

**THE EFFECT OF EAST AFRICA REGION CURRENCIES  
EXCHANGE RATE FLUCTUATIONS ON THE PERFORMANCE  
OF THE NAIROBI SECURITIES EXCHANGE**

**BY:**

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**A RESEARCH PROJECT SUBMITTED IN PARTIAL  
FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OF  
THE DEGREE OF MASTERS OF BUSINESS ADMINISTRATION,  
SCHOOL OF BUSINESS, UNIVERSITY OF NAIROBI**

**DECEMBER, 2017**

## DECLARATION

This project is my original work and has not been submitted for an examination or degree in any other university.

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

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## **ACKNOWLEDGEMENTS**

I give gratitude to the Almighty God for enabling me undertake MBA studies at the University of Nairobi. Many thanks to my supervisor, Dr. Mirie Mwangi for his invaluable support and guidance throughout the research period and Dr. Cyrus Iraya for moderation of the project.

I acknowledge my beloved wife Winnie, my parents and my lovely son Jesse and daughter Abigail for their patience and understanding throughout the entire postgraduate study period. You inspired me to undertake this course with resilience.

## **DEDICATION**

The research project paper is dedicated to my loving mother Florence Igunza who did not get a chance to step into a university and my father Francis Igunza who taught me the value of education at a very young age. I dedicate this to my children as a source of inspiration and encouragement to pursue further education in life. God bless you all.

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## ABBREVIATIONS

<b>CBK</b>	Central Bank of Kenya
<b>EAC</b>	East African Community
<b>CPI</b>	Consumer Price Index
<b>FOREX</b>	Foreign Exchange
<b>NASI</b>	Nairobi Securities Exchange All Share Index
<b>NSE</b>	Nairobi Securities Exchange
<b>PPP</b>	Purchasing Power Parity
<b>RWF</b>	Rwandese Frank
<b>TSHS</b>	Tanzania Shilling
<b>UGSH</b>	Uganda Shilling
<b>USD</b>	US Dollar
<b>ANOVA</b>	Analysis of Variance

## ABSTRACT

Currently, because of increasing pace of international investment portfolio diversification, cross-border capital inflows, inter-market return links, the embrace of floating exchange rate regimes in developing countries, equities and foreign exchange markets have become closely inter-connected. This paradigm has increased the kind of investment possibilities as well as the change of exchange rates, investment risk decisions and diversification of portfolios for a high return. Consequently, getting an understanding of the connection between exchange rates and stock markets will facilitate local and world-wide investors creating strategies for diversifying and hedging their portfolios. This research sought to explore the consequence of exchange rate oscillations of East African region currencies on the performance of the Nairobi Securities Exchange. The variables under study included exchange rate fluctuations of KES/USHS, KES/TSHS and KES/RWF as independent variables, changes Nairobi All Share Index (NASI) as the dependent variable, changes in inflation and CBK rate as control variables. The research utilised descriptive research design and secondary data for a period covering eight years and 5 months. The data collected was analysed using the excel multiple regression model to arrive at the relationship equation of the variables. The findings revealed existence of a negative weak relationship between foreign exchange rate changes of KES/USHS and, KES/TSHS against the NASI while the KES/RWF had a positive relationship with changes in NASI. These findings supported the flow oriented model of exchange rate theories and consummated the objective of this study. This research revealed existence of a relationship between exchange rates fluctuations of East Africa region currencies and the Nairobi Securities All Share Index. This therefore means investors in the region must monitor these exchange rate changes to manage their investment risk and diversify their portfolios accordingly. These findings provide a source of reference that the East Africa Community Monetary Union secretariat should consider and examine this association between exchange rates and the equity market performance as they design and structure the EAC common monetary union. In addition these findings should be considered by the monetary policy regulators i.e. the central banks in managing the exchange rates through money supply between the regional currencies. Finally the findings revealed existence if a weak relationship between the variables and a significant portion of changes in the dependent variable (Change in NASI) being unexplained by independent the variables under study hence, need to carry out further research on other factors responsible for the changes in performance of the Nairobi Securities Exchange.

# **CHAPTER ONE: INTRODUCTION**

## **1.1 Background of the Study**

The current world is a global village with no nation being self-sufficient in infrastructure, natural resources and human capital but subject to increased globalization of trade, financial systems, human resources and innovative concepts in one global market place. Each nation engages with other trade partners at different levels of collaboration to market its products or services, to procure what it in needs and also comparatively produce more efficiently in given sectors of its economy. This has led to the adoption of trade integration through tariff agreements, technological advances, liberalized capital markets, economic block treaties and standardization of financial processes.

The financial sector plays a critical role in facilitating global trade by creating sources of investment capital and credit for consummation of global commercial transactions. Global financial systems allow conversion of foreign currencies according to the prevailing market exchange rates that are set by forces of demand and supply (Tatjana & Spire, 2011).

Currency markets and securities markets are an integral part of the financial ecosystem. The currency markets also known as forex markets are a conduit through which investment in financial markets is facilitated. It allows foreign investors to access domestic financial markets and a channel for local investors to access foreign financial markets. Equity or securities markets are essential for borrowers to access funding through the issue of, investing in and the trading of marketable equity instruments like shares (Faure, 2013). The equity market and forex market interact as foreign investors

diversify and invest in securities at a price valued at the exchange rate existing between the various currencies of the countries involved based on the market forces. International investors who transact in foreign stock market enjoy the dual benefit of foreign equities and foreign currency hence their risk-return component is a combination of currency factors and domestic market factors (Anand & Manley, 1997).

As global trade and international movement of capital gains eminence at an increasing pace, foreign exchange rate risk influence the yield of the foreign investors and rate of return over their securities investment portfolios (Kim, 2003). Among the many economic factors that affect the local rate of return on stock like dividend, stock cross border prices, interest rate and employment rate, exchange rates too poses a significant influence (Kurihara, 2006).

Currently, because of increasing pace of international investment portfolio diversification, cross-border capital inflows, inter-market return links, and currency markets or the embrace of floating exchange rate regimes in developing countries, these two markets have become closely inter-linked. This dynamism has increased the kind of investment opportunities as well as the unpredictability of exchange rates, investment risk decisions and diversification of portfolios for a high return. Consequently, getting an understanding of the relationship between exchange rates and stock markets will facilitate local and global investors creating strategies for diversifying and hedging their portfolios (Aydemir & Demirhan, 2009). This research sought to drive this investors' concern about the nature of this relationship.

The Economic Survey 2017 shows that the East African Community (EAC) is made of various member states including: Tanzania, Uganda, Kenya, Rwanda and Burundi which continue to provide Kenya with a ready regional market representing 51.9 per cent of the trade between African States. The EAC bloc, which is pursuing assimilation at economic and political levels, has also endowed Kenya with a market for investments in banking, manufacturing and provision of professional services. Uganda remained the biggest market for Kenyan goods where Sh62 billion worth was sold with Rwanda receiving goods valued at Sh17.5 billion, Burundi Sh7.2 billion and Tanzania recorded Sh34.8 billion up from 2015 Sh33.7 billion. It is evident that these Intra-EAC trade volumes have grown tremendously and impact the currency exchange rates between the community country states. With the eminent growth of intra-East Africa trade, Kenya needs to understand the impact of such trade on its financial markets and it is on this premise that this research sought to study the effect of exchange rate fluctuations of East African currencies i.e. UGSH, TSHS and RWF on the performance Kenya's stock market as will be represented by the Nairobi Securities Exchange All Share Index (NASI).

### **1.1.1 Exchange Rate Fluctuations**

Exchange rate is the conversion of the one country's domestic currency in terms of another country's currency as a representation of price (Faure, 2013). Foreign exchange rate fluctuations occur in floating exchange rate regimes where market forces of demand and supply determine the rate at which the currencies will exchange between the countries involved. Any investor engaging in foreign investment will be exposed to exchange rates and hence impacted by such changes. Exchange rates impact stock prices

for international and export orientated firms but also for local firms. For an international company with operations in various countries, exchange rate oscillations will cause a variation in valuation of its overseas operations and a revision in the return of its assets mirrored in reported earnings. Therefore, the shifts in the valuation of a firm's overseas operations may upset the prices of stocks as earnings per share change. Domestic companies can also be influenced by deviations in foreign exchange rates because they might import a portion of their needed inputs and sell their products to other countries (Aydemir & Demirhan, 2009).

Exchange rate fluctuations occur through changes in the value of a given currency relative to another currency through a process of devaluation and appreciation. For instance, a devaluation of domestic currency results into high cost for imported inputs and low cost for a company's exported yields. Therefore, currency devaluation will positively affect the valuation of export oriented firms (Aggarwal, 1981) and an increase in the earnings of these firms, subsequently, improving the share prices (Wu, 2000).

Dornbusch and Fischer (2013) proposed that oscillations in exchange rates substantially impacts on a firms' value, as they sway the conditions of rivalry, the value of firms' commitments and resources valued in foreign currencies, the input and output prices. This will ultimately lead to an effect on the earnings potential of the firm which is represented in the share price as a proxy for the present value of the prospective discounted and weighted cash flows.

### **1.1.2 Performance of Securities Exchanges**

Securities markets are a component of the financial system through which a platform for consumers and vendors to come together, to transact at a fair transaction price arrived at by the free forces of market demand and supply for share issued through an initial public offer or already issued shares (Faure, 2013). Therefore securities markets provide information to buyers and sellers and reduce transaction costs since the involved parties may be unaware of each other, they may be in different locations and might also be available at different times (Lawrence, William, & Gregory, 2009).

Dubravka and Petra (2010) established that the market indices have the highest statistical worth in explaining stock returns. Securities markets are said to be stable and performing if they deliver low price volatility as represented by: a good depth of the market i.e. easy to identify arbitrage opportunities through purchase or sell orders better and lower the current market prices; breath of the market i.e. orders high or below the current prices occur in large volumes and resilience of the market and lastly with speed new orders are processed at a pace which prices move up and down.

The performance of securities markets is measured using an index. Stock market indices aggregate vast amounts of price and other information about subsets of stock markets. The majority of the most popular equity and bond indices used today weight the constituents according to market capitalisation (Clare, Motson, & Thomas, 2013). This index facilitates the comparison with between securities and measuring of the level of activity and development in the securities market. The performance of the securities exchange markets can be unpredictable and affected by various factors like specific



internal firm developments, inflation, interest rates, hysteria and exchange rates. (Wolski, 2007)

### **1.1.3 Exchange Rate Fluctuations and Performance of the Securities Exchange Market**

The currency market and the securities market continue to interact with each other as investors transact to build and diversify their portfolios. The form and type of connection between equity market prices and currency exchange rate fluctuations is a contentious subject among researchers though there is a dearth of literature on it. The performance of share prices on the bourse will determine the value of the market index during the period of trading. (Ramasamy & Yeung, 2005) concluded that the reason for such contradictory results on the interaction between equity prices and exchange rate changes was that the kind of relationship between equity and forex markets is affected by the various stages of business cycles' and other varying economic factors, such as changes in in economic market structures.

The study of the nature and type association between equity prices and exchange rate fluctuations is vital for a different reason to various stakeholders. Such studies may guide the choice and evaluation of monetary and fiscal policies adopted in a given state. (Gavin, 1989) suggested that a thriving stock market has a favourable influence on cumulative demand. For instance policy-makers may adopt a cheaper currency strategy so as to boost the export earnings which may impact the stock market performance negatively. The interaction between exchange rate fluctuations may be utilised to forecast the trends of the exchange rate at a given time.

The study between equity prices and exchange rate interactions will facilitate international firms to manage their exposure to foreign exchange risk and foreign currency denominated agreements which has a bearing on their profitability. Dornbusch and Fischer (2013) postulated that variations in foreign exchange rates can materially impact a firm's value, since they guide the conditions of competition, the amount of liabilities and assets valued in foreign currencies, the input and output prices. Therefore, the fluctuations affect the cost of a firm's funds and its earnings competitiveness and thereby impacting the value of its shares trading on the equities market. This included local firms too.

#### **1.1.4 Nairobi Securities Exchange and Exchange Rate Fluctuations in Kenya**

The Nairobi Securities Exchange (NSE) the Kenyan stock market established in 1954, granting it to a six decade legacy in listing equity and debt securities. It offers a trading platform for local and foreign investors looking to gain access Kenya's market and Africa's economic growth at large. NSE is critical in the expansion of Kenya's economy by boosting the level and nature of savings and investment, in addition to facilitating domestic and world-wide firms' access less expensive source of capital. Under the regulation of Capital Markets Authority of Kenya (CMA) since 1989 the NSE currently lists fixed income securities and small-cap shares amounting to sixty three listed firms including cross listed equities with neighbouring East African bourses (NSE, 2017).

In 2016 the NSE received a boost through the elimination of foreign ownership restrictions in listed firms, which was previously capped at a threshold of 75%. This opened an opportunity for increased foreign attraction of the NSE and foreign equity investment activity from the globe. NSE overall level of performance is determined through a market index called the NSE All-Share Index (NASI) introduced in 2008 which is a consolidation of all NSE securities weighted for market capitalisation. The NASI closed 152.92 points in Q2. 2017 compared to 140.60 points in Q2. 2016 representing 9% growth (NSE, 2017).

The level of East Africa investors' participation at the NSE stands at 259 for East Africa corporates and 7,448 for the individual investors representing regional interest in the stock market (NSE, 2017). The exchange rate fluctuations between the Kenya Shilling and the East African currencies have recorded mixed trends. KES/USHS stood at 34.57 in Q2 2017 compared to 33.68 in Q2 2016 representing the depreciation of the KES by 2.64% while the KES/TSHS closed at 21.57 in Q2 2017 compared to 21.66 same time last year recording KES appreciation of 0.42%. The KES/WRF stood at 7.96 in Q2 2017 compared to 7.38 same time last year, indicating a KES depreciation of 7.86% (CBK, 2017). This research sought to investigate how these three currencies fluctuate against the Kenya Shilling and its effect the Kenyan stock market performance.

Various studies undertaken to scrutinise the link between exchange rate dynamism and the Kenyan equity market performance but these is no single agreed finding. Omondi (2016) identified a negative relationship while Mongeri (2011); Sifunjo and Mwasaru

(2012) revealed a positive relationship with exchange rate fluctuations impacting on the performance of the stock market.

## **1.2 Research Problem**

The nature and type of relationship between the stock and forex markets remains debatable without a universal conclusion and point of congruence for many decades now both in the academic and policy environment. Among many international research studies done to investigate this relationship, Lim and Sek (2014) found out a two-way causality between stock returns and exchange rate volatility in Thailand, Indonesia and Korea.

In addition, Kolawole and Olalekan (2007) concluded that the force of exchange rate dynamism stimulated an adverse influence on the Nigeria stock market performance. Further Seri, Dileep, Jamil, and Saqib (2015) carried out the same research and arrived at a conclusion that there existed no association amongst the exchange rate fluctuations and the equity values and both the variables were interdependent in Pakistan. Local empirical studies on the same subject have yielded a myriad of conclusions on this subject matter.

Mwanza (2014) concluded that foreign exchange shifts had a favourable influence on stock prices and hence on NSE performance. Mongeri (2011) undertook the same study and inferred that exchange rate oscillations had a considerable adverse bearing on the performance of the indices of the NSE. Nyamute (1998) study supported the presence of a favourable association between equity market values and level of exchange rates. Sifunjo and Mwasaru (2012) examined the existence of a causal association between

stock prices and exchange rates in Kenya and inferred that the exchange rates granger caused stock prices in Kenya.

Among many local and international empirical research studies done, there is exist no single similar and agreed conclusion on the nature and type of link between foreign exchange rates and equity market performance hence this research study sought to contribute to towards unravelling and solving this gap of failed agreement on this study area.

The integration of the East African Community (EAC) is a major objective for all the member countries of the region. According to the Economic Survey 2017 this region that brings together Tanzania, Kenya, Rwanda, Burundi and Uganda continued to provide Kenya with a ready regional market that accounted for 51.9 per cent of trade among African states. In total EAC trade to Kenya amounts to Ksh 104 billion worth of business. The cross-listing of securities between Kenya, Uganda, Tanzania and Rwanda, presents the contagion effect potential into the NSE stock market resulting from the cross-border transactions, economic status and business performance in the specific countries. The fluctuations in the RWF, USHS and TSHS against the KES was of interest to analyse its effect on the Kenyan stock market as Kenya remains the largest economy in the EAC.

It is in this strength that this research purposed to investigate the effect of fluctuations of East African currencies i.e. USHS, RWF and TSHS on the performance Kenya's stock market as denoted by the Nairobi Securities Exchange (NSE) All Share Index (NASI) as a consideration during planning and policy development. Various scholars have carried out research in this area and utilised various variables to arrive at the diverse conclusions.

Nyambura (2014) undertook a research to establish the connection between these two variables in Rwanda, where she evaluated the fluctuations between RWF/USD against the Rwanda stock market performance where it was inferred that there existed a strong connection between the stock market index and the RWF/USD exchange rate. In addition, Omondi (2016), Mwanza (2014), Mongeri (2011) and Cheruiyot (2012) researched about the effect of exchange rate variations on the NSE performance based on the Kenya shilling and US dollar parity against the NSE All and 20 share Indices where both arrived at contradicting conclusions. None of the previous research done in this area domestically has departed and considered a regional approach other than the US dollar as the foreign currency of comparison hence this research sought to investigate how the Kenya shilling fluctuations with the RWF, USHS and TSHS will impact the NSE performance. This research study proposed to cover this gap and pursued an investigation of the effect of exchange rate fluctuations of KES against three major EAC currencies on the NSE stock market level of activity different from the use of the USD as a foreign currency of comparison.

### **1.3 Research Objective**

To investigate the effect of exchange rate fluctuations of East African region currency on the performance of the Nairobi Securities Exchange.

### **1.4 Value of the Study**

This study will contribute to theory and literature on the nature and type of interface amongst equities market performance and foreign exchange rate dynamics. This will form a reference point for future research by academicians and researchers on this subject

matter through testing of the conclusions that will be arrived at the end of this research, changing the context and any other way to further research on these variables.

This study will help investors in understanding the nature and impact of exchange rate movements on their investment portfolios valuation and return in an effort to manage and minimize the foreign exchange risk exposure posed by the forex market changes.

In addition, since the forex and stock markets are regulated, the research findings will be considered by policy makers as they formulate exchange rate actions within the floating forex regime in East Africa and even as the EAC looks forward to come with exchange rate arrangements as a platform of transition to the East African Monetary Union.

## **CHAPTER TWO: LITERATURE REVIEW**

### **2.1 Introduction**

This chapter covers the theoretical and empirical analysis of recognized literature about the effect of exchange rate movements on the performance of the stock market as manifested in the impact on stock prices and stock market indices. In addition, this involved a theoretical review of the pertinent subject theories as well as empirical studies done by other researchers and scholars in this study area. This chapter focused both on local and international study findings and conclusions as well as a criticism of the same.

### **2.2 Theoretical Review**

This section analysed the theoretical models postulated on this area of study regarding exchange rate movements, equity market performance and the link between equity market level of performance and foreign exchange rate fluctuations. These theories include: The Purchasing Power Parity Theory, Flow Oriented and Stock Oriented Models

#### **2.2.1 The Purchasing Power Parity Theory**

This is a theory developed by Cassel (1918) which considers the exchange rates between two currencies at any given time to be in balance when their buying power is equivalent in each of the two countries. Therefore, the exchange rate should equal the ratio of the two countries' fixed basket of goods and services price level. Sometimes whenever a country's domestic price level is snowballing especially during inflation, the exchange rate has to decline in order to balance at purchasing power parity.



This theory is guided by the "law of one price" where it is assumed in the absence of transaction charges and transportation costs, efficient and assimilated markets will equalize the price of a given good or service in two countries when the prices are conveyed in the same currency. There are three qualifications regarding the law of one price; the transportation costs, trade controls, and other transaction charges, can be substantial. In addition, there must be efficient markets existing in the countries involved for the goods and services. Lastly, the principle of one price replicates well to marketable goods and services; immovable goods and services that are domestic cannot be traded between two countries (Claudia, 2014). It is on this premise that the price of shares across the EAC security market is equal to the market determined exchange rate existing between the currencies. The forces of market demand and supply may fluctuate until price parity is attained but it's prohibited by the existence of imperfect markets.

The purchasing power parity between Kenya Shilling and the East African region currencies will affect the demand of goods between the EAC member states. According to PPP theory a depreciation of the USHS, RWF or TSHS will result in low prices for a basket of goods in the three countries versus the Kenyan Market hence occasioning an escalation of demand for the USHS, RWF and TSHS in the foreign exchange market. This will eventually impact the supply and demand which will result into an upsurge in the three currencies in demand hence the exchange rate will increase.

### **2.2.2 Flow Oriented Model**

This theory was put forward by Dornbusch and Fischer (1980), who postulated that exchange rate fluctuations are the source of stock price movements. This phenomena according to Granger-Sim causality is referred to as ‘uni-directional’ causality emanating from currency exchange rates to stock prices, or exchange rates ‘Granger-cause’ stock prices. This theory is founded on the broad view that as stock prices are a representation of the discounted current value of a firm’s predicted forthcoming cash flows, then any occurrence that impacts a firm’s level of cash flow will be revealed in that firm’s stock market price when the market is developed at the level of strongly efficiency as suggested by the Efficient Market Hypothesis.

Therefore, the flow oriented model represents a negative relationship between equity prices and currency exchanges rates with bearing of causation emanating from exchange rates towards stock prices. This ‘Granger Causation’ can be explained in practical terms to mean domestic currency depreciates it makes the local firms products more affordable in the global market place, making their exports cheaper to foreign buyers. Increase in the level of exports demand would lead to higher company income, improving the firms’ profitability performance and upsurge in firms’ stock prices (Joseph, 2011).

The flow oriented model would facilitate and set a platform for analysis of how the NSE responds to changes in firm performance resulting from changes in exchange rates which affects the prices of its products and inputs as manifested in the price of the listed equities. In addition, according to this theory the exchange rate between the KES and the USHS, RWF and TSHS will affect the value of the firm listed on the NSE through

affecting the valuation of foreign denominated operations and cost of doing business as the cost of purchasing inputs keeps oscillating around the exchange rates (Joseph, 2011). This study sought to ascertain if this causality is true and supported.

### **2.2.3 Stock Oriented Model**

This theory is also called portfolio balance approach. This theory put forward by Branson et. al (1977) hypothesised that stock prices had an influence on market exchange rates. Contrary to the flow oriented, stock oriented model advocates that movements in stock prices Granger-cause shifts in the exchange rates through the nature of capital account transactions.

The level to which this model actually explains actual securities and forex market interactions is reliant on upon various factors not limited to stock market liquidity and level of market segmentation. This means illiquid markets make it difficult and/or less efficient for investors to purchase and sell stock freely, while differentiated markets cause imperfections, for example state controls on investment, increased transaction expenses and major foreign currency risks, each of which may depress or inhibit overseas investment (Eiteman et. al. 2004).

The stock model theory provided a platform to examine whether the exchange rates between the KES and the USHS, RWF and TSHS will impact the share performance of listed counters on the NSE. With the current global capital movements the foreign market is dominated with such transactions which affect the exchange rate. Therefore, the currency variations anticipations have a substantial effect on the price fluctuations of assets held financially and could thus affect stock price fluctuations. This may lead to

investors leaning towards transacting in domestic currency to reduce foreign exchange risk.

## **2.3 Determinants of Security Market Performance**

Apart from exchange rates which influence the amount of cash flow and the stock price other factors that would affect the securities market include:

### **2.3.1 Internal Firm Specific Characteristics**

The type of firm orientation as a multinational or domestic company is one of the peculiarities of how exchange rates interact with stock prices (Franck & Young, 1972). For world-wide entities, shifts in the exchange rate through currency appreciation or depreciation alter the valuation of the multinational's overseas operations, as reflected in the positive yield or loss on its reported results which would then have a spill over effect in its share price as a signalling effect to the investors on the financial health of the organization.

The way in which currency movements sway a company's earnings and by extension its stock price depends on the characteristics of that firm as a multinational or a local company (Omondi, 2016). Through the exposure to foreign exchange risk investors are adopting the use of derivatives, such as currency options and forward contracts to moderate the impact of currency changes on their earnings.

Firm specific features will impact how it will interact in the environment. The level of interaction and sensitivity to fluctuations in exchange rates is considered to be as a result of growing eminence of reliance on international oriented trade. This has created a

platform to transact in various currencies globally and in diverse locations which impacts the profitability of the firm. Producers who are not insured against foreign exchange risk will transfer the extra cost of such exposure to consumers of their produce hence increasing the cost of inputs which impacts profitability to a large extent (Caroline, 2014).

### **2.3.2 Interest Rates**

Higher interest rates results into high discounting rates which would decrease the present value of expected operational cash flows consequently reducing the appealing power of investment and shrinking the rate of stock returns(Rahman, et al. 2009). This assertion is further affirmed by Dubravka and Petra (2010) who established that a rise in interest rates led to a decline in equity prices in the Croatian stock market.

Interest rates could also cause portfolio substitution, where an upsurge in the interest rate escalates the opportunity cost of owning real cash, which causes the creation of choice between owning stocks and other interest resulting instruments for instance bonds (Rahman, 2009). As far as money supply is concerned, Mukherjee and Naka (1995) argued that if a rise in cash supply leads to economic improvement, the advantage emanating from adoption of an expansionary monetary policy would boost equity prices. This is so since increase in money available leads to increased market liquidity at a lesser interest rate, which can spill over into the stock market.

Investors are interested in investing in a market devoid of imperfections. In a perfect market fewer people have the capacity to create super normal profit. During such cases, if the rate of interest paid by banks to depositors rises, people would shift their money from

the stock market to the banks so as to benefit from interest income on deposits. This will result into a decline in the demand of stocks leading to depression in share prices for affected counters and vice versa.

On the contrary, when amount of interest paid by banks on deposits increases, the lending interest rate also escalates leading to a decline in investments in the stock, theoretically there is inverse association between share price and interest rate levels (Mahmudul & Uddin, 2009).

### **2.3.3 Inflation**

Inflation is a representation of the general increase in the cost of living via the consumer price index (CPI) at a given point in time. This variable is critical as it determines the purchasing power of money and the cash available for other uses like investment, saving etc. hence considered by investors. Asprem (1989) through research on macroeconomic variables, asset portfolios and stock prices in ten European Countries inferred that inflation was positively linked to stock return but the stocks provided a margin of safety against inflation impacts. This is founded on Fisher (1930) assertion that stock markets are autonomous of inflation outlook because shares are a claim against actual belongings of the company.

This generalized Fisher hypothesis was challenged by Fama (1981) on the basis that a rise in inflation results in ambiguity and shrinks future economic activity, which contracts the stock price. Inflation can take the form of demand pull oriented inflation or cost push oriented inflation type. Demand pull oriented inflation is results when we have

progressive increase in total demand hence the firms react by raising consumer prices and partially by increasing levels of output to meet such market demand. Cost push inflation is associated by progressive increase in the input costs incurred by firms.

Firms react by raising prices and shifting the high input costs on to the consumer and partially cutting back on production levels (Sloman & Kevin, 1997). Hensdry (2006) concluded that inflation is the result of many surplus demands and supplies in the economy. Inflation therefore impacts on the level of available cash for saving, consumption and investment as it creates opportunities for holding cash in order to achieve the highest benefit of holding cash in an economy experiencing run-away inflation.

## **2.4 Empirical Review**

This section of literature review covered an analysis of empirical studies done by other researchers and scholars in this study area. This section focused both on local and international study findings and conclusions as well as a criticism of the same.

### **2.4.1 International Studies**

Ihsan et al. (2014) examined the causal association between exchange rates and the Pakistan's Karachi Stock Exchange (KSE) 100 Index. They used secondary of the daily data from September, 2012 to May, 2014 .They utilised the Jarque-Beta test to check normality of both the variables before regression. The exchange rate movement considered the nominal exchange rate between Pakistani Rupee (Rs.) to one unit of the US Dollar (\$). The results indicated that there was no long-standing relationship between

the variables which implied that past data of either variable could not be used to predict one another.

The Granger test of causality was applied to check the nature of causality between the two variables. The study results revealed that exchange rate dynamism did not Granger cause the Pakistan's KSE 100 Index and vice versa therefore concluded no causal affiliation between exchange rates and Pakistan's KSE 100 Index existed. This research finding contradicted the exchange rate theories of stock oriented model and the portfolio balance approach theory arousing the need to carry out further research on these variables to confirm this conclusion.

Noel et al. (2009) examined the relationship between Australian stock prices and Australian dollar exchange rates. Their scope was broad and included an investigation on the variations in key economic variables and the interactions that existed between those variable deviations through the Granger-Sim causality test. Their data covered a period starting from 2nd January, 2003 to 30th June 2006. From their research study findings it was determined that uni-directional causal relationship existed between the variables, with stock price shifts found to Granger cause fluctuations in the Australian dollar exchange rate. This finding authenticates a proposition consistent with the portfolio balance approach model but this can be further researched to affirm this revelation and conclusion.

Neda (2011) examined whether Armenia and Iran stock market indices and exchange rates were interrelated to each other for the period starting June 2006- March 2011 and April 2002-March 2011 respectively. The variables used in the study included the Iran's



Tehran stock index, Armenia's NASDAQ OMX and exchange rate of both countries against the US dollar. The study utilised monthly data of the US Dollar monthly average price, Tehran stock index as Iran Stock market performance indicator and the NASDAQ OMX as the indicator of Armenia's level of securities market. To study the association between stock indices and exchange rates they utilised the typical Granger causality tests. In addition they analysed the data stationarity using unit root tests on the time series. The Augmented Dickey-Fuller (ADF) unit root test was utilised to carry out this stationarity test. The results of this study showed that no Granger Casualty existed between the Armenia and Iran stock indices and the market exchange rate for each of the countries against the US Dollar. This finding may be an indicator that other variables might be a play to create an impact on interaction of stock values and exchange rates hence need for further research on these variables to find out their nature and degree of association.

Saadet (2003) empirically investigated the association between the Turkey stock market equity prices and exchange rates using high-frequency data of exchange rates. The data sample consisted of daily exchange rates secondary data obtained from the Central Bank and the closing stock prices of four combined indices: National 100, Financial Sector Index, Production Sector Index, and Service Sector Index. The data utilised ranged the period from 1990 to 2002 with the exchange rate expressed in terms of the U.S. dollar and local currency. Using the Augmented Dickey-Fuller (ADF) test the data was tested for stationarity before regression analysis was carried out.

After analysis it was concluded that there was an evidence of a long-term bond between the Turkey stock market indices and exchange rates with the causality emanating from

exchange rates to industry stock market sector. This study further validated conclusions by the balance portfolio approach that movements in exchange rates cause a shift in stock market performance and presents a platform to test the same variables locally to confirm the assertions and why this association is stronger in the long-run other than the short term.

Rakesh et al, (2016) examined the relationship the impact of currency fluctuations on Indian Stock Market considering the US dollar (USD), POUNDS ,EURO and currency fluctuation against Indian rupee as independent variables and national stock exchange index (NIFTY) as a dependent variable. The study period covered of five years from 2011 to 2015 and utilised multiple regression analysis technique for data scrutiny. The study outcomes revealed that there were some variations observed in the Indian stock market index (NIFTY) with select currency fluctuation. The Dollar movements to the Indian rupee were the most significant than Euro and Pound. The nature of causality was not analysed in this study hence creating a need to investigate this parameter using the same three currencies and in a local context.

#### **2.4.2 Local Studies**

Omondi (2016) investigated the effect of exchange rate movement (shilling dollar parity) on the NSE Market performance based on changes in the NSE All and 20 Share Indices. The study used a descriptive design as well as a longitudinal design to achieve its objectives. The data used for the study consisted of monthly data observations from December 2010 to August 2016 for both index movement and FOREX volatility. Regression and correlation analysis was carried out to arrive at a conclusion that the from

both the Pearson's partial correlation and regression analyses it exposed weak and negative associations between the Nairobi Securities Exchange Market Performance as measured by both the 20 Share Indices, NSE All and exchange rate movements. This research study seeks to take a regional approach of analysing the UGHS, TSHS and RWF exchange rates against the KES. In addition, this study will utilise more current data to analyse the relationship between exchange rates and NSE performance status.

Mongeri (2011) examined the impact of changes in market exchange rates and CBK's foreign exchange reserves on the NSE performance. The methodology of study was a longitudinal research design. Secondary monthly data of the NSE share index, foreign exchange rates and foreign exchange reserves covering the period 2003-2010 were utilised during the study. Analysis was carried out using multiple regression analysis techniques to determine the nature of the relationship under study. The study findings pointed out that the NSE performance was impacted by foreign exchange rates and foreign exchange reserves. The foreign exchange rates had an adverse effect on the Kenyan stock market performance which was more substantial. Foreign exchange reserves had a favourable bearing on NSE performance which was significant too. The study further revealed that no major relationship existed between foreign exchange rates and the CBK's foreign exchange reserves. The research also revealed low NSE efficiency despite an increased flow of information in the capital market. This research study findings seem to support both the flow oriented model and the balance portfolio model of exchange rates but can be investigated further to ascertain this finding.

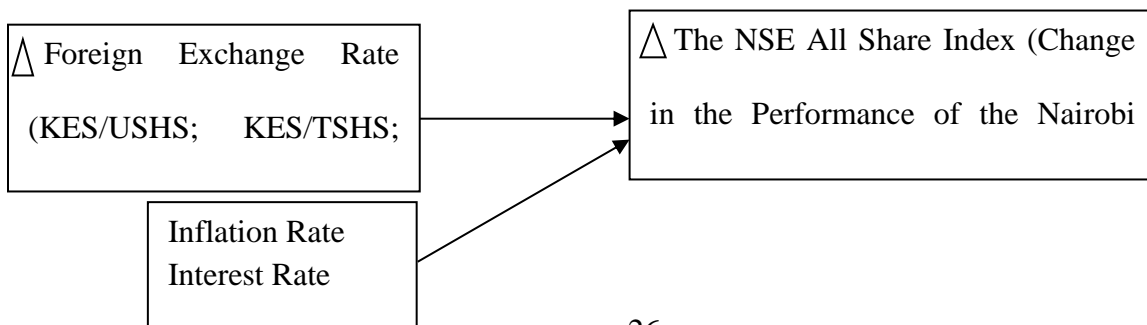
Mwanza (2014) investigated the influence of foreign exchange rates on the Kenya's NSE performance from January 2011 to December 2013. The study utilised secondary data from the NSE and dollar changes from the Central Bank of Kenya statistics. The study used a multiple regression model of NSE 20share index dependent on three variables; foreign exchange rate, inflation and interest rate. The regression results indicated that foreign exchange rates, inflation and interest rates explained 72.9% of the changes in stock prices. Foreign exchange rate had significant relationship with the stock performance.

Sifunjo and Mwasaru (2012) studied the link between foreign exchange rates and equity prices in Kenya. The study utilised secondary data type composed of monthly NSE share price index and the Kenya shilling against the US dollar exchange rates for a period between November 1993 and May 1999. They carried out stationarity and integration tests between equity prices and exchange rates using VECM causality test. The research study's stationarity and integration tests revealed that both in first differences and equal forms foreign exchange rates and stock prices were nonstationary, and there was an order one integration between the two variables. The study further inferred that foreign stock prices are Granger caused by exchange rates in Kenya. There was single directional causality to stock prices emanating from exchange rates with exchange rate changes resulting in a significant bearing on the equity price. This study affirmed the flow oriented model, which can be examined again to ascertain whether the findings are still the same in the current times.

Nyaga (2014) studied the impact of exchange rate exposure of foreign currency on share prices in services and commercial segment of NSE listed firms. The study employed an event study methodology by scrutinizing the reaction of the stock price around the event (exchange rate fluctuation). An annual aggregated data was adopted to approximate equity's sensitivity to exchange rate of the particular segment of NSE covering a period January 2009 to December 2013. The NSE services and commercial segment listed firm's stock returns were regressed on foreign exchange rate fluctuation, interest rate, inflation and market return. The variables degree of relationship was tested using the Pearson product moment correlation. The study findings revealed the presence of an adverse association between the listed share values and exchange rate shifts. These findings can be researched further to find out the how long such a relationship existed and the impact in order of strength for the other economic variables.

## 2.5 Conceptual Framework

This study's conceptual framework involved the following variables: foreign exchange rate movements between the KES/USHS, KES/TSHS, KES/RWF and NSE performance represented by the change in the NSE All Share Index.



## **Figure 2.1: The Conceptual Framework**

### **2.6 Chapter Summary**

From the international empirical evidence there existed a myriad of conclusions on the nature of the interaction between currency exchange rate oscillations and the equity market performance. Ihsan et al. (2014) arrived at a conclusion that there existed no causal link between exchange rates and the Pakistan stock market contradicting all the existing theories. This was further affirmed by Neda (2011) research which revealed Armenia and Iran stock markets did not respond to changes in exchange rates.

This could be an indication of other factors at play that could be responsible for changes in the equities market performance status. In addition, other international researchers identified the presence of a connection between these two variables; Noel et al. (2009) revealed the same in the Australian stock market, Saadet (2003) and Rakesh et al. (2016) identified the same relationship in the Turkey and Indian stock market respectively. Locally Omondi (2016), Mongeri (2011), Mwanza (2014), Sifunjo and Mwasaru (2012) and Nyaga (2014) all revealed the existence of a relationship leaning towards the flow oriented model that exchange rates cause changes in the performance of the NSE. This research study delved into the nature and degree of link between the exchange rates and the NSE performance to get congruence on this subject.

## **CHAPTER THREE: RESEARCH METHODOLOGY**

### **3.1 Introduction**

This chapter breaks down the blue print and framework adopted for this research study so as to achieve the study objective mentioned in the first chapter. This section describes the type of research design, population of study, techniques of data collection, sampling design technique, Sample Size and data analysis method employed in this study.

### **3.2 Research Design**

This research utilised the descriptive and longitudinal research design to arrive at the study conclusions. This method facilitated the examination of the relationship between the variables and allowed for analysis of changes over a time through longitudinal approach. The variables used in this study were foreign exchange rates (KES/USHS/TSHS/RWF) and the NSE All Share Index.

### **3.3 Data Collection**

The research study employed secondary data sourced from the Central Bank of Kenya (CBK) exchange rates and the Nairobi Securities Exchange statistics. The data under study covered the period beginning March 2008 to August 2017. March 2008 was selected as the starting point since the NSE All Share Index (NASI) was first implemented on 25th February, 2008 hence March 2008 become the only first full NASI indexed month. Exchange rate changes were based on the monthly average closing exchange rate as per the Central Bank of Kenya publications. The monthly data guaranteed a significant amount of observations to support the conclusions thereof.

### 3.4 Data Analysis

This study utilised the Correlation and Regression analysis methods for data analysis. The Regression analysis facilitated examination of the nature of the relationship between the dependant and autonomous variables. The Correlation analysis identified the nature of movement between these two variables to help determine causality.

The research adopted the following regression model to analyse the data collected:

$$Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \beta_5X_5 + \epsilon$$

Where: Y = represents dependent variable; NSE All Share Index (NASI). Change in NASI will be represented as a percentage. The changes in NASI will be a representation of the NSE performance exposed to various economic variables including exchange rates.

X1, X2 & X3 = represents the exchange rate movement in: KES/USHS, KES/TSHS and KES/RWF respectively as obtained from the Central Bank of Kenya publications expressed as a percentage for each month of the year for the study period considered.

X4 = represents the first control variable; interest rate as published by the CBK in the form of the average interest rate for the month (CBR).

X5 = represents inflation rate which is a second control variable in this study. This is given by the monthly inflation rate reported for the study period as published by the KNBS reports indicating changes in the general increase in the price of commodities.

$\beta_0$  = this is the constant term (regression constant)



$\beta_1, \beta_2$  &  $\beta_3$  = represents the NSE stock index sensitivity to foreign exchange rate fluctuations (regression coefficient)

$\beta_4$  &  $\beta_5$  = represents NSE stock index sensitivity to the change in interest rate and inflation rate respectively (interest rate coefficient and inflation rate coefficient).

$\epsilon_t$  = denotes the error term with a constant variance and an expected value of zero.

The study carried out a T-test at 95% confidence level to establish the significance of the foreign exchange rate fluctuations in explaining the changes in the security exchange market index.

## CHAPTER FOUR: DATA ANALYSIS, RESULTS AND DISCUSSION

### 4.1 Introduction

This chapter covers a comprehensive analysis of the data under study and a results analysis section. The data under study covered eight years and five months for the period beginning March 2008 to August 2017. March 2008 is selected as the starting point since the NSE All Share Index (NASI) as a method of measuring market performance was first implemented on 25th February, 2008 hence March 2008 was the only first full NASI indexed month. Exchange rate changes and the monthly Central Bank of Kenya rates were based on the monthly average closing exchange rate and CBK Rates as per the Central Bank of Kenya publications. Inflation rates were gotten from the Kenya National Bureau of Statistics monthly publications.

### 4.2 Correlation Analysis

**Table 4.1: Correlation Analysis**

	% Change( NASI)	% Change( KES / USHS)	% Change (KES / TSHS)	% Change( KES/ RWF )	% Change (CBK RATE)	% Change INFLATION RATE)
% Change( NASI)	1					
% Change (KES / USHS)	-0.03	1				
% Change( KES / TSHS)	-0.02	0.28	1			
% Change( KES / RWF)	0.22	0.31	0.42	1		
% Change (CBK RATE)	-0.11	-0.03	0.20	0.17	1	
% Change ( INFLATION RATE)	-0.13	-0.12	0.01	0.00	0.15	1

Source (Research data, 2017)

In this section the study analyzed the nature and strength of correlation among the study variables to reveal the association status. The rule of thumb on multicollinearity is that if the correlation coefficient is higher than 0.7 for any two independent variables then a problem of multicollinearity is said to be eminent and existing. Therefore either of the variables should be dropped while performing regression analysis (Mwangi, 2016).

From the correlation matrix above exchange rate changes of KES/USHS and KES/TSHS is negatively correlated to the change in NASI. Negative correlation against NASI is also revealed by the change in monthly CBK rate and monthly inflation rate with correlation coefficients of -0.11 and -0.13 respectively. The only variable positively correlated to change in NASI was exchange rate changes of KES/RWF.

Change in KES/TSHS and KES/RWF is positively correlated to change in USHS while CBK rate and Inflation rate are negatively correlated to change in KES/USHS exchange rate. The monthly change in inflation rate is positively correlated with the monthly change in CBK rate. From the correlation analysis there was no problem of multicollinearity between any variable.

### **4.3 Regression Analysis**

This research study utilised multiple regression analysis to establish the relationship between fluctuations in exchange rates of the East African region currencies and the performance of the Nairobi Securities Exchange. This analysis was made possible by the use of excel data analysis tool.

**Table 4.2: Regression Output Summary**

<b>Regression Statistics</b>	
Multiple R	0.329
R Square	0.108
Adjusted R Square	0.067
Standard Error	0.057
Observations	113

Source (Research data, 2017)

R is a representation of the correlation coefficient as a proxy for indicating the nature of relationship existing between the study variables. From the results above there existed a positive but weak correlation of 0.329. Given that this study utilised multiple regression adjusted R square is more relevant than R square which is used during single regression technique. The adjusted R square is the coefficient of determination which represents the level of variance in the dependent variable that can be explained by the changes in the independent variables. The variables under examination in this study had a coefficient of determination of 0.0667 meaning 6.67% of changes in the performance of the NSE is caused by the changes in the fluctuations in the KES/USHS, KES/TSHS and KES/RWF. This is after incorporation of the control variables into the regression model. With such a small percentage of influence caused to the performance of the NSE due to the fluctuations the EA currencies exchange rate against the KES means the performance of the NSE is affected by other factors other than the variables examined and tested in this study.

#### 4.4 Descriptive Statistics

The study analyzed the descriptive statistics with respect to the study variables over the study period of eight years five months. The median, mean, standard deviation, sample variance, skewness, kurtosis, maximum and minimum values of the percentage changes in variables were determined and presented in the table:

**Table 4.3: Descriptive Statistics**

	%Change (NASI)	%Change (KES / USHS)	%Change (KES / TSHS)	%Change (KES / RWF)	% Change (Monthly CBK Rate)	% Change (Monthly Inflation Rate)
Mean	0.64%	0.28%	0.14%	-0.03%	0.47%	0.48%
Median	1.51%	0.31%	-0.04%	0.03%	0.00%	-0.22%
Standard Deviation	5.85%	3.08%	2.20%	2.65%	9.62%	13.30%
Sample Variance	0.34%	0.10%	0.05%	0.07%	0.93%	1.77%
Kurtosis	297.96%	178.12%	938.81%	429.93%	3984.94%	27.72%
Skewness	-85.71%	14.87%	123.16%	61.87%	548.98%	31.83%
Minimum	-21.55%	-8.86%	-6.10%	-7.78%	-21.21%	-31.18%
Maximum	18.76%	10.09%	12.54%	11.11%	76.00%	40.68%

Source (Research data, 2017)

The descriptive statistics revealed that the NASI fluctuations had a mean of 0.64%, a median of 1.51%, a standard deviation of 5.85% with a positive kurtosis and negative skewness. Over the same period NASI performance fluctuations registered a minimum decline of -21.55% and a maximum increase of 18.76%.

The KES/USHS, KES/TSHS, KES/RWF exchange rate fluctuations had a mean of 0.28%, 0.14% and -0.03% respectively. All the three variables had a positive kurtosis and skewness. Of the three East African currencies Ugandan Shilling had the highest depreciation of -8.86% versus the Kenya shilling while the Tanzania Shilling had the highest appreciation of 12.54% followed by the Rwandese Frank at 11.11%. The movements of the CBK Rate oscillated at a mean of 0.47% with a minimum decline being 21.21% and the highest increase being 76%. The fluctuations in the monthly inflation rate had mean of 0.48% with a standard deviation of 13.3%. Both control variables had positive kurtosis and skewness.

#### **4.5 Statistical Significance of the Model**

The significance of this model was tested using the Analysis of Variance (ANOVA) report of the regression analysis. The statistical significance of the model is shown in by the ANOVA summary as in Table 4.4.

**Table 4.4: Analysis of Variance**

ANOVA					
	df	SS	MS	F	Significance F
Regression	5	0.042	0.008	2.600	0.029
Residual	107	0.342	0.003		
Total	112	0.384			

Source (Research data, 2017)

The results in the table above indicated that the model significance level was 0.0416 which is an indication that the model can be relied to make conclusions on the populations since the significance level value is less than 5%. This qualified the model as a basis for examining the relation between foreign exchange rates fluctuation against the KES and its implications on the NSE performance.

## 4.6 Estimated Model Coefficients

The regression report revealed the following model coefficients.

**Table 4.5: Estimated Model Coefficients**

	Coeffi cients	Standard Error	t Stat	P- value	Lower 95%	Upper 95%	Lower 95.0%
Intercept	0.008	0.005	1.53	0.127	-0.002	0.019	-0.002
%Change( KES / USHS)	-0.242	0.187	1.29	0.198	-0.614	0.129	-0.614
%Change( KES / TSHS)	-0.228	0.275	0.83	0.408	-0.773	0.316	-0.773
%Change( KES / RWF)	0.706	0.229	3.08	0.003	0.251	1.160	0.251
%Change ( CBK RATE)	-0.081	0.058	1.39	0.165	-0.196	0.034	-0.196
% Change ( INFLATION RATE)	-0.056	0.041	1.36	0.175	-0.137	0.025	-0.137

Source (Research data, 2017)

From the above analysis the equation for the regression model is as follows:

$$\Delta \text{NASI} = 0.008 - 0.242(\Delta \text{KES /USHS}) - 0.228(\Delta \text{KES/TSHS}) + 0.706(\Delta \text{KES/RWF}) - 0.081(\Delta \text{CBK Rate}) - 0.056(\Delta \text{Inflation Rate}) + \epsilon t$$

This can be represented well in the below simplified model:

$$Y = 0.08 - 0.242X_1 - 0.228X_2 + 0.706X_3 - 0.081X_4 - 0.056X_5 + \epsilon t$$



If all the variables were held at a zero constant the change in the NSE performance would be 0.08. The model reveals that the NSE performance is positively correlated with one single variable KES/RWF while negatively correlated to all the remaining four study variables. This negative association is also evident among the two control variables; the CBK rate and inflation rate changes. One unit negative in KES/USHS & KES/TSHS and one unit positive in KES/RWF exchange rate would result into a decrease of 24.2%, 22.8% and an increase of 70.6% in the NASI performance respectively. One unit decrease in inflation rate and CBK rate would result into 8.1% and 5.6% decreases to the NASI respectively.

#### **4.7 Discussion of Research Findings**

From the above regression analysis it was identified that there existed a weak negative correlation between KES/USHS, KES/TSHS, CBK rate and inflation rate fluctuations and the change in the NSE performance (NASI) but these could not outweigh the KES/RWF positive correlation with the NSE performance (NASI). This was summed by a 0.329 positive correlation coefficient only influencing 6.67% of the changes in NASI hence it can be concluded that exchange rate fluctuations of the EA region currencies influenced performance of the NSE positively or negatively depending on which currency was at play.

When all the three currencies are at play at the same time the NSE performance will be influenced positively but in a very small magnitude of 6.67% change. From the correlation matrix above exchange rate changes of KES/USHS and KES/TSHS is negatively correlated to the change in NASI. Negative correlation against NASI is also

revealed by the change in monthly CBK rate and monthly inflation rate with correlation coefficients of -0.11 and -0.13 respectively.

The only variable positively correlated to change in NASI was exchange rate changes of KES/RWF. With all these variable fluctuations at play they only influence 6.67% change in NASI meaning there exists other factors responsible for influencing the performance level of the Kenya's stock market. It will be beneficial to research this further in the future to establish the significant influencers in such a case.

The establishment of the existence of a link between the exchange rate fluctuations of the EA region currencies and the performance of the NSE contradicts previous studies like Ihsan et al. (2014) who had arrived at a conclusion that there existed no causal relationship between exchange rates and the Pakistan stock market and further Neda (2011) research which revealed Armenia and Iran stock markets did not respond to changes in exchange rates. From contradiction resulting with these two research studies done in Pakistan and Armenia, it may show that the stock market and forex markets in the countries studied are different from the Kenyan stock market and East African forex market hence the conflicting outcome.

However, other international researchers identified the existence of a relationship between changes in exchange rates and stock market performance confirming the findings of this study; Noel et al. (2009) revealed the same in the Australian stock market, Saadet (2003) and Rakesh et al. (2016) identified the same relationship in the Turkey and Indian stock market respectively. Locally Omondi (2016), Mongeri (2011), Mwanza (2014), Sifunjo and Mwasaru (2012) and Nyaga (2014) all revealed the

existence of a relationship leaning towards the flow oriented model where the exchange rates cause changes in the activity levels of the stock market which affirms the finding of this current study.

Being the first time a research has been undertaken between the changes in the NSE performance and the East African region currencies i.e. USHS, TSHS and RWF the findings of this study do not replicate the mentioned local findings since they were based on different foreign currency ; the US dollar. The interest rate and inflation changes had minimal impact in the changes of the dependent variable (NASI) of 5.6% and 8.1% respectively. These two variables controlled the relationship under examination to end up with changes in KES/USHS, KES/TSHS and KES/RWF influencing the performance of Kenya's stock market at -24%, -23% and 70% respectively.

The Ugandan shilling and Tanzania shilling forex changes negatively impact the NSE performance while the RWF forex changes positively impact the NSE performance. Policy makers, investors and foreign companies located in these countries need to carefully monitor these exchange rate fluctuations and align their portfolios and operations accordingly. It will also mean Kenya needs to consider the market operations of the KES versus the USHS and TSHS so as to turn this negative impact on NSE performance into a favourable form.

# CHAPTER FIVE: SUMMARY, RECOMMENDATIONS AND CONCLUSION

## 5.1 Introduction

This chapter recaps the results, research study conclusions, study limitations, policy recommendations and suggestions for further future research in this study area.

## 5.2 Summary of Findings

This research study sought to investigate the consequence of exchange rate fluctuations of East African region currencies on the activity level of the Nairobi Securities Exchange using descriptive and longitudinal research methodology. The study utilised secondary data which was examined and analysed using descriptive statistics and multiple regression model analysis to establish the relationship.

The descriptive statistics revealed that the NASI fluctuations had a mean of 0.64%, a median of 1.51%, a standard deviation of 5.85% with a positive kurtosis and negative skewness. The KES/USHS, KES/TSHS, KES/RWF exchange rate fluctuations had a mean of 0.28%, 0.14% and -0.03% respectively. All the three variables had a positive kurtosis and skewness. Of the three East African currencies Ugandan Shilling had the highest depreciation of -8.86% versus the Kenya shilling while the Tanzania Shilling had the highest appreciation of 12.54% followed by the Rwandese Frank at 11.11%. The movements of the CBK Rate oscillated at a mean of 0.47% and the fluctuations in the monthly inflation rate had mean of 0.48% with a standard deviation of 13.3%. Both control variables had positive kurtosis and skewness.

The model significance level was 0.0416 which is an indication that the model can be relied to make conclusions on the populations since the significance level value is less than 5%. This qualified the model to be used as a basis for examining the relation between foreign exchange rates fluctuation against the KES and its implications on the NSE performance.

The regression analysis revealed a positive but weak correlation coefficient indicating the nature of relationship existing between the study variables of 0.329. The adjusted R square which represented the coefficient of determination stood at 0.0667 meaning 6.67% of changes in the performance of the NSE is caused by the changes in the fluctuations in the KES/USHS, KES/TSHS and KES/RWF. This also meant with such a small percentage of influence caused to the performance of the NSE by the fluctuations the EA region currencies, the performance of the NSE is affected by other factors other than the variables examined and tested in this study.

### **5.3 Conclusion**

The study findings revealed that there was a negative connection between exchange rate movements of KES/USHS and KES/TSHS and a positive relationship of KES/RWF with the change in the NSE performance. The study also identified a negative relationship between changes in CBK rates and inflation rates to changes in the NSE performance.

After the study findings it can be recognized that there exist a weak negative relationship between NSE performance and foreign exchange changes of KES/USHS, KES/TSHS, inflation rate and CBK. The coefficient of determination revealed a 6.67% change in

NASI being determined from changes in exchange rates of KES/USHS, KES/TSHS and KES/RWF. This further shows that there are other factors which affect NSE performance other than exchange rate fluctuations of East Africa region currencies. These other factors may include type of investors, technology innovation level, economic growth, taxation laws, government regulations and securities market development status. These factors can be considered during future research in this study area.

The negative impact of the Ugandan shilling and Tanzanian shilling exchange rates fluctuations on the NSE performance could mean these two countries could have a significant cross listing and spill over impact on the Kenyan stock market performance. There is need to investigate further why this so to come up with strategic measures to reduce such negative impact. A depreciation of these two currencies escalates this negative impacts hence need to manage such eventualities by the stakeholders concerned. The positive impact of the RWF exchange rate changes on the NSE performance means there is need for market players to take advantage of such and grow Kenya's financial relationship with Rwanda to leverage on such positive effect. This can be through more cross listing and trade. Investors can increase their holding in stocks whose currency risk on stock market performance is positive like the Rwandese Frank as revealed by this research finding.

#### **5.4 Policy Recommendations**

The study findings revealed that there exists a negative association between exchange rate movements of KES/USHS and KES/TSHS and a positive relationship of KES/RWF to the change in the NSE performance. The study also identified a negative relationship

between changes in CBK rates and inflation rates to changes in the NSE performance. This therefore requires policy makers involved in the formulation of policies meant to promote East Africa region integration to consider the effects of the regional currencies on the performance of securities markets of the member states as they look forward to coming up with exchange rate arrangements as a platform of transition to the East African Monetary Union.

This study also helps policy makers involved in promotion of economic growth in the East Africa region to focus on other factors affecting performance of stock markets other than exchange rate fluctuations as a means to grow the financial markets which are intermediaries for the equities markets.

From the outcomes of this study it is suggested that governments look for ways to manage currency risk to reduce the spill over impact of such risk. This can be through establishment and growth of derivatives markets, proper management of the capital and current accounts with other states so as to reduce oscillations of exchange rates resulting into adverse effects resulting from currency depreciation.

## **5.5 Limitations of the Study**

The study relied on secondary data from Central Bank of Kenya and Kenya National Bureau of Statistics which was in an incompatible format for easy of manipulation hence more time was consumed formatting this data before analysis. This required more time for editing to allow for further analysis of the data which consumed more time but this did not affect the quality of the research results.

From the coefficient of determination ( $R^2$ ) the research variables could only explain 6.67% of the change in the NSE performance, meaning this research study did not capture other important factors which may have significant influence on the activity level of the stock market. This will require further research to identify and scrutinise the impact such factors on the equity market.

The research findings were based on regression analysis which revealed a weak positive correlation coefficient of 0.329. This research did not further investigate why the association between the variables was so; hence there is a need to further investigate the reasons for such association so as to clearly define the causality and increase the acceptability of the research conclusions thereof.

## **5.6 Suggestions for Further Research**

The research took a regional focus by considering the East African region currencies i.e. Ugandan shilling, Tanzania shilling and Rwandan shilling versus the Kenya shilling to find out the impact of exchange rate fluctuations on the Kenya's stock market activity level hence further research is needed for other African and global currencies that exchange with the Kenya shilling. This would create diverse findings for consideration by various stakeholders in the financial market like investors who would know which currencies to reduce their exposure to and which ones to increase their holding as the currency risk impact on the stock market dictates.



From the study findings, the East African currencies exchange rate fluctuations explained a very small portion of 6.67% of the changes in the NSE performance, hence there is need to consider research on other factors like type of investors, technology innovation level, economic growth, taxation laws, government regulations and securities market development status. These factors may have be able to explain the large portion of what affects the performance of the NSE apart form exchange rate changes. This will be relevant to increase knowledge on stock market operations to benefit various stakeholders like the securities market regulator on which factors to focus on.

This research revealed that different currency exchange rates impact the stock market differently. Further research is needed as to why the Uganda and Tanzania shilling exchange rate changes with the Kenya shilling negatively impact the NSE performance while the RWF exchange rate changes with the Kenya shilling positively impact the NSE performance. This investigation of the reasons for such association will inform the decisions various parties need to undertake with regard to their investment portfolios and business operations to reduce the currency risk exposure.

## REFERENCES

- Aggarwal, R. (1981). Exchange Rates and Stock Prices: A Study of the U.S. Capital Markets under Floating Exchange Rates. *Akron Business and Economic Review*, 7-12.
- Anand, S., & Manley, J. (1997). *Analysis of the Currency Impact on International Investment*. Iona: Iona College.
- Asprem, M. (1989). Stock Prices, Asset Portfolios and Macroeconomic Variables in Ten European Countries. *Journal of Banking and Finance*, 589-612.
- Aydemir, O., & Demirhan, E. (2009). The Relationship between Stock Prices and Exchange Rates, Evidence from Turkey. *International Research Journal of Finance and Economics*, 5-23.
- Branson, W., Halttunen, H., & Masson, P. (1977). Exchange Rate in the Short Run: the Dollar Deutsche Mark Rate. *European Economic Review*, 10, 303-324.
- Caroline, M. (2014). *Effect of Exchange Rates on the Performance of Nairobi Securities Exchange*. University of Nairobi: Unpublished MBA Project.
- Cassel, G. (1918). Abnormal Deviations in International Exchanges. *The Economic Journal*, 28, 413-415.

CBK. (2017, August 20). *Rates and Statistics*. Retrieved from Central Bank of Kenya:  
<https://www.centralbank.go.ke>

Cheruiyot, C. (2012). *The relationship between the stock market performance and economic performance*. University of Nairobi: Unpublished MBA project.

Clare, A., Motson, N., & Thomas, S. ((2013)). *An Evaluation of Alternative Equity Indices: Heuristic and Optimised Weighting Schemes*. London: Cass Consulting.

Claudia, S. (2014). *Information Frictions and the Law of One Price: When the States and the Kingdom became United*. London: World Trade Organization.

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

Dornbusch, R., & Fischer, S. (2013). *Macroeconomics*. New York: McGraw-Hill.

Dubravka, B., & Petra, P. (2010). *Do Macroeconomic Factors Matter for Stock Returns? Evidence from Estimating a Multifactor Model on the Croatian Market*. Zagreb: University of Zagreb.

Fama, E. F. (1981). Stock returns, Real Activity, Inflation and Money. *American Economic Review*, 71(4) , 545-565.

Faure, A. P. (2013). *Foreign Exchange Market: An Introduction*. London: Quoin Institute (Pty) Limited.

Fisher, I. (1930). *The Theory of Interest*. New York: Macmillan.

- Gavin, M. (1989). The Stock Market and Exchange Rate Dynamics. *Journal of International Money and Finance* 8, 181-200.
- Hendry, D. (2006). *Modelling UK Inflation*. London(UK): Economics Department, Oxford University.
- Ihsan, A., Bakhsh, Q. B., & Shahid, J. K. (2014). Relationship between Exchange Rates and Stock Market Index: Evidence from the Pakistani Stock Market. *Abasyn Journal of Social Sciences*, 20-30.
- Joseph, C. O. (2011). *An Empirical Analysis of the Relationship between Exchange rate and Stock prices in Nigeria*. University of Nigeria, Nsukka: Unpublised MBA Project .
- Kim, K. (2003). Dollar Exchange Rate and Stock Price: Evidence from Multivariate Cointegration and Error Correction Model. *Review of Financial Economics*,12, 301-313.
- Kolawole, S., & Olalekan, M. S. (2007). *Exchange Rate Volatility and the Stock Market: The Nigerian Experience*. Maleta, Nigeria: Kwara State University.
- Kurihara, Y. (2006). The Relationship between Exchange Rate and Stock Prices during the Quantitative Easing Policy in Japan. *International Journal of Business*,11(4), 375- 386.
- Lawrence, S. R., William, L. S., & Gregory, F. U. (2009). *Principles of Banking, Money and Financial Markets*. Newyork: Pearson Addison-Wesley.

- Lim, S., & Sek, S. (2014). *Exploring the inter-relationship between the volatilities of exchange rate and stock return*. Washington: Procedia Econom. Financ.
- Mahmudul, A., & Uddin, G. S. (2009). Relationship between Interest Rate and Stock Price: Empirical Evidence from Developed and Developing Countries. *International Journal of Business and Management Vol.4(3)*, 2-9.
- Mongeri, O. (2011). *The impact of foreign exchange rates and foreign exchange reserves on the performance of Nairobi Stock Exchange share index*. University of Nairobi: Unpublished MBA Project.
- 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*, XVIII(2 ), 223-237.
- Mwangi, E. (2016). *Relationship Between Capital Structure And Profitability Of Construction And Allied Firms Listed At The Nairobi Securities Exchange*. Nairobi: Unpublished MBA Project(University of Nairobi).
- Neda, B. (2011). *The Relationship between Stock Prices and Exchnage Rates :Evidence of Iran and Armenia*. Yeravan: Yeravan state university.
- Noel, D. R., John, S., & Evans, J. (2009). The Interaction between Exchange Rates and Stock Prices: An Australian Context. *Internations Journal of Economics and Finance*, 9-21.
- NSE. (2017, August 20th). *NSE*. Retrieved from NSE: <https://www.nse.co.ke>

- Nyaga, E. (2014). *The Effects of Operating Foreign Exchange Exposure on Share Prices in Commercial and Services Firms at the Nairobi Securities Exchange*. Nairobi: University of Nairobi Unpublished MBA Project.
- Nyambura, B. (2014). *To establish the relationship between exchange rate fluctuations and stock prices in Rwanda*. Nairobi: Unpublished MBA Project.
- Nyamute, M. (1998). *The relationship of the Nairobi Stock Exchange index of major economic variables, inflation rate, money treasury bills rate and exchange”*,. University of Nairobi Unpublished MBA Project.
- Omondi, J. (2016). *The Effect of Exchange Rate Movement on the Performance of Niarobi*. University of Nairobi: Unpublished MBA Project.
- Rahman, A. A., Sidek, N. Z., & Fauziah, H. T. (2009). Macroeconomic Determinants of Malaysian Stock Market. *African Journal of Business Management*, 3(3), 95-106.
- Rakesh, D., Raju, J., & Basavangowda, K. (2016). An Impact of Currency Fluctuations on Indian Stock Market. *International Journal of Application or Innovation in Engineering & Management*,5(6), 2-6.
- Ramasamy, B., & Yeung, M. C. (2005). The Causality between Stock Returns and Exchange Rates: Revisited. *Australian Economic Papers*.
- Saadet, K. (2003). *The Relationship Between Exchange Rates and Stock Prices: A Causality Analysis*. Celal Bayar University,Turkey.

- Seri, S., Dileep, K. M., Jamil, F., & Saqib, M. (2015). Impact of Exchange Rate on Stock Market. *International Journal of Economics and Financial Issues*, 385-388.
- Sifunjo, K., & Mwasaru, A. (2012). The Causal Relationship between Exchange Rates and Stock Prices in Kenya. *Research Journal of Finance and Accounting*, 3(7), 121-130.
- Sloman, J., & Kevin, H. (1997). Stock Market Returns and Monetary Policy. *Journal of Finance Vol. 52*, 635-654.
- Tatjana, D., & Spire, L. (2011). *Globalization, Trade and Business*. Oxford: Oxford University.
- Tian, G., & Ma, S. (2010). The Relationship between Stock Return and the Foreign. *Journal of the Asian Pacific Economy*, 490-508.
- Wolski, C. (2007). *Factors that Affect Stock Market*. Ottawa: Oberon Press.
- Wu, Y. (2000). Stock Prices and Exchange Rates in a VEC model-the Case of Singapore in the 1990s. *Journal of Economics and Finance* 24(3), 260-274.

## APPENDICES

### Appendix 1: Data Collection Form

Date	MEAN EXCHANGE RATE			NSE All Share Index
	KES / USHS	KES / TSHS	KES / RWF	
Mar-08				
▼				
Aug-17				

### Appendix 2: Complete Data Collection Form

Date	%Change	%Change	%Change	%Change	% Change	% Change
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	(KES / USHS)	(KES / TSHS)	(KES / RWF)	NASI)	(CBK RATE)	( INFLATIO N RATE)
Mar-08	0.0%	0%	-	0%	0%	
Apr-08	0.9%	1.8%	1.1%	7.8%	0.0%	34.3%
May-08	-7.4%	-0.7%	0.2%	1.0%	0.0%	11.1%
Jun-08	0.0%	-5.5%	-4.0%	3.0%	2.9%	-10.2%
Jul-08	-3.4%	-4.8%	-3.6%	-9.2%	0.0%	-8.7%
Aug-08	-1.2%	-2.6%	-1.6%	-4.1%	0.0%	4.2%
Sep-08	0.0%	-5.9%	-6.3%	-10.0%	0.0%	2.1%
Oct-08	-1.4%	2.6%	-7.1%	-21.5%	0.0%	2.3%
Nov-08	7.6%	0.1%	2.4%	3.5%	0.0%	5.2%
Dec-08	-1.0%	2.6%	1.3%	2.9%	-5.6%	-11.9%
Jan-09	-0.5%	-3.1%	-1.0%	-8.5%	0.0%	-13.9%
Feb-09	-0.5%	1.2%	-0.1%	-21.4%	0.0%	9.6%
Mar-09	6.6%	-0.8%	-0.7%	12.6%	-2.9%	-1.2%
Apr-09	6.9%	4.2%	2.2%	-1.1%	0.0%	-16.2%
May-09	0.4%	-0.9%	0.0%	1.5%	-3.0%	-18.3%
Jun-09	-6.2%	1.0%	2.2%	18.8%	0.0%	-0.2%
Jul-09	3.1%	1.5%	0.6%	0.7%	-3.1%	4.8%
Aug-09	-2.0%	-0.1%	0.4%	-5.1%	0.0%	-5.6%
Sep-09	-5.0%	1.5%	1.1%	-1.6%	0.0%	-5.8%

Oct-09	-2.1%	0.4%	0.4%	1.4%	0.0%	-4.3%
Nov-09	0.1%	0.6%	1.2%	5.3%	-9.7%	-18.9%
Dec-09	-0.1%	-0.5%	-1.4%	0.5%	0.0%	12.3%
Jan-10	2.5%	0.2%	-0.5%	9.1%	0.0%	-6.1%
Feb-10	3.5%	0.3%	-0.9%	1.3%	0.0%	-31.2%
Mar-10	1.3%	-0.8%	-0.2%	6.6%	-3.6%	-23.4%
Apr-10	2.4%	1.9%	0.2%	6.8%	0.0%	-7.8%
May-10	0.5%	-0.5%	-2.1%	2.4%	0.0%	6.0%
Jun-10	0.6%	0.8%	-1.1%	3.0%	0.0%	-10.0%
Jul-10	-0.3%	5.4%	1.4%	2.8%	-11.1%	2.2%
Aug-10	0.6%	-0.8%	-0.4%	-1.9%	0.0%	-9.7%
Sep-10	-0.9%	-1.0%	0.3%	3.1%	0.0%	-0.4%
Oct-10	1.9%	-0.3%	0.5%	3.5%	0.0%	-0.9%
Nov-10	1.0%	-0.9%	0.7%	-4.2%	0.0%	20.9%
Dec-10	0.0%	0.9%	-0.2%	-0.2%	0.0%	17.4%
Jan-11	-0.7%	-0.1%	0.0%	1.2%	-4.2%	20.1%
Feb-11	0.9%	-0.4%	-1.3%	-2.4%	0.0%	20.6%
Mar-11	0.9%	-1.7%	-0.8%	-7.4%	4.3%	40.7%
Apr-11	-1.6%	-0.1%	-0.5%	5.2%	0.0%	31.1%
May-11	-1.8%	-1.0%	-2.6%	-1.0%	0.0%	7.4%
Jun-11	8.7%	0.5%	-4.5%	-2.0%	0.0%	11.9%
Jul-11	-5.6%	-3.0%	-1.4%	-7.7%	4.2%	7.2%

Aug-11	5.2%	-0.9%	-3.0%	-9.7%	0.0%	7.3%
Sep-11	-5.2%	-3.8%	-6.0%	-8.9%	0.0%	3.9%
Oct-11	-8.9%	0.2%	0.3%	4.8%	76.0%	9.2%
Nov-11	10.1%	12.5%	11.1%	-8.8%	50.0%	4.2%
Dec-11	3.0%	0.1%	5.8%	2.6%	9.1%	-4.0%
Jan-12	-6.8%	0.6%	0.5%	1.3%	0.0%	-3.3%
Feb-12	3.9%	1.6%	1.9%	4.5%	0.0%	-8.8%
Mar-12	6.1%	-0.4%	0.1%	1.9%	0.0%	-6.5%
Apr-12	-0.5%	-0.4%	-0.1%	4.7%	0.0%	-16.4%
May-12	-5.0%	-4.0%	-4.5%	2.0%	0.0%	-6.4%
Jun-12	2.7%	2.2%	3.4%	2.9%	0.0%	-17.8%
Jul-12	0.2%	0.3%	0.3%	3.1%	-8.3%	-23.0%
Aug-12	0.7%	-0.7%	0.2%	1.7%	0.0%	-21.4%
Sep-12	0.3%	-0.8%	0.9%	3.2%	-21.2%	-12.6%
Oct-12	2.2%	0.8%	-0.3%	5.0%	0.0%	-22.3%
Nov-12	2.9%	0.0%	-0.9%	0.5%	-15.4%	-21.4%
Dec-12	-0.1%	-1.1%	-0.1%	2.9%	0.0%	-1.6%
Jan-13	-2.9%	0.1%	-1.8%	9.1%	0.0%	14.7%
Feb-13	0.9%	2.0%	4.0%	3.3%	0.0%	21.3%
Mar-13	-1.1%	0.3%	0.9%	10.3%	-13.6%	-7.7%
Apr-13	2.8%	3.0%	1.7%	0.1%	0.0%	0.8%
May-13	-2.2%	-1.3%	1.1%	7.4%	-10.5%	-2.2%

Jun-13	-1.0%	-1.3%	-0.6%	-8.3%	0.0%	21.2%
Jul-13	-1.8%	-1.8%	-1.7%	5.6%	0.0%	22.7%
Aug-13	-0.3%	-0.7%	-0.1%	-2.4%	0.0%	10.8%
Sep-13	0.4%	0.7%	4.0%	6.2%	0.0%	24.2%
Oct-13	0.0%	1.5%	2.2%	4.6%	0.0%	-6.3%
Nov-13	-1.9%	-1.8%	-2.3%	6.0%	0.0%	-5.2%
Dec-13	0.3%	0.5%	0.5%	-3.2%	0.0%	-2.8%
Jan-14	-1.5%	1.1%	1.4%	-1.5%	0.0%	0.9%
Feb-14	1.5%	0.0%	0.3%	4.7%	0.0%	-4.9%
Mar-14	1.1%	0.9%	-0.5%	2.0%	0.0%	-8.6%
Apr-14	-1.5%	-0.3%	-0.5%	5.0%	0.0%	2.2%
May-14	0.4%	0.2%	-0.9%	-0.6%	0.0%	13.9%
Jun-14	1.6%	-0.4%	0.0%	0.1%	0.0%	1.3%
Jul-14	0.9%	0.2%	1.3%	0.9%	0.0%	3.8%
Aug-14	-0.7%	-0.2%	-0.7%	4.1%	0.0%	9.0%
Sep-14	0.0%	-0.5%	-1.0%	3.5%	0.0%	-21.1%
Oct-14	2.2%	1.8%	0.2%	-2.6%	0.0%	-2.6%
Nov-14	1.6%	1.2%	-1.1%	2.5%	0.0%	-5.3%
Dec-14	-0.7%	-1.2%	-0.5%	-0.2%	0.0%	-1.1%
Jan-15	2.0%	1.9%	-1.2%	1.8%	0.0%	-8.2%
Feb-15	1.5%	3.1%	0.3%	6.0%	0.0%	1.5%
Mar-15	1.5%	-0.4%	-1.0%	-0.3%	0.0%	12.5%

Apr-15	-1.8%	5.0%	-2.5%	-1.1%	0.0%	12.2%
May-15	-1.1%	1.6%	-3.5%	-6.4%	0.0%	-3.0%
Jun-15	6.7%	-6.1%	4.4%	1.4%	17.6%	2.4%
Jul-15	0.1%	2.9%	-7.8%	-9.7%	15.0%	-5.9%
Aug-15	5.6%	0.0%	3.9%	-3.8%	0.0%	-11.8%
Sep-15	-0.4%	-0.5%	-0.8%	2.9%	0.0%	2.1%
Oct-15	-0.1%	4.4%	4.3%	-6.6%	0.0%	12.6%
Nov-15	-6.2%	-0.9%	0.5%	4.5%	0.0%	8.9%
Dec-15	0.4%	-0.4%	0.2%	1.6%	0.0%	9.3%
Jan-16	2.9%	1.3%	0.4%	-6.1%	0.0%	-2.9%
Feb-16	-2.9%	0.5%	0.0%	3.8%	0.0%	-8.9%
Mar-16	1.0%	0.4%	1.9%	3.8%	0.0%	-9.0%
Apr-16	-1.1%	0.3%	-1.4%	-0.3%	0.0%	-18.3%
May-16	1.2%	0.4%	0.3%	-2.3%	-8.7%	-5.2%
Jun-16	1.0%	-0.3%	-0.3%	-2.1%	0.0%	15.9%
Jul-16	-1.2%	-0.3%	-0.3%	1.3%	0.0%	10.3%
Aug-16	-0.1%	-0.1%	4.7%	-5.2%	-4.8%	-2.1%
Sep-16	0.5%	-0.1%	-4.4%	1.3%	0.0%	1.3%
Oct-16	2.1%	-0.2%	9.6%	0.2%	0.0%	2.1%
Nov-16	4.3%	-0.5%	1.0%	-0.3%	0.0%	3.2%
Dec-16	-0.9%	-0.7%	-2.6%	-2.4%	0.0%	-4.9%
Jan-17	-2.1%	1.2%	0.9%	-8.3%	0.0%	10.1%

Feb-17	0.6%	0.5%	-1.2%	2.2%	0.0%	29.3%
Mar-17	1.0%	0.3%	0.6%	4.5%	0.0%	13.7%
Apr-17	0.7%	-0.1%	2.0%	2.1%	0.0%	11.7%
May-17	-1.3%	-0.1%	-2.1%	11.3%	0.0%	1.9%
Jun-17	-0.8%	-0.3%	-0.1%	3.0%	0.0%	-21.3%
Jul-17	0.5%	-0.1%	0.0%	5.5%	0.0%	-18.9%
Aug-17	0.5%	0.9%	1.1%	4.8%	0.0%	7.6%

Source: CBK and KNBS