

**THE RELATIONSHIP BETWEEN FOREIGN EXCHANGE RATES
AND INTEREST RATES IN KENYA**

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DECLARATION

The undersigned declare that this research project is my original work and has not been presented for a ward of a degree in this or other University.

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This research project has been submitted for examination with my approval as the University supervisor

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I am sincerely grateful to God for the gift of peaceful and serenity mind throughout my studies from the beginning of the course up to now

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I must admit humbly that the success of this research has been largely due to the collaborative efforts and devotion of many people to whom I owe a lot of gratitude.

DEDICATION

This research project is dedicated to my father Joseph Kiruga,my mother Margaret Wambui,my wife Virginiah Nyambura , my son Andy Kiruga and my sister Ann Wanjiru,without whom my academic potential would not have been realized. I say thank you to the support they give me during my academic life.

ABSTRACT

The study sought to understand the relationship of Foreign Exchange Rates on Interest rates in Kenya. The descriptive research design was used. It was a case study of all the Foreign Exchange Rates, Interest Rates, Inflation Rates and Gross domestic Product in Kenya. Central Bank of Kenya (CBK) was the source of information in the pursuit to establish the relationship of foreign Exchange rates on interest Rates in Kenya. The study used monthly average foreign exchange rates, monthly average interest rates. Monthly average inflation rates and Gross domestic product from 2010 to 2014. Multiple linear regression was used to model the relationship between the three explanatory variables and a response variable was used by fitting a linear equation to the observed data. Multiple regression analysis was also used to assess whether correlation exist .The study found that 42.3% of the variation in the dependent variable can be explain by the independent variables, interest rates, inflation rates and GDP,while 57.7% can be explain by other factors outside the model. As a result the research found that there was a positive linear relationship between foreign exchange rates, interest rates and inflation. However there was a negative linear relationship between foreign exchange rates and Gross domestic products (GDP). The study concluded that there was a positive relationship between foreign exchange rates and interest rates in Kenya but not significant. The study recommends that more research be carried out to determine the effect of other factors line relative employment, taxation policies, political situation and market adjustment on how they affect the foreign exchange rates.

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ABBREVIATIONS AND ACRONYMS

CBK	- Central Bank of Kenya
CBR	- Central Bank Rate
CIRP	- Covered Interest Rate Parity
GDP	- Gross Domestic Product
KSH	- Kenya Shillings
NER	- Nominal Exchange Rate
RER	- Real Exchange Rate
USD	- United State Dollar
UCIRP	- Uncovered Interest Rate Parity
VAR	- Vector Autoregressive

CHAPTER ONE: INTRODUCTION

1.1 Background of the Study

Exchange rate stability is one of the main factors that promote investments, price stability and stable economic growth. Foreign exchange rate is the conversion of one currency into another currency. Foreign exchange also refers to the global market where currencies are traded virtually around the clock (Ngari, 2011). Foreign exchange rate can also be said to be the rate or price of the currency of one country in terms of currency of another for example value of Kenya shilling expressed in US dollars. It is widely believed that changes in exchange rates have important implication for financial decision making and for the profitability of the firm (Frankel & Rose, 2002). Exchange rate movement affects both the prices of imported goods and the cost of imported inputs. The economic performance is judged by the stability in macroeconomic variables such as exchange rates and interest.

The interest rate parity theory was developed by Keynes (1923), to link the exchange rate and interest rate. The theory has two forms, covered interest rates parity and uncovered interest rates parity. The covered interest rates parity describes the relationship of the spot market and forward market of exchange rate with nominal interest rates, while uncovered interest rates describes the relationship of the spot and expected exchange rates with nominal interest rates of two economies (Ahmed & Khan, 2005). This relationship can be rationalized on the basis that unanticipated money disturbance are likely to affect both the interest rates and exchange rates (Ndung'u, 2000). The raise of the home interest rates is usually followed by the increase of the home currency, and a

fall in the home interest rates is followed by a decrease of the home currency. High interest rates currencies tends to increase whereas one might expect the investors would demand higher interest rate on currencies expected to fall in value (Fama,1984).

Exchange rates in Kenya have been fluctuating over the last few years with a raising trend. The exchange rates for the one shilling to one US dollars was 79.23 in 2010,88.81 in 2011, 84.53 in 2012, 86.12 in 2013 and 87.92 in 2014 respectively, while the interest rate was 6.4, 8.4, 15.8, 8.8 and 8.5 in the same period. This trend indicates there is either an increase or decrease in exchange rate and interest rates in Kenyan economy. This fluctuation came as a wakeup call to the regulator, Central bank of Kenya (CBK) on how to regulate the interest rates and foreign exchange rate instability. In May 2013 the central banks through the monetary policy committee decided to peg and stabilize the interest rate at 8.5 as a measure to tam instability in foreign exchange rate and attract investment. The foreign exchange rate continued to increase sharply despite aggressive monetary policy adopted by the CBK to address fluctuation and stabilize the exchange rate. The foreign exchange rate increased from 80.57 at the end of the year December 2010 to 90.44 in December 2014 and interest rate from 6 to 8.5 respectively (CBK, 2015).

1.1.1 Interest rates

Interest rate is the price a borrower pays for the use of money they borrow from a lender/financial institutions or fee paid on borrowed assets (Crowley, 2007). Interest can be thought of as "rent of money". Interest rates are fundamental to a 'capitalist society' and are normally expressed as a percentage rate over the period of one year. Interest rate

as a price of money reflects market information regarding expected change in the purchasing power of money or future inflation (Ngugi, 2001).

According to Cowley, (2007) interest rate is the price the borrower pays for the use of money borrowed from the lender or financial institution. It is the fee paid for the use of borrowed assets. Interest rate risk is the exposure of the firm's financial position due to fluctuations in interest rates. Excessive interest rate fluctuation can pose significant threats to a firm's earnings and capital base changes and increase its operating expenses. Changes of interest rates may also affect the underlying value of assets, liabilities and present value of future cash flows, (Cliff & Willy, 2000)

Its primary role is to help mobilize financial resources and ensure the efficient utilization of resources in the promotion of economic growth and development (Ngugi, 2001). The study further argues that interest is the rent paid for money. The interest rate measures the rate of return expected by the lenders. It should thus reflect all the information regarding future changes in the purchasing power and the risk undertaken.

1.1.2 Foreign Exchange Rate

An exchange rate is defined as a price at which one currency may be converted into another. Exchange rate is referred to as the nominal exchange rate (NER) when inflation effects are embodied in the rate and as the real exchange rate (RER) when inflation influences have not been factored in the rate (Copeland, 1989:4, Lothian, and Taylor, 1997). Before 1972 all countries of the world were operating a fixed exchange rate regime where each country currency had affixed exchange rate relative to the USA dollar.

The significance of exchange rate is that it allows a continuous adjustment of the exchange rate in line with the demand and supply conditions of foreign exchange in the economy. It equilibrates the demand and supply of foreign exchange by changing the exchange rate rather than the level of reserves. It allows the country to pursue its own monetary policy without having to be overly concerned about the balance of payments effects. External shocks and imbalances are reflected in exchange rate movements rather than in reserve movements or Central Bank intervention to control the adjustment process (Ndungu, 2000). The Exchange rates are driven largely by market supply and demand. Using the flexible exchange rate system regime the price of currencies is determined by supply and demand of the currency in the forex market.

1.1.3 Interest Rates and Foreign Exchange Rates

High interest rates policies destabilize exchange rates by raising corporate bankruptcy levels while accelerating capital outflows (Furman & Stiglitz, 1999). On the other hand low interest rates stabilizes the exchange rates thus attracting more investment and capital inflows. The effect of high exchange rates variability in stabilizing interest rates is that it releases the pressure off the economy and promotes stability in such macroeconomic variables, such as the interest rates, money supply and output (Reinhart, 2001). An increase in interest rate is necessary to stabilize the exchange rate depreciation and to curb the inflationary pressure and thereby help to avoid many adverse economic consequences (Alvo & Reinhart, 2000).

The relationship between exchange rate and interest rate is seen in the fluctuations of prices of foreign currencies due to the movement of interest rates (European commission,2013).High interest rates may mean high return on investments therefore attracting more investors. This increases the demand of the currency of that particular country and hence raising the foreign exchange rate .At the same time this relationship may be complicated since high interest rate can results to high inflation rate, which reduces purchasing power of consumers resulting to lower demand for foreign currency and hence lower exchange rate (Elbanna &Yunnies, 2008).

1.1.4 Foreign exchange and interest rates in Kenya

The liberalization experience in Kenya shows that domestic interest rates have remained high even when inflation has been low and declining and exchange rate volatile (Ndungu, 2000). In the 1990s the Kenyan Government liberalized the financial, foreign exchange and domestic goods markets. The liberalization of the foreign exchange market in Kenya was gradual, from a fixed exchange rate regime up to 1982 to crawling peg during the period 1983 to 1993 before a floating exchange rate regime was adopted in 1993. Following the liberalization of the foreign exchange market, Kenya attained monetary independence to control inflationary pressures but lost the nominal anchor to tie domestic prices down and thus globalization effects are transmitted directly into the country (Moses & Leonard, 2008).

The financial sector in Kenya suffered from severe repression prior to implementation of its structural adjustment programme (SAP) in 1993.Interest rates were maintained below market clearing levels, and direct controls of credit was the primary monetary control

instrument of the authorities (William, 1995).Accompanying the SAP, interest rates de-regulation took place. In September 1991,the maximum leading rate was increased from 10 to 14% .The discounting rate for crop finance paper was raised to 11.25%,while the maximum savings deposit rates was raised to 12.5%.

According to William (1995) between 1983 and 1987, the differential between the interest rates of banks and other financial institutions were narrowed. This improved the competitiveness of commercial banks. One of the first step towards freeing interest rates was taken in 1989,when the government started selling treasury Bonds through the auctioning .In 1991,interest rates were completely left to the force of demand and supply, and since then, interest rates have been following a steep upward ascent (William, 1995).The interest rate in Kenya had been pegged on Treasury bill rate which was being used as yield stick for measuring the interests rates, but from August 2005,the central bank committee on monetary policy changed to central bank rate (CBR) (Central Bank, 2005).

1.2 Research Problem

An increase in the interest rate mean a decrease in the foreign exchange rate for the country's currency and inflow of capital attracted by attractive interest rate. This is because high interest rates lead to fewer investments because investors will find it hard to get loan with very high interest rate hence decreasing the exchange rate. As a result investors move their investment out of the country this reduces the demand for the country's currency leading to lower exchange rates for the currency (Otuori, 2013).

Interest rates and foreign exchange rates lies at the centre of monetary policy, not just a passive reflector on money supply but rather as one of the main policy instrument. Exchange rates and interest rates have played a central role in macroeconomic policy. In developing country like Kenya, interest rates and foreign exchange rates have enjoyed high popularity as policy instruments. For instance, high interest rates has been essential component of many stabilizing programs with chronic high exchange rates(Asgharpur et.al 2007).Interest rates have been fluctuating in Kenya with the central bank of Kenya putting more tight monetary measure to control its raising trend since it has high impact on exchange rate. The high interest rate regime witnessed in Kenya although an instrument to meet the goals of the monetary authorities, jeopardize chance of an early economic recovery and over the years have discouraged investment necessary for future economic growth hence exchange rate. On the other hand, foreign exchange rate has also been moving up and down for example from year 2010 to 2014 the trend has been 79.23, 88.81, 84.53, 86.12 and 87.92 respectively.

Nyamute (1998) did a study which focused on the causal relationship between stock prices and financial variables such as money supply, interest rates, and inflation rates and exchange rates in Kenya. The study established that a positive relationship exist between stock prices and exchange rates. Kisaka (1999) also conducted a study to establish the causal relationship between exchange rates and stock prices. The results indicated a unidirectional causality relationship from foreign exchange rates to stock prices in Kenya. Musyoki, Pokhariyal and Pundo (2012) did study on real exchange rates equilibrium and misalignment in Kenya; they established that actual real exchange rate was more often

above its equilibrium value and country international competitiveness deteriorated over the study period. The result concluded that higher levels of interest rates leads to higher profitability and higher levels of export and imports leads to higher profitability of commercial bank in Kenya. From the studies reviewed, no studies have been done in Kenya so far to establish the empirical relationship between interest rates and foreign exchange rates in Kenya. Hence this study seeks to fill this gap by answering the following question; what is the relationship between the foreign exchange rates and interest rates in Kenya?

1.3 Objective of the Study

To establish the relationship between the foreign exchange rates and interest rates in Kenya.

1.4 Value of the Study

The findings of this study benefit players in the Kenyan financial markets in monitoring the behavior of foreign exchange rates using the local interest rates. Current and prospective investors will be able to understand better on how to mitigate on the risks of the possible interest and foreign exchange rates fluctuations. The finding will also help the management of the Nairobi stock exchange, investment Banks, and risk managers with information on how to monitor the behavior of foreign exchange rates using the local interest rates.

The finding of this study is of paramount importance in assisting the policy makers to enable them come up with the necessary regulations to guide the central Bank of Kenya in drafting a foreign exchange rate and base lending rates regulatory frameworks. This

will also help the law makers to come up with appropriate laws and regulations which protect the economy specifically the members of parliament.

This study finally makes a contribution to the body of academic knowledge on the debate of the relationship between foreign exchange rates and interest rates and its application in a sector. This will form the basis for more study and analysis of the relationship of exchange rates and interest rates and how they are also related to other economic variables.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This chapter discusses the theoretical framework which includes: theoretical review, empirical review and summary of the literature review.

2.2 Theoretical Review

In this theoretical review consideration will be given to foreign exchange rates and interest rates theories, which are Purchasing Power Parity (Cassel ,1918), Interest Rate Parity (Keynes, 1923) and finally Balance of Payment theory that have been developed over a number of decades and which are relevant to this study.

2.2.1 Purchasing Power Parity Theory

This theory was advanced by Cassel (1918) which is also called inflation theory of exchange rates. Cassel (1918) argued that without it, there would be no meaningful way to discuss over-or-under valuation of a currency. This theory states that exchange rates adjust at least in the long run so that comparable basket of goods from different countries will cost the same when denominated in a common currency (Fisher, 2000).

According to Cassel (1923) the purchasing power-parity theory is an operational theory with two propositions. The first is that monetary factors are the most important long-run determinants of the exchange rate under a flexible exchange-rate standard. The second is that tariffs and hindrances to trade, transport costs, capital flows, and expectations are random deviations aside, the remaining determinants of the exchange rate under a flexible exchange-rate standard. Cassel (1923) formulated this theory so that it applied not only to a flexible exchange rate standard but also to the gold standard. In this more

general formulation the primary determinants of the price of a country's goods domestically were monetary factors, and the secondary determinants were tariffs and hindrances to trade, transport costs, capital flows, and expectations. Two different interpretations of Cassel's purchasing-power-parity theory are given in the literature. The first interpretation is that changes in monetary factors, measured by some index of prices in one country relative to another country, are the sole determinants of the exchange rate of any importance. The second interpretation is that monetary factors in two countries measured by the ratio of some pair of price indexes in each country exactly determine the exchange rate (Holmes, 1967).

The movements in exchange rates affect the profitability of multinationals and increase exchange exposure to enterprises and financial institutions. This theory has faced support and criticism in equal measures. A stable exchange rate may help enterprise and financial institutions in evaluating the performance of investments, financing and hedging and thus reducing their operational risks (Nieh and Wang, 2005; Rahman and Hossain, 2003). Fluctuations in the exchange rate may have a significant impact on the macroeconomic fundamentals such as interest rates, prices, wages, unemployment, and the level of output. This may ultimately results in a macroeconomic disequilibrium that would lead to real exchange rate devaluation to correct for external imbalances (Parikh and Williams, 1998). The economist have criticized this by arguing that it does not consider transaction cost, transport cost and other trade barriers.

2.2.2 Interest Rate Parity

This theory was developed by Keynes (1923) it indicates that the price of asset play a role in exchange rate variation. According to Keynes (1923) in the early periods of gold standard, monetary policy makers found that exchange rate were influenced by changes in monetary policy. The rise of the home interest is usually followed by the appreciation of the home currency, and a fall in the home interest rates is followed by a depreciation of the home currency. The theory links the exchange rate, interest rate and inflation. It has two forms: covered interest rate parity (CIRP) and uncovered interest rate parity (UCIRP) Under the condition of free capital flow, covered interest rate parity states that the forward premium of a foreign currency should be equal to the interest rate differential between a domestic asset and a substitute foreign asset. CIRP implies the equality of the return on comparable financial asset denominated in different currencies. Chinese university of Hong Kong (2000). The underlying mechanism for CIRP is covered interest arbitrage. Covered interest arbitrage is the transfer of liquid funds from one monetary center to another to take advantage of higher rates of return or interest, while covering the transaction with a forward currency hedge.

According to the Chinese University Hong Kong (2000), empirical deviations from CIRP are always explained as violations to the assumptions of free flow and the substitutability of assets from different countries. The possible explanation includes: There may be transaction costs, which introduces “transaction band’ into CIRP; There may be possible capital controls, which actually adds cost to the CIRP; There may be difference in tax rates on interest income and foreign exchange losses and or gain in different countries.

These differences contribute to the non-substitutability of investments in different countries and makes investments in a country more preferable than the other.

Uncovered interest rate parity (UCIRP) states that if funds flow freely across a country borders and investors are risk-neutral, after adjustment of expected depreciation, the expected rates of return to substitutable assets denominated in different currencies should be equal. Algebraically, it is expressed as the equality between the expected changes in spot exchange rates and interest differential of two countries. Like that of CIRP, the underlying mechanism of UCIRP is interest arbitrage activities. For example, if domestic interest rates are lower than the expected rate of return on an identical foreign asset, investors will borrow from the home country and invest in foreign country. The borrowing and investing process will cause domestic interest rates to increase and foreign interest rates to decrease until two kinds of returns reach the same level. Dimitrios & Nikolaos, (2005) is that rational investors actions in purchasing one currency and selling another will move exchange rate until excess profit from uncovered interest rate arbitrage are eliminated, hence bringing interest rates differentials into with spot exchange and expectations of their movement.

2.2.3 The Balance of Payments Theory

The balance of payments theory of exchange rate is also named as 'General equilibrium theory of exchange rate. According to this theory, the exchange rate of the currency of a country depends upon the demand for and supply of foreign exchange. If the demand foreign exchange is higher than its supply, the price of foreign currency will go up. In case, the demand of foreign exchange is lesser than its supply, the price of foreign exchange will decline (Kanamori & Zhao, 2006). The demand for foreign exchange and

supply of foreign exchange arises from the debit and credit items respectively in the balance of payments. The demand for foreign exchange comes from the debit side of balance of payments. The debit items in the balance of payments are (1) import of goods and services (2) Loans and investments made abroad (Kanamori & Zhao, 2006).

The supply of foreign exchange arises from the credit side of the balance of payments. It is made up of the exports of goods and services and capital receipts. If the balance of payments of a country is unfavorable, the rate of foreign exchange declines. On the other hand, if the balance of payments is favorable, the rate of exchange will go up. The domestic currency can purchase more amounts of foreign currencies (Kanamori & Zhao, 2006). When the exchange rate of a country falls below the equilibrium exchange rate, it is a case of adverse balance of payments. The exports increase and eventually the adverse balance of payment is eliminated. The equilibrium rate is restored. When the balance of payments of a country is favorable, the exchange rate rises above the equilibrium exchange rate resulting in the decline of exports (Kanamori & Zhao, 2006).

2.3 Determinants of Exchange Rates

Some of the factors that influence currency supply and demand that is exchange rates are inflation rates, interest rates, economic growth, and political and economic risks.

2.3.1 Relative Inflation Rates.

Suppose that the supply of Kenya shillings increases relative to its demand. This excess growth in the money supply will cause inflation in the Kenya, which means that Kenya prices will begin to rise relative to prices of goods and services for example in Uganda shillings. Ugandan consumers are likely to buy fewer Kenyan products and begin

switching to Ugandan substitutes, leading to a decrease in the amount of Uganda shillings supplied at every exchange rate. The result is a leftward shift in the Ushs supply curve. Similarly, higher prices in Kenya will lead Kenyan consumers to substitute Ugandan imports for Kenyan products, resulting in an increase in the demand for Uganda shillings as depicted by. In effect, both Kenyans and residents of Uganda are searching for the best deals worldwide and will switch their purchases accordingly as the price of Kenyan goods change relative to prices in Uganda. Hence, a higher rate of inflation in the Kenya than in Uganda will simultaneously increase Ugandan exports to the Kenya and reduce Kenyan exports to Uganda.

A new equilibrium exchange rate occurs. In other words, a higher rate of inflation in Kenya than in Uganda will lead to a depreciation of the Kenya shilling relative to the Uganda shilling or, equivalently, to an appreciation of the Uganda shilling relative to the Kenya shilling. In general, a nation running a relatively high rate of inflation will find its currency declining in value relative to the currencies of countries with lower inflation rates.

2.3.2 Real Interest Rates.

Interest rate differentials will also affect the exchange rate. A rise in Kenya's interest rates relative to Ugandan rates, all else being equal, will cause investors in both nations to switch from Ushs- to Ksh-denominated securities to take advantage of the higher Kenya shilling rates. The net result will be depreciation of the Uganda shilling in the absence of government intervention. The real interest rate equals the nominal or actual interest rate minus the rate of inflation. The distinction between nominal and real interest rates is critical in international finance. If the increase in Kenya interest rates relative to Ugandan

rates just reflects higher Kenya inflation, the predicted result will be a weaker Kenyan shilling. Only an increase in the real Kenyan interest rate relative to the real Ugandan rate will result in an appreciating Kenya shilling.

2.3.3 Relative Economic Growth Rate.

Similarly, a nation with strong economic growth will attract investment capital seeking to acquire domestic assets. The demand for domestic assets in turn results in an increased demand for the domestic currency and a stronger currency, other things being equal. Empirical evidence supports the hypothesis that economic growth should lead to a stronger currency. Conversely, nations with poor growth prospects will see an exodus of capital and weaker currencies.

2.3.4 Political and Economic Risk.

Other factors that can influence exchange rates include political and economic risks. Investors prefer to hold lesser amounts of riskier assets; thus, low-risk currencies—those associated with more politically and economically stable nations—are more highly valued than high-risk currencies.

2.4 Empirical Review

Braillford et al (2006) tested for Granger causality between interest rates and foreign exchange rates in four Asian countries (south Korea, Philipines, Thailand and Malaysia) over the Asian financial crisis period from 1 July 1997 to 1 July 1998. The results indicated that sharply interest rates helped to support the exchange rates of Korea, the Philippines and Thailand, for Malaysia, no significant causal relation was found from the rate of interest to exchange rates, as the authorities in Malaysia did not actively adopt a high interest rate policy to defend the currency.

Cliff and Willy (2014) did a study on macroeconomic fluctuation effect on the financial performance of listed manufacturing firms in Kenya from 2003 to 2012. The study applied descriptive research design. Their finding concluded that the effect of macroeconomic factors such as exchange rates, interest rates and inflation on financial performance was insignificant.

Cho and West (2001) did a study to establish the relationship between exchange rates and interest rates in five East Asian crisis countries from 1982 to 1990; (Korea, Philippines, Thailand and Malaysia and Indonesia). The study used monthly data from the five countries stock exchange database. The objective was to find the causal relationship between exchange rates and interest rates after the Asia crisis. The conclusion of the study was that high interest rates stabilized the exchange rates in the five Asian countries.

Goldfajn and Gupta (1999) did a study to establish the relationship between exchange rates and interest rates, using monthly data for 80 countries for 1902 to 1998. The study used data from the 80 different countries stock exchange databases. The objective of the study was to establish whether the 80 countries interest rates and exchange rates exhibit the same trend. The study found that high interest rates helped to stabilize exchange rates.

Kwan and Yoonbai (2004) did a study to establish the empirical relationship between exchange rates and interest rates in post Asia-Crisis and they used call rate to represent interest rates. They employed weekly data obtained from DataStream's for the period January 1993 to July 2002 for Indonesia, Korea, Philippines and Thailand. The study

concluded that all Asian crisis countries appeared to adjust their exchange rate more sensitively in the post –crisis period to change to the neighbor’s exchange rates.

Leonard and Moses (2001) did a study on external shocks and real exchange rates movement in Kenya. The study employed monthly data from 1996 to 2007. The model also incorporated domestic variables such as real GDP growth, interest rates differential and government spending. The result showed that external shock to a large extent influence real exchange rates.

Musyoki., Pokhariyal and Pundo (2012) did a study on Real Exchange Rates (RER) misalignment in Kenya by using Johansen Co integration and error correction technique based on single equation and Vector Autoregressive (VAR) specification. It was found that actual real exchange rates was more often above its equilibrium value for the study period of June 1993 – December 2009 and the country’s international competitiveness deteriorated over the study period.

Ndung’u (2000) presented a discussion paper on the relationship between real exchange rate movement and real interest differential in Kenya, a monetary and fiscal policy dilemma. The study concluded that the nominal exchange rate deviates from the perceived long term equilibrium level determined by purchasing power parity relationship and this deviation are governed by interest rates differential.

Tobias (2011) examined the effect of short term interest rate on the volatility of the foreign exchange rate. In his study he used Treasury bill rates from august 1991 to December 2007. He used the GARCH model to analyze the data. The results of the study

were consistent with the hypothesis that the volatility is positively correlated with the level of short term interest rates. The key findings revealed that there exists a link between short term interest rates and the volatility of foreign exchange rate in Kenya.

2.4. Summary of Literature Review

Exchange rate and interest rate policies are key tools in economic management and in the stability in developing countries. In order to minimize the possibility of the financial loss and country economic downturn, it is therefore essential to stabilize exchange rates and interest rates by indentifying appropriate measures more effectively. Studies by Braildford et al., (2006), Kwan and Yoonbai (2004), Goldfajn and Gupta (1999) found that high interest rates helped to stabilize exchange rates in a country. Nyamute (1998) and Kisaka (1999) established that there is unidirectional causality relationship from foreign exchange rates to stock prices in Kenya.

There exist conflicting conclusions on the relationship between the foreign exchange rate and interest rate from studies in different parts of the world call for similar study here at home. Studies reviewed here at home have focused mostly on other macroeconomic variables like share prices, inflation, GDP and foreign exchange of firm performance, various ways of mitigating risks. The studies reviewed have not looked at the relationship between foreign exchange rates and interest rates in Kenya, a country that experiences very irregular movement of foreign exchange rates and interest rates. Other studies done elsewhere have given mixed results. It is against this backdrop that, from studies reviewed there is no study which has been done in Kenya on the relationship between foreign exchange rate and interest rate hence this study seeks to fill this gap.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

This chapter discusses the research design, data collection instruments and data analysis techniques that is used to meet the objective of this study.

3.2 Research Design

This study used the descriptive research design. Descriptive research design is an attempt to collect data from number of population in order to determine the current status of that population with respect to one or more variables (Norman and Fraenkel, 2001). The descriptive research design is suitable to describe the interrelationships between interest rates and exchange rates in Kenya. This study was a case study consisting of all observations on interest rates of the central Bank rate and the Monthly foreign exchange rates of Kenya shillings per US dollar for the year 2010 to 2014.

3.3 Data Collection

The study used secondary data, where, monthly KSHS /USD closing values of the nominal exchange rate and the closing central Bank rate will be obtained from Central Bank of Kenya for 5 years from 2010 to 2014. The data set consist of monthly observations of the nominal value of the daily closing average exchange rate represented by the Kenya shillings price of one US dollar and aggregated interest rate, represented by Central Bank rate between 2010 to 2014. The US dollar is used for it is the most traded currency and the most transactions in Kenya are pegged against the US dollar which also acts as the intermediary in triangular currency in Kenya.

3.4 Data Analysis

This study used both descriptive and inferential statistics to analyze the data. The Regression analysis and correlation analysis is used to check for causality between independent variable and the dependent variable. The nominal exchange rate is treated as the independent variable to test whether past values of Central Bank rates predicts the current value of the interest rate. The statistical package for social science is used in the data analysis.

3.4.1 Analytical Model

The model that is used in this study is similar to one used by Zhang (2009). The research is based on the following,

$$Y_i = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \varepsilon_t \quad \text{Where:}$$

Y_i = Exchange rate

X_1 = Interest rate

X_2 and X_3 = Inflation rate, GDP (control variables)

ε_t = Error term

β_0 is a constant and $\beta_1, \beta_2, \beta_3$, are coefficient of regression equation

3.5 Operationalisation of the study variables

The dependent variable of the study is Exchange rates, while the independent variable is interest rates.

3.5.1 Measurement of interest rate

The measurement of interest rate is the Central Bank rate (CBR) while its indicator is the annual interest rate fluctuations obtained from central Bank of Kenya.

3.5.2 Measurement of Exchange rates

Exchange rate movements have been a big concern for investors, analyst, managers and shareholders since the abolishment of the fixed exchange rate system. Given the frequent changes of supply and demand influenced by numerous external factors, this new system is responsible for currency fluctuations (Abor, 2005). The indicators for exchange rate is the annual exchange rate fluctuation in Kenya shilling per US dollar, while the measure of exchange rate is the average annual exchange rate in Kenya shilling per US dollar (KSH/US\$) obtained from Central Bank of Kenya.

3.5.3 Test of significance

To test for statistical significance between interest rates and foreign exchange rates Coefficient of determination (r^2) was used to measure the extent of variation between the independent the dependent variables in the model. F-test is used to test the significance of the whole model and T-test to test the significance of each individual parameter in the model. Test of Significance of 5% is used since this is the generally accepted conventional level in social science research.

CHAPTER FOUR: DATA ANALYSIS, RESULTS AND DISCUSSION

4.1 Introduction

This chapter consist data analysis, findings and interpretations on the data collected to address the objective of the study. Descriptive statistics, charts, regression analysis, model summary and the coefficient of determination also presented in this chapter.

4.2 Descriptive Statistics

This section sought to provide a description of the variables used in describing the relationship between foreign exchange rates and interest rates. The results are presented in figures and graphs.

Table 1: Descriptive Statistics

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
Exchange Rates	20	76.49	93.87	85.3325	4.27502
Interest Rates	20	5.83	18.00	9.4285	3.68658
Gross Domestic Product	20	3.10	11.50	6.0750	2.39382
Inflation Rate	20	3.33	15.17	6.4545	2.81401

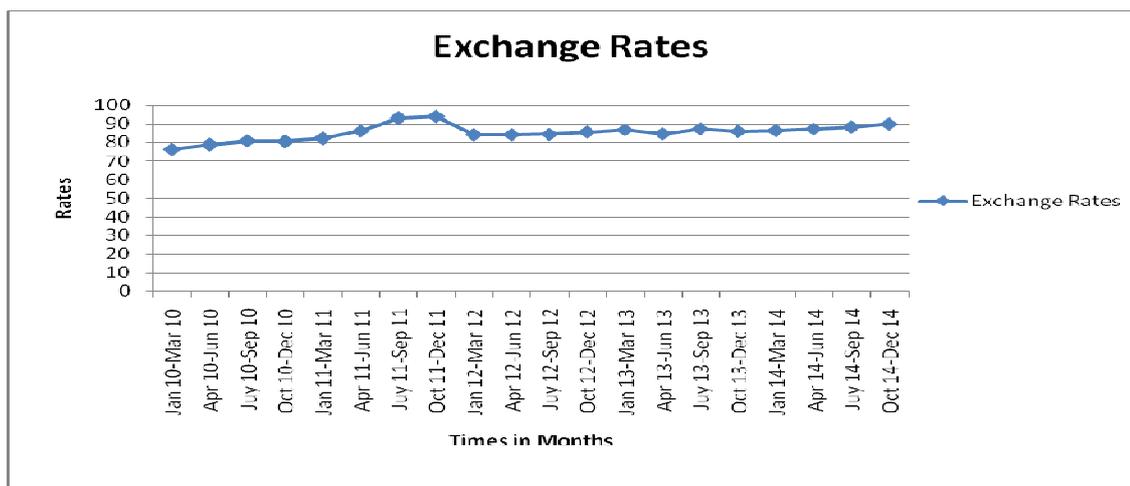
Table 1 provides the descriptive statistics of dependent variables represented by foreign exchange rates and independent variables that is interest rates, GDP and inflation rates. The table includes the Mean, Standard Deviation, Minimum and maximum for both dependent and independent variables.

The exchange rate appreciated over the five years period with low of ksh.76.49 and high of ksh.93.87. The period recorded a mean exchange rate of 85.3325 while standard deviation at 4.2750. The interest rate recorded a low of 5.83 and high of 18.00 over the five period of study. The mean was 9.4285, while the standard deviation was 3.6887. Therefore, from the descriptive statistics; the increase in interest rate from 5.83 to 18 resulted to higher margin increase in Foreign Exchange rate from Ksh 76.49 to 93.89 at maximum. The other independent variables, Gross domestic product and Inflation rate recorded a low margin increase over the five years period with low of 3.10 and 3.33 and a high of 11.50 and 15.7 respectively. They recorded the mean of 6.0775 and 6.4545 with the standard deviation of 2.3938 and 2.8140 over the same period respectively.

4.2.1 Foreign Exchange Rates Trend

The monthly average date of foreign exchange rates over the period of January 2010 to December 2014 was used to analyze the trend of the exchange rate. The trend is described below.

Figure 4.2: Foreign Exchange rates Trend



Source: Researcher data (2015)

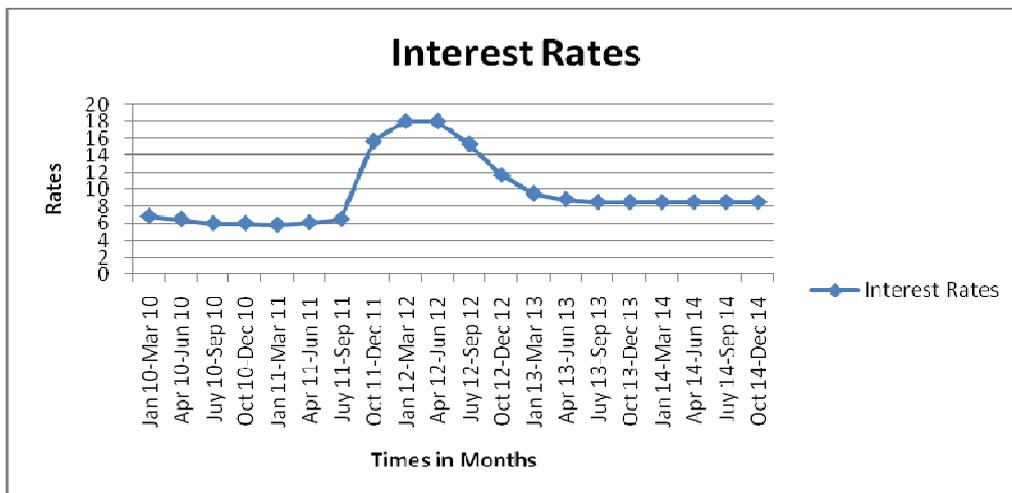
The results in the figure 4.2 above shows, in the mid of 2010 the foreign exchange rates average Ksh.78.93 with a slight rise in the next period upto January 2011. This rise in Kenyan shillings against dollars indicates the Kenya shillings was losing value over the dollar.

However, the shilling continued to lose till mid October to December 2011 where the rate reached ksh.101.27. Thereafter the shillings started to gain over the year 2013 where the foreign exchange reached Ksh.87.50 in the month of August 2013. In the same year 2013 October the shillings continuously lost value against dollar from Ksh.85.31 to 90.44 in the year 2014.

4.2.2 Interest Rates Trend

The monthly average data of interest rates over the period of January 2010 to December 2014 was used to describe the trend of the rate over that period. The trend is described below.

Figure 4.3 Interest Rates Trend



Source: Researcher data (2015)

The result indicates, in the early January 2010 the interest rates averaged 7% but dropped to 6% in the same year. In the early January 2011 the interest rates dropped to 5.75 up to

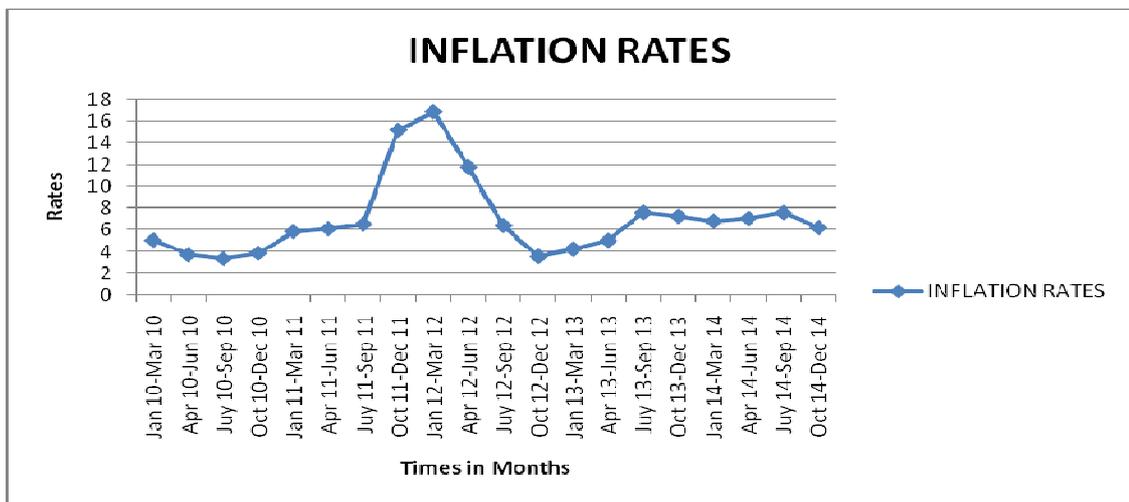
February the same period where it maintained a constant rate of 6% till July 2011 and with yet another slight increase of 0.25% till August 2011.

From September 2011 the interest rates had a sharp increase from 7% to 18% in mid 2012. This represents an 11% increase significantly within a period of 9 months, as shown in the graph above. The rate maintained a constant trend for a short period and started to drop in the year 2012 till March 2013 where the interest rates were at 9.5% and with a further drop to 8.5% continually. This was due to the central Bank of Kenya pegging the interest rate at 8.5% indefinitely.

4.2.3 Inflation Rates Trend

The monthly average data of inflation rates over the period of January 2010 to December 2014 was used to analyze its trend as shown below.

Figure 4.4: Inflation Rates Trend



Source: Researcher data (2015)

From the results, in early January 2010 the inflation rate averaged 5.95% with a slight drop to 5.15% in the following month of February followed by a tremendous drop to 3.18% in October in the same year. The same period in November 2010 the inflation started

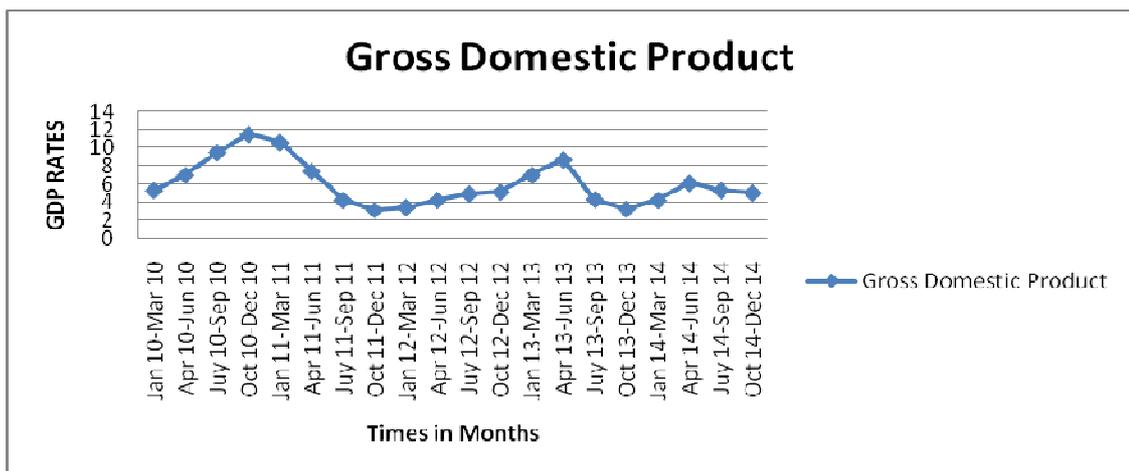
raising slightly to 3.84% and then in increase tremedeouly to 5.45% in January 2011 to 19.72% in November the same period.This indicates the Kenya shillings was losing value to dollar and eroding the purchasing power hence making foreign exchange expensive.

However,inflation rates dropped slightly from 19.72% to 10% in the mid 2012.The drop was maintained till December 2012 at 3.2%,it started again to raise slightly from January 2013 to December 2013 from 3.20% to 7.15% which makes 4.5% increase in inflation rates within the one year.Theresafter the inflation rate droped slightly for three months from7.15% to 6.41% and then raise for another three months in the same years to 8 36% in and August 2014 and then droped significaltely to 6.02% in December 2014.

4.2.4 Gross Domestic Product Trend

The monthly average data of Gross Domestic Product over the period of January 2010 to December 2014 was used to anayls its trend as shown below.

Figure 4.5 Gross Domestic Product Trend



Source: Researcher data (2015)

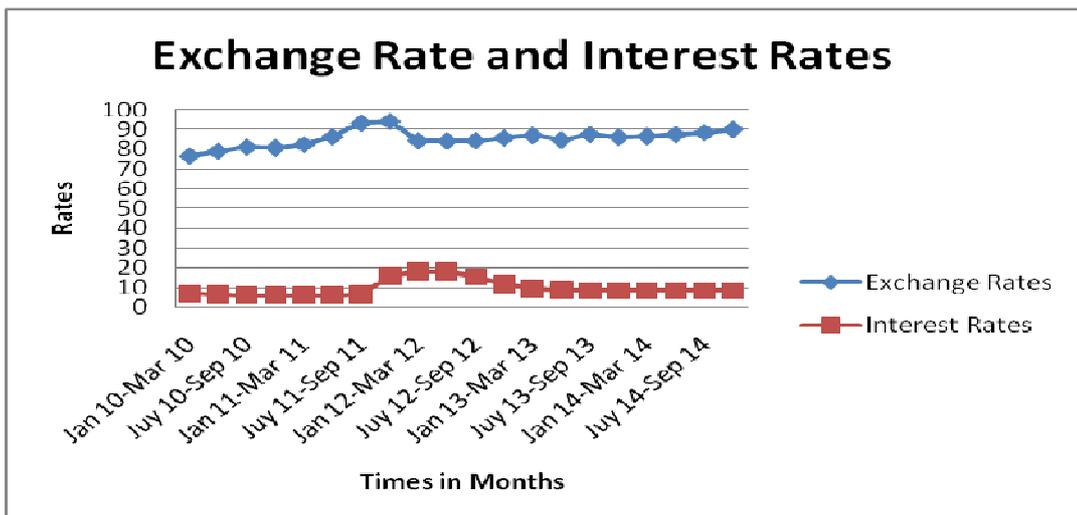
The from the figure 4.5,in January 2010,Gross domestic product the average was at 5.3% which increased significantly to 11.5% in the same period.The GDP dropped to 10.6% in January 2011 and a decreased to 3.1% in the same year which shows 7.5% drop in GDP.This indicates that the economy was not growing.

However,in January 2012 there was slight increase from 3.1% to 3.4%.In the following month the rates increased significantly up to 8.7% in April 2013 which indicate the economy was growing at 5.3%.There was a slight drop in GDP from 8.7% to 3.2% in December the same year 2013,then a increase to 6.11% then a drop to 5.3% in August 2014.In December 2014 the GDP was 6.18% which shows an increase from 5.3% to 6.18% in period of three months.

4.2.5 Foreign Exchange Rates and Interest Rates Trend

In order to establish the trend of foreign exchange rates and interest rates, the researcher compared the variables on the same graph as indicated below in figure 4.5

Figure 4.6 Foreign Exchange Rates and Interest Rates Trend



Source: Researcher data (2015)

From the results, change in interest rates did not highly affect exchange rates in months of January 2010 to May 2010. However, an increase in interest rates in month of September 2011 to March 2013 shows a significant increase in exchange rates.

4.3 Regression Analysis

Multiple linear regression model was used to establish relationship between Exchange rates and interest rates in Kenya from the year 2010 to 2014.

Table 2: Model Summary

Model Summary									
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.651 _a	.423	.315	3.53767	.423	3.915	3	16	.028

a. Predictors: (Constant), Inflation Rate, Gross Domestic Product, Interest Rates

Table 2 shows model summary of regressed variable of the study. The correlation coefficient (R) value represents the degree and strength of relationship between dependent variable and the independent variables. Coefficient of correlation ranges between -1 and 1 and in this model the coefficient of correlation is 0.651 which indicates a positive correlation between Foreign exchange rates, interest rates, inflation rate and GDP. The R Squared is the coefficient of determination which indicates how much of the total variation in the dependent variable, Foreign exchange rate can be explained by the independent variable, interest rate, inflation rate and GDP. From the above the R squared statistic gives the goodness of fit of the model which shows how good the regression model approximates the real data points. An R squared of 1.0 indicates that the regression

line perfectly fit the data. The R squared of this model is 0.423 which shows that the model is a good fit of the actual data. The coefficient of determination of 0.423 implies that 42.3% of the variance in dependent variable, Foreign exchange rate can be explained by the independent variable, Interest Rates Inflations rate and GDP.

The model summary also indicates that the regression model predicts the dependent variable significantly well. The F test indicates the statistical significance of the regression model that was run. The $P < 0.028$, which is less than 0.05 indicates that, overall the regression model statistically and significantly predicts the outcome variable that is good fit for the data.

Table 3: Coefficients

Coefficients^a					
Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	87.215	4.932		17.684	.000
1 Interest Rates	-.306	.289	-.264	-1.057	.306
Gross Domestic Product	-.665	.432	-.372	-1.538	.144
Inflation Rate	.781	.393	.514	1.986	.064

a. Dependent Variable: Exchange Rates

The overall equation model for exchange rate, interest rates, inflation rates and GDP contemplated before at 3.4.1 was as follows:

$$Y_i = 87.45 - 0.306 x_1 - 0.665 x_2 + 0.0781 x_3 + 4.932$$

From the model, in any given month, the foreign exchange will be 87.215 when all the predictor values are zero. The model indicates that when the interest rates and Gross domestic product changes by one unit the foreign exchange rate will decrease by 0.306 and 0.335 respectively. On the other hand when inflation rate changes by one unit the exchange rate increases by 0.0781, and 4.932 represent the error term of the model.

To test the significance of each individual variable which was based at 0.05 the t-test was carried out. The result indicates the interest rate and Gross domestic product has a value of 0.306 and 0.144 against the exchange rate in the model respectively. This shows that the relationship between exchange rate, interest rate and Gross domestic product is not significant. The relationship between foreign exchange and inflation rate recorded at a rate of 0.064 which is not significant since it's more than p-value (P.0.05).

4.4 Correlation Analysis

The correlation table displays Pearson's correlation coefficient, significant values and the number of cases. The Pearson's correlation coefficient is a measure of strength of association between two variables. Pearson's correlation coefficient assumes the data are normally distributed. The value of the correlation coefficient ranges from -1 to 1. The sign of the correlation coefficient indicates the direction of the relation whether positive or negative.

When a Pearson correlation analysis was run on the data to test the level of association between, foreign exchange rate versus the value of the three independent variables, the results were as illustrated in table 4 below

Table 4: Correlation Analysis

		Correlations			
		Exchange Rates	Interest Rates	Gross Domestic Product	Inflation Rate
Exchange Rates	Pearson Correlation	1	.248	-.529*	.568**
	Sig. (2-tailed)		.291	.016	.009
Interest Rates	Pearson Correlation	.248	1	-.532*	.611**
	Sig. (2-tailed)	.291		.016	.004
Gross Domestic Product	Pearson Correlation	-.529*	-.532*	1	-.578**
	Sig. (2-tailed)	.016	.016		.008
Inflation Rate	Pearson Correlation	.568**	.611**	-.578**	1
	Sig. (2-tailed)	.009	.004	.008	
N		20	20	20	20

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

It is clear from table 4 that interest rate have a weak positive relationship with foreign exchange rate at the rate of 0.248. The relationship is not significant since the recorded value of 0.291 which is more than the p-value ($P > 0.05$). The Gross domestic product have a moderate strong negative relationship with foreign exchange rate at the rate of -0.529. The relationship is significant since it recorded a value of 0.016 which is less than the p-value. However, the inflation rate recorded a strong positive relationship with foreign exchange rate at 0.568 and the relationship is positive at 0.009 which is less than the p-value. This shows that the correlation is significant and foreign exchange rate and inflation rate are linearly related

CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMEDATIONS

5.1 Introduction

This chapter highlights the summary of the findings, conclusion and recommendation for the findings. It does also suggest areas for further research as well as limitations encountered during the research study.

5.2 Summary of Findings

The study was necessitated to understand the relationship that exists between the foreign exchange rates on interest rates in Kenya. The study found that the interest rate fluctuations do affect the foreign exchange rate in Kenya. From the study there is a relationship between foreign exchange rate and interest rates in Kenya but not significant. In the analysis of the regression model used, the study found that the model was fit for the data, but the interest rate could not be used alone to predict the changes in the foreign exchange rate. Other variables should used together with interest rate to predict the changes in foreign exchange rate.

The coefficient of determination value was 0.423; this meant that about 42.3% of the variation of the response variable foreign exchange rate can be explained by the three independent variables. This implies that the chosen variables specifically interest rate, inflation rate and GDP during the year of study 2010-2014 affects the foreign exchange rate by 42.3% and therefore 57.7% of the variation in foreign exchange rate was associated with other unexplained factors. The regression result also indicates that the relationship between interest rate, inflation rates and GDP on foreign exchange rate was significant at 5% level of significance with p-value of 0.028.

The correlation analysis also found that the relationship between foreign exchange rate and interest was positive at a rate of 0.248 but not significant. The relationship between foreign exchange rate and inflation rate was positive at the rate of 0.568 and the relationship was significant. However Gross domestic product indicated a negative relationship of -0.529 and the relationship was significant.

5.3 Conclusion

From the findings, the study concludes that interest rate has no significant effect on foreign exchange rate and it cannot be used alone to predict the movement of exchange rate. This is because there is a weak but positive relationship of 0.248 of between interest rate and foreign exchange rate. However Gross domestic product has a moderate strong negative relationship with foreign exchange rate and the relationship is significant; also inflation rate has strong and positive relationship which was significant.

In conclusion also the study found that there was relationship between foreign exchange rates and interest rates in Kenya but not significant since only 42.3% of the variations could be explained by variable in the models and 57.5% of the variation in the dependent variations was attributed to other unknown factors.

5.4 Recommendations

From the findings, the study recommends that in controlling the exchange rate in Kenya, the Central Bank alone through the use of central bank rate is not enough as it is evidence from the study that the level of inflation rate and GDP are important determinant of exchange rate in Kenya since they have a significant influence on exchange rate.

The government through Central Bank of Kenya (CBK) should come up with monetary policy that will have an impact on foreign exchange rate, thus making CBK intervention significant in stabilizing and predicting the movement of foreign exchange rate.

5.5 Suggestions for further study

The study as indicated was not all exhaustive on the factors affecting exchange rate and its relation with other factors like relative employment, relative corruption, taxation policies, political situation and market adjustment among others, which affect the foreign exchange rates, therefore future scholars and researcher, should investigate these factors in details. Further research also should be carried out to find out the effect of government intervention through CBK to control exchange rates.

5.6 Limitations of the study

The study limited itself to the relationship of exchange rate on interest rate, other factors like relative taxation and market adjustment also affect foreign exchange rate.

The study was also limited to period of five years a much longer period will have increased the accuracy of the findings.

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APPENDIX 1: Monthly Average Data

Times in Months	Exchange Rates	Interest Rates	Gross Domestic Product	INFLATION RATES
Jan 10-Mar 10	76.49	6.83	5.3	5.03
Apr 10-Jun 10	78.93	6.5	7	3.68
July 10-Sep 10	80.93	6	9.5	3.33
Oct 10-Dec 10	80.58	6	11.5	3.84
Jan 11-Mar 11	82.24	5.83	10.6	5.83
Apr 11-Jun 11	86.12	6.08	7.4	6.08
July 11-Sep 11	93.02	6.5	4.2	6.5
Oct 11-Dec 11	93.87	15.67	3.1	15.17
Jan 12-Mar 12	84.14	18	3.4	16.87
Apr 12-Jun 12	84.12	18	4.2	11.78
July 12-Sep 12	84.28	15.33	4.9	6.38
Oct 12-Dec 12	85.58	11.67	5.1	3.53
Jan 13-Mar 13	86.72	9.5	7	4.22
Apr 13-Jun 13	84.61	8.83	8.7	4.99
July 13-Sep 13	87.26	8.5	4.3	7.57
Oct 13-Dec 13	85.91	8.5	3.2	7.24
Jan 14-Mar 14	86.33	8.5	4.2	6.78
Apr 14-Jun 14	87.25	8.5	6.1	7.03
July 14-Sep 14	88.24	8.5	5.3	7.55
Oct 14-Dec 14	89.88	8.5	5	6.18

Sources: Central Bank of Kenya

