towards influencing the level of economic development in a nation. The rising capital movements and global trade have rendered exchange rates a key equity price and business profitability determinant (Kim, 2003). The fluctuation of foreign exchange normally plays quite a crucial role in the decision that investors will take in relation to taking up investment opportunities and this has majorly been brought about by the fact that a decline in foreign exchange rate usually leads to loss of investments (Muriu, 2003).

More private investment and integration into the global financial markets has been possible as a result of the introduction and expansion of stock markets in African nations over the recent past (Balparada, Caporale & Gil-Alana, 2015). The Kenyan

stock market is among Africa's emerging economies and the nature of its macroeconomic variables greatly influences its performance. Companies listed on this market are not an exception of the effects of adverse exchange rate movements. After the abolition of the fixed exchange rate system and its replacement with the floating rate system, whereby forces of demand and supply determine exchange rates, managers, shareholders and investors have registered a big concern on volatility of returns (Muriu, 2003).

1.1.1 Foreign Exchange Rates

A primary condition that is needed to allow free trade between different currencies in a common market is that one currency must be quoted in terms of the other. Mishkin & Eakins, (2009) define an exchange rate as the price of a single currency quoted against the other. The quantity of home currency required to purchase a unit of foreign currency is referred to as the direct exchange rate while the amount of the foreign currency obtainable from the home currency is referred to as the indirect exchange rate quotation (Howells & Bain, 2007). Exchange rate is called the nominal rate of exchange when inflationary effects are included in the rate and is referred to as the real rate if these effects have not been included in the rate. Before the year 1972, countries in the world operated on a fixed rate regime where every country's currency was quoted against the dollar (Lothian & Taylor, 1997).

The significance of exchange rate is that it can be adjusted continuously relative to demand and supply of foreign exchange in a given economy. It generates equilibrium between demand and supply by affecting the exchange rate without influencing the reserve level. This allows a country to be flexible in the pursuit of monetary policy without being concerned about effects on the balance of payments. Exchange rate movements reflect external shocks and imbalances which do not have an effect on

movement in reserves and does not need the central bank's intervention to control the process of adjustment. By use of the flexed exchange rate system, pricing of currencies is hence a result of demand and supply forces of the forex market (Ndungu, 2001).

1.1.2 Stock Market Returns

The yield obtained by an investor over a specific period of time is referred to as the stock market returns. This phenomenon is closely associated to the stock prices. The ability of a market to effectively incorporate new information regarding stock prices thus making the firm's stock prices accurate and stable determines its strength (Mwangi & Mwiti, 2015). The level of output and investment of a firm can be measured using stock market returns since stock market returns can be used to predict future discount rates and cash flows. Stock market returns serve as an index to investors or governments in making their investment decisions. Investors of different financial capacity are able to conduct investments in the stock market as long as they are able to get a return that is higher than their cost of capital (Wang, 2012).

Stock return is the gain or loss of the value of a share in a particular period usually quoted as a percentage. It consists of capital gains as well as any income received by the investor from the stock (Mugambi & Okech, 2016). Stock performance is mainly measured using the stock marketing index. Among the stock market performance measures are; Stock market liquidity which refers to the ease with which securities can be bought by the investors, capitalization which is used to measure stock market, the turnover ratio which is used to compare the transaction costs levels and the market liquidity rating and All Share Index, which indicates the performance and the stock market conditions (Daferighe & Sunday, 2012). In Kenya, the NSE 20 share index is

used to calculate the stock returns since the index forms the basis of stock market performance' measurement.

1.1.3 The Relationship between Exchange Rates and Stock Market Returns

The cash flows and common stock value of a market are greatly influenced by the foreign exchange rate. A great fluctuation in the relative prices of currencies was witnessed after the 1970 post-war Bretton Woods, fixed exchange rates collapsed (Rose, 2000). The adoption of floating exchange rate regimes and rapid growth in international trade in most nations triggered increased volatility of exchange rates. Karolyi (2001) states the annual rise in globalization and economic integration has made exchange rate movements a vital risk source for both the financial and non-financial firms. The corporate expected cash flows and stock returns are influenced by the exchange rate movements effecting changes in the foreign currency' home value denominated costs and revenue and the competition terms for firms with international activities and multinationals.

Jorion (1990) showed that currency appreciation might decrease stock prices by reducing business profits for export-oriented firms and multinationals, and also for domestic companies, which in turn impacts stock prices. According to Hussain and Liew (2004), the traditional perspective has two main implications of a local currency's appreciation and depreciation as follows; firstly, a decrease or increase in the debt burden in terms of foreign denomination currency. Local firms would end up paying more or less of the foreign-denominated debt thus deteriorating their cash flows (improve). Secondly, a change the costs of production in the growing economies in which the production process was reliant on foreign-sourced inputs. The consequences would be a drop-off in company revenues and loss (gain) in price competitiveness.

Rey and Hau (2006) suggested that equity and foreign exchange market performance should bear a negative correlation due to portfolio rebalancing. This is based upon a viewpoint of a foreign institutional investor with invested money in the US. In a scenario where the stock in the US market is higher than that of the foreigners market, the investor is overwhelmed with American equities. In order to neutralize back their portfolio position, they sell and reduce their holding of US stocks and sell the US dollar for local currency. Selling of dollars leads the dollar to depreciate at the same time that American equities are outperforming other markets; tying in with the uncovered equity parity (UEP) condition (Melvis & Prins, 2015).

1.1.4 Nairobi Securities Exchange (NSE)

The Nairobi Securities Exchange is registered and controlled by the Capital Markets Authority. It's obligated to watch over the listed firms as well as to offer a platform for transacting of securities. Ngugi (2005) affirms that the NSE was established in 1954 as a deliberate association of securities broker listed within the Societies Act. Ngugi (2005) also noted that trading of shares at the NSE was opened to all people to transact when Kenya became an independent country in 1963. The role of the NSE in the Kenyan economy cannot be underestimated as it facilitates the mobilization of savings, makes available a platform for the development of the economic services and increases enhanced financing source to companies (NSE, 2017).

Following the adoption of the floating exchange rate system, there has been a considerable foreign exchange rate movement observed at the NSE and this has seen the Kenya Shilling (Ksh) depreciating against the world's major currencies. A decreasing trend has also been observed in regard to the NSE 20 share index and the All share index of the NSE. The exchange rate movements have implication on share

prices of companies on the NSE listing (Mwangi, 2013). There has been a both positive and negative movement of foreign currencies affecting share prices and the overall firm value.

1.2 Research Problem

There are number of reasons to believe that foreign exchange rates should be a contributing factor in determining the stock market returns. Significant value of a nation's capital is tied up in the stock market and investors' wealth is at stake depending on how the market performs. There are cost implications on all economic agents as a result of foreign exchange market occurrences (Yucel & Kurt, 2003). Lauterbach and Benita (2004) maintained that exchange rates fluctuations are associated with economic costs which influence inflation, profitability of the firm and economic stability. Internationalization of capital markets has led to greater flows of money between market exchanges and in the cross-listing of firms. The appreciation of a currency reduces its ability to compete for exports; thereby hurting the domestic stock market.

In the recent past and specifically 2015 and early 2016, the Kenya shilling was depreciating in value and at the same time the NSE 20 share index and All share index were also declining. Different opinions have been given towards the fall in the indexes. The main argument is that a weak currency increases the finance cost of the listed company leading to increased debt and relatively less profit. Athi River Mining, one of the listed companies has been experiencing this problem due to the amount it owes to a Lagos-based Africa Finance Corporation (AFC). This has led its reduction in profits and share price. It would be easy to conclude that a positive association exists between exchange rates and the returns of the stock market based on this observation but some observations suggest otherwise. The main observation against

this relationship is that despite the Kenya shilling weakening, stock prices have increased in some sectors of the economy e.g. the agricultural sector, whose current stock prices has increased due to cheap exports.

Empirical evidence is largely inconsistent and quite varied on the influence of foreign exchange rate on stock market returns. Mishra (2004) was of the opinion that there was no clear theoretical unanimity on the interaction of foreign currency movements and stock market returns. Wongbangpo and Sharma (2002) did a study on the Asian countries and discovered a negative association between the exchange rate and market prices, but positively related in two others. Kolari, Moorman, and Sorin (2008) found stock returns said to be uncertain and to be very sensitive to foreign exchange risk. Solnik (1987) found a negative association between listed equities and the local unit of currency. A study by Liu (2013) in the Chinese market concluded an inverse correlation between depreciation and the stock market returns.

Locally, Sifunjo (1999) concluded that developments in exchange rates apply noteworthy impact on determination of stock value in Kenya. In another paper by Omondi and Olweny (2011), on foreign exchange and its impact on the market, they found that the magnitude of volatility is low and significant. Chirchir (2011) investigated the relationship between foreign exchange rates and share prices in Kenya during the period from November 1993 to April 2011 and found out that exchange rates have an influence on share prices in the Kenyan market. Makeri (2014) researched on the relationship between exchange rate volatility and stock market performance and found that exchange rate volatility as well as the volatility of different macro-economic variables had no significant effects on the performance of the stock market. Jumah (2013) examined the effects of foreign exchange rate changes

on stock returns volatility in which a weak correlation was established between the two variables.

The lack of consensus among the various scholars on the associations between foreign exchange rates and the returns of the stock market is reason enough to carry out further examination on the area of study. This paper will seek to identify how foreign exchange rates relate to stock market returns at the NSE. It will attempt to give an explanation to the research question, what is the relationship between foreign exchange rates and stock market returns at the NSE?

1.3 Objective of the Study

To determine the relationship between foreign exchange rates and stock market returns at the NSE.

1.4 Value of the Study

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

This study will assist investors in concluding if they can use the exchange rate parameter to have an objective opinion in knowing the countries stock market returns. Based on the performance of the currency, an investor can also decide whether it is safe to diversify share portfolio in an economy's stock market whose currency is either appreciating or depreciating. This study will also enable investors when to hedge the securities invested.

To government and organizations such as the Capital Markets Authority and the Central Bank, the study has given proposals with respect to the procedure of figuring and actualizing strategies and controls that represent both trade rates and fiscal approaches. The discoveries and recommendations of the study is intended help these organizations to enhance their arrangement detailing and in addition execution in order to balance out cash rates. This will contribute to the advancement of monetary development and improvement the economy.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter presents the theoretical framework applied in the study and a review of the studies done in the past on exchange rates and stock market returns. It contains the theoretical review, determinants of stock market returns, empirical review, conceptual framework and summary of literature review.

2.2 Theoretical Framework

This presents review of the applicable theories that explains the associations between exchange rate and stock market returns. The theoretical reviews covered are; Arbitrage Pricing Theory, Modern Portfolio Theory and Arbitrage Pricing theory.

2.2.1 Traditional economic theory

The theory argues that currency depreciation or appreciation causes either loss or a profit in the company's books and thus ending up affecting the share price. When the currency depreciates, it leads to higher exports, hence the corporate profits increase resulting in higher stock prices in the short run. The transmission mechanism according to this approach is the competitiveness of the firm's exports, resulting in changes in the value of the firm's assets and liabilities culminating in higher profits and reflecting its stock prices. Solnik (1987) argued that a real currency appreciation is unfavorable to the domestic company, because it reduces its competitive ability to export, while a real depreciation enhances its ability to export in the short run.

2.2.2 Portfolio Balance Theory

This theory indicates that the exchange rate is influenced by the mechanism of the stock market. That is, portfolio theories focus on the significant role of capital account

transactions in determining exchange rate dynamics (Phylaktis and Ravazzolo 2005). According to this theory, whenever there is change in the stock price, the movements in the foreign capital account occur. An increase in stock prices leads to more foreign capital inflow while a decline in the stock prices leads to diminished corporate wealth hence the reduction in the country's wealth. This may lead to a fall in the demand for money and monetary authorities reduce the interest rates to alleviate this situation. When interest rates are lower, capital may flow out of the country to take advantage of higher interest rates in other part of the world resulting in currency depreciation. Therefore, according to this theory, lower stock prices may lead to currency depreciation.

2.2.3 Arbitrage Pricing Theory

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

The theory established a theoretical framework that links performance with some variables that have the potential to influence sources of income volatility (Shrestha & Subedi, 2015). Arbitrage Pricing theory (APT) uses macro-economic variables to predict stock returns and the theory assumes that various macro-economic variables can actually affect stock returns other than systematic risk beta (Waqar & Mustabsar, 2015).

Some of the macro-economic indicators that influence stock performance include: the gross national product (GNP), the inflationary rates, the investor confidence levels, changes in the interest yield curve and expected returns on securities (Amarasignhe, 2015). Based on this linear relationship between the macroeconomic variables and performance, it can be deduced that inflation rate, exchange rate and economic growth have an influence on working capital management of firms. Consequently, the value of a firms' asset or security can be described as the total of the expected return and any unexpected returns on the asset (Cuthbertson, 2004).

2.3 Determinants of Stock Market Returns

Stock market investors are keen about stock market returns since it directly affects the wealth they hold. Key factors that are believed to play a part in the overall performance of stock markets are as follows:

2.3.1 Exchange Rates

The rate at which one currency can be converted to another currency is defined as exchange rate (Mohan & Chitradevi, 2014). The changes in exchange rates influence the relative prices of commodities which in turn affects both domestic and foreign producers' competitiveness. The cost of the domestic goods relative to the foreign goods will be higher when there is significant rise in the domestic currency thus shifting the demand to foreign goods from domestic goods. An appreciation of currency in an export-oriented country reduces her exports' competitiveness which is harmful to the domestic stock market (Kirui, Wawire & Perez, 2014).

When the currency of a country appreciates, the cost of the imported goods drops, this largely constitutes to production inputs for countries with emerging markets (Kuwornu, 2012). Accordingly, the depreciation of the domestic currency against the

foreign currencies leads to a decline in export prices leading to an increase in the volume of the export of a country .All this is only possible under elastic demand (Kuwornu, 2012). The foreign exchange rate affects the economy from a macro perspective whereas it has an impact on the firms from a micro perspective. This implies that the financial sector of a country is affected by the exchange rate volatility precisely the stock market (Obura & Anyango, 2016).

2.3.2 Inflation

Tucker (2007) in his works describes inflation as the overall increase in the standard price of services or goods in any given economy. Inflation is referred to as an overall rise in the average level of prices and not specifically in relation to a unit of a given product or service. Sloman and Kevin (2007) in their research paper expound that inflation could take the form of either demand pull inflation which is due to the increase in demand of goods or the form of cost push inflation. Demand-pull inflation arises as a result of a general rise in the overall demand in the market which in return results to the raising of prices and partially increases of the output in a given economy. The increase in the production costs leads to cost push inflation which may affect the firms thus resulting in the companies charging the consumers more (Hendry, 2006).

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

2.3.3 Interest Rates

The interest rate is defined as the savings' price as per the demand and supply of loanable money (Obura & Anyango, 2016). The interest rate serves as an income function and it mainly helps in the mobilization of financial resources and ensures efficient resource utilization so as to bring economic development (Osoro & Ogeto, 2014). The annual price charged on a borrower by a lender so as to avail loans to the borrower in form of the percentage of the sum of the loaned amount is referred to as the interest rate. The neoclassical theory of interest rate states that, the loans' investment cost for the entrepreneurs becomes expensive when the interest rates increase leading to a shrink in the investment opportunities in an economy (Barnor, 2014).

The interest rate is considered as the capital cost and the decisions of the investor are influenced by changes in interest rates (Olweny & Omondi, 2010). Accordingly, Rehman, Sidek and Fauziah (2009) argue that higher discount rates and interest rates will reduce the cash flows' present value leading to an increase in the opportunity cost of holding cash, the interest rates level, which finally results in a substitution effect between stocks and bonds.

2.3.4 Company News and Performance

According to Dehuan and Jin (2008), firms' performance affects returns of stocks at the stock exchange. In a study to investigate association between company performance, Yield on Equity, return on asset, profit margin, earning per share, changes in sales, as well as stock revenues and total asset turnover of the highest accomplishing stocks registered on Shanghai stock exchange, Dehuan and Jin (2008) discovered that each variable is expressively linked with stock prices in the year prior

to the disaster. But, during the period of crisis, the stock price program does not totally affect the company performance.

The study conducted by Uddin (2009) used multiple regression equations to examine the association of microeconomic aspects with stock. This study discovered a noteworthy linear connection between market yield as well as certain microeconomic aspects like net asset price per share, dividend proportion and earnings per share of bank renting, as well as insurance businesses. He also discovered that non-linear association amongst the variables is unimportant at ninety five percentage level of connotation.

Fisher (2009) determined the association between British stock returns and other dissimilar measurable variables. It displayed the effect of dividends, uncirculated profits, as well as company magnitude on stock revenues taken from five typical examples of equities cited on the London Stock Exchange as from 1949 to 1957. A study by Al-Shubiri (2010) adopted the multiple regression examination to establish the connection of microeconomic aspects with the stock value. Fourteen profitable banks were chosen from the Amman Stock Exchange between 2005 and 2008 for the successful execution of the study. The research discovered a positive significant connection between the stock market price as well as NAV for each share. It also discovered negative noteworthy link on loaning interest rate and inflation.

2.4 Empirical Review

There are numerous empirical studies both locally and internationally to support the associations between exchange rates and stock market returns, but these studies have produced mixed results.

2.4.1 Global Studies

Mukherjee and Naka (1995) modeled their investigation on the correlations between six macroeconomic variables using the Japanese stock market as the basis of the study. The variables under study included the exchange rate. A positive link was hypothesized between the stock prices and exchange rate. The depreciation of the Japanese Yen against the US Dollar would result on more exports thereby causing increased yen-denominated cash flows to Japanese companies, and higher stock prices. Using a 20-year sample beginning January 1971 to December 1990, Johansen's VECM (Vector Error Correction Model) was employed. As hypothesized, they found a positive association between the stock market performance and the exchange rate.

Fang (2002) looked into the effects of currency depreciation during the Asian financial crisis (1997–1999). Countries under observation were the markets of Thailand, Taiwan, Singapore, Hong Kong and South Korea. A bivariate GARCH model was used to ascertain the effects. Fang found statistically significant effects between currency depreciation and stock market returns. Stock returns were considerably affected and/or market volatility was increased. The exchange rate was detected to negatively impact local stock prices.

Sharma and Wongbangpo (2002) investigated the link between the prices of stock market and certain macroeconomic variables including the exchange rate. The study was conducted in the Philippines, Indonesia, Singapore, Thailand and Malaysia to ascertain the connection between the variables with the growth of those stock markets and economies. Interestingly, they found a positive relationship in Malaysia, Indonesia and Philippine but negative association in Thailand and Singapore.

Studies by Vezos and Joseph (2006) examined how foreign exchange rate movements and interest rates affected stock returns of US banks. The ARCH impacts in every day returns were analyzed using the EGARCH model. The outcomes recommended that exchange rate represented a significant portion of the fluctuation in market performance at the individual bank and portfolio level; and the level of the affectability of the stock performance to exchange rate fluctuations was not exceptionally maintained regardless of the utilization of high recurrence information. The study further demonstrated that ARCH impacts had an effect on measures of affectability.

A study by Sariannidis et al., (2010) on the effects of macroeconomic variables on the Dow Jones index utilized monthly data as from the first month of 2000 to the first month of 2008. The study made use of the GARCH framework and the conclusions of the study were that the price of crude oil had an inverse influence on the stock market and the different changes in the returns positively influenced the stock market of the 10 year bond prices. The stock returns were thus negatively influenced by the exchange rate.

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

2.4.2 Local Studies

Omondi and Olweny (2011) mulled over the impacts of macroeconomic variables at the Nairobi Securities Exchange on stock return unpredictability. The study's focus was on foreign exchange, interest rate and inflation fluctuations on market returns and volatility in Kenya. They used the time series data on a monthly basis over a ten-year period from the start of 2001 until the end of 2010 and employed the EGARCH methodology. They found the returns to be symmetric but leptokurtic and non-normally distributed. On foreign exchange, they found evidence of relatively low though significant effect of currency movement on stock returns. Stock return volatility was also affected by interest and inflation rates.

Studies by Sifunjo and Mwasaru (2012) explored the causal linkages between currency exchange rates and market prices at the Nairobi Stock Exchange (NSE). He was seeking to uncover the relation between movements in the foreign exchange and the stock exchange markets. He utilized monthly observations from November 1993 to May 1999 of the stock index and Kenya Shilling US Dollar exchange rate. With regard to stationarity, he found that the variables are not stationary both in level forms and first differences. The empirical results deduced evidence of co-integration. Lastly, using error-correction models, the outcome shows that exchange rates granger-cause stock market prices at the NSE.

Ouma and Muriu (2014) study was interested in confirming the influence of the macroeconomic variables on stock returns for the period between 2003 to 2013 in Kenya. Monthly data for the period was used and it was collected from secondary sources. The study focused on Capital Asset Pricing Model (CAPM) and applied the Arbitrage Pricing Theory (APT) to provide a framework. To test for validity of the model, Ordinary Least Squares (OLS) technique was used. The study aimed to

understand the significance of the macro-economic variables on the stock returns. The findings of the study concluded that there was a significant effect on the stock market returns in Kenya attributed to the money supply, exchange rate and inflation rate. The stock market return was however noted to be negatively influenced by exchange rate.

Obwogi and Laichena (2015) evaluated the impact of macroeconomic variables on East Africa's stock returns. The effects of interest rates, inflation rate, currency exchange rate, GDP and their impacts on East Africa's stock returns was examined in the study. Kenya, Tanzania and Uganda were examined as from 2005 to 2014. The study findings revealed a significant association between the East Africa's stock returns and the microeconomic variables used in the study. East Africa's policy makers were thus advised to work harder in order to make the macroeconomic conditions favorable so as to attain improved stock returns.

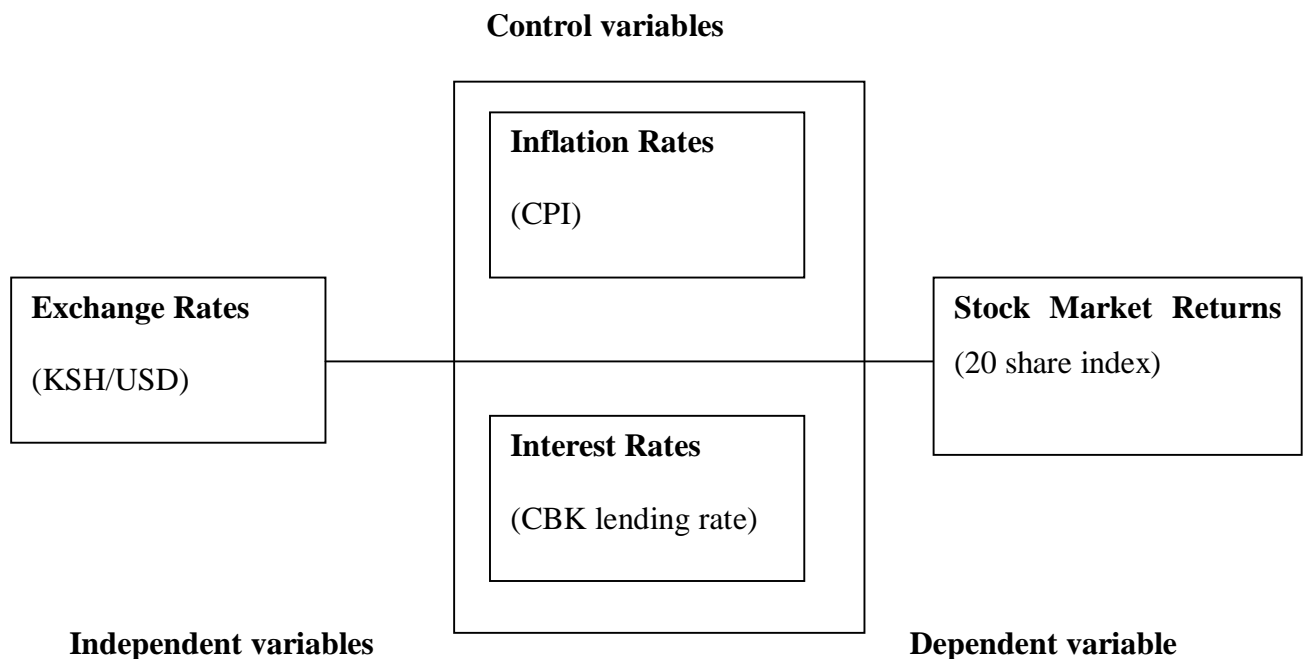
Mugambi and Okech (2016) studied the impact of macroeconomic variables on banks listed in the Nairobi Securities Exchange. The study employed secondary data from the CBK for a period from 2000 to 2015. The study used correlation analysis, Unit Root test and the linear regression model to establish the relationship. The study result shows that interest rate, exchange rate and inflation significantly influence the stock returns of banks, while the bank stock returns are not significantly influenced by the GDP. The study recommended that the government should ensure a stable macroeconomic environment and moderate its monetary policy interventions.

2.5 Conceptual Framework

The conceptual framework gives a portrayal of how the factors identified are related to each other. The factors characterized here are stock market returns and foreign exchange rates. The independent variable is exchange rate as measured by KSH/USD.

The control variables are inflation rates as measured by monthly CPI and interest rates as measured by CBK monthly lending rate. The dependent variable is the stock market return which the study seeks to explain and it will be measured by stock market index.

Figure 2.1: The Conceptual Model



Source: Researcher (2017)

2.6 Summary of the Literature Review

Various theoretical frameworks have attempted to explain the concept of foreign exchange rates. Three theories have been discussed in this theoretical review. The theories are namely: traditional theory, portfolio balance theory and arbitrage pricing theory. Some of the key determinants of stock market returns have also been discussed in this section. Several empirical studies have been conducted both internationally and locally on stock market returns and exchange rates. These studies' findings have also been discussed in this chapter.

The empirical studies analyzed indicate that different researchers have considered different macroeconomic variables with respect to stock returns and varying effects have been established depending on the stock market or period of study. The studies that were analyzed had different macro-economic variables investigated to understand how they affected or were interrelated to the returns of the stock market. The country and period of the studies also differed and this meant that further and current studies needed to be undertaken to institute what is the influence of foreign exchange rates on stock returns.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

The methods of research applied to objectively establish the relationship between foreign exchange rates and stock market returns are described in this chapter. It also shows the population of study, research design, a test of reliability and validity, the criteria for the collection of data and analysis.

3.2 Research Design

Descriptive cross sectional design was adopted for the study. It's a descriptive study since it involves description of all the elements of the population and allows estimates of a part of a population that has these attributes. Identifying relationships among various variables is possible, to determine if the variables are independent or dependent. Cross-sectional study methods are done once and they represent summary at a given timeframe.

3.3 Population and Sample

The study used index that is the NSE 20 share index values. The sample period runs from January 2007 to December 2016.

3.4 Data Collection

Data was exclusively collected from a secondary source. Monthly data for ten years (January 2007 to December 2016) was collected and analyzed. As the study focused on the NSE 20 share indexes, the study included all the companies that have been used to determine the index for the period between; January 2007 to December 2016. Data for the independent variables; exchange rate and the CBK lending rate was obtained from the CBK while data on inflation was collected from the Kenya National

Bureau of Statistics (KNBS). Data for the independent variable; stock returns referenced by the NSE 20 share index was acquired from the NSE. The study analyzed the NSE 20 share index as it related to the quoted companies that are considered blue chip and have superior profitability and dividend indicated in the stock return.

3.5 Diagnostic Tests

Linearity show that two variables X and Y are related by a mathematical equation $Y=bX$ where b is a constant number. The linearity test was obtained through the scatterplot testing or F-statistic in ANOVA. Normality is a test for the assumption that the residual of the response variable are normally distributed around the mean. This was determined by Shapiro-wilk test and Kolmogorov-Smirnov test. Autocorrelation is the measurement of the similarity between a certain time series and a lagged value of the same time series over successive time intervals. It was tested using Durbin-Watson statistic.

Multicollinearity is said to occur when there is a nearly exact or exact linear relation among two or more of the independent variables. This was tested by the determinant of the correlation matrices, which varies from zero to one. Orthogonal independent variable is an indication that the determinant is one while it is zero if there is a complete linear dependence between them and as it approaches to zero then the multicollinearity becomes more intense.

3.6 Data Analysis

The collected data was sorted, classified and coded then tabulated for easy analysis. Collected data was analyzed using both inferential and descriptive statistics. The SPSS version 21 computer software was used in the analysis since it's more user-friendly. The data was input into the SPSS and examined using descriptive, correlation

and regression analyses. In descriptive statistics, the study used mean, standard deviation, minimum and maximum. In inferential statistics, the study used multivariate regression analysis to determine the associations between the dependent variable (Stock market returns) and independent variables: Exchange rates, Interest Rates and Inflation Rate.

3.6.1 Analytical Model

Using the collected data, the researcher conducted a regression analysis to establish the extent of the relationship between exchange rate and stock market returns. The study applied the following regression model:

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

Where:

Y = Average monthly stock market returns

β_0 = Constant term

β_1, β_2 and β_3 = stock return sensitivity to foreign exchange rate, inflation and interest rates.

X_1 = average monthly exchange rates as measured by 1 Ksh against the Dollar in natural logarithmic form.

X_2 = average monthly inflation rates as measured by CPI

X_3 = average monthly interest rates as measured by CBK lending rate

ε = error term

3.6.2 Tests of Significance

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

CHAPTER FOUR

DATA ANALYSIS, FINDINGS AND INTERPRETATION

4.1 Introduction

This chapter represents the results and findings of the study based on the research objectives. The chapter focused on the analysis of the collected data from CMA, CBK and KNBS to establish the effect of foreign exchange rates on stock market returns at the Nairobi Securities Exchange. Using descriptive statistics, correlation analysis and regression analysis, the results of the study were presented in form of tables for easy interpretation.

4.2 Diagnostic Tests

The researcher carried out diagnostic tests on the collected data. The null hypothesis for the test was that the secondary data was not normal. If the p-value recorded was more than 0.05, the researcher would reject it. The results of the test are as shown in Table 4.1.

Table 4.1: Normality Test

Stock market Returns	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	Df	Sig.	Statistic	Df	Sig.
Exchange rates	.178	120	.300	.881	120	.723
Inflation rates	.176	120	.300	.892	120	.784
Interest rates	.173	120	.300	.918	120	.822

a. Lilliefors Significance Correction

Source: Research Findings (2017)

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

4.3 Descriptive Analysis

Descriptive statistics gives a presentation of the mean, maximum and minimum values of variables applied together with their standard deviations in this study. Table 4.2 below shows the descriptive statistics for the variables applied in the study. An analysis of all the variables was obtained using SPSS software for the period of ten years (2007 to 2016) on a monthly basis. Stock market returns had a mean of -.357 with a standard deviation of 4.646. Foreign exchange rate resulted to a mean of 84.14 with a standard deviation of 11.094. Inflation had a mean of 8.290 and standard deviation of 4.604 while interest rates recorded a mean of 9.40 with a standard deviation of 2.966.

Table 4.2: Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Stock market returns	120	-17.9	9.3	-.357	4.646
Exchange rate	120	62	105	84.14	11.094
Inflation rate	120	2	20	8.29	4.604
Interest rate	120	6	18	9.40	2.966
Valid N (listwise)	120				

Source: Research Findings (2017)

4.4 Correlation Analysis

Pearson correlation was employed to analyze the level of association between stock market returns at the NSE and the independent variables for this study (foreign exchange rates, inflation rates and interest rates). From correlation analysis, the study showed that there exist a weak negative correlation between foreign exchange rates and stock market returns ($p = -.144$, $p > .116$). This shows that exchange rates have a weak negative association with stock market returns but the association is not significant. The relationship between inflation and stock market returns was found to be weak and negative ($p = -.242$, $p > 0.008$). This implies that movement in the inflation rate is negatively correlated to stock market returns and in a significant manner. The study also showed the existence of a weak positive correlation between interest rates and stock market returns ($p = .056$, $p > .541$). This goes to show that the prevailing interest rates in a country have an association with stock market returns but that association is not significant. Although the independent variables had an association to each other, the association was not strong to cause Multicollinearity as all the r values were less than 0.70. This implies that there was no Multicollinearity among the independent variables and therefore they can together be used as determinants of stock market returns at the NSE in regression analysis.

Table 4.3: Correlation Analysis

Correlations					
		Stock market returns	Exchange rate	Inflation rate	Interest rate
Stock market returns	Pearson Correlation	1	-.144	-.242**	.056
	Sig. (2-tailed)		.116	.008	.541
Exchange rate	Pearson Correlation	-.144	1	-.099	.204*
	Sig. (2-tailed)	.116		.284	.025
Inflation rate	Pearson Correlation	-.242**	-.099	1	.241**
	Sig. (2-tailed)	.008	.284		.008
Interest rate	Pearson Correlation	.056	.204*	.241**	1
	Sig. (2-tailed)	.541	.025	.008	
**. Correlation is significant at the 0.01 level (2-tailed).					
*. Correlation is significant at the 0.05 level (2-tailed).					

Source: Research Findings (2017).

4.5 Regression Analysis

Stock market returns was regressed against three predictor variables; foreign exchange rates inflation rates and interest rates. The study obtained the model summary statistics as shown in table 4.4 below.

Table 4.4: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.337 ^a	.113	.091	4.4309	1.574

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

b. Dependent Variable: Stock market returns

Source: Research Findings (2017)

From the outcome in table 4.4 above, the value of R square was 0.113, a discovery that only 11.3 percent of the deviations in stock market return at the NSE are caused by changes in exchange rates, inflation rates and interest rates. Other variables not included in the model justify for 88.7 percent of the variations in stock market returns at the NSE. Also, the results revealed that there exists a weak relationship among the selected independent variables and the stock market return as shown by the correlation coefficient (R) equal to 0.337. A durbin-watson statistic of 1.574 indicated that the variable residuals were not serially correlated since the value was more than 1.5.

Table 4.5: Analysis of Variance

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	291.503	3	97.168	4.949	.003 ^b
	Residual	2277.371	116	19.633		
	Total	2568.873	119			

a. Dependent Variable: Stock market returns

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

The significance value is 0.003 which is less than $p=0.05$. This implies that the model was statistically significant in predicting how exchange rates, inflation rates and interest rates affect stock market returns at the NSE. Given 5% level of significance, critical value from the table is 2.74, table 4.5 above shows computed F value as 4.949. This confirms that overall the multiple regression model is statistically significant, in that it is a suitable prediction model for explaining how exchange rates, inflation rates and interest rates affects stock market returns at the NSE.

Table 4.6: Model Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	7.024	3.302		2.127	.036
1 Exchange rate	-.088	.038	-.209	-2.314	.022
Inflation rate	-.307	.092	-.304	-3.336	.001
Interest rate	.270	.145	.172	1.858	.066

a. Dependent Variable: Stock market returns

Source: Research Findings (2017).

The study applied t-test to determine the significance of individual variables applied in this study as predictors of stock market returns at the NSE. The p-value under sig. column was used as an indicator of the significance of the relationship between the dependent and the independent variables. At 95% confidence level, a p-value of less than 0.05 was interpreted as a measure of statistical significance. As such, a p-value

above 0.05 indicates a statistically insignificant relationship between the dependent and the independent variables. The results are as shown in table 4.6

From the above results, it is evident that foreign exchange rate and inflation rate are significant determinants of stock market returns as indicated by p values less than 0.05. Interest rate is an insignificant determinant of stock market returns as indicated by a p value that is greater than 0.05.

The following regression equation was estimated:

$$Y = 7.024 - 0.088X_1 - 0.307X_2 + 0.270X_3$$

Where,

Y = Stock market returns at the NSE

X₁ = Exchange rates

X₂ = Inflation rates

X₃ = Interest rates

On the estimated regression model above, the constant = 7.024 shows that if selected dependent variables (foreign exchange rates, inflation rate and interest rates) were rated zero, stock market returns would be 7.24. A unit increase in exchange rates would lead to a decrease in stock market returns by -0.088 while a unit increase in inflation rates would lead to a decrease in stock market returns by -0.307. A unit increase in interest rates would lead to an increase in stock market returns by 0.270.

4.6 Discussion of Research Findings

The study sought to determine the effect of foreign exchange rate on the stock market returns at the NSE. The independent variable was exchange rates as measured by monthly exchange rate between Ksh and USD. The control variables was inflation rates as measured by monthly CPI and interest rate as measured by CBK monthly lending rate. Stock market returns was the dependent variable which the study sought

to explain and it was measured by monthly returns of the 20 share index. The effect of each of the independent variables on the dependent variable was analyzed in terms of strength and direction.

The Pearson correlation coefficients between the variables revealed existence of a weak negative correlation between exchange rates and stock market returns ($p = -.144$, $p > .116$). This shows that exchange rates have a weak negative association with stock market returns but the association is not significant. The relationship between inflation and stock market returns was found to be weak and negative ($p = -.242$, $p > 0.008$). This implies that movement in the inflation rate is negatively correlated to stock market returns and in a significant manner. The study also showed that there exist a weak positive correlation between interest rates and stock market returns ($p = .056$, $p > .541$). This goes to show that the prevailing interest rates in a country have an association with stock market returns but that association is not significant.

The model summary revealed that the independent variables: foreign exchange rates, inflation rates and interest rates explains 11.3% of changes in the dependent variable as indicated by the value of R^2 which implies that there are other factors not included in this model that account for 95.9% of changes in stock market returns at the NSE. The model was found to be fit at 95% level of confidence since the F-value of 4.949 is higher than the critical value. This implies that overall the multiple regression model is statistically significant, in that it is a suitable prediction model for explaining stock market returns at the NSE.

The findings of this study are in agreement with Ouma and Muriu (2014) whose study was interested in confirming the influence of the macroeconomic variables on stock returns for the period between 2003 and 2013 in Kenya. Monthly data for the period was used and it was collected from secondary sources. The study focused on Capital

Asset Pricing Model (CAPM) and applied the Arbitrage Pricing Theory (APT) to provide a framework. To test for validity of the model, Ordinary Least Squares (OLS) technique was used. The study aimed to understand the significance of the macroeconomic variables on the stock returns. The findings of the study concluded that there was a significant effect on the stock market returns in Kenya attributed to the money supply, exchange rate and inflation rate. The stock market return was however noted to be negatively influenced by exchange rate.

This study is in agreement with Obwogi and Laichena (2015) who evaluated the impact of macroeconomic variables on East Africa's stock returns. The effects of interest rates, inflation rate, currency exchange rate, GDP and their impacts on East Africa's stock returns was examined in the study. Kenya, Tanzania and Uganda were examined as from 2005 to 2014. The study findings revealed a significant association between the East Africa's stock returns and the microeconomic variables used in the study. East Africa's policy makers were thus advised to work harder in order to make the macroeconomic conditions favorable so as to attain improved stock returns.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

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

5.2 Summary of Findings

The study sought to investigate the effect of foreign exchange rates on stock market returns at the NSE. The independent variables for the study were foreign exchange rates, inflation rate and interest rates. The study adopted a descriptive research design. Secondary data was obtained from CBK, CMA and KNBS and was analyzed using SPSS software version 21. The study used monthly data covering a period of ten years from January 2007 to December 2016.

From the results of correlation analysis, a weak negative correlation was found to exist between foreign exchange rates and stock market returns at the NSE. The relationship between inflation and stock market returns at the NSE was found to be weak and negative while interest rates was found to have a weak and positive relationship with stock market returns at the NSE. Interest rates and exchange rates were found to have an insignificant relationship with stock market returns as indicated by p values that are more than 0.05 while inflation rate exhibited a significant correlation indicated by a p value of less than 0.05.

The co-efficient of determination R-square value was 0.113 which means that about 11.3 percent of the variation in stock market returns can be explained by the three

selected independent variables while 88.7 percent in the variation of stock market returns is associated with other factors not covered in this research. The study also found that the independent variables had a weak correlation with stock market returns at the NSE ($R=0.337$). ANOVA results show that the F statistic was significant at 5% level with a $p=4.949$. Therefore the model was fit to explain the relationship between the selected variables.

The regression results show that when all the selected dependent variables (interest rates, exchange rates, inflation rates and interest rates) are rated zero, the stock returns would be 7.024. A unit increase in inflation and exchange rates would lead to a decrease in stock market returns by -0.307 and -0.088 respectively while a unit increase in interest rates would lead to an increase in stock market returns by 0.270. Analysis of model coefficients revealed that both foreign exchange rate and inflation are statistically significant determinants of stock market returns while interest rate was found to be an insignificant determiner.

5.3 Conclusion

From the study findings, foreign exchange rates were found to be negatively related to stock market returns at the NSE and therefore an increase in exchange rates leads to a decrease in stock market returns at the NSE. The study found a positive effect of interest rates on stock market returns and therefore concludes that stock market returns at the NSE have a positive association with interest rates. The study therefore concludes that higher interest rates lead to improved stock market returns even though not to a significant extent. The study found that inflation rate had a negative correlation with stock market returns at the NSE and we can therefore conclude that higher inflation rates tends to discourage performance of firms listed at the NSE leading to low stock market returns.

This study concludes that independent variables selected for the study foreign exchange rates, inflation and interest rates influence stock market returns at the NSE but not to a large extent as they only account for 11.3 percent of the changes in stock market returns. The fact that the three independent variables explain 11.3% of changes in stock market returns imply that the variables not included in the model explain 88.7% of changes in stock market returns. The overall model was found to be significant as explained by the F statistic. It is therefore sufficient to conclude that these variables significantly influence stock market returns as shown by the p value in ANOVA summary.

This finding concurs with Ouma and Muriu (2014) whose study was interested in confirming the influence of the macroeconomic variables on stock returns for the period between 2003 and 2013 in Kenya. Monthly data for the period was used and it was collected from secondary sources. The study focused on Capital Asset Pricing Model (CAPM) and applied the Arbitrage Pricing Theory (APT) to provide a framework. To test for validity of the model, Ordinary Least Squares (OLS) technique was used. The study aimed to understand the significance of the macro-economic variables on the stock returns. The findings of the study concluded that there was a significant effect on the stock market returns in Kenya attributed to the money supply, exchange rate and inflation rate. The stock market return was however noted to be negatively influenced by exchange rate.

5.4 Recommendations

The study found that exchange rates and inflation rates have a negative relationship with stock market returns recorded at the NSE. The variables were also found to be significant determinants of stock market returns. This study recommends that policy makers should pay attention to the prevailing rates of these selected independent

variables as they can negatively affect stock market returns recorded at the Nairobi Securities Exchange.

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

5.5 Limitations of the Study

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

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

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

functional regression model, the hypothesized relationship between two or more variables may not hold.

5.6 Suggestions for Further Research

This study focused on foreign exchange rates and stock market returns at the NSE and relied on secondary data. A research study where data collection relies on primary data i.e. in depth questionnaires and interviews covering all the listed firms on factors affecting stock market returns is recommended so as to compliment this research.

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

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

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APPENDICES

Appendix 1: Data used in the study

Year	Month	Stock market returns	Interest rate	Inflation rate	Exchange rate
2007	JAN	8.30	10	4.63	70.537
	FEB	(4.38)	10	3.12	69.733
	MAR	(11.95)	10	2.31	68.781
	APR	2.74	10	2	68.306
	MAY	(1.08)	10	2.09	66.966
	JUN	(0.42)	8.5	4.05	66.564
	JUL	1.45	8.5	5.39	67.509
	AUG	1.38	8.75	5.19	66.989
	SEP	3.75	8.75	5.45	66.971
	OCT	(7.22)	8.75	5.32	67.114
	NOV	1.59	8.75	5.98	64.424
	DEC	3.21	8.75	5.6	62.675
2008	JAN	(4.35)	8.75	7.93	70.561
	FEB	(4.07)	8.75	11.04	68.978
	MAR	3.94	8.75	12.53	62.848
	APR	0.63	8.75	16.83	62.136
	MAY	2.53	8.75	18.7	62.029
	JUN	1.57	9	16.79	64.694
	JUL	(4.68)	9	15.33	67.318
	AUG	(6.48)	9	15.98	68.733
	SEP	(7.89)	9	16.32	73.219
	OCT	(15.44)	9	16.7	79.653
	NOV	(1.46)	9	17.56	77.881
	DEC	(8.80)	8.5	15.48	77.711
2009	JAN	3.25	8.5	13.33	79.544
	FEB	(17.91)	8.5	14.62	79.687
	MAR	(8.66)	8.25	14.44	80.431
	APR	8.57	8.25	12.1	78.662
	MAY	2.48	8	9.88	78.348
	JUN	8.79	8	9.86	77.158
	JUL	6.56	7.75	10.33	76.607
	AUG	(3.03)	7.75	9.76	76.233
	SEP	(3.42)	7.75	9.19	74.999
	OCT	(2.09)	7.75	8.8	75.239
	NOV	3.44	7	7.14	74.907
	DEC	1.92	7	8.02	75.82
2010	JAN	8.77	7	7.52	75.886

	FEB	3.48	7	5.18	76.897
	MAR	9.25	6.75	3.97	77.331
	APR	5.65	6.75	3.66	77.266
	MAY	2.94	6.75	3.88	79.745
	JUN	0.59	6.75	3.49	81.917
	JUL	1.10	6	3.57	80.23
	AUG	5.35	6	3.22	81.071
	SEP	(0.79)	6	3.21	80.778
	OCT	2.32	6	3.18	80.787
	NOV	(1.27)	6	3.84	80.974
	DEC	(4.51)	6	4.51	80.752
2011	JAN	3.77	5.75	5.42	81.272
	FEB	(4.75)	5.75	6.54	82.364
	MAR	(7.61)	6	9.19	82.989
	APR	0.33	6	12.05	83.419
	MAY	0.53	6	12.95	85.704
	JUN	(0.28)	6.25	14.48	89.864
	JULY	(4.95)	6.25	15.53	91.1
	AUG	(6.75)	6.25	16.67	93.622
	SEP	(4.43)	7	17.32	99.832
	OCT	(2.45)	11	18.91	99.778
	NOV	1.74	16.5	19.72	89.721
	DEC	(7.55)	18	18.93	85.068
2012	JAN	2.51	18	18.31	84.588
	FEB	(0.16)	18	16.7	82.971
	MAR	4.62	18	15.61	83.056
	APR	4.20	18	13.06	83.216
	MAY	4.30	18	12.22	86.825
	JUN	1.38	18	10.05	84.233
	JULY	3.60	16.5	7.74	84.213
	AUG	0.33	16.5	6.09	84.321
	SEP	2.66	13	5.32	85.283
	OCT	2.67	13	4.14	85.178
	NOV	2.73	11	3.25	85.935
	DEC	(1.62)	11	3.2	86.029
2013	JAN	7.22	9.5	3.67	87.611
	FEB	3.93	9.5	4.45	86.236
	MAR	4.16	9.5	4.11	85.639
	APR	3.81	9.5	4.14	83.821
	MAY	0.28	8.5	4.05	85.124
	JUNE	(2.48)	8.5	4.91	86.008
	JULY	(1.93)	8.5	6.02	87.28
	AUG	1.75	8.5	6.67	87.597

	SEP	(1.45)	8.5	8.29	86.646
	OCT	4.32	8.5	7.76	85.147
	NOV	2.37	8.5	7.36	86.993
	DEC	(2.25)	8.5	7.15	86.31
2014	JAN	1.68	8.5	7.21	86.236
	FEB	(2.89)	8.5	6.86	86.326
	MAR	1.48	8.5	6.27	86.441
	APR	(0.48)	8.5	6.41	86.871
	MAY	0.29	8.5	7.3	87.797
	JUN	(2.03)	8.5	7.39	87.627
	JUL	1.27	8.5	7.67	87.804
	AUG	2.80	8.5	8.36	88.394
	SEP	3.84	8.5	6.6	89.279
	OCT	0.71	8.5	6.43	89.352
	NOV	(2.53)	8.5	6.09	90.179
	DEC	(0.78)	8.5	6.02	90.598
2015	JAN	1.44	8.5	5.53	91.674
	FEB	4.05	8.5	5.61	91.423
	MAR	(0.59)	8.5	6.31	92.335
	APR	(4.34)	8.5	7.08	94.6
	MAY	(2.92)	8.5	6.87	97.781
	JUN	(3.45)	10	7.03	98.639
	JUL	(2.79)	11.5	6.62	102.521
	AUG	(6.19)	11.5	5.84	103.87
	SEP	(3.66)	11.5	5.97	105.293
	OCT	(5.58)	11.5	6.72	101.8
	NOV	(0.94)	11.5	7.32	102.114
	DEC	1.38	11.5	8.01	102.311
2016	JAN	(3.36)	11.5	7.78	102.283
	FEB	(0.81)	11.5	6.84	101.697
	MAR	3.42	11.5	6.45	101.334
	APR	0.59	11.5	5.27	101.141
	MAY	(1.63)	10.5	5	100.831
	JUNE	(4.24)	10.5	5.8	101.102
	JULY	(4.59)	10.5	6.39	101.389
	AUG	(4.70)	10	6.26	101.41
	SEP	(6.18)	10	6.34	101.423
	OCT	1.44	10	6.47	101.429
	NOV	0.53	10	6.68	101.381
	DEC	(3.24)	10	6.35	101.323