THE EFFECT OF EXCHANGE RATE CHANGES ON STOCK MARKET RETURNS AT THE NAIROBI SECURITIES EXCHANGE

BY

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DECLARATION

I hereby declare that this project is my work and has never been submitted for a degree award in any university.

Signed…………………………………………..Date………………………

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This project has been submitted for examination with my approval as university supervisor.

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DEDICATION

I dedicate this work to my lovely daughter, Sasha for her love, and my husband,

Joseph who has always been my source of inspiration.

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LIST OF ABBREVIATIONS

AFC   Africa Finance Corporation

ASEA   Africa Security Exchange Association

CPI   Consumer Price Index

CBK   Central Bank of Kenya

EASEA   East African Security Exchanges Association

ER   Exchange Rate

GDP   Gross Domestic Product

IR   Interest Rate

INF   Inflation

KNBS   Kenya National Bureau of Statistics

NSE   Nairobi Securities Exchange

REER   Real Exchange Rate

RIR   Real Interest Rate

SMR   Stock Market Returns

UNCTAD   United Nations Conference of Trade and Development

VAR   Vector Autoregressive

ABSTRACT

Exchange rate is an important macroeconomic factor driving economies around the world. Equally important, is the performance of the stock market. Literature on the effect of exchange rate on stock market performance indicates mixed findings. This is an indication that debate on the relationship between exchange rate and stock market share indices around the world is still far from over. Arising from this, the study had sought to investigate the effect of real exchange rate on the Nairobi Securities Exchange. The study focused on the Nairobi Securities Exchange 20 share index and the Kenya shillings/United States Dollar real exchange rate. The study applied simple regression (ordinary least squares) on half-yearly data for 16 years, that is, from 2001-2016. Data was obtained from Nairobi Securities Exchange data base, Kenya National Bureau of Statistics, and the United Nations Conference on Trade and Development. Since ordinary least square regression estimates are affected by multicollinearity and heteroscedasticity problems, multicollinearity and heteroscedasticity tests were conducted on the variables. These tests confirmed the absence of both multicollinearity and heteroscedasticity meaning that the estimated coefficients are valid, and the study can draw reliable inferences. Findings indicate that real exchange rate is significant and positively correlates with the Nairobi Securities Exchange index. In addition, the rate of inflation was also found to be significant but with a negative sign (relationship). Based on these findings, the study recommended for the government to put in place better policies to manage levels of inflation.

CHAPTER ONE: INTRODUCTION

1.1 Background of the study

Existing body knowledge show there is a link between exchange rates and stock market activities. This relationship emanates from the integration of financial institutions at the global level (Rudebusch & Wu, 2008). The stock market acts as a primary avenue in which firms and governments mobilize capital for investment. This also allows companies and countries to inject investor savings into profitable business opportunities such as sale of stock market securities to other investors, and thus reducing the amount of investment risk a firm may undergo as well as availing of liquidity to ease the operation of the firm or an economy ((Adan & Tweneboah, 2008).

Several hypotheses observe that exchange rates and stock market prices are linked. For instance, Dombusch & Fischer (1980) proposed that exchange rate changes impact on the competitiveness of companies because exchange rate volatility impacts on the income values and costs of operations because many firms borrow in terms of foreign currencies for investment and day to-day operations. A devaluation of domestic currency, makes a country's exports more competitive, and hence more demand for local exports by foreigners. This ultimately leads to increase in firm's profits and prices of the securities, while increase in the value of the domestic currency produces opposite results.

There is empirical evidence of the existence of a causal link between exchange rates and stock market returns (Richard et al., 1998). From the theoretical point of view one can quickly conclude that exchange rates have a causal relationship with stock market prices. The same underlying factors which include demand and supply, Gross Domestic Product (GDP), fiscal and

monetary policies, affect exchange rates and stock market prices. Currently, the value of a company is subject to foreign exchange rate values irrespective of whether the company is foreign or local (Shapiro, 1997).

1.1.1 Exchange Rates

Exchange rate is the price of one country's currency to that of another country. This implies that exchange rate has two components, i.e. the domestic and foreign component and hence indicating that it can be expressed directly or indirectly (Akong'a, 2014). Direct expression of exchange rate is where the exchange rate is expressed based on domestic currency. On the other hand, indirect expression is where the rate of exchange is expressed in foreign currency terminologies. In direct expression, local currency is termed as the counter currency, while the foreign currency, becomes base currency.

Globally, most exchange rates are expressed in terms of United States Dollar (USD), and in some cases, the Euro and other currencies from the common wealth including: British pound, and Australian dollar (Akong'a, 2014). There are two exchange rate regimes; the floating (flexible) and fixed. In the fixed exchange rate regime, the rates of exchange are determined by central banks, while in the floating regime, forces of demand and supply determine exchange rates

1.1.2 Stock Market Returns

Stock market returns can be understood as the gains made by firms. These gains can either be in terms of dividends or revenues for companies (Akong'o, 2014). Since stock market return generally fluctuate due to market risks, most investors buy the stocks when the prices are low and sell them when prices go up to get maximum profits. Prudent investors conduct stock analyses to determine what the future holds before either buying or selling securities. These

analyses are technical in nature and mainly focuses on the movement of prices, liquidity growth as well as revenue growth of firms and other information deemed necessary to lead to higher security prices. The market for stocks is very unpredictable because of dramatic movements of prices which can give investors positive or negative returns on their stock (Aggarwal & Harper, 2010).

Existing literature argues for a strong connection between fluctuations of the stock prices and stock market performance. An increase in stock market price fluctuations increases stock market risks, a situation likely to jeopardize performance at the stock market (Jamil & Ullah, 2013). An anticipated fluctuation has a greater influence on the returns of the stock market than the expected fluctuations (Brandnom et al., 2014).

Several factors are known to contribute to changes in the stock market performance and therefore fluctuations. Key among these factors is exchange rate. Any fluctuation in exchange rate influences market trends especially in the long-term (Akong'o, 2014). While the main concern of the policy markers being what explains stock market fluctuations and their impact on the economy, analyst in the financial sector focus mainly on the effects of time varying fluctuations. It is therefore important to pay more attention on the stock market volatility particularly in the case where a country relies so much on financial stability attributed to market for securities.

1.1.3 Exchange Rate and Stock Market Return

Existence of the relationship between the exchange rates and stock markets is not in doubt. Firms listed on the stock exchange determine share prices based on their net profits (Adjasi & Biekpe, 2005). The share price of a firm thus depends on the profit and especially, how much the

company expects to earn in the long-term. The price of a given security is more likely to increase if based on speculation, the firm anticipates getting more profit in future. On the other hand, if the company anticipates a downward trend in its future revenue, then its share price is likely to decline.

Both theory and empirical findings indicate the relationship exist between exchange rates and stock market prices. Dombusch and Fischer (1980) proposed that any change in exchange rate affect competitiveness of companies because exchange rate volatility impacts on the income values and costs of operations because many firms borrow in terms of foreign currencies for investment and day to-day operations. A devaluation of domestic currency, makes a country's exports more competitive, and hence more demand for local exports by foreigners. This ultimately leads to increase in firm's profits and stock prices, and increase of the domestic currency produces contrary results.

1.1.4 Nairobi Securities Exchange

The stock market in Kenya commenced in 1920 (Murungi, 2012). At this time, this market was very informal because no any form of regulations was in existence. Transacting in stocks was based on the gentleman's agreement where a standard commission was charged and clients were obliged to their contracts for making perfect deliveries and settling relevant charges. The initial formal stock broker company is traced way back in 1951 by an Estate agent in the name of Francis Drummond (Ngugi et al, 2009). This then was followed by establishment of other stockbrokerage companies. The Nairobi Stock Exchange which is now then known as Nairobi Securities Exchange was established in 1954 when its trading took place over a cup of tea at Stanley Hotel in Nairobi (Nyasha & Odhiambo, 2017). The NSE at this time was merely an association of individuals working as volunteer stockbrokers. This was registered under the

society's Act Laws of Kenya. The association was then converted into a limited company with no share capital in early 1991.

Since then, NSE has seen tremendous growth including an increase in the number of stockbrokers, introduction of investment banks, custodian institutions, credit firms, and an increase in the number of companies listed on the market. Among the securities traded on NSE include equities, bonds, and preference shares. NSE facilitates transfer of resources from not so active financial agents to the most active players (Adjasi & Biekpe, 2005). Currently, there are a total of 64 companies listed on the NSE. Out of these, 63 of them are in the investment segment while one is registered in the growth enterprise segment (NSE, 2016).

The magnitude of the stock market activities is measured by NSE 20 Share Index. This index is what traces the performance of individual firms quoted on the NSE. To be listed on the market, companies are evaluated based on how they have performed for the last 12 months in terms of number of traded shares and stock turnover as well their number of deals (Adjasi & Biekpe, 2005). An efficient stock market would guarantee better economic performance by raising liquidity levels, rational decision making, risk diversification and good corporate government.

1.2 Research Problem

The effect of exchange on various macro and microeconomic variables has been studied extensively across the world. Karam (2008) studied long-term effects between the Indian stock market and variables including exchange rates, inflation, interest rates and savings in the Indian economy, and established the existence of long-range link between the stock market and other macroeconomic variables. Similarly, Coleman and Tettey (2008) observed that exchange rates had a great impact of the stock market in Ghana.

In Kenya, there is limited literature on the effect of exchange rate on the stock market returns for firms listed on the NSE. In fact, most studies have focused on how exchange rates affect stock market return (NSE-20 share index) as opposed to stock market returns for the individual firms, which is the aim of this study. In addition, even for the few studies conducted at a macro-level, their findings are not conclusive. For example, Murungi (2012), established only short-tern impact rates of exchange on market returns while, Liu (2013) did not find either long-term or short- term effects between the two variables. On the contrary, Brooks in (Adjasi & Biekpe, 2005) in the case of Australian firms observed a strong positive link between rates of exchange and stock market returns. In the long-tern, Murungi (2012) found that a decrease in the local currency occasions an increase in the stock price while in the short run depreciation leads to lower stock returns. Another study is therefore necessary to fill this gap. Furthermore, since some of the macroeconomic variables (Inflation, interest rates, exchange rates) used in the past studies have undergone changes owing to the constant changes in the economic climate, it will be imperative to conduct another study to establish the current effect of exchange rates on the stock market returns for firms listed on the Nairobi Securities Exchange. The study sought to answer the question, "What is the effect of exchange rates on stock market returns at the Nairobi Securities Exchange?"

1.3 Objective of the Study

To determine the effect of KSHS/USD exchange rates on the NSE 20 share index at the Nairobi Securities Exchange.

1.4 Value of the Study

The Nairobi Securities exchange plays a pivotal role in the Kenyan economy-that of providing a platform for trading in shares and thus leading to expanded economic activities, more capital to investors as well as savings. Existing literature is inconclusive however, on how the exchange rates affects returns on this market. Thus, this study sought to fill this gap. Establishment of the effects of exchange rate on the stock market returns will also be instrumental to investors especially in their technical analysis of various securities which they intent to transact into.

Investment bankers and stockbrokers will also be able to know whether the weakening currency will affect their decision on whether to buy or sell a share leading to an increase in their brokerage commissions. Since some of them are also investors in the same market they may benefit the same way as an ordinary investor. Furthermore, the study is also expected to generate academic debate which could lead to more studies, using this as a spring board.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

Chapter presents literature review of the study. Both theory and empirical evidence which relates to the topic of the study (effects of exchange rate of stock market returns) is discussed. The first part of this chapter reviews related theories, while the second part presents empirical evidence. Finally, the study chapter presents a conceptual framework for the study.

2.2 Theoretical Foundation of the Study

There are various theories which attempts to explain the relationship as well and impact of exchange rate on market returns. The main theories which the study will adopt are: the economic theory, portfolio adjustment theory, traditional and the Keynesian approaches.

2.2.1 Economic theory

Proponents of economic theory argue that for one to understand the trends in the stock prices, variables like interest rates, the supply of money and inflation are very important in forecasting movements in the exchange rates. This theory postulates that any change in the exchange rate influences balance sheet items because at the global level, the competitiveness of a firm is expressed in terms of foreign currency (Branson and Masson, 1977). This in turn, affects equity and firm revenues. The link existing between exchange rate and market returns on the stock market was also confirmed by Meese and Rogoff (1983), who also argued that exchange rates affects the stock market returns through other macroeconomic variables.

Economic theory asserts that firms with operations beyond borders encounter three exposures, i.e. transaction, operation and translation exposures. Transaction exposure comes about when trading is dominated by foreign currency, and hence leading to either profits or losses.

Translation exposure comes about when foreign currencies are being converted into aggregate financial statements, which is normally expressed in terms the local currency. Finally, operating/economic exposure comes about due to fluctuations in the exchange rates. This theory will therefore be used to interpret findings based on these three types of exposure. In addition, the theory will also guide the comprehension of the impact of rates of exchange on market returns.

2.2.2 Portfolio adjustment theory

This portfolio adjustment theory postulates that portfolio adjustments i.e. fluctuations in the flow of foreign assets comes about when changes in the prices of stocks occur. For instance, an increase in stock prices greatly attracts foreign assets (capital). On the other hand, a decrease in the price of stocks, reduces the wealth companies, which may bring a reduction in the money demanded. Basically, a reduction in the levels of interest rate will alleviate this situation, because, lower interest rates encourages outflow of foreign assets to capitalize on high interest rates in other economies. This in turn, leads to devaluation of the domestic currency. The implication of this theory is therefore, that, currency devaluation (depreciation) is attributed to low stock prices. The theory will be employed to understand how currency appreciation and depreciation affects the stock prices and this ultimately affects the stock returns of firms listed on the NSE.

2.2.3 Traditional theory

This theory holds that a depreciation of the local currency encourages export trade and this boosts the revenues of firms participating in international trade, which in turn leads to higher stock prices (Solnick, 1987). Traditional theories attributes competitiveness of the company's exports as the avenue through which exchange rate affects the firm's profitability and therefore

stock market prices. Solnick (1987) noted that appreciation of the domestic currency in real terms is not good news for the indigenous firms, because it reduces their competitive advantage in the export market and thereby lowering their returns.

The study will thus use the theory to determine how exchange rate volatility affects stock market prices, and hence the returns.

2.2.4 The Keynesian Theory

The theory was developed by John Maynard Keynes who used the hypothetical newspaper beauty contest to explain the behaviour of investors in the stock market. Aggarwal & Harper (2010) Keynes argued that much of the investments in the stock market are driven by expectations about what the other investors think, rather than rational expectation about the fundamental viability of a particular share investment. He explains that stock market volatility occur because investments are determined by the herd-like 'animal spirits' of the investors.

Keynes illustrated this herd mentality of investor with the analogy of a beauty contest that featured in a newspaper picture of a number of young women. The contest will be won on popular vote and readers are expected to vote for their favourite contestants. The participants are requested to make a choice from six sets of faces of women whom they perceive to be more beautiful. The ones who pick the most beautiful, becomes eligible to contest for the award. The theory will be used to determine how investor expectations affects the volatility of exchange rates and also how this affects the stock market returns of companies trading on the NSE.

2.3 Determinants of stock market returns

2.3.1 Government regulations

Introducing Capital gain tax on the share prices will be less attractive to the investors. This will lead to them seeking alternative stock markets in other countries leading to a reduction in the demand for the shares listed hence poor performance in the stock market.

2.3.2 Interest rates

Generally, interest rates are determined through forces of demand and supply of money, or financial assets in the economy. Investors in the market for securities are highly attracted when interest rates on savings are high, as opposed to when they are low, because during this time, it becomes more profitable for them to keep money in savings accounts rather than in stocks (Adan & Tweneboah, 2008). This is because, high interest rate increases lending costs for listed firms and thereby a decline in profitability. Investor's speculation on the reduction of profits will lead to less demand on the stocks hence its poor performance

2.3.3 Inflation

Inflation influences return to investment through input costs (Mishra, 2004). For example, higher inflation rates increase the cost of business operation, and hence their performance in terms of profits. This has an ultimate effect of lowering the share price of a company's stocks.

2.4 Empirical Review

Relationship between the rates of exchange on market returns have received much attention from many researchers across the world. In applying Vector Autoregressive Model (VAR) in four countries, Abdalla and Murinde (1997) observed that there was link between exchange rate volatility on the price of stocks in India, Korea and Pakistan. However, the study established no relationship between the two variables in Philipines. Using a descriptive design, Bartram &

Bodnar (2012) established that exchange rates strongly influences stock market returns. The study noted that exchange rate fluctuations, leads to stock market volatility.

Bartram & Bodnar (2012) using descriptive research design, investigated the impact of exchange rate volatility on the stock market returns. The findings indicate that conditional market returns were insignificantly linked to exchange rate movements. On the other hand, the variance or returns showed a strong link between stock market returns and the exchange rate fluctuations. Increased foreign investor participation in the stock market is likely to push up share prices and result in increased returns. The NASI Index to foreign investor's turnover is positively correlated to the market return. An increase in foreign investor turnover shows that foreign investors have a reasonable level of confidence in the domestic market and this pushes market return up (Brandnam et al., 2014). In addition, their findings indicate that returns on the stock market is determined by the amount of foreign assets in the stock market. This implies that foreign investment influences stock prices.

Jumah (2013) employed simple regression equations to study the link between stock market returns and the exchange rate movements in Mexico. The study found a positive correlation between stock market returns and exchange rates. Similar findings were reported by Jamil & Ulhal (2013) in the case of Australian. However, Jamil & Ulhal (2013) study was only limited to the banking industry and, the relationship only existed in the long-run.

Omondi and Olweny, (2011) mulled over the impacts of macroeconomic components at Nairobi Securities Exchange on stock return unpredictability with foreign rate exchange being one of the informative elements. This study used time series methodology on the data from 2001-2010.

Results demonstrated that foreign exchange rate adversely influence stock return unpredictability.

Aroni (2011) investigated variables impacting stock costs for firms recorded in NSE and the outcomes demonstrated that exchange rate volatility had adverse effects on the stock market returns. Sewe (2016) conducted a similar study using time series data from NSE covering the period November 1993-April 2011 and also established that exchange rates negatively affect the stock market returns. In another study on the effects of exchange rates on the stock market returns on the NSE, Sewe (2016) established that exchange rates have adverse effects on the stock market returns, though the effects were of low magnitude.

2.5 Summary of Literature Review

There is no doubt that a lot of studies have been done regarding the effects of exchange rate and stock market returns. However, the studies reviewed are inconclusive due to contradictions in their findings. While some studies established a negative correlation between the two variables (see Sewe (2016), others (see Omondi and Olweny, 2011) observed a positive correlation. This therefore means that there is a gap for which this study hoped to fill.

2.6 Conceptual Framework

The conceptual framework of this study as shown in Figure 2.1, presents the dependent variable which is stock market returns and independent variables as exchange rates, inflation, and interest rate.

Control variables

```
┌─────────────────────┐
│      Inflation      │
│       (CPI)         │
└─────────────────────┘
```

Independent variable   Dependent variable

```
┌─────────────────┐                          ┌─────────────────┐
│   Exchange      │ ───────────────────────► │    NSE-20       │
│   Rate (ER)     │                          │    Share        │
│                 │                          │    Index        │
└─────────────────┘                          └─────────────────┘
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┌─────────────────────┐
│      Interest       │
│      Rate (IR)      │
└─────────────────────┘
```
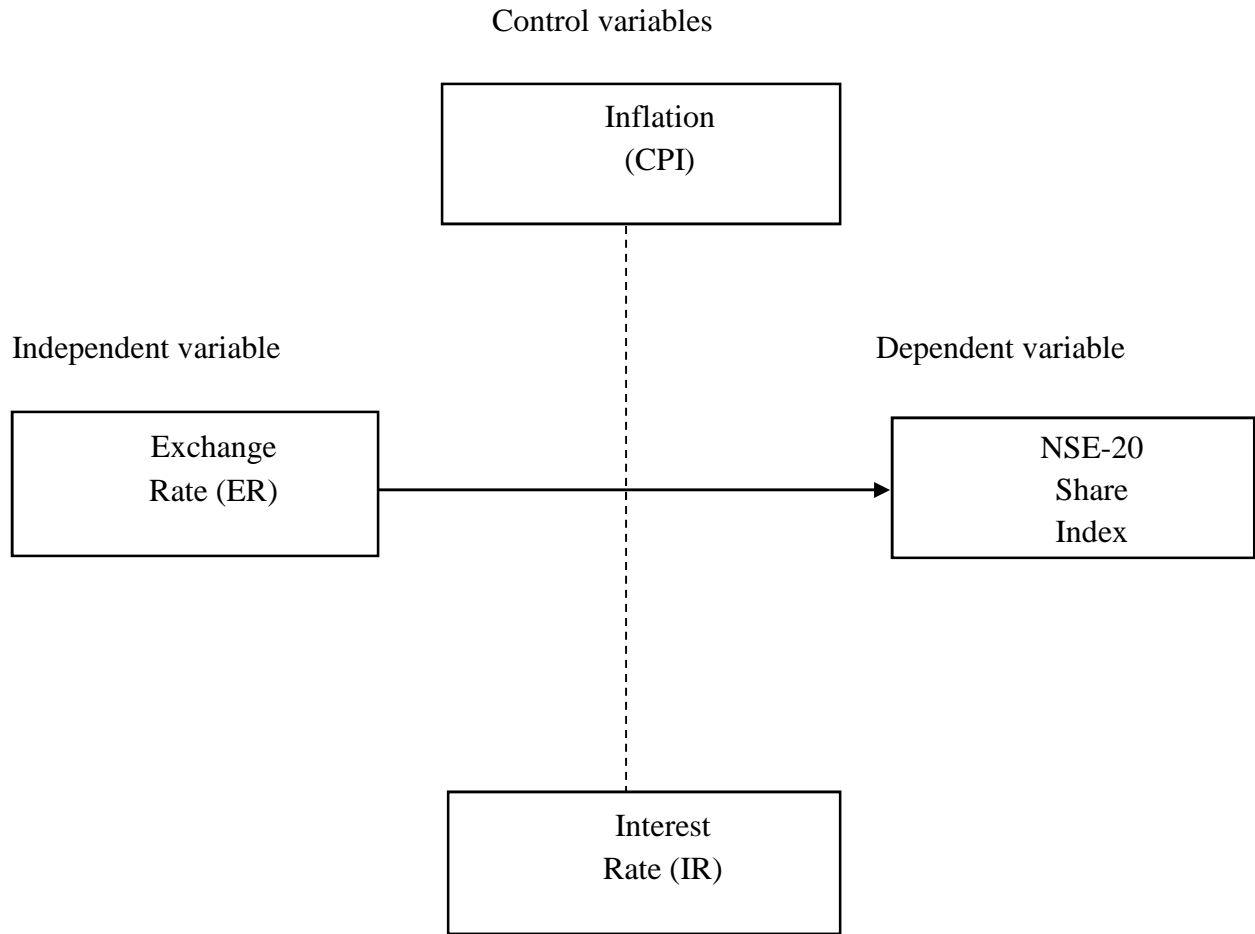
Figure 2.1: Conceptual Model

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introductions

The chapter presents the research methods to be adopted in answering the objective of the study. These includes: the study design, universe, sample, and sampling, data collection and analysis.

3.2 Research Design

This is a plan that is used to answer research question. The study will use a descriptive approach to explain how exchange rate fluctuations affect stock market returns. This design is important because, it seeks to explain phenomena the way they are. The purpose here is to help all stakeholders in making rational decisions on policies.

3.3 Study Population

Population of a study refers to all accessible elements with the researcher's characteristics of interest (Mugenda and Mugenda, 2003). The study population comprises of all the companies listed on the NSE. There is a total of 64 companies listed in the Nairobi Securities Exchange.

3.4 Sample Design

A sample in research refers to a sub-group which is selected to represent the entire population (Mugenda, 2003). Data collection can at times prove to be hectic due to the challenges that come about with it such as availability or access to respondents, restrictions of time and money (Kothari,2004) sampling provides a wide array of methods that help reduce the size of the data to be collected as a subgroup is chosen to represent the whole group of study (Saunders, Lewis &Thornhill, 2003). Sampling simplifies data collection by enabling the researcher to collect data from a subgroup and thereafter draw conclusions about the entire population. The study used NSE-20 share index to capture stock market returns at NSE share.

3.5 Data Collection

The study collected secondary annual data for a period of 16 years (2001- 2016). These data comprised of the NSE-20 share index, volume and value of traded shares for the 10 selected listed companies at NSE, Exchange rates, Interest rates, and inflation. The data was obtained from World bank database, Central Bank of Kenya (CBK), NSE, Kenya National Bureau of Statistics (KNBS) and UNCTAD annual reports.

3.6 Data Analysis

Both regression and descriptive data analysis methods were used in the study. A regression analysis can determine both the relationship between two variables and the effect of one variable on another. Based on the theory, empirical and the conceptual framework, the study estimated the following model:

$$SMR_{it} = \beta_0 + \beta_i ER_t + \varepsilon_{it}$$ …………………………………………………………..(1)

Where;

SMR_{it} is the stock market return of firm i and at time t,

β_0 is the constant term

's are coefficients for estimation

ER_t is the exchange rate movements

ε_{it} = error term

The research considered the movement of the Kenyan Shilling in relation to the US Dollar. SMR represents the percentage change in stock prices using yearly opening and closing stock prices. In addition, the model considered other factors which could explain stock

market returns. These factors include: inflation, interest rate. Therefore, the regression equation for the study was presented as:

$$SMR_{it} = \alpha_0 + \alpha_i REER_t + \alpha_{ii} RIR_t + \alpha_{iii} INF_t + \varepsilon_{it} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots.(2)$$

Where:

SMR_{it}=is the stock market returns (NSE 20 share index) for stock i at time t

α_0=is the constant term

α's =are coefficients to be estimated

$REER_t$ =exchange rate at time t

RIR_t=interest rate spread at time t,

INF_t =inflation at time t,

ε_{it} = is the error term

3.6.1 Variables

Table 3.1 describes gives a description of variables, and the expected relationship among the dependent and independent variables

Table 3.1: Description of variables

Variable	Description/expected relationship	Source
SMR	Stock market returns, which is the dependent variable. This was measured by the NSE 20 share index	NSE
REER	Real Exchange rate. Its coefficient is expected to be either negative or positive depending on the value of the Kenyan shilling. The study will consider the exchange rate of Kenya shilling against United States Dollar	NSE, CBK
RIR	Real Interest Rate- High RIR is expected to increase stock market returns.	CBK
INF	Inflation = This is a yearly-end change in the CPI index monthly.	CBK, KNBS, UNCTAD

3.7 Test for significance

The study will use correlation coefficient (r) to ascertain the strength and direction of the relationship between exchange rate and stock market returns and other independent variables. In addition, coefficient of determination, R^2, will be used to determine the proportion of variance in the dependent variable explained by the independent variables. Furthermore, while F-test will test statistical significance at 1%, 5% and 10%, t-test will be adopted to check significance of the relationship between depended and independent variables.

CHAPTER FOUR: FINDINGS AND DISCUSSION

4.1 Introduction

Exchange rate is a very important macro-economic variable as far economic growth and development is concerned. Equally important is the performance of the Nairobi Securities Exchange. It was therefore very important for this study to investigate the effect of stock market performance-focusing of the Nairobi Security Exchange. This chapter presents findings and discussion of both descriptive and regression results.

4.2 Descriptive Statistics

The descriptive statistics presented in this section are the graphs showing the movements of variables over time. In addition, the means, standard deviation, maximum and minimum, skewness and kurtosis statistics of all the variables are also presented. Furthermore, the correlation matrix is also computed. Figure 4.1 presents the trend in the NSE-20 share index covering the study period (2001-2016).
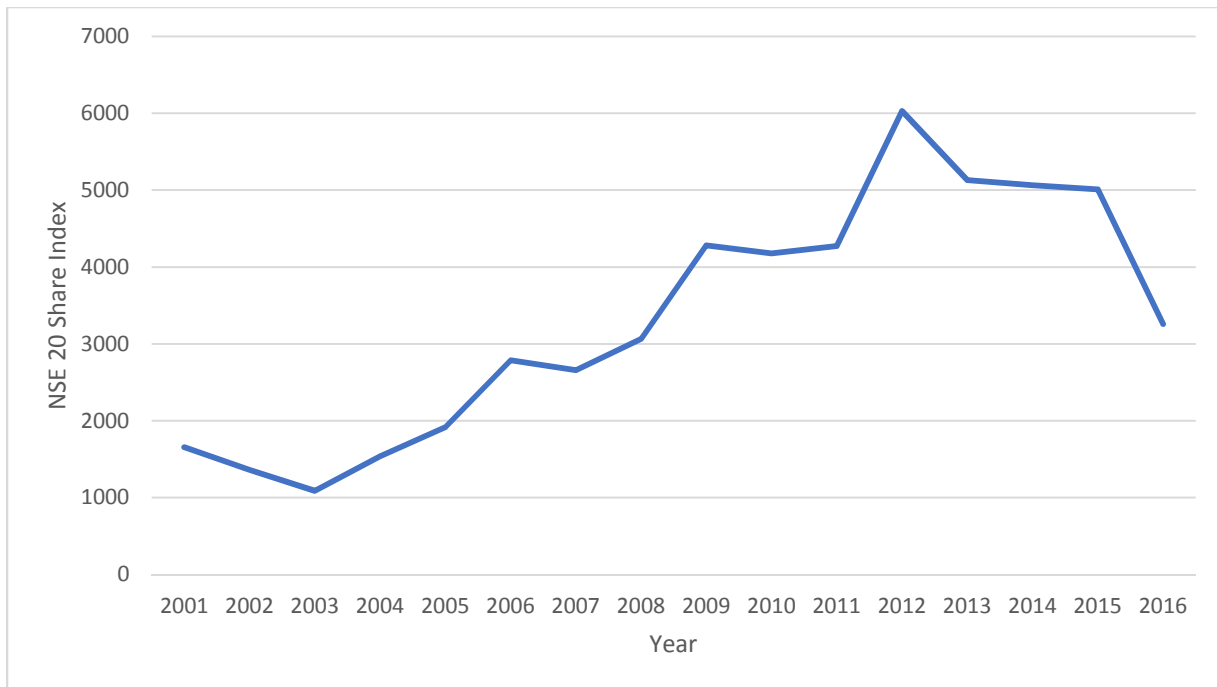
Figure 4.1: NSE 20 Share Index from 2001-2016

Source: Computed from research data

According to Figure 4.1, the NSE 20 share index has been increasing over time between the year 2003 and 2012. From the year 2012 up to present, Kenya's stock market has been recording poor performance going by the NSE 20 share index.

Next, Figure 4.2 displays movements in the exchange rate of Kenya shilling against United States Dollar from 2001 up to 2016.
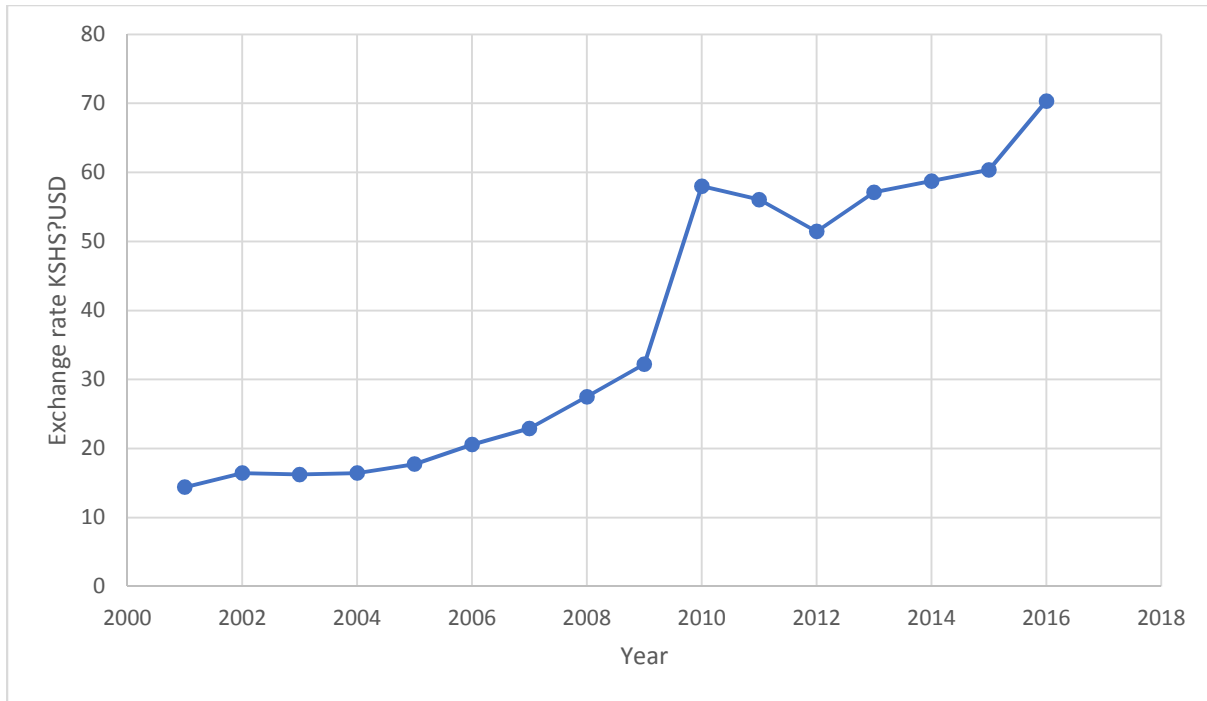
Figure 4.2: Real exchange rate (Kshs/USD) from 2001-2016

Source: Computed from research data

Figure 4.2 indicates that exchange rate of the Kenyan shilling against the USD has been on the rise throughout the study period.

Regarding inflation, Figure 4.3 indicates that Kenya's inflation has been fluctuating from time to time. The rate of inflation reached its highest between the year 2010 and 2012. The study attributes this situation to consequences of Kenya's post-election violence of 2007/2008, as well as the global crisis of 2008.

Figure 4.3: Inflation from 2001-2016

Source: Computed from research data

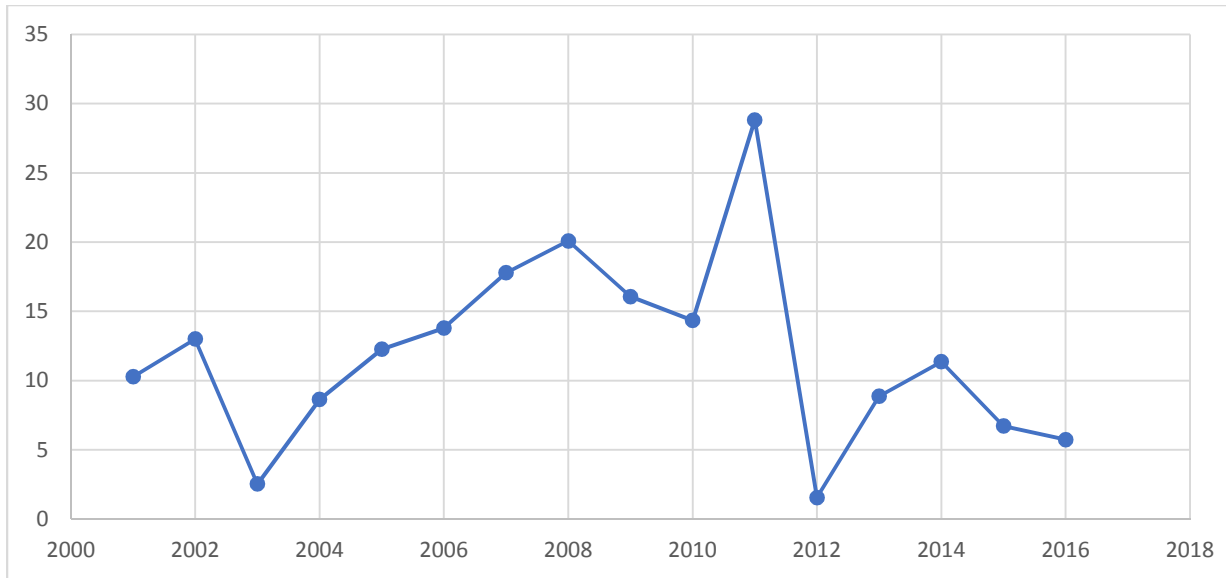Finally, figure 4.4 presents movements in the real interest rates for the study period. According to the curve, Kenya's real interest rate have remained volatile throughout this period. The study associates this trend to unstable macro-economic environment under which Kenya has been operating.
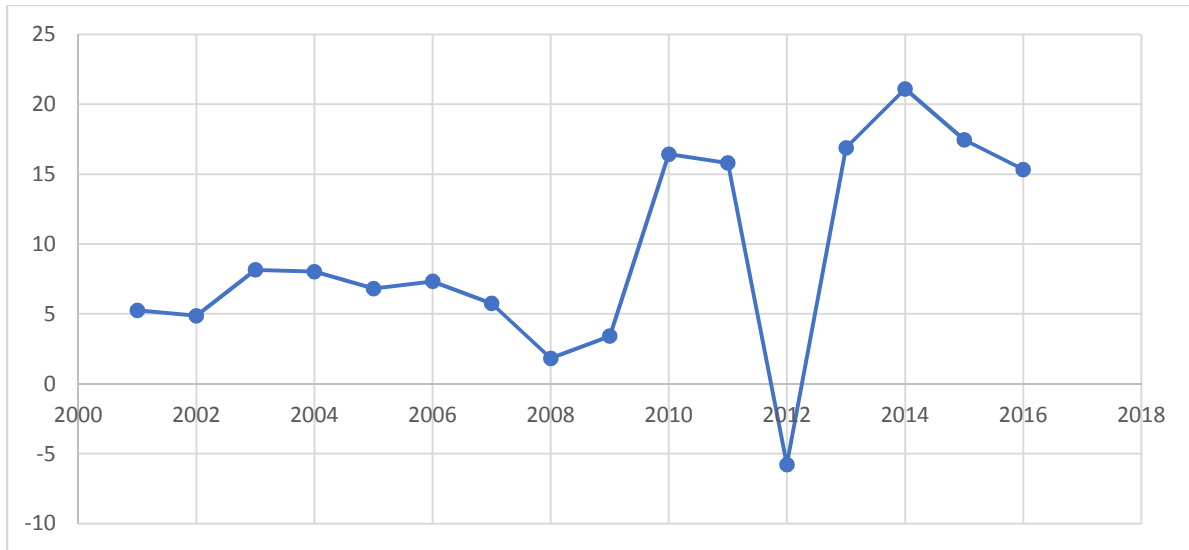
Figure 4.4: Real Interest Rate from 2001-2016

Source: Computed from research data

Table 4.1 Summary Statistics

Variable	Obs	Mean	S. D	Min	Max	Skewness	Kurtosis
NSE-20 Share index	32	3714.784	1254.96	1090.15	6030.83	-.46704	2.4738
Exchange Rate	32	58.48128	26.3935	14.4138	98.18	-.54760	1.87
Real Interest rate	32	8.23088	6.77	-8.0098	21.1	-.20733	2.9470
Inflation	32	12.200	9.17	1.55432	26.47	-.323779	3.1064

Source: Computed from Research Data

According to the statistics displayed in Table 4.1 indicate that the average NSE 20 share index for the study period (2001-2016) was 3714.784 and it oscillated from a minimum of 1090.15 and a maximum 6030.83 with the standard deviation of 1254.96. The maximum real exchange rate (REER) of Kenya shilling against UDS for this period was 98.18, while the minimum was 14.4138 KSHS/ USD during the same period. The same results indicate

that average inflation for this period was 12.200 with a standard deviation of 9.17 and ranging between 1.55432 and 26.23982. During this period (2001-2016), the mean Real interest rate of was 8.23088 with a standard deviation of 6.77. Test for normality using skewness and kurtosis reveal that all variables were normally distributed. Normal distribution requires skewness value of between -2 and +2, and for kurtosis, the value has to be in the region of -3 and +3. The statistics displayed in Table 4.1 show that all the variables under consideration met the threshold for normality.

Finally, the study also considered a correlation matrix whose results are presented in Table 4.2

Table 4.2: Correlation Matrix

	NSE 20-Share Index	Exchange Rate	Inflation	Real Interest Rate
NSE 20-Share Index	1.000			
Exchange Rate	0.6776	1.000		
Inflation	0.1099	-0.1953	1.000	
Real Interest Rate	0.1232	0.1485	0.1028	1.000

Source: Own Computation from Research data

Correlation matrix investigates how the dependent and explanatory variables are related before carrying out regression analysis. It also helps to determine which variables best explain the dependent variable. The results from Table 4.2 show that all the explanatory variables; Real Exchange Rate (REER), Real Interest Rate (RIR), and inflation are

positively correlated with the dependent variable (NSE 20 share index). This means that NSE share price index responds positively to any change in the explanatory variables.

4.3 Regression analysis

This study had sought to establish the effects of exchange rate on the performance of the NSE 20 share index. To determine this, the study apply simple least squares (OLS) regression to estimate the effect. Before estimating the equation, the study carried out diagnostic tests which include: multicollinearity and heteroscedasticity. This were to ensure that the estimated results are meaningful and that their conclusions are valid.

4.3.1 Test for multicollinearity

Variance Inflation Factors (VIF) test was used to determine the presence or absence of multicollinearity in the variables. VIF values greater than 10 and 1/VIF values which are less than 0.10 for this test is an indication of the presence of multicollinearity. The results of this test are shown in Table 4.3.

Table 4.3: Variance Inflation Factors

Variable	VIF	1/VIF
Exchange Rate	1.07	0.933151
Inflation	1.06	0.944096
Real Interest Rate	1.04	0.959881
Mean VIF	1.06	

Source: Own Computation from Research data

Findings from Table 4.3 indicates the absence of multicollinearity. This is because variance inflation factors are all less than 10 and the tolerance values (1/VIF) are all greater than 0.1. This therefore implies that estimated coefficients are stable and unbiased.

4.3.2 Test for Heteroscedasticity

Heteroscedasticity occurs when the variance is different across observations; it can lead to biased estimators. The study employed Breush Pagan to predict the constancy of the variance across observations. The null hypothesis states that there is constant variance which means there is no heteroscedasticity. The test on the variables had a P value of 0.1320 greater than 5% which led to the acceptance of the null hypothesis; illustrating the absence of heteroscedasticity.

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity

Ho: Constant variance

chi2(1) = 2.27	
Prob > chi2 = 0.1320	

4.4 Model estimates

Table 4.4 presents estimated coefficients of the regression analysis.

Table 4.4: Regression results

NSE 20-Share Index	Coef.	Std. Err.	T	P>t	[95% Conf	. Interval]
Exchange Rate	0.012	0.0021	5.38	0.000	0.0072681	0.0162132
Inflation	-0.012	0.006	1.88	0.071	-0.001050	0.0245387
Real Interest Rate	-0.001	0.008	-0.08	0.935	-0.017896	0.0165066
_cons	7.321	0.172	42.58	0.000	6.969676	7.674218
Number of obs	32					
Prob > F	0.0001					
R-squared	0.5202					

Source: Own Computation from Research data

Based on the results from Table 4.4, the regression equation was well fitted given that probability of F statistic (Prob > F =0.0001) is less than 5%. The R-squared statistic indicated that independent variables explains (real exchange rate, real interest rate and inflation) explain NSE 20 share index by 0.5202 or 52.02%. This implies that collectively, a unit change in any explanatory variable, lead to 52.02% change in the dependent variable.

Regression results indicate that Real Exchange Rate (REER) is positively correlated with NSE 20 share index. In the addition, REER was found to be significant at 1% confidence level. The value for the real exchange rate coefficient show that 1unit increase in exchange rate leads to 0.012 or 1.2% increase in the NSE 20 share index. These findings indicate that an appreciation of exchange rate, enhances the performance of the NSE share index.

Results for inflation show that the variable was significant at 10% confidence level. In addition, inflation is negatively correlated to NSE 20 share index. However, inflation has less impact on NSE share index given the size of its coefficient. According to the coefficient, 1unit increase in the CPI index leads to 0.012 or 1.2% reduction in the NSE 20 share index.

Finally, even though the coefficient for real interest rate indicate negative relationship with NSE 20 share index, the p-vale (0.935) show that this variable is not a significant determinant of NSE 20 share index. In addition, the value of its coefficient (0.001) reveal that real interest rate is less impactive to NSE share index.

CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATION

5.1 Introduction

The aim of this study was to investigate the effect of exchange rates on the stock market returns focusing of the Nairobi Securities Exchange 20 share index. The study focused on the Kenyan economy. In this chapter, the study presents summary of the results, conclusion and key recommendation.

5.2 Summary

Stock market development is very critical for economic growth and development of any economy. This study sought to determine the effect of exchange rate (Kenya shillings against USD) on the performance of NSE 20 share index (proxy for stock market performance). In addition, the study included two control variables; real interest rate and inflation believed to influence the relationship between NSE 20 share index and real exchange rate. Simple regression method was used to estimate the coefficients of explanatory variables.

Findings indicate that Real Exchange rate has a strong and positively relationship with the NSE 20 share index. In addition, this relationship was also found to be highly significant at 1% confidence interval. Increased foreign investor participation in the stock market is likely to push up share prices and result in increased returns going by this. Other studies which established similar results include: Jumah (2013) for the case of Mexico, Jamil and Ulhal (2013) for the case of Australian. However, Sewe (2016) established that exchange

rates have adverse effects on the stock market returns, though the effects were of low magnitude.

On inflation, the study has found a negative correlation with NSE share index. As an important macroeconomic variable, these findings indicate that an increase in inflation leads to poor stock market performance. Finally, even though real interest rate variable was not statistically significant, its negative coefficient show that the variable can adversely affect the NSE 20 share index.

5.3 Conclusion

The objective of this study was to establish the effect of exchange rate on the performance of NSE share index. This study established that Real exchange rate has a positive and strong influence on the performance of the NSE 20 share index. The study concludes that inflation is a key determinant of the stock market performance. Inflation has an inverse relationship with NSE share index.

Nevertheless, based on the mixed finding regarding the effect exchange rate and stock market performance, results of this study should not be construed as conclusive, and hence more needs to be done

5.4 Recommendation

Globally, it is acknowledged that stock markets play pivotal role towards economic growth and development. Based on the findings, the study recommends that the government should find ways of how to manage exchange rates. This will be to safeguard the performance of firms.

Since real interest rate and inflation are negatively related to the stock market performance as measured by the NSE 20 share index, the government should implement better macroeconomic policies to manage this variable so as to enhance the performance of the Nairobi securities Exchange.

5.5 Limitations of the Study

The study used a time series data for a 16-year period from 2001-2016 due to the limitation of data. This data can be viewed to be relatively small for purposes of making generalization.

5.6 Suggestion for further studies

There are mixed findings regarding the effect of exchange rate on the stock market performance. Given that some studies have observed negative relationship, while others positive, the debate on the relationship between exchange rate and stock market performance indicator (NSE share index) remain inconclusive. Further studies are necessary to bring this debate to an end.

REFERENCES

Abdalla, I.S. A., & Murinde, V. (1997). Exchange Rate and Stock Price Interactions in Emerging Financial Markets: Evidence on India, Korea, Pakistan, and Philippines, *Applied Financial Economics vol. 7*: 25-35.

Adam, A. M., & Tweneboah, G. (2008). Macroeconomic factors and stock market movement: evidence from Ghana.

Adjasi, C.K., & Biekpe, B.N. (2005). Stock market returns and exchange rate dynamics in selected Africa countries: A Bivariate analysis, Africa *financial journal*, *1*(July): 23-45

Aduda, J.O. & Cheramum, S.C. (2010). Market Reaction to Stock Splits: Empirical Evidence from the Nairobi Stock Exchange. *African Journal of Business & Management,* 1:165-184.

Aggarwal, R., & Harper, J. T. (2010). Foreign exchange exposure of "domestic" corporations, *Journal of International Money and Finance, 29*(8): 1619-1636.

Aroni, J. M. (2011). Factors influencing stock prices for firms listed in the Nairobi Stock Exchange. *International Journal of Business and Social Science, 2* (20):123-155

Bartram, S. M., & Bodnar, G. M. (2012). Crossing the lines: The conditional relation between exchange rate exposure and stock returns in emerging and developed markets. *Journal of International Money and Finance, 31*(4):766-792

Bartram, S. M. (2007). Corporate cash flow and stock price exposures to foreign exchange rate risk. *Journal of Corporate Finance, 1*3(5): 981-994.

Bradnam, K. R., Fass, J. N., Alexandrov, A., Baranay, P., Bechner, M., Birol, I.,& MacCallum, I. (2013). Assemblathon 2: evaluating de novo methods of genome assembly in three vertebrate species. *GigaScience, 2(*1): 1-31.

Chang, C., Hui-Kuang, H., & McAleer, M. (2013) Is Small Beautiful? Size Effects of Volatility Spillovers for Firm Performance and Exchange Rates in Tourism. Working Paper (Unpublished), Taiwan Tourism Industry

Chen, N. F., Roll, R., & Ross, S. A. (1986). Economic forces and the stock market. *Journal of business, 2*(1): 383-403.

Coleman, A.K. & Tettey, K.F.A. (2008). Impact of macroeconomic indicators on stock market performance, Journal *of Risk Finance, 9* (4): 365-78.

Dornbusch, R., & Fischer, S. (1980). Exchange Rates and the Current Account, *American Economic Review*, *70*(5): 960-971

Fama, E. F. (1981). Stock returns, real activity, inflation, and money. *The American Economic Review, 3*(4): 545-565.

Fama, E. F., & Schwert, G. W. (1977), Asset Returns and Inflation, *Journal of Financial Economics, 5:115*-146.

Fisher, B. & Myron, S. (1973). The pricing options and corporate liabilities, *Journal of Political Economy*, *81* (3): 637-654.

Henry, B. (2000). Do stock market liberalizations cause investment booms? *Journal of Financial Economics, 58:* 301-334.

Jamil, M., & Ullah, N. (2013). Impact of Foreign Exchange Rates on Stock Prices, *Journal of Business and Management, 7*(3): 45-51

Jumah, I. M. (2013). Effects of foreign exchange rate fluctuation on stock returns volatility: a case study of Nairobi Securities Exchange (NSE) (Doctoral dissertation, University of Nairobi).

Karam, C. (2008). Impact of macroeconomic indicators on Indian capital markets, T*he Journal of Risk Finance, 12* (2): 84-97.

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

Kutty, G. (2010). The relationship between exchange rates and stock prices: the case of Mexico, *North American Journal of Finance and Banking Research, 4* (1): 1-23

Lee, L.C., & Boon, H.T. (2007). Macroeconomic Factors of Exchange Rate Volatility, Evidence from Four Neighbouring ASEAN Economies. *Studies in Economics and Finance, 24*(4): 266-285.

Lee, F. G. (2001). Stock Returns and Volatility on China's Stock Markets. *Journal of Financial Research, 24 (2)*: 523-543.

Mishra, K.A. (2004). Stock Market and Foreign Exchange Market in India. Are they Related? *South Asia Economic Journal, 5 (*2): 12-45

Mugenda, O. M. & Mugenda, A. G. (2003). Research Methods: Quantitative and Qualitative Approaches, Acts Press, Nairobi-Kenya

Mukherjee, T. K., & Naka, A. (1995). Dynamic relations between macroeconomic variables and the Japanese stock market: an application of a vector error correction model. *Journal of Financial Research, 18*(2): 223-237.

Murungi, C. M. (2012). The impact of inflation on stock market returns and volatility" Unpublished MBA (Finance). Thesis, University of Nairobi. Nairobi Securities Exchange Website https://www.nse.co.ke.

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

Olweny T., & Kimani, D. (2011). Stock market performance and economic growth: Empirical evidence from Kenya using causality test approach. *Advances in Economics and Applied Economics, 1*(3): 153-196.

Orodho, J.A. (2009). T*echniques of writing Research Proposals and Reports in Education and Social Science,* (2nd Ed). Bureau of Education Research, K.U: Kanezja HP publishers.

Richard A, Joseph, F., & Seyed, M. (1998) the causality of between stock returns and exchange rate, *Global Finance Volume 9,*2(5): 1-24

Rudebusch, G. D., & Wu, T. (2008). A Macro-Finance Model of Term structure, Monetary Policy and the Economy. *The Economic Journal, 118* (530): 906-926.

Solnik, B. (1983). International arbitrage pricing theory. *The Journal of Finance*, *38*(2): 449-457.

Saunders, M., Lewis, P., & Thornhill, A. (2009). *Research Methods for Business Students* (5th edition). Italy: Pearson Education Limited

APPENDIX 1: REGRESSION RESULTS

reg lnNSEindex REER INF RealInterestRate

Source	SS	df	MS		Number of obs	=	32
					F(3, 28)	=	10.12
Model	2.91637979	3	.972126595		Prob > F	=	0.0001
Residual	2.68997009	28	.09607036		R-squared	=	0.5202
					Adj R-squared	=	0.4688
Total	5.60634988	31	.180849996		Root MSE	=	.30995

lnNSEindex	Coef.	Std. Err.	t	P>t	[95% Conf.	Interval]
REER	.0117406	.0021834	5.38	0.000	.0072681	.0162132
INF	.0117442	.0062461	1.88	0.071	-.0010504	.0245387
RealInterestRate	-.0006951	.0083976	-0.08	0.935	-.0178967	.0165066
_cons	7.321947	.1719733	42.58	0.000	6.969676	7.674218

APPENDIX II: VIF

. vif

Variable	VIF	1/VIF
REER	1.07	0.933151
INF	1.06	0.944096
RealIntere~e	1.04	0.959881
Mean VIF	1.06	