THE EFFECT OF EXCHANGE RATE VOLATILITY ON MARKET RETURNS AT THE NAIROBI SECURITIES EXCHANGE

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D61/77060/2015

A RESEARCH PROJECT SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENT FOR AWARD OF MASTER OF BUSINESS ADMINISTRATION AT SCHOOL OF BUSINESS, UNIVERSITY OF NAIROBI

NOVEMBER 2017

DECLARATION

I, Simon Kamau Kimura, affirm that this research is my original work and has not been presented in any other University.

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This research project has been submitted for examination with our approval as the University supervisors.

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ACKNOWLEDGEMENT

I thank God, the Almighty, for granting me with life, good health and knowledge to complete this project.

I appreciate my supervisors Mr Ronald Chogii and Dr Cyrus Iraya for their valuable guidance, patience and understanding; Dr Mirie Mwangi, the Chairman of the Department of Accounting and Finance for expediting the moderation; and the moderator Dr Lishenga Lisiolo for further guidance.

DEDICATION

To my dear wife Gladwell Wanjiku, Daughters Ivy Nduta and Sheena Wangui for your immense support and understanding. My loving parents John Kimura and Nancy Nduta for encouragement.

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ABBREVIATIONS

CBK	Central Bank of Kenya
CDSC	Central Depository and Settlement Corporation
CMA	Capital Markets Authority
GBP	Great Britain Pound
GC	Granger Causality Model
GDP	Gross Domestic Product
KSHS	Kenya Shilling
NSE	Nairobi Securities Exchange
USD	United States Dollar

ABSTRACT

Foreign exchange rate volatility has implications on the economic activities of any country since it affects the importation and exportation of goods and services by firms. In addition, foreign investors shift funds to markets whose prices are fair or undervalued and have a potential for high returns. This may ultimately be reflected in the market returns. The study sought to examine the effects of exchange rate volatility on the market returns at the Nairobi Securities Exchange over the period January 2007 to December 2016. The study used secondary data from the websites of the Nairobi Securities Exchange and the Central Bank of Kenya. The study employed multiple regression model and correlation analysis. On the one hand, the NSE 20 share index was the dependent variables while on the other hand the macroeconomic fundamentals namely foreign exchange volatility, monthly average interest rate and monthly inflation rate were the dependent variables. The economic theories postulate a relationship between exchange rate volatility and market returns but do not conclusively define the direction of the relationship. The study established that foreign exchange volatility, average interest rate and average rate of inflation explain 14.22% change in market returns. The study further established that foreign exchange volatility has a positive but insignificant relationship with the market returns. The average monthly rate of inflation has a negative and significant relationship of 36.26% change in market returns implying investors shift resources from the market when inflation increases. The study further established that the monthly average rate of interest has a negative but significant relationship of 23.89% with market returns meaning investors shift from securities to interest bearing investments such as bonds. The findings also established that the Kshs had depreciated gradually against the USD over the period of study and this may have had adverse implications on businesses and the general economy.

CHAPTER ONE: INTRODUCTION

1.1.Background to the Study

According to Benita and Lauterbach, (2004)the exchange rate volatility is among the major factors that economically affects stability of prices, profitability of organizations and the general stability and operations of a firm. It disrupts the diverse economic system of a state including the stock market. The adoption of flexible exchange rate in Kenya in 1993 undoubtedly created a risky business environment relating to profit and business operations uncertainties. As Musa, (2014) reaffirms, the level of local prices, profitability of traded goods and services, resources allocation and investment decisions are all directly affected by the exchange rate. These economic repercussions may ultimately be reflected in the market returns.

Stock market is one of the most vigorous sectors which play a significant role in contributing towards economic wealth of a country (Dagar, 2014). The market links borrowers and lenders of long term financing through trading of stocks and bonds (Mishkin, 2000). The long-term capital allows businesses to expand through alternative investment vehicles. There are also short-term investors who seek potential gains based on financial performance for firms (Osoro, 2013). Long-term and short-term investors seek positive returns from the market through stock prices appreciation or payment of dividends. The stock market also acts as a financial intermediary between developed and developing economies as investors are likely to move their portfolios from a bad performing stock exchange to a better performing one. Therefore, foreign direct investors are greatly attracted to a country with stable exchange rates (Benassy-Quere, Fontagne, Lahreche-Revil, 2001) which is likely influence their decision. In 1995 foreign investors accounted for only 5% of the total market trading (Ngugi, 2003). Foreigners' participation at the NSE has increased tremendously with all-time high of 87.18% reached in

the quarter ended June 2016 (www.standardmedia.co.ke) and also owned a significant 40% shares in the NSE (www.businessdailyafrica.com) as at January 2016.

Whereas the economic theory postulate that foreign exchange rate changes may affect the stock prices, several studies have shown that there exist no significant consensus or any direct connection between currency transactions and securities market return(Muhammad and AbdulRasheed, 2002). Dimitrova (2005) asserts that securities prices are not in any way influenced by the currency transactions rates since there does not exist any support may it be positive or negative of such relationship. However, the exchange rate and stock market returns relationship has attracted immense interest from researchers (Abdalla and Murinde, 1997).The classical theory suggests two approaches to explain the relationship; the 'flow-oriented' model and the 'stock-oriented' model. The flow oriented model stipulates that exchange rate movement can result to a stock price movement whereas the 'stock-oriented' model (country's current account) postulates that stock prices movement can cause movement in exchange rate through transactions in account.

The NSE comprises of 66 firms in diverse sectors of the economy. The firms are licensed by the CMA to trade in stocks and their performance is used to gauge the general welfare of the economy. Aside from equities, corporate and government bonds are also traded as the Nairobi Securities Exchange.

1.1.1 Exchange Rate Volatility

Exchange rate refers to the price of a domestic currency compared to a foreign currency. Therefore, it is the amount of local currency that can be exchanged for a local currency (Mishkin and Eakins, 2009).Taylor, (2007) defines volatility as the frequency and relative rate

that price moves up or down within a very short period of time. Therefore, exchange rate volatility may be described as the amount of local currency price in terms of price of another currency, and the upwards or downwards movement within a very short period.

The volatility of exchange rate has been of great concern to policy makers, academicians, researchers and investors since the adoption of the flexible exchange rate in Kenya in 1993. Profitability of both imports-oriented and exports-oriented firms is impacted by the conversion rate volatility. A country whose currency has a higher value is able to make more expensive exports while importing cheaper commodities in international markets. Also, a country whose currency value is lower exports cheaper commodities while at the same time it imports more expensive in global markets. The reaction of foreigners as a result of exchange rate volatility is also a good indicator of the direction the market and general economy are likely to take. Firms listed at the NSE are exposed to currency exchange risk via translations, transactions and economic recession or depression. Extreme volatility disrupts smooth running of the NSE. There are various factors which determine the rate of foreign exchange rate with the major ones being inflation rate, political stability, interest rate, government debt, terms of trade, current account/balance of payments, recession and speculation (www.investopedia.com).

1.1.2 Market Return

Market return refers to the yield an investor gains over a particular period of time (Mogire 2014). Vena (2012) defines return as profit or dividend generated from trading of various marketable stocks in an efficient currency market. Return constitute of any value in excess of what the investor had earlier on invested. The return obtained is expressed in terms of absolute term or as a percentage on the investment.

In stock pricing, the first component is known as capital gain yield when the gain or loss is expressed as a percentage of the beginning stock prices. The second component is known as dividend yield when dividend is divided by the stock price. Frequent and wide stock market differences cause doubt about the value of an asset and affects investors' confidence (Kao, 1990).The stock market return is computed from prices of selected stocks (stock market index). According to Brown and Reilly (2008), the stock index computes the total required as well as the risk measures for the cumulative market or a section of the market over a stated time period. In the NSE, the 20 best performing firms are tracked using mainly the NSE 20 share index (www.nse.co.ke).

1.1.3 Exchange Rate Volatility and Stock Market Return

The relationship between the stock market return and the exchange rate volatility are well suggested by the classical economic theory. The flow-oriented model by Dornbuschand Fisher in 1980is the initial model which stipulates that the movement in exchange rate can cause stock price movements. In contrast, however, the 'stock-oriented' model (Branson, et al 1977) postulates that stock prices movement can cause movement in exchange rate through transactions in capital account. However, for an export- dominant country and an imports-dominant country there may exist both the positive as well as negative effects of currency appreciation on stock prices (Ma and Kao, 1990). Adler and Dumas (1980) demonstrated that even hose firms who operates domestically may be affected in the event that volatility affects prices of inputs or outputs such as fuel prices for Kenya. Continuing rise in global trade and capital movement has made the conversion rate to be a major determining factor of both profitability and equity prices of a business (Kim, 2013).

Despite increase in studies linking exchange rate volatility to securities market returns, there is also a rise in diversity in findings. Studies conducted by Roll (1992) and Aggarwal (1981) indicated a substantial positive connection between these variables while others such as Soenen and Hennigar (1988) indicated a substantial negative connection. However, according to Solnik(1987), and Bhattacharya and Mukherjee (2003) studies, it was established that there exist no substantial association between the variables whereas Niehand Lee (2001) did not note any long-run relationship. According to Mao (2013) both the empirical and theoretical studies do not agree about the connection that exists between securities prices and currency transaction rates. The researcher further asserts that this relationship is subject to various factors including the estimation technique used, the kind of markets analyzed, and time period.

1.1.4 The Nairobi Securities Exchange

The Nairobi Securities Exchange (NSE) functions as the key primary or secondary market where public listed companies trade their stocks in order to raise capital (Initial Public Offers), by issuing shares to either new members or the existing ones. It is the only market in Kenya where securities are traded. Trading in shares started way back in 1920s whereby transactions were executed on casual agreement with no trading floor (www.nse.co.ke). The NSE was licensed as an overseas stock exchange by the London Stock Exchange officials in 1953. At first, the NSE was incorporated under the societies act (1954) as a voluntary association of stock brokers before being registered as a limited company 1991. Trading in securities was floor-based open outcry system until 2006 when the Automated Trading System (ATS) was introduced and increased trading hours from 2 hours to 3 hours. The Capital Markets Authority (CMA) in 2014officially recognized and approved the NSE to carry put its operations as a demutualized entity. The NSE shares, as a firm, are traded at the market.

In the entire Africa continent, the NSE is recognized as the fourth and fifth largest stock exchange market in terms of trading volumes and capitalization as a percentage of GDP respectively. Some securities are cross-listed in Tanzania, Rwanda and Uganda Exchanges (Njuguna, 2015). As at end of May 2017, the market (www.nse.co.ke) comprised of 66 listed companies and employs the following indices to measure the performance of the stock market: NSE 20 share Index; FTSE NSE Kenya 15 Index, NSE All share Index (NASI); NSE 25 Share Index; FTSE NSE Kenya 25 Index; FTSE ASEA Pan African Index, NSE Kenya Govt Bond Index;. The oldest (since 1964) and commonly used index is the NSE 20 Share Index which is occasionally reviewed in order to reflect an accurate picture of the stock market performance (NSE Press Release, June 2014).The selection of the listed 20 companies is based on weighted market performance using the following standards: Trading activity measures i.e. shares traded, market capitalization, deals/equity and turnover in the ratio 4:3:2:1 respectively; A firm must have a free float of at least 20 percent; A company must have a minimum market capitalization of twenty million; A company must be a blue chip with superior profitability and dividend record.

1.2.Research Problem

The NSE mobilizes savings and thus provides a platform for economic development and expanded financial sources to companies. In addition, continuing increase in capital movement and international trade has presented the exchange rate as a significant equity price and business profitability determinants. An enormous value of Kenya's wealth is tied up in the stock market with market capitalization standing at Kshs2.3T as at May 2017 (www.nse.co.ke). This investment is at risk depending on how the market performs. Furthermore, firms listed at the NSE import and export goods and services denominated in foreign currencies. The

performance of the Kshs against the world's major currencies may determine profitability and financial health of firms. Depreciation of Kshs causes uproar in business circles and heightens calls for CBK to intervene and shore the shilling. According to Kurihara (2006), exchange rate is among the macroeconomic determinants that affects stock prices on daily basis.

As a result of increased international trade, foreign exchange market and foreign investors' participation at the NSE, it is therefore important to examine the stock market return is influenced by fluctuations in the conversion rate given there is little evidence for the NSE.

Local and international empirical evidence is inconsistent on the relationship. Tian and Ma (2010) in their study established that there existed a positive correlation between Yuan/Hong Kong Dollar (HKD) exchange rates movements in the Chinese Stock Market. Additionally, the European stock returns have been established to be negative in the event that the Euro price falls against another foreign currency (Muller and Verschoor 2006 & 2007).Mlambo, et al (2013) in their survey established a weak relationship at the Johannesburg Stock Exchange. At NSE, Kipyegon et al (2014) established that a positive relationship existed between the exchange rate and securities prices. Sifunjo and Mwasaru (2012) did not establish any relative relationship between the exchange rates and the stock prices in the same market while Waweru (2012) found a significant negative relationship. Four major relations in various stock markets have been established by the empirical evidence which are: unidirectional relations from stock prices to exchange rates, bi-directional relations, unidirectional relation from exchange rate to securities prices, and no interrelationship (Mao 2013). Issam and Murinde (1997) and Mishra (2004) assert that the interrelationship between exchange rate and stock prices is both theoretically and empirically inconclusive. Therefore, study sought to provide a suitable answer

to the question: Does Exchange Rate Volatility impact Market Returns at Nairobi Securities Exchange?

1.3. Research Objective

To determine the impact of Exchange Rate Volatility on Market Returns at the Nairobi Securities Exchange.

1.4. Value of the Study

The NSE has experienced lows and highs with the currency volatility contributing to huge impact to investors and the general economy. This study will help the management of listed firms better understand how currency exchange rate volatility between Kshs and USD impacts on profitability and the share prices at the NSE, and thus help firms remain competitive through efficient management of currency risks. Finance and Economics researchers and students will find this study useful as it will contribute to the existing knowledge and guide further research in addressing the research gaps. In addition, the findings will provide reference materials for future research.

The recommendations will be a useful guide to The Central Bank of Kenya (CBK) as well as the Treasury in formulating policies that can curb exchange rate volatility and consequently spur economic growth. The Capital Markets Authority and the Management of the NSE will use these findings to understand how the market responds to exchange rate volatility and communicate to the stakeholders as necessary. Kenya is the East Africa's economic and financial hub. Business trends in Kenya are closely monitored by regional and global players.

CHAPTER TWO: LITERATURE REVIEW

2.1Introduction

The section provides summary findings of other scholars work in ascertaining whether there exists causality between the exchange rate volatility and stock market returns(proxied by NSE 20-Share Index).The chapter consists of some theories that have been advanced and empirical studies conducted. Some studies prove causal relationship while other studies do not show any relationship. Theoretically, the performance of stock market returns are expected to be influenced by currency transaction rate since it is a macroeconomic variable. However, various studies over the years have established a pattern of the influence (sign and extent) on security market which varies from one research to another and from economy to another. Therefore there lacks theoretical agreement on existence or direction of interrelationship between exchange rate and stock market index (Muhammad and AbdulRasheed, 2002). This makes it paramount to establish further this relationship, or lack of it, at the NSE.

International trade has permitted financial transactions and money to move across economies. This has made exchange rate to be a vital macroeconomic fundamental for managing the Kenya's economy.

2.2 Theoretical Review

Theoretical framework lays the foundation for this study and it reviews the existing theories and hypothesis. Empirical research has its findings based on studies conducted by other researchers. This study is therefore founded on both theory and empirical literatures both local and international.

0.2.1 Flow Oriented Model

Dornbusch and Fisher proposed the flow oriented model also known as the goods market theory or the traditional approach in 1980. According to the model, the trade balance performance and a country's current account are the two main factors that determine the exchange rate. The model assumes that movement in share prices is usually triggered by the currency transaction rate movements. The model considers the capital flows to have an impact on international competitiveness and profits of firms, which in turn affect the anticipated firm's cash flows as well as their expected stock prices. The fact that companies carry out their business activities beyond their domestic market, therefore the Exchange Rate Volatility will have a positive or negative effect on their operations. Papaioannou (2009) found that a rise in the value of the domestic currency may not be beneficial to a company as this may lower the firm's overall benefits as well as its competitiveness in exporting commodities which will ultimately lower its share price. In such cases, international companies are more affected in when compared to local companies though there is no firm which can protected fully from the effects of the exchange rate volatility.

Ma and Kao (1990) carried out a study in developed economies to establish the connection between share prices and the exchange rates the survey outcomes were reliable as the other models. The study thus concluded the overall connection between share prices and currency exchange rate and depended on whether the state exported or imported various commodities. The findings also established that the local securities market for an export dependent nation was adversely impacted by the local stock market while at the same time positively affecting local share market for an import dependent state.

Adlers & Dumas (1984) established that even local operating firms may also be affected by exchange rate in the event where the input and output prices are affected by currency volatility which consequently, affects their demand? The fluctuations in exchange rates lead to loss or profit in international firms statement of financial position which makes their share prices to decline (Aggarwal 1981). Solnik (1987) however found evidence that is inconsistent with the flow oriented model. The survey failed to establish any connections between securities prices and exchange rate.

Kenya imports and exports are transacted in foreign currencies mainly the United States Dollar. Exchange rate volatility therefore has an impact on cost of production and revenue, which have a direct effect on firms' profitability, dividends pay outs and stock prices. Thus the model is relevant to the Kenyan context.

0.2.2 Stock Oriented Model

Branson et al (1977), developed the stock oriented model also known as the portfolio approach. The model unlike the flow model assumes that through the transaction capital account, the movement in rates. The model emphasizes the role of capital (financial) accounts as a major determinant of exchange rate. According to Yousuf and Nillson (2013) the share market of an import-dominated economy is expected to be stimulated by the currency expectation (positive effect) while at the same time depressing an exports-dominated economy. Financially held assets are greatly impacted by the expectations of currency volatility. The model is thus categorized into portfolio balance and monetary models.

Exchange rate is viewed by the monetary model as a relative price asset as well as the local currency price against another foreign currency. The expected rate of return of an asset is

assumed to greatly influence the present value of that particular asset. Moosa (2000), affirms that the relative demand and supply of two different currencies usually determine the exchange rate. Variations in real supply of money will result in variations in interest rate and consequently the capital flows (Siddaiah 2010).

The Balanced portfolio model postulates an adverse connection between exchange rate and securities. Adjasi and Biekpe (2007) asserted that the demand and supply of stocks and bonds equates to the exchange rate in the stock oriented model.

Kenya receives foreign direct investments (FDI), loans, grants and diaspora remittances in foreign currencies. These monies therefore currency market rates as well as securities prices.

0.2.3 Efficient Market Hypothesis

This theory is also commonly known as the Random Walk Theory. Fama, (1970), affirms that, the fact that efficient processing of information is, the share prices will thus reflect all available data about the stock. The strong market hypothesis postulates that share prices factor in all public information and the insider information. In the weak form, the hypothesis contends that security prices fully indicate to the public all the information. Semi-strong market hypothesis argues that share prices reveal all historical and publicly held information.

Several studies have suggested that the share market indices movement is extremely sensitive to changes in the macroeconomic essentials especially to future prospects expectations about the economy changes (Ahmed, 2008).

Therefore, as the efficient market hypothesis (EMH) stipulates, the share prices at the NSE would be expected to change with arrival of new information about the exchange rate volatility.

This information would also be expected to have a bearing in the investment decisions investors are likely to make.

0.2.4 Purchasing Power Parity Theory

Gustav Cassel developed the purchasing Power Theory (PPP) in 1918. It describes the connection between the rate of currency transactions in a particular state as well as the movement of the national price level compared to that of another foreign country. The foundation of the theory is the 'law of one price' where similar commodities should be priced the equally across different markets with absent variant taxes and transportation costs functional in the two markets. Arbitrage opportunities are created if large price differentials between countries result to purchasing goods at a lower price in one country and selling them at a margin in another state. The Exchange Rate thus adjusts to this.

The following Kenyan firms are cross-listed in Uganda, Tanzania and Rwanda: Centum Investments Ltd, East Africa Breweries Ltd, Jubilee Holdings, Kenya Commercial Bank Ltd, Equity Bank, Kenya Airways, Nation Media Group, and Uchumi Supermarkets. If stock prices differentials exist, investors would sell stocks in the market where they are expensive and buy in the market where they are cheaper resulting to the adjustment of Exchange Rate.

0.2.5 Foreign Exchange Exposure Theory

Buckley, Levi and Shapiro (as cited by Mbithi, 2013) areof the view that the conversion rate differences is expected to impact the worth of international company via international sales and net international assets which require to be reflected in the parents company domestic currency. Mbithi (2013) quotes recent studies by Jongen et al (2003) and Gao (2000) that confirm that

exchange rate movement through its impact on sales and net assets of a company are significant factors while determining the value of a firm.

NSE-listed listed firms with operations outside Kenya are exposed to this risk though the value of the investments is vital. For instance, when civil unrest erupted in South Sudan that also resulted to the depreciation of the South Sudanese Pound, operations of NSE-listed firms such as Kenya Commercial Bank and Equity Bank were adversely affected.

2.3 Determinants of Stock Market Returns

Various studies have been conducted to ascertain effects of several aspects on the securities performance. Results are varied and largely dependent on the macroeconomic variables and other dominant economic-specific drivers such as precious mineral prices such as gold and oil price.

2.3.1 Inflation Rate

Inflation is rapid increase in prices of commodities occasioned by more money circulating in the economy (Tucker 2007). Persistent rise in general prices levels erodes the purchasing power of the local currency. A high inflation rate causes investors to shift their investment resources towards consumption hence reducing the volume of stock traded. Inflation also raises firm's production costs which lowers profits, and ultimately decreases the future cash flows. In addition, consumers with fixed income (salaries) demand less goods and services due to increase in prices. Uncertainty over future inflation my hinder investments and savings.

2.3.2 Interest Rate

Interest rate refers to the cost of capital. Investment decision may be affected by either a rise or a decline in interest rates. High interest rates may cause a potential investor to prefer investing in securities such as bonds which are usually non-fixed income securities and which may bring in either profit or loss reported in the firm's statement of financial position (Adam and Tweneboah, 2008). When profit or loss is announced, stock prices react immediately. Many firms borrow from financing institutions and other lenders to finance capital expenditure. High interest rate increases financing costs and consequently suppresses the net earnings. Muthike and Sakwa, (2012), therefore suggest that NSE quoted firms would become less profitable which may cause them to be avoided by both local and foreign investors. In addition, changes of the rate of interest impacts negatively discounted cash flows, liabilities and value of underlying assets.

2.3.3 Gross Domestic Product

Gross Domestic Product (GDP) is the total monetary value of goods and services in an economy and provides the most comprehensive scorecard about the health of the overall economy. Economies from time to time experience bullish and sluggish periods. Increased economic activities and demand for credit are high during periods of boom and low during recession. This increase in activities is expected to result to increased profitability for firms, *ceteris paribus,* which is consequently mirrored in the stock prices. Most of surveys performed have confirmed an optimistic correlation between GDP and securities prices (Sharma, 2002). The stock prices will in this case increase since GDP will likely influence stock prices through firm's profitability. In the case of a recession, the opposite holds.

2.3.4 Money Supply

The quantity of currency circulating at any given time constitutes money supply. The impact of money supply in an economy can either negative or positive (Gupta and Modise, 2011). Increase in money supply occasioned by inflation may have a negative relationship with stock prices. Fama, (1981) affirm that the inflation rate is positively related to money growth rate hence more money supply within the economy might lead to higher discount rate and subsequent decrease in share prices. Increase in money supply creates demand for equities which causes an increase in securities prices. The undesirable impact of money supply can be alleviated through money growth which will in turn rise share prices and increase cash flows. Monetary base M1 and M2 are the most common tools used to measure money supply.

In this case, monetary base is the amount of currency held by banks and also in circulation. Therefore, M1 includes cash money and check deposits while M2 incorporates M1 and all near money items including mutual funds, money market securities, fixed savings deposits, and other time deposits.

Fiscal monetary tools such as the setting the base lending rate, moral persuasion to commercial banks and mopping up of the excess liquidity in the market are employed by the CBK to regulate money circulating in the economy. These monetary tools affect the growth of the money hence influencing share prices and ultimately returns.

2.4 Empirical Review

Several studies have been conducted in several markets and during different periods. The findings on the effects of currency exchange rate fluctuation on the stock index are however inconclusive.

The Exponential Generalized Autoregressive Conditional Heteroskedascity (EGARCH) was applied by Adjasi, Harvey and Agyapong (2008) in Ghana so as to survey the securities prices and the currency transaction rates correlations. The research aim was to examine whether currency transaction rate volatility has an impact on securities market returns. The findings revealed that decline in value of domestic currency value caused a subsequent rise in securities market returns in the long term while it shrank stock market returns in the short term. Moreover, there was volatility perseverance in majority of the macroeconomic variables. The study thus suggested that in order to ensure stable macroeconomic environment, proper measures should be taken to ensure that investors are willing to invest their monies and proper and adequate decisions are made to aid future investments.

Mlambo, Maredza and Sibanda (2013) assessed the Johannesburg Securities Exchange so as to establish effects of currency volatility. They used GARCH model to examine the exchange rate volatility and securities market performance relationship. Data used was obtained on monthly basis from 2000-2010 to ensure satisfactory observations were made. The research established a very weak connection between exchange rate volatility and securities market. However, the rate of interests in the United States securities market was observed to positively affect market capitalization. Fang and Fu (2008) whose similar study established weak to no connection between securities prices volatility and currency transaction rate fluctuation supported the findings of initial study.

Olugbenga (2012) investigated both the short-term and the long-term currency exchange rate on share market development in period 1985:1-2009:4 in Nigeria utilizing both the Johansen cointegration tests and error correlation mechanism. A significant negative market performance to exchange rate in the long-run and a significant positive stock market performance to

exchange rate in the short-run were observed through the use of a specified bi-variate model. The findings agree with suggestions of the theory by fact being Nigeria is an import dominated economy. The Granger Causality test showed adequate relationship that connection exists from the exchange rate to securities market performance; suggesting differences in the Nigerian securities Market are clarified by the currency transactions rate volatility.

Aggarwal (1981) investigated the connection between securities prices and currency transaction rates by examining relationship between the fluctuations in the United States trade-weighted rate of exchange and monthly variations in the United States securities market indices between 1974 and 1978. His results, which were hinged on regression analysis, established that the trade-weighted rate of exchange and the United States Securities Market Indices positively interrelated for the period under investigation and the relationship was not as strong in long run as it was in short run. Soenen and Hennigar (1988) researched the same market though he evaluated the period from 1980-1986. The findings were not similar to other previous surveys as it indicated existence of substantial negative connection between securities prices and currency transaction rates.

Yang, Doong and Wang (2005) investigated the correlation between stocks prices and exchange rate from 1989-2003 using the granger causality test in Asian countries namely Thailand, Malaysia, Korea and Indonesia. They found a substantial negative correlation between the stock returns and fluctuation in exchange rate except for Thailand. Additional studies by Apte (2001) and Mishra (2004) in emerging markets established a satisfactory connection between the currency transaction rates and securities prices.

Mburu (2015) studied the interrelationship between exchange rate volatility (Kshs versus USD) and stock market performance in Kenya over the period 2011 to June 2015. The data was analyzed by use of Microsoft Excel 2013 and SPSS version 17. To establish the impacts of exchange rate volatility on securities market performance, regression and Correlation analysis were utilized. Additionally, other factors such as money supply volatility, rates of interest volatility and inflation rate volatility were also incorporated. The survey established non-existence of significant positive connection between currency transaction rate volatility and securities market performance. The survey was limited to the USD and the author measured the performance of the stock market by employing the NSE 20 Share Index. In further research, the study recommended use of other hard currencies such as GBP and Euro, and other indices such as the NASI and Pine Bridge 27 Index.

Sewe (2016) conducted a research to establish the impact of foreign exchange fluctuations (Kshs versus USD) on equity market performance at the NSE from July 2006 to June 2016. The study applied EGARCH model to assess monthly impact of foreign exchange fluctuations on stock market performance. The foreign exchange fluctuation was observed to exhibit a substantial adverse impact on stock market returns, albeit of low magnitude. The study was however biased since it looked at the NSE 20 Share Index rather than the whole population of the firms listed at the NSE. In addition, other factors believed to influence the NSE such as inflation, interest rate, money supply were not factored into the study model. The author suggested further research on the potential effect of other macro-economic factors on NSE either in a bivariate or a multivariate framework.

Mwanza (2014) studied the influence of foreign rate of exchange (Kshs versus USD) on the performance of the NSE from 2011January to 2013 December. The research used a simple

multiple regression model of NSE 20 Share Index dependent on three variables; inflation rate foreign currency transaction rate and the rate of interest. Survey established a statistically insignificant negative connection between exchange rate and performance of NSE, *ceteris paribus*. The study was limited to NSE 20 Share Index which might not be a true representative of all listed firms. Furthermore, the study used USD and the author reckoned that there could be other foreign currencies that can influence the share prices. The author recommended further studies that cover longer periods, more firms and more macroeconomic variables.

Irungu (2015) studied the effect of exchange rate fluctuation (Kshs versus USD) on market capitalization at the NSE using 2012 to 2014 monthly data. The study performed a regression analysis to establish the extent of the connection between the fluctuations in the exchange rate and market capitalization. The research found a significant positive correlation the variables total market capitalization and monthly exchange rate fluctuations. The study was however limited to three years and not all factors affecting the market capitalization at the Nairobi Securities Exchange were considered. The author recommended studies to establish determinants of monthly exchange fluctuations, monthly average rate of inflation and monthly average interest rate. The author further recommended comparison of different markets as the study looked at firms listed at NSE.

Waweru (2013) analyzed the determinants of securities price volatility at the NSE. The study utilized monthly data spanning from 2003 January to 2013 December. Macroeconomic data was acquired from CBK, NSE and the Kenya Bureau of Statistics. Regression analysis and descriptive statistics were used to evaluate the connection between exchange rates, inflation, stock price volatility and the interest rates. The results established a significant negative connection between exchange rate (Kshs versus USD) and the NSE 20 Share Index thus

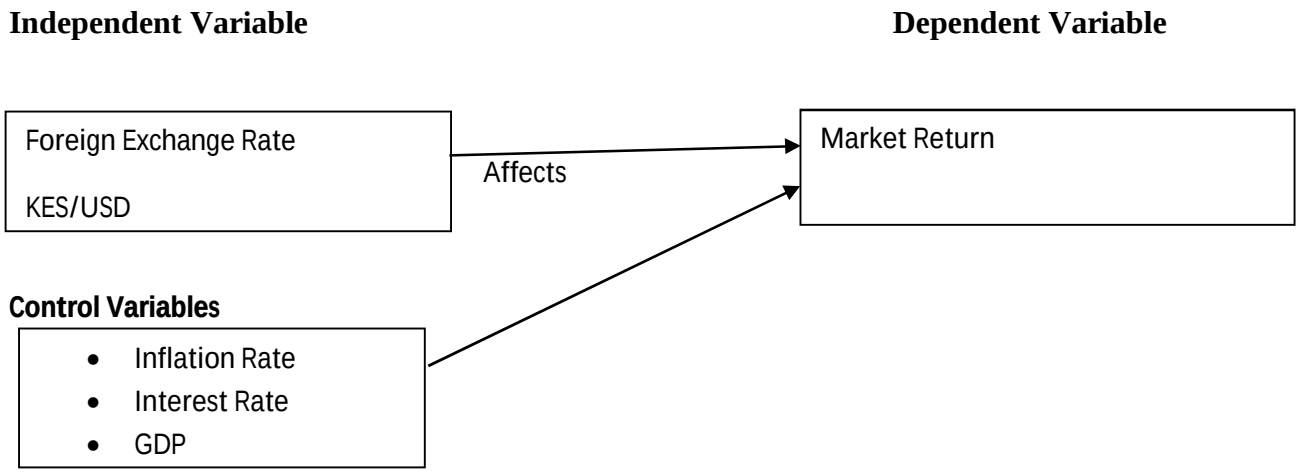
depicting currency transaction rate has a substantial negative connection to securities price. The study was limited to the sample size. The researcher recommended further studies on other exchange rates other than the USD and the use of weekly data to improve on significance of the results.

Due to lack unanimity in the connection between currency transaction Rate Volatility and securities Market Returns, this survey is important as it will contribute further to the existing literature. Most studies conducted used the Exchange Rate relationship between Kshs and USD. This study will use the exchange rate between Kshs and GBP to address the limitations expressed by the researchers.

2.5 Conceptual Framework

The securities market is generally regarded as a predictor or an indicator of the economy situation. Decrease in stock trend signifies recession while increase signifies economic boom. The traditional method is centered on the concept of volatility of exchange rate that it impacts on stock market returns. The debate on the relationship of these variables is inconclusive. Most studies were carried out in advanced economies which are different from the Kenyan context in terms of size and sophistication. This study seeks to provide more literature on the NSE market returns and exchange rate volatility.

Figure 2.1 Conceptual Framework



2.6 Summary of Empirical Review

The Flow Oriented Model, Stock Oriented Model, Efficient Market Hypothesis, Purchasing Power Parity Theory and Foreign Exchange Exposure Theory concur the existence of a correlation between the currency transaction rate and the securities market returns. According to these theories, the currency transaction rate dynamics may affect the securities prices innovations (Kipyegon, 2014). Additionally, exchange rates might exhibit either gains or losses on the stock prices subject to whether the economy is import-oriented or export-oriented (Dimitrova, 2005)

The empirical findings undertaken in different stock markets are however inconclusive on the nature, direction, and magnitude of the relationship between Exchange Rate Volatility and securities Market Returns. Certain studies established a weak relationship (Mlambo, 2013), others a strong relationship (Kipyegon, 2014), others a relationship only in the long run while

others established a relationship both in the long run and short run (Adjasi, Harvey and Agyapong, 2008).

This survey aims at contributing to this literature; to find out the nature and direction of connection between exchange rate volatility and share market returns.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

This section describes the methodology employed to arrive at the research findings. It contains the research design, research instruments, population & sample, data collection & data methods.

3.2 Research Design

A research design refers to the specification of method and techniques for obtaining the information needed (Green and Tull, 2010). It is the general operational outline of the study that specifies the kind of data to be collected, from where it was collected and what procedures were employed. This study adopted descriptive case study. A simple regression test was used to assess underlying connection between exchange rate and stock index.

3.3 Data Collection Methods

The study used secondary data. The NSE 20 Share Index was downloaded from the Nairobi Securities Exchange website while the Exchange rate between Kenya Shilling and the USD were acquired from the Central Bank of Kenya website. These are the official and credible sources of this information and the data were deemed valid and reliable. The NSE 20 Share Index was selected since it is the best indicator of the overall market performance. The data consisted of monthly observations between January 2007 and December 2016 to guarantee an acceptable quantity of observations.

3.4 Data Analysis

Collected data was first cleaned, analyzed and properly coded in order to attain significant information. Secondary data for this survey for January 2007 to December 2016 was organized in excel for purpose of analysis. The daily Exchange Rate and daily NSE 20 share Index were obtained from the websites of CBK and NSE respectively. Monthly average data was computed from the daily observations. The monthly rate of interest and monthly rate of inflation were obtained from the CBK website.

Using this data, the study conducted a regression analysis to assess how volatility of rate of exchange affects market returns at Nairobi Securities Exchange.

3.4.1 Analytical Model

The study regression model is depicted by the regression model:

$Y = \alpha + \beta 1X1 + \beta 2X2 + \beta 3X3 + \mu i$

Where;

Y - Average monthly Stock Market Return measured by NSE 20 Share Index.

X1- Exchange Rate Volatility of Kenya Shilling against the US Dollar.

X2- Monthly average Inflation rate measured by Measured by Consumer Price Index Changes

X3- Monthly average 91 day Treasury bill interest rate.

α- Constant term(Stock Market Performance not influenced by the three independent variables)

μί- Normal distribution error term; defines the variation in the response variable Y which cannot be explained by the predictor variables.

β1-β3 - Determines the relationship between the independent variable X and the dependent or Gradient/Slope of the regression measuring the amount of the change in Y associated with a unit change in X.

3.4.2 Test of significance

To assess the significance of the relationship between the effects of shilling volatility and achieve the intended objectives, the study carried out an Analysis of Variance. Upon working out the ANOVA statistics, the researcher considered the F-values calculated. 95% confidence level was considered while significant level was at 5%. If the Significance F-calculated was less than 0.05, the researcher considered the model significantly adequate to explaining the relationship.

CHAPTER FOUR: DATA ANALYSIS, RESULTS AND DISCUSSION

4.1 Introduction

This Chapter presents the data analysis, results and discussions of the study. It presents both descriptive and inferential statistics. The study sought to determine the effect of the exchange rate volatility on the stock market returns at the Nairobi Securities Exchange. Secondary data was obtained on a monthly basis from January 2007 to December 2016. Maximum, minimum, mean and standard deviation values are presented under descriptive statistics whereas correlation analysis and multiple regressions are presented under inferential statistics.

4.2 Descriptive statistics

The study variables were the NSE 20 Share Index, the exchange rate volatility, the interest rate and the rate of inflation. The variable trends are discussed below.

Summary Descriptive Statistics

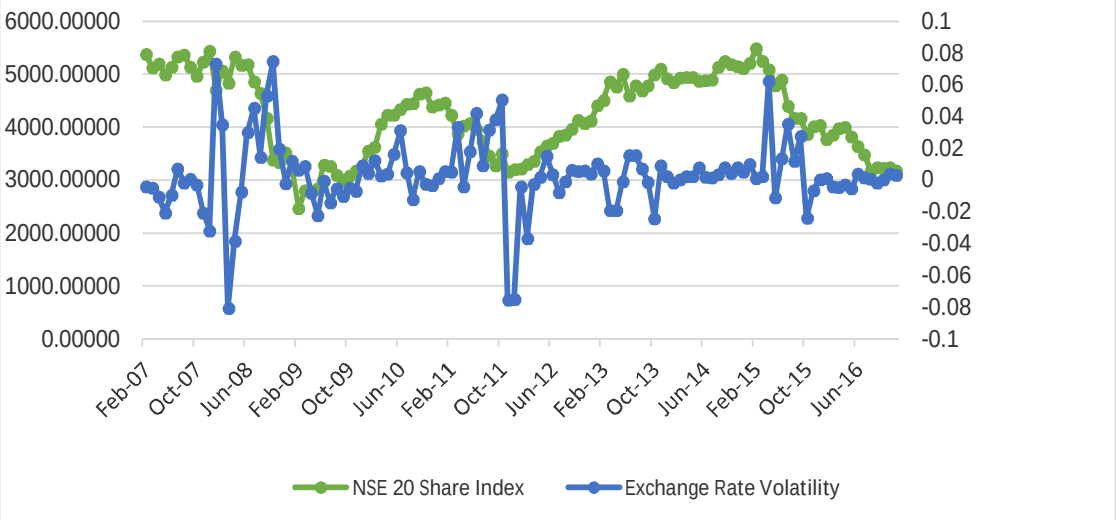
Variable	N	Minimum	Maximum	Mean	Standard Deviation
NSE 20 Share Index	120	2,474.75	5,774.27	4,253.83	776.27
Exchange Rate Volatility	120	-8.03%	7.52%	0.32%	0.02
Inflation Rate	120	1.85%	19.72%	8.29%	4.77
91 day Treasury bill rate	120	1.6%	21.65%	8.43%	3.51

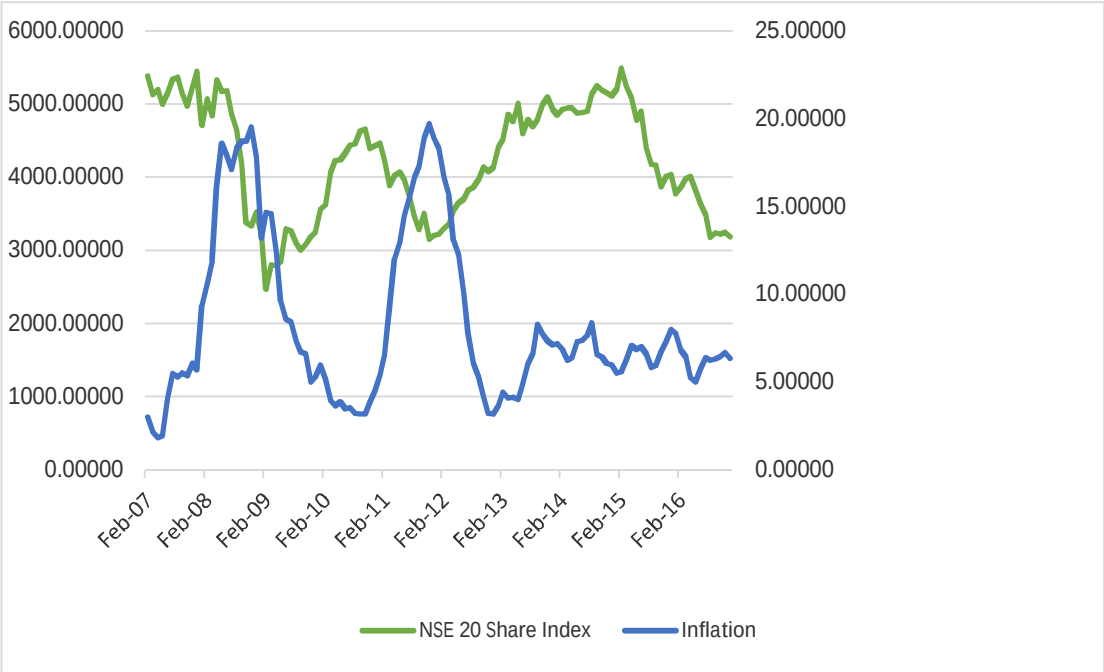
Period of study: January 2007-December 2016

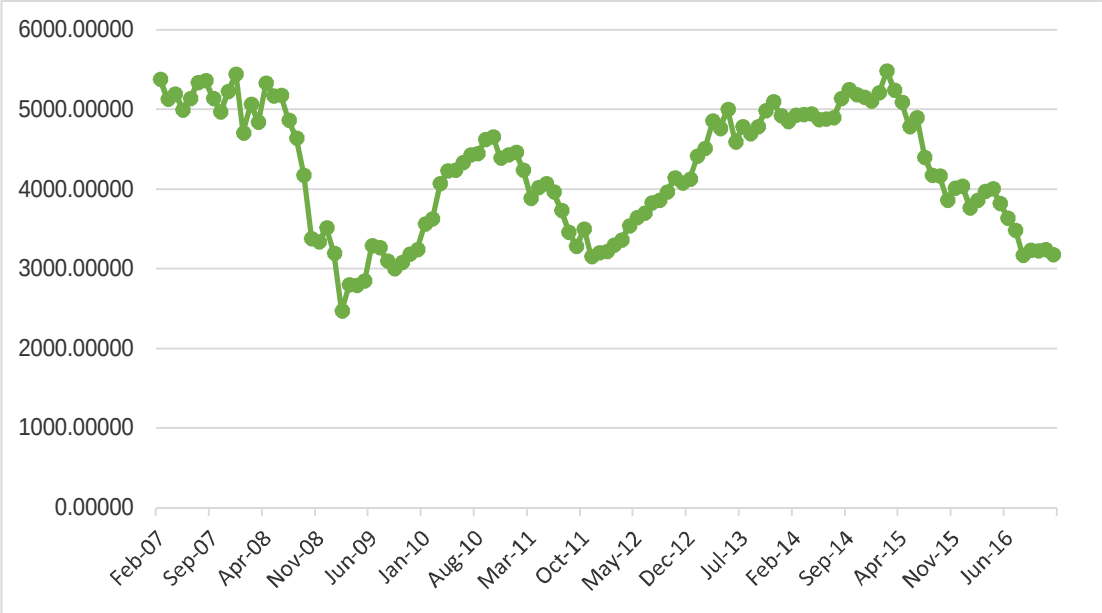
The Descriptive statistics showed the average performance of the NSE 20 Share Index was at 4,253.83 with a standard deviation of 776.27. The average exchange rate volatility stood at

0.32% with a standard deviation of 0.02. The average 91 day Treasury bill rate at 8.43% with a standard deviation of 3.51 while the average rate of inflation stood at 8.29% with a standard deviation of 4.77

4.3 Graphical Trend Analysis







Trend Analysis of the NSE 20 Share Index

4.4 Correlation Analysis

Table 4.2 Correlation Analysis

Variable	NSE 20 Share Index	Inflation Rate	Exchange Rate Volatility	91 T Bill rate
NSE20shareindex	1.0000			
Inflation Rate	-0.3626*	1.0000		
91 days T bill Rate	-0.2389	0.4157	1.0000	
Exchange Rate Volatility	0.02265	0.1049	-.2024	1.0000

Source: CBK, NSE, January 2007-December 2016

*Significant determinant at 0.05

The correlation analysis table shows a stronger negative correlation of 36.26% between the rate of inflation and the NSE 20 Share Index, a strong negative correlation between 91 days T bill rate and NSE 20 Share Index. The Exchange Rate Volatility shows a positive but insignificant relationship with the NSE 20 Share Index.

4.5 Regression Analysis

Table 4.3 Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.3371	0.1422	0.1198	722.4972

Source: CBK, NSE, January 2007-December 2016

The summary shows that the variables produced statistically insignificant values for the study at 95% confidence level ($p>0.05$) hence not very reliable in explaining the relationship between exchange rate volatility and stock market returns. At 95% confidence interval the adjusted R squared value from the findings was 0.1198 and this indicated that 11.98 % of the deviations of the dependent variable was expounded by a variation independent variables. This signifies that other factors not included in the research contribute 88.02% of the changes in market returns. The findings of ANOVA (Analysis of Variance) are as shown in table 4.4.

Table 4.4 Analysis of Variance

Model	df	Sum of Squares	Mean Square	F	Significance F
Regression	3	9,950,828.9109	3,316,942.9703	6.3543	0.000504
Residue	115	60,030,251.9778	522,002.1911		
Total	118	69,981,080.8888			

Source: CBK, NSE, January 2007-December 2016

The results show that the significance F is 0.0005. The results are statistically significant (reliable) since this value is less than 0.05

Table 4.5 Regression Coefficients

Model	Unstandardized coefficients	Standard Error	t-Statistic	P Value
Intercept	4,849.5089	183.5349	26.4228	0.00000
Exchange rate volatility	1,269.18	3,042.4278	0.4172	0.6773
Inflation rate	-52.5030	15.6056	-3.3644	0.0010
91 t bill rate	-20.8022	21.5190	-0.9667	0.3357

Source: CBK, NSE, January 2007-December 2016

From the regression model $Y = \alpha + \beta 1X1 + \beta 2X2 + \beta 3X3 + \mu$, the established regression model becomes:

Y=4,849.5089-52.5030X2

The P Values for exchange rate volatility and 91 Treasury bill rate are above 0.005

The research established that if the three independent variables; exchange rate volatility, inflation rate and 91 days Treasury bill are held at a constant zero (0), the stock market performance would be 4,849.5089. A unit increase in the rate of inflation and interest rate (measured by the 91 days Treasury bill rate) causes market return to decrease by 52.5030.

As demonstrated in the trend analysis between NSE 20 Share Index and the exchange rate volatility, the movement between the two is consistent except between October 2007 to June 2008 and between October 2011 and June 2012 where the exchange rate volatility experienced a higher slump. The trend confirms the data analysis that the two variables are insignificantly positively correlated as shown by the narrow margin between the trends.

The wider margins between NSE 20 Share Index and exchange rate, and NSE 20 Share Index and the rate of inflation also corroborate the data analysis that these variables have a significant negative relationship as demonstrated by the wider variations between the trends. From the NSE Share Index trend, the Index experienced an average of over 5,000 between January 2007 and May 2008, and between October 2013 and January 2015. The lowest index was between October 2008 and March 2009.

4.6 Discussion of Research Findings

The objective of the study was to establish the effect of exchange rate volatility on market returns at the Nairobi Securities Exchange. The study established the existence of a positive relationship between exchange rate volatility and market returns at the NSE. This relationship was however insignificant with the P value being at 0.6773 which is above 0.005. The intervening variables, that is, inflation rate and interest rate contributed to negative correlation with a P value of 0.0010 and 0.3357 respectively. From these values, only the rate of inflation has a P value of less than 0.005 meaning it is the only significant variable in the analytical model.

The study agree with Irungu (2015) who studied the effect of exchange rate fluctuation (Kshs versus USD) on market capitalization at the NSE using 2012 to 2014 monthly data. The study performed a regression analysis to establish the extent of the connection between the fluctuations in the exchange rate and market capitalization. The research found a positive but significant correlation the variables total market capitalization and monthly exchange rate fluctuations. Based on the study, exchange rate volatility has a positive but insignificant relationship market returns and thus do not help in predicting volatility at the NSE. The study however disagrees with Waweru (2013) and Mwanza (2014) who established a significant negative and statistically insignificant relationship respectively.

The exchange rate between Kshs and USD was observed to have increased significantly over the study period. The rate was volatile during the study period and generally showed that Kshs depreciated. This indicates that the country's global competitiveness had reduced gradually while the cost of living had increased.

Financial markets regulators such as CBK who are in charge of monetary policy do not therefore have a reason to be concerned or intervene with volatility in exchange rates and the resulting impact on the stock market returns. The findings in this research will assist CBK in mastering the relationship between exchange rates and the NSE 20 Share Index. Based on the finding of this research, depreciation of the Kenya shilling may not erode the value of shares. The depreciation of the Kenya Shilling specifically against the United States Dollar means that Kenya being an exporter had suffered export losses that may have had significant economic implications.

The government through its financial regulators may consider special assistance targeted to firms that are directly hit by the depreciation of the Kenya Shilling rather than general financial market intervention such as buying or selling of USD.

CHAPTER FIVE: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter discusses the summary, conclusion and recommendations of the research study. The chapter summarises the results on the effect of exchange rate volatility on the stock market returns at the Nairobi Securities Exchange. Based on the research findings described in chapter four, the study gives policy recommendations.

5.2 Summary of the Findings

The aim of the research study was to investigate the effects of exchange rate volatility (appreciation, depreciation and stability) on market returns at the NSE for the period from January 2007 to December 2016 as measured by the NSE 20 Share Index. The study had two specific objectives: firstly, to examine if exchange rate volatility impacts market returns at NSE, and secondly to investigate the direction of the relationship between these variables.

The findings revealed that exchange rate volatility (appreciation, depreciation and stability) had an impact on the market returns in the period of study. The study further established a weak positive correlation between the currency exchange rate volatility and the market returns over the period of study. There was a significant negative relationship between rate of interest (91 Treasury bill rate) and market returns while the rate of inflation also reflected a significant negative relationship during the period of the study. These variables however explained only 14.22 % of the market returns at the NSE for the period January 2007 to December 2016.

5.3 Conclusions

Several studies have been conducted to establish if a relationship exists between currency exchange rate and market returns for developed and developing economies. Four major relations in various stock markets have been established by the empirical evidence which are: unidirectional relations from stock prices to exchange rates, bi-directional relations, unidirectional relation from exchange rate to securities prices, and no interrelationship (Mao 2013).

In this study, the relationship between exchange rate volatility and market returns was investigated from January 2007 to December 2016. According to the findings of the study, there was a weak insignificant correlation of 2.265% between exchange rate volatility and market returns measured by the NSE 20 Share Index.

Additionally, the rate of interest was found to have a negative but significant effect of 23.89% on the performance of the NSE 20 Share Index meaning that investors channel funds to interest bearing securities when the 91 days Treasury bill rate increases. High rate of interest therefore impacts negatively on the Index. The rate of inflation was also found to have a negative but strong relationship of 36.262% with the NSE 20 Share Index meaning that investors keep off or redirect their funds from the market when inflation rises.

5.4 Recommendations

It is paramount for the Central Bank, National Treasury and other state regulators to implement prudent macroeconomic policies that support growth of the stock market due to the pivotal role it plays in the economic growth and development of a country. Based on the findings, the regulators must implement sound macroeconomic policies to manage the rate of inflation and

the rate of interest. This may include government support in vital sectors of the economy such as agriculture to bring down prices of food as well as other drivers of inflation such as fuel prices. The currency exchange rate however is not a significant determinant of the market returns, and based on the findings, does not influence the market returns. The government should not be keen to shield the shilling against the United States Dollar in relations to market returns and may consider finding alternative intervention policies to help specific businesses that are hardly hit by depreciation of the Kenya shilling.

5.5 Limitations of the Study

The study used the NSE 20 share index which may not be an accurate representative of all other firms listed on NSE. Other firms could respond differently to the effects of exchange rate volatility. Market returns at NSE was measured using NSE 20 share index only. There are many other variables that can be used to measure market returns.

Regression model assumed that variables in the model are the only ones that impact the NSE 20 share index. The study did not therefore capture other important variables and information that could affect the NSE 20 share index such as economic growth, money supply performance of other stock markets in the region and across the globe, and other qualitative information.

Data analysed covered a period of 10 years from January 2007 to December 2016. The immediate reaction of investors as information on the exchange rate volatility arrived may have been lost in the monthly averages as opposed to more frequent data observations such as weekly or daily which may have different findings.

5.6 Suggestions for Further Research

Further research is recommended on the effects of exchange rate volatility on market returns at the Nairobi Securities Exchange. The research will enable capturing of other factors affecting market returns at the NSE. The study should incorporate other factors such as money supply, Gross Domestic Product, Foreign Direct Investments, performance of other securities markets in developing economies and globally, and economic growth.

We suggest further study on market returns at the NSE based on performance of bonds or a combination of returns for securities and bonds. This is because NSE 20 share index measures returns for 20 selected companies and this excludes trading in fixed income securities. Further studies is recommended on exchange rate volatility against other indices such as NASI (NSE All Share Index) which measures returns for all the firms listed at the market or Pine Bridge 27 index that measures returns for more firms that the NSE 20 share index.

In addition, future research should extend to exchange rate between Kenya Shilling and other world's strong currencies such as Euro and Pound, or currencies for Kenya largest trading partners such as Uganda.

The significance of the findings could possibly be improved by use of more frequent dynamics such as weekly or daily data. This may be a better reflection of investors' reaction to exchange rate volatility.

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APPENDIX

Month	NSE 20 Share Index	Inflation rate (%)	Exchange rate (USD/Kshs)	Interest rate (%)
Jan-07	5774.27000	4.63000	69.88452	6.00000
Feb-07	5387.28000	3.02000	69.61594	6.22000
Mar-07	5133.67000	2.19000	69.29285	6.32000
Apr-07	5199.44000	1.85000	68.57708	6.65000
May-07	5001.77000	1.96000	67.19063	6.77000
Jun-07	5146.73000	4.07000	66.57483	6.53000
Jul-07	5340.08000	5.48000	67.06773	6.52000
Aug-07	5371.72000	5.30000	66.96758	7.30000
Sep-07	5146.46000	5.53000	67.02428	7.35000
Oct-07	4971.04000	5.38000	66.85121	7.55000
Nov-07	5234.54000	6.08000	65.48995	7.52000
Dec-07	5444.83000	5.70000	63.42483	6.87000
Jan-08	4712.71000	9.40000	68.08122	6.95000
Feb-08	5072.41000	10.58000	70.46626	7.28000
Mar-08	4843.17000	11.90000	64.80759	6.90000
Apr-08	5336.03000	16.12000	62.33983	7.35000
May-08	5175.83000	18.61000	61.89926	7.76000
Jun-08	5185.56000	17.87000	63.78279	7.73000
Jul-08	4868.27000	17.12000	66.70396	8.03000
Aug-08	4648.78000	18.33000	67.69162	8.02000
Sep-08	4180.40000	18.73000	71.29762	7.69000
Oct-08	3386.65000	18.74000	76.65714	7.75000
Nov-08	3341.47000	19.54000	78.18284	8.39000
Dec-08	3521.18000	17.83000	78.03973	8.59000
Jan-09	3198.90000	13.22000	78.99970	8.46000
Feb-09	2474.75000	14.69000	79.53273	7.55000
Mar-09	2805.03000	14.60000	80.26149	7.31000
Apr-09	2800.10000	12.42000	79.62581	7.34000
May-09	2852.57000	9.61000	77.86135	7.45000
Jun-09	3294.56000	8.60000	77.85117	7.33000
Jul-09	3273.10000	8.44000	76.75133	7.24000
Aug-09	3102.68000	7.36000	76.37187	7.25000
Sep-09	3005.41000	6.74000	75.60489	7.29000
Oct-09	3083.63000	6.62000	75.24358	7.26000
Nov-09	3189.55000	5.00000	74.73922	7.22000

Dec-09	3247.44000	5.32000	75.43115	6.82000
Jan-10	3565.28000	5.95000	75.78620	6.56000
Feb-10	3629.41000	5.18000	76.73050	6.21000
Mar-10	4072.93000	3.97000	76.94675	5.98000
Apr-10	4233.24000	3.66000	77.25437	5.17000
May-10	4241.81000	3.88000	78.54140	4.21000
Jun-10	4339.28000	3.49000	81.01808	2.98000
Jul-10	4438.58000	3.57000	81.42617	1.60000
Aug-10	4454.59000	3.22000	80.43976	1.83000
Sep-10	4629.80000	3.21000	80.91194	2.04000
Oct-10	4659.56000	3.18000	80.71430	2.12000
Nov-10	4395.17000	3.84000	80.46024	2.21000
Dec-10	4432.60000	4.51000	80.55925	2.28000
Jan-11	4464.92000	5.42000	81.02907	2.46000
Feb-11	4240.18000	6.54000	81.47340	2.59000
Mar-11	3887.07000	9.19000	84.20551	2.77000
Apr-11	4029.23000	12.05000	83.88982	3.26000
May-11	4078.10000	12.95000	85.43301	5.35000
Jun-11	3968.12000	14.48000	89.04928	8.95000
Jul-11	3738.46000	15.53000	89.89773	8.99000
Aug-11	3465.02000	16.67000	92.78596	9.23000
Sep-11	3284.06000	17.32000	96.35726	11.93000
Oct-11	3507.34000	18.91000	101.26979	14.80000
Nov-11	3155.46000	19.72000	93.67556	16.14000
Dec-11	3205.02000	18.93000	86.66285	18.30000
Jan-12	3224.18000	18.31000	86.34257	20.56000
Feb-12	3303.75000	16.69000	83.17611	19.70000
Mar-12	3366.89000	15.61000	83.00099	17.80000
Apr-12	3546.66000	13.06000	83.18779	16.01000
May-12	3650.85000	12.22000	84.46185	11.18000
Jun-12	3703.94000	10.05000	84.78874	10.09000
Jul-12	3832.42000	7.74000	84.14472	11.95000
Aug-12	3865.76000	6.09000	84.07545	10.93000
Sep-12	3972.03000	5.32000	84.61330	7.77000
Oct-12	4143.35000	4.14000	85.11161	8.98000
Nov-12	4083.52000	3.25000	85.62857	9.80000
Dec-12	4133.02000	3.20000	85.99399	8.30000
Jan-13	4416.60000	3.67000	86.89961	8.08000
Feb-13	4518.59000	4.45000	87.44553	8.38000
Mar-13	4860.83000	4.11000	85.81764	9.88000

Apr-13	4765.23000	4.14000	84.18905	10.38000
May-13	5006.96000	4.05000	84.14618	9.46000
Jun-13	4598.16000	4.91000	85.48845	6.21000
Jul-13	4787.56000	6.03000	86.85947	5.92000
Aug-13	4697.75000	6.67000	87.49294	10.03000
Sep-13	4793.20000	8.29000	87.41287	9.58000
Oct-13	4992.88000	7.76000	85.31038	9.72000
Nov-13	5100.88000	7.36000	86.10303	9.94000
Dec-13	4926.97000	7.15000	86.33556	9.52000
Jan-14	4856.15000	7.21000	86.21432	9.26000
Feb-14	4933.41000	6.86000	86.27784	9.16000
Mar-14	4945.78000	6.27000	86.48874	8.98000
Apr-14	4948.97000	6.41000	86.71629	8.80000
May-14	4881.56000	7.30000	87.41162	8.82000
Jun-14	4885.04000	7.39000	87.61158	9.81000
Jul-14	4906.09000	7.67000	87.76924	9.78000
Aug-14	5139.39000	8.36000	88.10590	8.29000
Sep-14	5255.62000	6.60000	88.83591	8.38000
Oct-14	5194.89000	6.43000	89.23139	8.67000
Nov-14	5156.33000	6.09000	89.96310	8.64000
Dec-14	5112.65000	6.02000	90.44421	8.58000
Jan-15	5212.11000	5.53000	91.35836	8.59000
Feb-15	5491.37000	5.61000	91.48859	8.59000
Mar-15	5248.16000	6.31000	91.72737	8.49000
Apr-15	5091.43000	7.08000	97.45522	8.42000
May-15	4786.74000	6.87000	96.38936	8.26000
Jun-15	4906.07000	7.03000	97.70491	8.26000
Jul-15	4404.72000	6.62000	101.19820	10.57000
Aug-15	4176.59000	5.84000	102.43071	11.54000
Sep-15	4173.52000	5.97000	105.27481	14.61000
Oct-15	3868.83000	6.72000	102.79226	21.65000
Nov-15	4016.18000	7.32000	102.15214	12.34000
Dec-15	4040.75000	8.01000	102.18664	9.81000
Jan-16	3773.17000	7.78000	102.31277	11.36000
Feb-16	3862.24000	6.84000	101.93166	10.63000
Mar-16	3982.09000	6.45000	101.48539	8.72000
Apr-16	4009.26000	5.27000	101.22843	8.92000
May-16	3827.80000	5.00000	100.73234	8.15000
Jun-16	3640.61000	5.80000	101.14463	7.25000
Jul-16	3488.67000	6.40000	101.33157	6.16000

Aug-16	3178.83000	6.26000	101.41024	8.48000
Sep-16	3243.21000	6.34000	101.27119	8.06000
Oct-16	3229.22000	6.47000	101.32341	7.76000
Nov-16	3247.19000	6.68000	101.74808	8.22000
Dec-16	3186.21000	6.35000	102.06941	8.44000