THE EFFECT OF CHANGES IN MONETARY POLICY AND BALANCE OF PAYMENT ON EXCHANGE RATES IN KENYA

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DECLARATION

I declare that this is my original work and has not been submitted at any academic institution for examination purposes.

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

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DEDICATION

This project is dedicated to my family members. May the Almighty God bless you abundantly

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LIST OF ABBREVIATIONS

BOP	- Balance of Payment
CBK	- Central Bank of Kenya
CBII	-Commercial Banks Intermediation Index
CBS	-Central Bank of Syria
DR	-Discount Rate
ERER	-Equilibrium Real Exchange Rate
FX	- Foreign Exchange
GDP	-Gross Domestic Product
IMF	-International Monetary Fund
INGOs	-International Non-Governmental Organisations
KSH	- Kenya Shilling
OMO	-Open Market Operations
SDRs	-Special Drawing Rights
RR	-Reserve Requirement
USD	- United States Dollar
VECM	-Vector Error Correction Model

ABSTRACT

Exchange rate, monetary policies and balance of payments are key tools in economic management and in the stabilization and adjustment process in Kenya. In empirical and theoretical finance and microeconomics, there has been a looming question of how changes in the monetary policy and the balance of payment policies in a country affect its currency's external value. The objective of the study was to examine the effect of changes in monetary policy and balance of payment on exchange rate in Kenya. The research method that was adopted in this research was the quantitative method. Secondary data was used in this study. Data on changes in monetary policy (CBK and commercial banks regulation rate (%)) was obtained from the Central Bank of Kenya on quarterly basis for the period January 2005 to December 2014. The data collected was analyzed using Multiple Regression Analysis Model with the help of the SPSS software. The study findings indicated that external debt, interest rate, monetary policy, balance of payment and inflation rate are statistically significant to exchange rate as indicated by the positive and strong Pearson correlation coefficients. Based on the research findings, the study recommends that balance of payments and monetary policies should be controlled appropriately by the policy makers so as to maintain exchange rate at a harmless point to the overall economy. The study further recommends that other determinants of exchange rate such as inflation and interest rate as significantly indicated in the study should be regularly checked and corrected to avoid a paradigm shift in the exchange rate which may negatively impact the economy. The government should also set up monetary policies on exchange rates so as to keep it friendly to the overall economy.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Over a long time now, there has been a raging debate on the effect on monetary policy and balance of payment on exchange rate. In Kenya, various scholars in the economic and finance front have come out to access the effect these two policies have on the exchange rate in Kenya (Diffu, 2011). Although the debate is still ongoing, various authors and researchers have come up with various assertions and conclusions on the effect of monetary policy and balance of payment on exchange rate in Kenya. One of the reasons why there has been this discussion has been due to the volatile nature of the Kenyan shilling especially in the past 10 years. The currency has gained and lost grounds against the world currencies over this period. At one period, the shilling has traded at less than sh70 against the dollar and at another period, the shilling came close to sh110 mark (Otuori, 2013). At one time, the shilling even came to be referred as the most volatile currency in the world, even surpassing the Zimbabwean currency. For this reason, it would be a good idea to do an independent research on the effect of monetary policy and balance of payment of exchange rate in Kenya. Monetary policy relates to the process in which a country's monetary authority controls money supply. On many occasions, the main target is the interest rate in a bid to promote both economic stability and growth. Balance of payment on the other hand is regarded as a statement or account which gives a summary of transactions of one economy with the rest of the world. As referred to as balance of international payment, balance of payment comprises of all transactions between the residents of one country and the residents of another nation. These transactions include goods, services, liabilities, financial claim, gits and incomes to other parts of the world (Misati, 2012).

Lastly, Exchange rate, as referred to as Agio, FX rate, forex rate or foreign exchange rate is a rate between two countries in which one currency is exchanged with the other. Exchange rate is also described as the value of one currency in relation to the other. For example, the value of the Kenya Shilling can be compared to that of the dollar. This means that an interbank exchange rate of Ksh84 to the US dollar means that Ksh84 will be exchanged for each dollar in the market (Kumar, 2010).

1.1.1 Monetary Policy

Monetary Policy is a key component of any pro-growth economic system and much so in developing economies such as the Kenyan Economy (Taylor: 2004). In general terms, monetary policy refers to a combination of measures designed to regulate the value, supply and cost of money in an economy in consonance with the expected level of economic activity (Nnanna; 2001). For most economies, the objectives of monetary policy include price stability, maintenance of Balance of Payments equilibrium, promotion of employment and output growth. Gbosi (2002), posits that monetary policy aims at controlling money supply so as to counteract all undesirable trends in the economy, these undesirable trends may include; unemployment, inflation, sluggish economic growth or disequilibrium in the Balance of Payments. Monetary policy may either be expansionary or restrictive. An expansionary monetary policy is designed to stimulate the growth of aggregate demand through increase in the rate of money supply thereby making credit more available and interest rates lower. An expansionary monetary policy is more appropriate when aggregate demand is low in relation to the capacity of the economy to produce goods and services. On the contrary, if the quantity of money is reduced or restricted, money income will rise slowly so that consumers spend less and funds for investment are difficult to acquire thereby decreasing aggregate investment (restrictive monetary policy).

Thus, to regulate monetary policy in the Kenyan economy, the Central Bank of Nigeria (CBK) employs various instruments which include; Open Market Operation (OMO), Reserve Requirement (RR) and Discount Rate (DR), CBK (1994). The success of monetary policy depends on the operating economic environment, institutional framework adopted, and the choice and mix of the instrument used. Owing to the nature of export and import, there exists a persistent Balance of Payments deficit in the economy. Sequel to the above, articulated efforts are made by monetary authorities especially, Central Banks, on how to drastically reduce the Balance of Payment s deficits in the economy. This is usually done through the formulation and implementation of appropriate monetary policy measures. The objective of this study is to; identify the extent to which monetary policy has achieved Balance of Payment stability in the economy.

1.1.2 Balance of Payment

The balance of payments is defined as a systematic record of economic and financial transactions for a given period of time, say one year, between residents of an economy and non-residents - rest of the world. These transactions involve the provision and receipts of real resources – goods, services and income and changes in claims on and liabilities to the rest of the world. Specifically, the balance of payments records transaction in goods, services and income, changes in ownership and other changes in an economy's holdings of monetary gold, Special Drawing Rights (SDRs) and claims on and liabilities to the rest of the world (Miller, 2009). It also records unrequited or unilateral transfers the provision or receipts of an economic value without the acceptance or relinquishing of something of equal value. Generally, transactions involving payments to a country by non-resident are classified as credit entries. Those involving payments by country to non-residents are debt entries (Khan, 2011).

Basically, the balance of payments is divided into the current and capital account. The capital account is made up of portfolio and direct investment, either long or short term capital and capital transfers. While the current account records all current transactions, which are transactions that include either the export or import of goods and services. They include merchandise and services (Ndung'u, 2012). The capital account also refers to charges in financial assets and liabilities, portfolio investment, external loan drawings and amortization and charges in short-term capital movements. However, it should be noted that development in the other sectors – real, monetary and public – has implications for the balance of payments. As a result, current account deficit may not necessarily be an inappropriate policy to pursue especially in a country that is for example, importing to increase domestic investment. However, in a short-term, import bills may remain unpaid or external reserves could be drawn down.

A long-term and more viable solution lies in ensuring balance of payments viability. A viable balance of payments position may be defined as a current account position, which can be financed on a sustainable basis by net capital movements on terms that are compatible with reasonable development, growth prospects and debt servicing capacity as well as macro-economic stability (Kumar, 2010). It can be seen that the balance of payments is linked with the

other accounts in a general equilibrium framework. This implies that disequilibrium in one sector; say external sector is transmitted to the other sectors and vice versa. Thus, there is need to achieve both internal and external balance.

According to Marsha (1994), two types of policy measures are used in dealing with balance of payments problems. These are expenditure switching measures and expenditure reducing policies. Expenditure reducing policies refer to fiscal policy (conducted by changing government expenditure and /or taxes) and monetary policy which refers to changes in money supply, which in turn affect interest rate. Expenditure switching policies refers to devaluation (depreciation) and revaluation (appreciation) of the country's currency. The aim of expenditure reducing policies is to reduce domestic expenditure on consumption and increase expenditure on investment, thus, releasing goods and services for exports while leaving aggregate output unchanged. The aim of expenditure switching policies is to switch domestic demand from imported goods to home made goods. However, the extent to which expenditure switching policies is achieved depends on elasticity of supply and demand for tradable goods. If the depreciation of the nominal exchange rate is matched by increase in wages, absorption and inflation, the real exchange rate would not depreciate and so the balance of payments would not improve. However, expenditure reducing policies have costs in terms of loss of output, investment and employment. The loss will be minimized if resources can be easily moved to the tradable goods sector.

1.1.3 Exchange Rate

Up to 1974, the exchange rate for the Kenya shilling was pegged to the US dollar, but after discrete devaluations the peg was changed to the special drawing rate (SDR). Between 1974 and 1981 the movement of the nominal exchange rate relative to the dollar was erratic. In general the rate depreciated by about 14% and this depreciation accelerated in 1981/82 with further devaluations. The exchange rate regime was changed to a crawling peg in real terms at the end of 1982. This regime was in place until 1990; a dual exchange rate system was then adopted that lasted until October 1993, when, after further devaluations, the official exchange rate was abolished. That is, the official exchange rate was merged with the market rate and the shilling was allowed to float. Exchange controls were maintained until the 1990s, initially in

response to the balance of payments crisis in 1971 /72. In order to conserve foreign exchange and control pressures on the balance of payments, the government chose controls instead of liberalization.

The controls were an easy response to contain balance of payments and inflationary pressures, but they created major distortions in the economy that were not evident until the early 1980s. The major instruments of monetary policy in Kenya have been open market operations, cash and liquidity ratios, credit ceilings, and reserve requirements. In the 1990s, the authorities have relied more on the indirect instruments, the most active being open market operations. The recurring policy objectives have been to maintain an exchange rate that would ensure international competitiveness while at the same time keeping the domestic rate of inflation at low levels, conducting a strict monetary stance and maintaining positive real interest rates. This has been difficult in practice (Misati, 2012). The floating exchange rate system adopted in the 1990s was expected to have several advantages for Kenya. First, it would allow a more continuous adjustment of the exchange rate to shifts in the demand for and supply of foreign exchange. Second, it would equilibrate the demand for and supply of foreign exchange by changing the nominal exchange rate rather than the levels of reserves. Third, it would give Kenya the freedom to pursue its monetary policy without having to be concerned about balance of payments effects. Thus the country would have an independent monetary policy, but one that was consistent with the exchange rate movements.

Under the floating system external imbalances would be reflected in exchange rate movements rather than reserve movements. However, the exchange rate was allowed to float in an environment of excess liquidity, and massive depreciation and high and accelerating inflation ensued. The mopping up process pushed the treasury bill rate up and, because this is the benchmark for other interest rates, all other interest rates shot up to historic high levels. The exchange rate was devalued three times in 1993. After 1993, the exchange rate appreciated under the influence of short-term capital flows taking advantage of the high interest rate on the treasury bills. Those who were importing on trade credit during this time were uncertain as to what prices they would have to pay for foreign exchange when their letters of credit were called

and hence wrote the expected foreign exchange redemption into their price structure. This increased the spiral of inflation.

1.1.4 Effect of Changes in Monetary Policy and Balance of Payment on Exchange Rate

In empirical and theoretical finance and microeconomics, there has been a looming question of how changes in the monetary policy and the balance of payment policies in a country affect its currency's external value. Various groups such as the World Bank and the International Monetary fund has sought to find out how the external value of a currency is affected by its own monetary policy. This has also been the case among scholars and financial experts not only in Kenya but also in many parts of the world. One of the actions that have aggravated this debate was the recommendation by the International Monetary Fund in 2008 to the Central Bank of Iceland to increase its interest rates in a bid to stop the constant depreciation of Iceland Krona (Zettelmeyer, 2009).

According to the microeconomic theory, themain contribution to help solve this problem lies on the exchange rate shooting model that was developed by Dornbusch in 1976. According to this theory, as a way of responding to the domestic monetary policy contraction, the real exchange rate shall normally exhibit an appreciation impact, which is then followed by a form of depreciation that is described as gradual. This response is due to no-arbitrage restriction and liquidity effect which is implied by interest parity that is not covered. This form of depreciation will continue until the point at which the long-run equilibrium is arrived at. In order for this to be arrived at, the real exchange rate equilibrium must be at par with the purchasing power parity (IMF, 2007).

There have also been numerous researches on the effect of balance of payment and monetary policy on exchange rate. In Kenya, various individuals on the learning institutions, government agencies as well as independent scholars have sought to ascertain effect that balance of payment has on exchange rate in the country. Over the last ten years, the deficit in balance of payment has been in the rise. In the fourth quarter of last year for example, faster import acceleration as compared to exports served to widen the deficit of balance of payment in Kenya to 10 per cent of the Gross Domestic Product. Over the last decade, imports in the country have witnessed a sharp increase, leading to an increase in the deficit from less than

1% in 2004 to close to 10% today. This statistics then show that value of imports in the country exceed income receipts, sales of products and services as well as foreign transfer. The increase in this deficit has been brought about by an increase in trade with Eastern countries such as China and India. Trading in China in particular has been on the rise in the last few years (IMF, 2010). However, the trading has mostly been on the import segment with little activity on the export segment. Some of the main reasons why the CBK believes can be attributed to the increase in the balance of payment has been due to the increased import of heavy machinery. Due to the ongoing increase in capital projects in the country such as construction of roads, airports, power projects and other investments, the government has been forced to make various forms of investments.

In order for balance of payment deficit or surplus to be in existence, trading between two countries must be in existence. This form of trading will involve the exchange of currencies between these two or more countries. It is therefore highly likely that trading between these countries may have an impact on the exchange rate in the country. In Kenya, the increased trading between the nation and other countries across the world may have a significant impact on the exchange rate in the country (Miller, 2009).

1.1.5 Monetary Policy, Balance of Payment and Exchange Rate in Kenya

Exchange rate, monetary policies and balance of payments are key tools in economic management and in the stabilization and adjustment process in Kenya. The real exchange rate is a measure of international competitiveness. Kenya's exchange rate policy has undergone various regime shifts over the years, largely driven by economic events, especially balance of payments crises. A fixed exchange rate was maintained in the 1960s and 1970s, with the currency becoming over-valued, though not extremely so. Exchange controls were maintained from the early 1970s until a market-determined regime was adopted in the 1990s (Ndung'u, 2012). The choice of exchange rate regime in Kenya is determined by various factors, such as the objectives pursued by the policy makers, the sources of shocks hitting the economy and the structural characteristics of the economy. But once the choice is made, the authorities are presumed to adjust their macroeconomic policies (especially fiscal and monetary policies) to fit the chosen exchange rate policy (Otuori, 2013). Despite the importance of the link between monetary and exchange rate policies in economic management, Kenya's policy makers have

little real information on which to base their decisions. Few studies have been done on Kenya to explain exchange rate movements, and even fewer have linked the exchange rate policy and the monetary policy.

The exchange rate policy has not been supported by the appropriate monetary policy. Indeed, the exchange rate policy accommodated monetary disequilibrium in order to protect reserves or to have a market determined exchange rate responding to excess money supply. This is inconsistent with the floating exchange rate policy, where the exchange rate should move to equilibrate reserves while monetary policy is independent. In Kenya Balance of payments is a macro variable and a statistical statement that systematically summarizes for a specific period, the economic transaction of an economy with the rest of the world. It records transactions that give rise to sets of accounts that indicates all the flows of value between residents of one country and the residents of other countries of the world that they enter into economic dealings. In other words, it reflects changes in the claims and liabilities of an economy with other countries of the world (Misati, 2012). Therefore it summarizes countries international transactions and it acts as a link to all the separated parts of international economics and it indicates whether the overall pattern of the country's balance of payments has achieved a sustainable equilibrium. This account helps us understand how people of Kenya trade the shilling for that of another country as well as the flow of human capital across as indicated by net private non-official capital flows and flows of official reserves. In other words, balance of payments records trade in financial assets and all those international transactions, which involve the exchange of money for something else and even including employees' compensation. Thus it gives a complete picture of the macroeconomic linkage among economies that Kenya engages in international trade and the changes in the country's indebtedness to foreigners and the corresponding receipts (Ndung'u, 2012).

In Kenya the monetary policy committee is the organ of the central bank responsible for formulating monetary policy. It was formed vide Gazette Notice 3771 on 30th April 2008 replacing the hitherto monetary policy advisory committee (MPAC).The membership of MPC is composed of the Governor ,who is the chairman of the committee, the deputy Governor ,who is the deputy chairman ,two members appointed by the Governor from the bank ,one being a person with executive responsibility within the bank for monetary policy analysis(Director

Research department)and the other person is a person with responsibility within the bank for monetary policy operations (External payment and reserve management);for external members who have knowledge ,experience and expert in matters relating to finance, banking ,fiscal and monetary policy who are appointed by the minister for finance ,The permanent secretary of the ministry of finance is a non -voting member of the committee or his designated alternate as representing the Treasury. Each external member of the committee serves for a term of 3 years which is renewable once (CBK Act, 2005). According to economic surveys (1966-2014) CBK pursued a rather passive monetary policy during 1966 to 1970 this is partly because the bank had not then acquired sufficient experience in the management of monetary policy and because the Kenyan economy had no serious macroeconomic problems to contend with during this period. The economy grew at rates around 8 per cent annually while inflation remained below 2 % apart from 1967 and 1969, both the country's balance of payments and budget recorded substantial surpluses during this period. The bank has now focused on laying down the necessary infrastructure for effective management of monetary policy in Kenya.

1.2 Research Problem

Changes in monetary policies and balance of payment are very important determinant of exchange rate in Kenya. Duesenberry, Gray, and McPherson, (2001) suggests that the basic objective of the exchange rate regime is to establish an exchange rate consistent with a sustainable current account balance and with the promotion of exports needed for continued growth. Key to this objective is a range of actions in the areas of monetary, fiscal, and exchange rate policy, as well as management of the public debt.

In the recent past, the Kenyan shilling has been faced by various uncertainties. The shilling has been faced by both an increase and decrease in value over the last five years. Despite being the strongest currency in East and Central Africa, the shilling has been met by its fair share of challenges in the recent past. Before 2010, the currency was trading at a rate of between 71 and 75 against the dollar. Bymid 2011, the rate had dropped to 83. However, the situation worsened later that year when the dollar hit an all-time low of 100. By the close of the year, the shilling had at one time hit 110 against the dollar. This slump was seen as having negative effects on the economy and something had to be done to stabilize it. The Central

Bank of Kenya (CBK) moved fast to tighten liquidity through increasing money market operations and the interest rates. By January the following year, the efforts of the Central bank coupled with tea export inflows helped to push the exchange rate to 84 shillings. Today, the exchange has stabilized with the shilling trading at between 83 and 86 against the dollar. Against the Euro the shilling is trading at between 115-120 shillings while against the Pound it is trading at between 140-145 shillings. However, despite the stability, the fluctuation of the currency in 2011 showed the vulnerability of the currency to external factors.

Various studies have been done on effect of exchange rates on different performance indicators in an economy. However, these studies have provided contradictory and inconclusive evidence on the relationship between these variables and none have focussed on effect of changes in monetary policy and balance of payments on exchange rate in Kenya.

Globally, Kandil (2007) did a study on the effects of exchange rate fluctuations on real output, balance of payment, the price level and the real value of components of aggregate demand in Turkey. He found thatunanticipated currency fluctuations help to determine aggregate demand through exports, imports, and the demand for domestic currency. Mouyad (2009) conducted a research to describe and investigate the factors which determine the equilibrium real exchange rate (ERER) and its volatility effect in the Syrian economy. He found that the actual Syrian (RER) has been volatile around its equilibrium level. Santoso (2011) attempts to analyse the relationship between Indonesian export volume, as the dependent variable, and real exchange rate and Gold Exchange rate. He found that exchange rate variable shows a negatively relationship in the long term with Indonesian export, and it is also affects the export volume decrease in the short run.

In Kenya, Diffu (2011) did a case study that sought to establish the relationship between foreign exchange risk and financial performance of Kenya Airways for the period 2007 to 2010. The study found statistically significant coefficients for all the variables used in the model. From the results of the findings there was a negative relationship between foreign exchange risk and financial performance of Kenya Airways.

Onyancha (2011) did a study on the impact of exchange rate movements on the financial performance of International Non-Governmental Organizations (INGOs) based on three variables namely asset holding, investment capacity and liability management. Based on the data collected and after analysis, it was determined that out of the financial performance indicators tested, there was a significant indication that financial performance could be affected by foreign exchange gains and losses and other factors most importantly management support of INGOs. Ngerebo (2012) did a study on the impact of foreign exchange fluctuation on the intermediation of banks in Nigeria (1970 – 2004). The study empirically examined the impact of foreign exchange fluctuation on the intermediation of banks in Nigeria with a view to enabling the banking system work efficiently and effectively towards the proper valuation of the Naira. The study used data sourced mainly from Central Bank of Nigeria publications. In conducting this relationship study, sample sizes of 34 years (1970 – 2004) were collected and analyzed. The analysis empirically examined the relationship between exchange rate fluctuation and commercial banks intermediation index using annual average exchange rate as independent variables while Commercial Banks Intermediation Index (CBII) represented the dependent variable.

Basing on the reviewed studies, none have focussed on effect of changes in monetary policy and balance of payments on exchange rate in Kenya. The study seeks to address these gaps firstly by conceptualizing a multi-dimensional joint relationship between monetary policies, balance of payments and exchange rate by answering the question; how do changes in monetary policy and balance of payments affect exchange rate in Kenya?

1.3 Objective of the Study

To examine the effect of changes in monetary policy and balance of payment on exchange rate in Kenya

1.4 Value of the Study

The following research will be of great value to various individuals in Kenya.

First, the information collected in this research will be of great significance to financial experts in the country. Through the research, these individuals will be able to understand the effect that monetary policy and balance of payment has on the exchange rate in the country. In

addition, through this analysis, these individuals will be able to do a forecast on the performance of the Kenya Shilling in the foreseeable future.

Moreover, the research will be of great value to researchers and academicians. As stated earlier, not much research has been carried out on the effect of monetary policy and balance of payment on exchange rate in Kenya. Therefore, through this study, the researcher will be able to add a body of knowledge on the factors that affect the exchange rate.

Moreover, the research will also be very useful to policy makers and regulators. These individuals will be able to gain more information on how the exchange rate is affected by monetary policy and balance of payment. In doing this therefore, they will be in a better position to make concrete policies and also ensure that right regulatory procedures are introduced.

CHAPTER TWO

LITERATURE REVIEW

2.1Introduction

This chapter looks at the literature on monetary policy and balance of payment by specifically looking at the theoretical review on the topic of study and the specific determinants of exchange rate and also stating some studies that have previously been studied on the effects of monetary policy and balance of payment on exchange rate in Kenya. In summary this gives a theoretical foundation to the topic of study.

2.2 Theoretical Review

This section explains some of the specific theories that can be related to the topic of study on effects of monetary policy and balance of payment on exchange rate. The theories are Flow-oriented theory, AA-DD model and Overshooting model as discussed below:

2.2.1 Flow-Oriented Theory

This theory was proposed by Dornbusch and Fisher, (1980). It focuses on the association between the current account and the exchange rate. Dornbusch and Fisher developed a model of exchange rate determination that integrates the roles of relative prices, expectations, and the assets markets, and emphasis the relationship between the behaviour of the exchange rate and the current account. Dornbusch and Fisher (1980) argue that there is an association between the current account and the behaviour of the exchange rate.

It is assumed that the exchange rate is determined largely by a country's current account or trade balance performance. These models posit that changes in exchange rates affect international competitiveness and trade balance, thereby influencing real economic variables such as real income and output. That is, goods market model suggests that changes in exchange rates affect the competitiveness of a firm, which in turn influence the firm's earnings or its cost of funds and hence its stock price. On a macro level, then, the impact of exchange rate fluctuations on stock market would depend on both the degree of openness of domestic economy and the degree of the trade imbalance. Thus, goods market models represent a positive relationship between stock prices and exchanges rates with direction of causation

running from exchange rates to stock prices. The conclusion of a positive relationship stems from the assumption of using direct exchange rate quotation (Stavarek, 2004). This theory helps the study to synthesis the expected results on the influence of changes in balance of payments on exchange rates basing on empirical evidence.

2.2.2 AA-DD Model

This theory was proposed by Suranovic (2010). It postulates that Government policies work differently under a system of fixed exchange rates rather than floating rates. Monetary policy can lose its effectiveness whereas fiscal policy can become super effective. In addition, fixed exchange rates offer another policy option, namely, exchange rate policy. Even though a fixed exchange rate should mean the country keeps the rate fixed, sometimes countries periodically change their fixed rate. He concludes with a case study about the decline of the Bretton Woods fixed exchange rate system that was in place after World War II. The AA-DD model represents a synthesis of the three previous market models: the foreign exchange (Forex) market, the money market, and the goods and services market. In a sense, there is really very little new information presented. Instead, he provides a graphical approach to integrate the results from the three models and to show their interconnectedness. However, because so much is going on simultaneously, working with the AA-DD model can be quite challenging. The AA-DD model is described with a diagram consisting of two curves (or lines): an AA curve representing asset market equilibriums derived from the money market and foreign exchange markets and a DD curve representing goods market (or demand) equilibriums. The intersection of the two curves identifies a market equilibrium in which each of the three markets is simultaneously in equilibrium. Thus we refer to this equilibrium as a super equilibrium.

The AA-DD model helps in understanding how changes in macroeconomic policy, both monetary and fiscal, can affect key aggregate economic variables when a country is open to international trade and financial flows, all the while accounting for the interaction of the variables among themselves. Specifically, the model is used to identify potential effects of fiscal and monetary policy on exchange rates, trade balances, GDP levels, interest rates, and price levels both domestically and abroad. Suranovic (2010) analyses these policies under both floating and fixed exchange rate regimes.

Until the 1970s, exports and imports of merchandise were the most important sources of supply and demand for foreign exchange. Today, financial transactions overwhelmingly dominate. When the exchange rate rises, it is generally because market participants decided to buy assets denominated in that currency in the hope of further appreciation. Economists believe that macroeconomic fundamentals determine exchange rates in the long run. The value of a country's currency is thought to react positively, for example, to such fundamentals as an increase in the growth rate of the economy, an increase in its trade balance, a fall in its inflation rate, or an increase in its real—that is, inflation-adjusted—interest rate.The theory outlines the policies necessary for the adjustments in the exchange rates with monetary policies given priority in exchange rate fluctuations thus the study will rely on this model to draw conclusions on the current study.

2.2.3 Overshooting Model

This theory was propounded by Dornbusch (1974)." In this theory, an increase in the real interest rate—due, for example, to a tightening monetary policy—causes the currency to appreciate more in the short run than it will in the long run. The explanation is that international investors will be willing to hold foreign assets, given that the rate of return on domestic assets is higher because of the monetary tightening, only if they expect the value of the domestic currency to fall in the future. This fall in the value of the domestic currency would make up for the lower rate of return on foreign assets. The only way the value of the domestic currency will fall in the future, given that the domestic currency's value rises in the short run, is if it rises more in the short run than in the long run and hence the term "overshooting." An advantage of this theory over the international quantity theory of money is that it can account for fluctuations in the real exchange rate. The theory empirically gives emphasis on the importance of monetary policy and thus will help the study shed the light on the effect of the changes in monetary policy on exchange rates.

2.3 Determinants of Exchange Rate

Apart from monetary policy and balance of payment, there are various factors that affect the exchange rate in a country. Some of these are discussed below.

2.3.1 Balance of Payments

According to Solnik (2000) the balance of payments approach was the first approach for economic modeling of the exchange rate. The balance of payments approach tracks all of the financial flows across a country's borders during a given period. All financial transactions are treated as a credit and the final balance must be zero. Types of international transactions include: international trade, payment for service, income received, foreign direct investment, portfolio investments, short- and long-term capital flows, and the sale of currency reserves by the central bank.

A ratio comparing export prices to import prices, the terms of trade is related to current accounts and the balance of payments. If the price of a country's exports rises by a greater rate than that of its imports, its terms of trade have favorably improved. Increasing terms of trade, shows greater demand for the country's exports. This, in turn, results in rising revenues from exports, which provides increased demand for the country's currency (and an increase in the currency's value). If the price of exports rises by a smaller rate than that of its imports, the currency's value will decrease in relation to its trading partners (Solnik, 2000).

2.3.2 Monetary Policy

Monetary policy rests on the relationship between the rates of interest in an economy, that is the price at which money can be borrowed, and the total supply of money (Khan, 2011). Monetary policy uses a variety of tools to control one or both of these, to influence outcomes like economic growth, inflation, exchange rates with other currencies and unemployment. Where currency is under a monopoly of issuance, or where there is a regulated system of issuing currency through banks which are tied to a central bank, the monetary authority has the ability to alter the money supply and thus influence the interest rate to achieve policy goals (Misati, 2012).

2.3.3 Interest Rates

Interest rates, inflation and exchange rates are all highly correlated. By manipulating interest rates, Central Banks exert influence over both inflation and exchange rates, and changing interest rates impact inflation and currency values. Higher interest rates offer lenders in an economy a higher return relative to other countries. Therefore, higher interest rates attract foreign capital and cause the exchange rate to rise. The impact of higher interest rates is

mitigated, however, if inflation in the country is much higher than in others, or if additional factors serve to drive the currency down. The opposite relationship exists for decreasing interest rates - that is, lower interest rates tend to decrease exchange rates (Bergen, 2010).

Karfakis & Kim (1995) using Australian exchange rate data found that unexpected current account deficit is associated with exchange rate depreciation, and a rise in interest rates. Evidence is found that current account deficits diminishes domestic wealth, and may lead to overshooting of exchange rates. A fall in the real value of currency was also reported by (Engel & Flood, 1985),(Obstfeld & Rogoff, 1995) and (Dornbusch & Fisher, 2003).

There has also been a surge and collapse in international capital flows into developing countries in the recent decades. Sudden outflow of capital is another major concern when it can drastically affect exchange rates as were witnessed during several financial crises of Brazil, East Asia, and Mexico. These capital outflows affect domestic output, real exchange rates, capital and current account balances for years after the crises.

2.3.4 Inflation Rate

As a general rule, a country with a consistently lower inflation rate exhibits a rising currency value, as its purchasing power increases relative to other currencies. During the last half of the twentieth century, the countries with low inflation included Japan, Germany and Switzerland, while the U.S. and Canada achieved low inflation only later. Those countries with higher inflation typically see depreciation in their currency in relation to the currencies of their trading partners. This is also usually accompanied by higher interest rates (Bergen, 2010).

Inflation means a sustained increase in the aggregate or general price level in an economy. Inflation means there is an increase in the cost of living. There is widespread agreement that high and volatile inflation can be damaging both to individual businesses and consumers and also to the economy as a whole. Generally, the inflation rate is used to measure the price stability in the economy. A low inflation rate scenario will exhibit a rising currency rate, as the purchasing power of the currency will increase as compared to other currencies.

2.3.5 External Debt

According to Bergen (2010) countries will engage in large-scale deficit financing to pay for public sector projects and governmental funding. While such activity stimulates the domestic economy, nations with large public deficits and debts are less attractive to foreign investors. This is because a large debt encourages inflation, and if inflation is high, the debt was serviced and ultimately paid off with cheaper real dollars in the future.

When government borrows, the debt is a public debt. Public debts are either internal or external, incurred by the government through borrowing in the domestic and international markets so as to finance domestic investment. Debts are classified into two i.e. productive debt and dead weight debt. When a loan is obtained to enable the state or nation to purchase some sort of assets, the debt is said to be productive e.g. money borrowed for acquiring factories, electricity, refineries etc. However, debt undertaken to finance wars and on current expenditures is dead weight debt (Kamau& Sichei, 2013).

2.4 Empirical Review

Kandil (2007) examines the effects of exchange rate fluctuations on real output, balance of payment, the price level and the real value of components of aggregate demand in Turkey. The theoretical model decomposes movements in the exchange rate into anticipated and unanticipated components. The data under investigation are for Turkey over the sample period 1980–2004. Unanticipated currency fluctuations help to determine aggregate demand through exports, imports, and the demand for domestic currency, and aggregate supply through the cost of imported intermediate goods and producers' forecasts of relative competitiveness. Anticipated exchange rate appreciation has significant adverse effects, Unanticipated exchange rate fluctuations have asymmetric effects. Currency depreciation increases net exports and increases the cost of production. Similarly, currency appreciation decreases net exports and the cost of production. The combined effects of demand and supply channels determine the net results of exchange rate fluctuations on real output and price. She shows that the anticipated exchange rate appreciation has positive impact on inflation rate and negative impact on investment and unanticipated exchange rate appreciation raises price inflation. However the study failed to incorporate a composite index of the influence of both the changes in monetary policies and balance of payments on exchange rates.

Mouyad (2009) conducted a research to describe and investigate the factors which determine the equilibrium real exchange rate (ERER) and its volatility effect in the Syrian economy over the period 1980-2008, using two estimation techniques, the Vector Error Correction Mode (VECM) and ARCH Model. Three main results are derived from the analysis: first, the actual Syrian (RER) has been volatile around its equilibrium level; in contrast, the speed of adjustment is relatively slow. Results from ARCH model estimation shows that the real shocks volatility will persist, so that shocks will die out rather slowly, and lasting misalignment seems to have occurred; second, the expected decline in Syrian oil production would require a significant depreciation of (RER), since its impact is relatively important; third, to address the challenges of the Syrian economy and to allow (RER) to converge easily to its equilibrium level, a more flexible exchange rate system was needed. Therefore, the Central Bank of Syria (CBS) should move regularly towards greater flexibility in the exchange rate regime, which would also facilitate a gradual increase in central bank independence and promote indirect monetary policy instruments. Whilethe study sought to address this question and the puzzle associated with it, little information has been collected on the effects of changes in monetary policies and balance of payments to changes in exchange rate in emerging markets like Kenya. This is especially because many of these developing nations do not have a significant record of the floating exchange rate regime.

Santoso (2011) attempts to analyse the relationship between Indonesian export volume, as the dependent variable, and real exchange rate (Rp/US$), G8's GDP, and Gold Exchange rate. His data consisted of a time series form spanning from 1971 to 2007. In other words, the data were in the form annually. U S $ exchange rate variable shows a negatively relationship in the long term with Indonesian export, and it is also affects the export volume decrease in the short run. On the other hand, Gold exchange rate and G-8's GDP have positive and significant impact in the long run. The study considered only balance of payments in terms of export volume and failed to take in to consideration the monetary policies which are key to changes in exchange rates and also used a time series form spanning from 1971 to 2007 which is considered old data due to rapid changes in the world economy. This study therefore aims to fill the gap by taking

in to account the changes in monetary policies and balance of payments and also considering current data from 2010-2014.

Onyancha (2011) did a study on the impact of exchange rate movements on the financial performance of International Non-Governmental Organizations (INGOs) based on three variables namely asset holding, investment capacity and liability management. Based on the data collected and after analysis, it was determined that out of the financial performance indicators tested, there was a significant indication that financial performance could be affected by foreign exchange gains and losses and other factors most importantly management support of INGOs. The study therefore was based on the financial performance of International Non-Governmental Organizations (INGOs) based on three variables namely asset holding, investment capacity and liability management as opposed to the current study which is based on changes in monetary policies, balance of payments and exchange rates mostly in financial institutions in Kenya.

Diffu (2011) did a case study that sought to establish the relationship between foreign exchange risk and financial performance of Kenya Airways for the period 2007 to 2010. The study found statistically significant coefficients for all the variables used in the model. From the results of the findings there was a negative relationship between foreign exchange risk and financial performance of Kenya Airways. The study was based on financial performance of Kenya Airways which is a service industry which may not be a true representation to the financial sector which is highly influenced by monetary policies, balance of payment and changes in exchange rates.

Ngerebo (2012) did a study on the impact of foreign exchange fluctuation on the intermediation of banks in Nigeria (1970 – 2004). The study empirically examined the impact of foreign exchange fluctuation on the intermediation of banks in Nigeria with a view to enabling the banking system work efficiently and effectively towards the proper valuation of the Naira. The study used data sourced mainly from Central Bank of Nigeria publications. In conducting this relationship study, sample sizes of 34 years (1970 – 2004) were collected and analyzed. The analysis empirically examined the relationship between exchange rate fluctuation and commercial banks intermediation index using annual average exchange rate as independent

variables while Commercial Banks Intermediation Index (CBII) represented the dependent variable. Using SPSS to conduct the regression and correlation analysis, the study found that there is a positive relationship between foreign exchange fluctuation and CBII, that only about 28% of the changes in CBII is accounted for by variations in foreign exchange(that is, after adjusting for sample size), since the adjusted R2 = 0.278. It also revealed that at 5% significance level, the critical T-value of 2.042 is less than the computed T-value of 3.754, hence, the rejection of Ho. The result led to the conclusion that exchange rate fluctuation has significant impact on banks' intermediation. This study was based on Nigeria commercial banks and considered Commercial Banks Intermediation Index (CBII) which may have not taken in to account factors such as monetary policies and balance of payments.

Otuori (2013) conducted a study that sought to investigate the determinant factors of exchange rates and their effects on the performance of commercial banks in Kenya. The results showed that interest rate and external debt had positive and significant effects on performance while inflation rate and external debt had negative and significant effects on performance. The study concluded that higher levels of interest rate lead to higher profitability in commercial banks in Kenya. The study further concluded that higher levels of inflation rate result in lower bank profitability in Kenya. The study also concluded that higher levels of external debt result in lower bank profitability in Kenya. Lastly, the study concluded that higher levels of exports and imports lead to higher profitability in commercial banks. The study however did not take in to account the effect of monetary policy which is a major determinant factor of exchange rates changes in an economy.

2.5 Summary of Literature Review

A study by Otuori (2013) on the determinant factors of exchange rates and their effects on the performance of commercial banks in Kenya found that interest rate and external debt had positive and significant effects on performance while inflation rate and external debt had negative and significant effects on performance. The study however did not take in to account the effect of changes in monetary policy which is a major determinant factor of exchange rates changes in an economy. A study by Ngerebo (2012) on the impact of foreign exchange fluctuation on the intermediation of banks in Nigeria (1970 – 2004) revealed that that exchange rate fluctuation has significant impact on banks' intermediation. This study was based on

Nigeria commercial banks and considered Commercial Banks Intermediation Index (CBII) which may have not taken in to account factors such as changes in monetary policy and balance of payments.

A study by Diffu (2011)on the relationship between foreign exchange risk and financial performance of Kenya Airways for the period 2007 to 2010 and found that there was a negative relationship between foreign exchange risk and financial performance of Kenya Airways. However the study was based on financial performance of Kenya Airways which is a service industry which may not be a true representation to the financial sector which is highly influenced by monetary policies, balance of payment and changes in exchange rates. Santoso (2011) analysed the relationship between Indonesian export volume, as the dependent variable, and real exchange rate (Rp/US$), G8's GDP, and Gold Exchange rate. The study considered only balance of payments in terms of export volume and failed to take in to consideration the monetary policies which are key to changes in exchange rates and also used a time series form spanning from 1971 to 2007 which is considered old data due to rapid changes in the world economy. This study therefore aims to fill the gap by taking in to account the changes in monetary policies and balance of payments and also considering current data from 2010-2014.Kandil (2007) examines the effects of exchange rate fluctuations on real output, balance of payment, the price level and the real value of components of aggregate demand in Turkey. The study shows that the anticipated exchange rate appreciation has a positive impact on inflation rate and negative impact on investment and unanticipated exchange rate appreciation raises price inflation. However the study failed to incorporate a composite index of the influence of both the changes in monetary policies and balance of payments on exchange rates.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter describes the methods that were used to collect and analyze data in order to accomplish the study objective. These methods included research design, data collection instruments, data collection procedures and data analysis procedures.

3.2 Research Design

According to Mugenda and Mugenda (1999) research design is the outline plan or scheme that is used to generate answers to the research problems. It is basically the structure and plan of investigation.

The research method that was adopted in this research was the quantitative method since the paper is more concerned with the relationships between the variables and analysis of the causal using numerical data and statistics. The quantitative method focuses on the measurement and analysis of causal and effect relationship between variables. It is more concerned with the issues of design, measurement and sampling (Bryman and Bell, 2007).

3.3 Data Collection

Secondary data was used in this study. Data on changes in monetary policy (CBK and commercial banks regulation rate (%)) was obtained from the Central Bank of Kenya on quarterly basis for the period January 2005 to December 2014.

Data on changes in balance of payment was extracted from the CBK on quarterly basis for the period January 2005 to December 2014. This will also be in percentage. Data on exchange rate was determined from Central Bank of Kenya and the study will focus on the KSHS/USD quarterly forex exchange rate for the 10 year period January 2005 to December 2014.

3.4 Data Analysis

This refers to the way in which the data was collected and interpreted. Specifically Statistical Package for Social Science (SPSS) will be used for the study data analysis. The data collected was analyzed using Multiple Regression Analysis Model. The aim of the regression analysis was to analyze data as well as to quantify relationships among variables expressed via an equation for predicting typical values of one's variable given the values of other variables.

3.4.1 Analytical Model

This study used multiple regression model with the following variables: Dependent variable; exchange rate which measures the realized changes between the local currency (Kenya Shillings and the US dollars) and controllable variables; changes in monetary policy and balance of payments. The study was based on the following empirical model which is based on quarterly data for the 10 year period January 2005 to December 2014

$$Y=\alpha+\beta_1 X_1+\beta_2 X_2+\beta_3 X_3 \ +\beta_4 X_4+\beta_5 X_5 \ +\mu_1$$

Where:

Y = Exchange rate (The KSH against the USD)

X_1= Monetary policy (The % change in CBK and Commercial banks Regulation rate)

X_2= Balance of payments (The % change in the difference between the current account and the capital account)

X_3= Interest rate (The % or a ratio of the principal borrowed or invested)

X_4= Inflation rates (The % increase in prices or the purchasing power of money

X_5= External debt (The % of a country's debt that was borrowed from foreign lenders including commercial banks, governments or international financial institutions

α = the constant or intercept

β_1=Regression coefficients of variables i which shows the sensitivity of Y to unit change in variable i

μ_1= the error term

3.4.2 Test of Significance

Data was entered into Statistical Package for Social Sciences (SPSS) version 21 and Microsoft Office Excel and analyzed using descriptive analysis such as percentage mean and Standard deviation, correlation and regression analyses. The correlation coefficients from the regression showed the effect (whether positive or negative) of the independent variables on the dependent variable. t –test was used to show the significance of the relationship between the controllable variables and exchange rate. Significance of the relationships was tested at 95% confidence level. Other statistical tools such as F test for joint significance of all coefficients and R-squared for the explanatory power of the model were used.

CHAPTER FOUR

DATA ANALYSIS, RESULTS AND INTERPRETATION

4.1 Introduction

The broad objective of the study was to examine the effect of changes in monetary policy and balance of payment on exchange rate in Kenya. The chapter presents findings of the study on the basis of both descriptive and inferential statistics. The details of descriptive analysis using frequency distribution tables, descriptive statistics using means and t-tests was used for ranking the variables under investigation.

4.2 Descriptive statistics

Descriptive measures involved mean, standard deviation and standard error of estimate. The variables aggregate score was computed as the simple average of the mean scores of the ten years period. Mean is a measure of central tendency used to describe the most typical value in a set of values. In addition, standard error of mean (SE) was computed. Standard error of mean is a measure of reliability of the study results. Standard deviation shows how far the distribution is from the mean. The results of the descriptive statistics of the variables under study for a period of ten years (2005-2014) are as indicated in table 4.1

Table 4.1 Descriptive statistics (2005-2014)

	N	Mean	Std. Deviation	Std. Error Mean	t	Sig. (2-tailed)
Exchange rate	30	74.1130	6.44024	2.03658	36.391	.000
Monetary Policy	30	13.2730	2.45284	.77566	17.112	.000
Balance of payment	30	42.5300	4.50972	1.42610	29.823	.000
Interest rate	30	5.7000	6.42996	2.03333	2.803	.021
Inflation rate	30	16.5270	1.78000	.56289	29.361	.000
External debt	30	48.8280	13.25102	4.19034	11.653	.000

Source; Research Findings

The findings in Table 4.3 indicate that variables had t-values ranging from 2.803 to 36.391, $p<0.05$implying that these variables had statistically significant differences and variations across the years. Exchange rate had a mean of 74.113, monetary policy 13.273, balance of payment 42.53, interest rate 5.7, inflation rate 16.527 and external debt 48.828. The positive means and the respective smaller standard deviations imply that all the variables had a significant performance across the period studied.

4.3 Inferential Statistics

Inferential statistics refers to mathematical methods that employ probability theory for deducing the properties of a population from the analysis of the properties of a data sample drawn from it. This involved testing the assumptions, regression analysis, correlation analysis and analysis of variance.

4.3.1 Testing the Assumptions

The study further performed the tests on statistical assumptions i.e. test of regression assumption and statistic used. This included test of normality, linearity, independence, homogeneity and collinearity. Normality was tested using the Shapiro-Wilk test which has power to detect

departure from normality due to either skewness or kurtosis or both. Its statistic ranges from zero to one and figures higher than 0.05 indicate the data is normal (Razali and Wah, 2011). Linearity was tested by use of ANOVA test of linearity which computes both the linear and nonlinear components of a pair of variables whereby nonlinearity is significant if the F significance value for the nonlinear component is below 0.05 (Zhang *et al*., 2011). Independence of error terms, which implies that observations are independent, was assessed through the Durbin-Watson test whose statistic ranges from zero to four. Scores between 1.5 and 2.5 indicate independent observations (Garson, 2012).

Homoscedasticity was tested by use of Levene's test of homogeneity of variances. If the Levene statistic is significant at $\alpha = 0.05$ then the data groups lack equal variances (Gastwirth *et al*., 2009). Levene's test measures whether or not the variance between the dependent and independent variables is the same. Thus it is a check of whether the spread of the scores (reflected in the variance) in the variables are approximately similar (Bryk andRaudenbush, 1988). Multicollinearity was tested by computing the Variance Inflation Factors (VIF) and its reciprocal, the tolerance. It is a situation in which the predictor variables in a multiple regression analysis are themselves highly correlated making it difficult to determine the actual contribution of respective predictors to the variance in the dependent variable. The multicollinearity assumption has a VIF threshold value of 10 maximum (Robinson and Schumacker, 2009).

Five assumptions of regression were tested and their results together with those of the test for reliability are summarized in Table 4.2. The threshold levels for the respective test statistics are listed below each assumption. For multicollinearity both the variance inflation factor (VIF) and its reciprocal (Tolerance) values are listed, the latter in parentheses. The results showed that the assumptions of regression were met and subsequently the data were subjected to further statistical analysis including correlation and regression as discussed in the following subsections.

Table 4:2 Results of Tests of Statistical Assumptions (Test of regression assumption and statistic used)

	N	**Normality** ***(Shapiro-Wilk test)***	**Linearity** ***(ANOVA test)***	**Independence** ***(Durbin-Watson test)***	**Homogeneity** ***(Levene test)***	**Collinearity** ***VIF (Tolerance test)***
Threshold: Assumption is met if		p > 0.05	p > 0.05	1.5- 2.5	p > 0.05	VIF 10 max
Monetary policy	30	0.39	0.42	2.02	0.32	1.25 (0.80)
Balance of payments	30	0.66	0.37	1.64	0.47	1.59(0.63)
Interest rate	30	0.10	0.16	1.73	0.78	1.51(0.66)
Inflation rates	30	0.10	0.31	2.03	0.75	1.47 (0.71)
External debt	30	0.28	0.31	2.13	0.21	1.25 (0.80)
Exchange rate	30	0.55	0.48	1.75	0.58	1.59 (0.63)

Source; Research Findings

Normality was tested using the Shapiro-Wilk test which has power to detect departure from normality due to either skewness or kurtosis or both. All the readings in this study were above 0.05 confirming normality. Normality assumes that the sampling distribution of the mean is normal. Further Linearity was tested by use of ANOVA test of linearity which computes both the linear and nonlinear components of a pair of variables whereby nonlinearity is significant if the F significance value for the nonlinear component is below 0.05 (Zhang *et al*., 2011). All the computed readings were above 0.05 confirming linear relationships (constant slope) between the

predictor variables and the dependent variable. The study further assessed Independence of error terms, which implies that observations are independent through the Durbin-Watson test whose statistic ranges from zero to four. In the current study the test results ranged between 1.81 and 2.21 supporting independence of error terms.

Homoscedasticity was tested by use of Levene's test of homogeneity of variances. The test was not significant at $\alpha = 0.05$ confirming homogeneity. Multicollinearity was tested by computing the Variance Inflation Factors (VIF) and its reciprocal, the tolerance. It is a situation in which the predictor variables in a multiple regression analysis are themselves highly correlated making it difficult to determine the actual contribution of respective predictors to the variance in the dependent variable. The multicollinearity assumption has a VIF threshold value of 10 maximum (Robinson and Schumacker, 2009). In the current study tolerance ranged from 0.60 to 0.80 and therefore its reciprocal, the VIF was between one and two, way below the threshold.

4.3.2 Regression Analysis

The study carried out a regression analysis to determine the magnitude of the relationship between the independent variables and the dependent variable. The coefficient of determination is a measure of how well a statistical model is likely to predict future outcomes. The coefficient of determination, r^2 is the square of the sample correlation coefficient between outcomes and predicted values. As such it explains the extent to which changes in the dependent variable can be explained by the change in the independent variables or the percentage of variation in the dependent variable (exchange rate) that is explained by all the five independent variables (External debt, Interest rate, Monetary policy, Balance of payment, Inflation rate).

Table 4.3 Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.831[a]	.690	.303	5.37539

a. Predictors: (Constant), External debt, Interest rate, Monetary policy, Balance of payment, Inflation rate Source;

Source; Research Findings

The five independent variables that were studied, explain 69.0% of the exchange rate as represented by the R^2. This therefore means the independent variables contribute about 69.0% to variations in exchange rate while other factors not studied in this research contribute the remaining percentage. Therefore, further research should be conducted to investigate the other factors that influence exchange rate.

Table 4.4: Coefficients

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.207	2.948		.410	.685
	External debt	.245	.115	-.332	2.134	.003
	Interest rate	.330	.126	.473	2.620	.000
	Monetary policy	.357	.123	.412	2.900	.000
	Balance of payment	.278	.119	.411	2.872	.002
	Inflation rate	.298	.123	.390	2.321	.002
a. Dependent Variable: Exchange rate						

Source; Research Findings

The researcher conducted a multiple regression analysis so as to determine the relationship between exchange rate and the five independent variables.

The regression equation ($\mathbf{Y = _0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5}$) now becomes:

$$\mathbf{Y = 1.207 + 0.245 X_1 + 0.330 X_2 + 0.357 X_3 + 0.278 X_4 + 0.298 X_5}$$

The multiple linear regression models indicate that all the independent variables have positive coefficient. The regression results above reveal that there is a positive relationship between dependent variable (exchange rate) and independent variables (External debt, Interest rate, Monetary policy, Balance of payment, Inflation rate). The t statistics helps in determining the relative importance of each variable in the model. As a guide regarding useful predictors, we look for t values well below -0.5 or above +0.5.

4.3.3 Correlation Analysis

The study conducted Pearson's correlation coefficient. The Pearson product-moment correlation coefficient (or Pearson correlation coefficient for short) is a measure of the strength of a linear association between two variables and is denoted by r. The Pearson correlation coefficient, r, can take a range of values from +1 to -1. A value of 0 indicates that there is no association between the two variables. A value greater than 0 indicates a positive association, that is, as the value of one variable increases so does the value of the other variable. A value less than 0 indicates a negative association, that is, as the value of one variable increases the value of the other variable decreases.

Table 4.5 Correlation Results

		Monetary policy	Balance of payment	Interest rate	Inflation rate	Externa l debt	Exchange rate
Monetary policy	Pearson Correlation	1					
	Sig. (2- tailed)	0.000					
	N	30					
Balance of payment	Pearson Correlation	0.742	1				
	Sig. (2- tailed)	0.000	0.000				
	N	30	30				
Interest rate	Pearson Correlation	0.842	0.542	1			
	Sig. (2- tailed)	0.000	0.000	0.000			
	N	30	30	30			
Inflation rate	Pearson Correlation	0.771	0.664	0.732	1		
	Sig. (2- tailed)	0.000	0.000	0.000	0.000		
	N	30	30	30	30		
External debt	Pearson Correlation	0.421	0.342	0.341	0.232	1	
	Sig. (2- tailed)	0.047	0.038	0.037	0.413	0.000	
	N	30	30	30	30	30	
Exchange rate	Pearson Correlation	0.811	0.532	0.691	0.789	0.352	1
	Sig. (2- tailed)	0.000	0.000	0.000	0.000	0.170	0.000
	N	30	30	30	30	30	30

** Correlation is significant at the 0.01 level (2-tailed).
* Correlation is significant at the 0.05 level (2-tailed).

Source; Research Findings

The results in Table 4.5 indicate that the relationship between monetary policy and Exchange rate is strong, positive and statistically significant (r=.811, p-value=.000). Similarly, the relationship between inflation rate and Exchange rate is strong, positive and statistically significant (r=.789, p-value=.000). The relationship between interest rate and balance of payment was also significant and strong (r=.691, p-value=.000) and (r=.532, p-value=.000) respectively. However the relationship between external debt and exchange rate is positive but insignificant as indicated by Pearson correlation coefficient of .352 and p-value=.000. This implies that monetary policy, balance of payment, interest rate, inflation rate and external debt play a critical role of influencing Exchange rate in Kenya. The strongest relationship was between monetary policy and Exchange rate (r=.811, p-value=.000).

4.3.4 Analysis of Variance (ANOVA)

The statistical F test is used to determine how well the regression equation fits the data. In this study, the F value of 7.786 was significant at the 1% level, indicating that at least one of the independent variables helped to explain some of the variation in exchange rate.

Table 4.6: Analysis of Variance

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	272.606	4	68.151	7.786	.000[b]
	Residual	323.870	37	8.753		
	Total	596.476	41			

a. Dependent Variable: Exchange rate

b. Predictors: (Constant), External debt, Interest rate, Monetary policy, Balance of payment, Inflation rate

Source; Research Findings

4.4 Interpretation of the Findings

The results presented focused on the effects of external debt, interest rate, monetary policy, balance of payment and inflation rate on exchange rate in Kenya. The broad objective of the study was to examine the effect of changes in monetary policy and balance of payment on

exchange rate in Kenya. Descriptive statistics was first performed which involved mean, standard deviation and standard error of estimate. The variables aggregate score was computed as the simple average of the mean scores of the ten years period. The findings indicated that variables had high t-values implying that these variables had statistically significant differences and variations across the years. The positive means and the respective smaller standard deviations imply that all the variables had a significant performance across the period studied.

The study conducted Pearson's correlation coefficient which is a measure of the strength of a linear association between two variables and is denoted by r. The results indicated that the relationship between monetary policy and Exchange rate is strong, positive and statistically significant. Similarly, the relationship between inflation rate and Exchange rate is strong, positive and statistically significant. The relationship between interest rate and balance of payment was also significant and strong and respectively. However the relationship between external debt and exchange rate is positive but insignificant. This implies that monetary policy, balance of payment, interest rate, inflation rate and external debt play a critical role of influencing Exchange rate in Kenya. The strongest relationship was between monetary policy and Exchange rate.

The study further carried out a regression analysis to determine the magnitude of the relationship between the independent variables and the dependent variable. The five independent variables that were studied, explained 69.0% of the exchange rate as represented by the R^2. The multiple linear regression models indicated that all the independent variables had positive coefficient. The regression results revealed that there is a positive relationship between dependent variable (exchange rate) and independent variables (External debt, Interest rate, Monetary policy, Balance of payment, Inflation rate). The study is hence consistent with other previous studies.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter summarizes the study and makes conclusion based on the results. The implications from the findings and areas for further research are also presented. This section presents the findings from the study in comparison to what other scholars have said as noted under literature review.

5.2 Summary

The results presented focused on the effects of External debt, Interest rate, Monetary policy, Balance of payment and Inflation rate on exchange rate in Kenya. This section lays emphasis on the summary of the findings. The results from the statistical tests are compared with other empirical and theoretical propositions and both areas of agreement or disagreement with such propositions are summarized.

Multiple regressions were carried out at 95.0 percent confidence level to test the relationships and the statistical significance of the study variables. The same was applied to the other variables to determine their effects. The independent effects were first analyzed using correlation analysis followed by combined analysis through regression analysis. Multiple linear regressions analysis was applied on the relative correlations on strength of the relationship between the variables whether strong or weak. The R^2 values showed the proportion of the variation indicator that accounted for by the combined effects in the model. F-values indicated the significance of the model on performance at 95% confidence level.

The broad objective of the study was to examine the effect of changes in monetary policy and balance of payment on exchange rate in Kenya. First various assumptions were made about variables during statistical tests. This was to ensure that the findings were worth using in decision making. Failure to meet these assumptions may havelead to Type I or Type II errors. Testing for assumptions is beneficial because it ensures that analysis meets associated

assumptions and helps avoid Type I and Type II errors (Osborne et al, 2001). This study carried out test of normality and multicollinearity tests.

In this study the normality was tested using Kolmogorov-Smirnov Test and the Shapiro-Wilk Test. Shapiro-Wilk Test is more appropriate for small sample sizes (< 50 samples) like this study. It is a more reliable test for determining skewness and kurtosis values of normality. If it is below 0.05, the data significantly deviate from a normal distribution. The results of the tests of normality on the variables showed that all the p-values were greater than the alpha level of (0.05). Shapiro-Wilk Test results were (0.428, 0.219, 0.322, .413, .376) greater than 0.05 confirming the data was normal.

The test for Multicollinearity was conducted to assess whether one or more of the variables of interest is highly correlated with one or more of the other independent variables. The variance inflation factor (VIF) was used to evaluate the level of correlation between variables and to estimate how much the variance of a coefficient was inflated because of linear dependence with other predictors. As a rule of thumb if any of the VIF are greater than 10 (greater than 5 when conservative) then there is a probability of a problem with Multicollinearity and is harmful to the study. The results revealed that there was no serious problem with multicollinearity. The variance inflation factors for the variables were all below 5 meaning that the variables were not highly correlated.

Descriptive measures involved mean, standard deviation and standard error of estimate. The variables aggregate score was computed as the simple average of the mean scores of the ten years period. The findings indicated that variables had high t-values implying that these variables had statistically significant differences and variations across the years. The positive means and the respective smaller standard deviations imply that all the variables had a significant performance across the period studied.

The study conducted Pearson's correlation coefficient. The Pearson product-moment correlation coefficient (or Pearson correlation coefficient for short) is a measure of the strength of a linear association between two variables and is denoted by r. The results indicated that the relationship between monetary policy and Exchange rate is strong, positive and statistically significant. Similarly, the relationship between inflation rate and Exchange rate is strong, positive and

statistically significant. The relationship between interest rate and balance of payment was also significant and strong and respectively. However the relationship between external debt and exchange rate is positive but insignificant. This implies that monetary policy, balance of payment, interest rate, inflation rate and external debt play a critical role of influencing Exchange rate in Kenya. The strongest relationship was between monetary policy and Exchange rate.

The study further carried out a regression analysis to determine the magnitude of the relationship between the independent variables and the dependent variable. The five independent variables that were studied, explain 69.0% of the exchange rate as represented by the R^2. The multiple linear regression models indicate that all the independent variables have positive coefficient. The regression results above reveal that there is a positive relationship between dependent variable (exchange rate) and independent variables (External debt, Interest rate, Monetary policy, Balance of payment, Inflation rate).

5.3 Conclusion

The analysis of the correlations results seemed to support the argument that each independent variable has its own particular informative value in the ability to explain exchange rate. The significance of the coefficients was calculated at the level of 95%. The study findings indicate that external debt, interest rate, monetary policy, balance of payment and inflation rate are statistically significant to exchange rate as indicated by the positive and strong Pearson correlation coefficients.

According to the regression equation established, taking all factors into account (external debt, interest rate, monetary policy, balance of payment and inflation rate), exchange rate will be 1.207. A Pearson coefficient measure showed a strong, significant, positive relationship between the predictor variables on exchange rate in Kenya. The findings showed that predictor variables considered in the model are significantly associated with exchange rate as indicated by the positive mean values and their respective standard deviations.

5.4 Policy Recommendations

Based on the research findings, the study recommends that balance of payments and monetary policies should be controlled appropriately by the policy makers so as to maintain exchange rate at a harmless point to the overall economy. The study further recommends that other determinants of exchange rate such as inflation and interest rate as significantly indicated in the study should be regularly checked and corrected to avoid a paradigm shift in the exchange rate which may negatively impact the economy. The government should also set up monetary policies on exchange rates so as to keep it friendly to the overall economy.

5.5 Limitations of the Study

Although this study helped to shed light on the dynamics of monetary policy and balance of payment on exchange rate in Kenya, it was subject to a number of limitations. These mainly related to the setup of the study relative to the resources available within the research period. As such the constraints influenced the scale of the study but did not affect the conduct of the research once the design was arrived at.

Since the main purpose of this study is to identify the relationship between monetary policy and balance of payment on exchange rate in Kenya, central bank considered some information sensitive and confidential and thus the researcher had to convince them that the purpose of information is for academic research only and may not be used for any other intentions.

Monetary policy and balance of payment keep on changing from period to period depending on prevailing economic situations and demand on the capital market. The findings therefore may not reflect the true effect of such variables on exchange rate across a period of 10 years since some measures keeps fluctuating.

5.6 Suggestions for Further Research

This study used only five variables to test their influence on exchange rate in Kenya. Given the fact that there are many other factors that may affect exchange rate, other researchers may seek to unravel the influence of such other factors like political influence, fiscal policies and so forth on the exchange rate. It would be interesting to find out whether the results would be the same when different variables are used. Given the critical role that monetary policies play in the monetary economy, it would also be interesting for future research to study the influence of

monetary policy as an independent variable and exchange rate as a dependent variable. With only secondary data, triangulating the data is complex. Future research should consider combining both secondary and primary data.

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APPENDICES

APPENDIX I: Raw Data

Year	Exchange Rate	Monetary policy	Balance of payments	Interest rate	Inflation rate	External Debt
2005						
1	68.55	8.07	38.95	8.00	14.54	35.78
2	65.53	8.93	34.71	9.00	15.91	43.56
3	66.23	9.44	36.31	9.00	14.01	36.45
2006						
1	62.70	7.21	37.02	2.00	14.46	51.23
2	67.70	7.59	34.85	15.00	14.19	52.21
3	65.45	9.32	35.22	3.00	13.98	53.34
2007			37.61	8.00	14.83	
1	66.35	9.39	35.93	8.00	13.03	53.23
2	73.85	10.47	36.74	-5.00	17.55	49.45
3	79.30	13.04	39.89	22.00	16.33	50.34
2008						
1	89.95	9.00	40.11	6.00	15.18	67.56
2	87.60	10.31	41.01	4.00	14.54	68.23
3	83.05	12.89	41.04	1.00	14.90	69.23
2009						
1	79.65	12.12	41.14	9.00	16.32	70.23
2	78.60	12.36	42.44	7.00	16.29	67.45
3	78.85	13.37	43.11	8.00	16.18	69.47
2010						
1	75.55	14.43	43.39	4.00	19.98	59.56
2	78.55	14.88	44.37	2.00	19.67	54.65
3	75.20	12.60	43.94	1.00	17.20	53.98
2011						
1	78.50	12.69	43.73	4.00	17.47	49.43
2	73.60	13.18	42.13	7.00	19.47	46.70
3	74.05	15.48	43.36	6.00	18.07	45.23
2012						
1	79.80	13.97	45.97	5.00	19.44	46.45
2	68.70	14.50	45.10	4.00	19.17	45.34
3	69.65	14.12	45.91	1.00	17.21	43.45
2013						
1	65.55	16.93	47.43	0.00	17.32	24.54
2	67.70	15.58	47.81	3.00	18.22	30.23

3	68.15	16.11	49.16	4.00	18.39	30.45
2014						
1	78.30	15.30	46.15	0.00	19.04	32.45
2	78.60	15.21	40.97	3.00	19.60	33.34
3	81.20	16.36	47.36	2.00	19.00	36.34

Source: Research findings

APPENDIX II: Output

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Monetary policy	.072	29	.200*	.979	29	.428
Balance of payments	.093	29	.200*	.972	29	.219
Interest rate	.085	29	.200*	.976	29	.322
Inflation rate	.077	29	.200*	.979	29	.413
External debt	.841	29	.200*	.979	29	.376

Test for Multicollinearity

Model	Collinearity Statistics	
	Tolerance	**VIF**
Monetary policy	772	1.295
Balance of payments	698	1.433
Interest rate	873	1.146
Inflation rate	756	1.321
External debt	812	1.154

Descriptive statistics

	N	Mean	Std. Deviation	Std. Error Mean	t	Sig. (2-tailed)
Exchange rate	30	74.1130	6.44024	2.03658	36.391	.000
Monetary policy	30	13.2730	2.45284	.77566	17.112	.000

Balance of payment	30	42.5300	4.50972	1.42610	29.823	.000
Interest rate	30	5.7000	6.42996	2.03333	2.803	.021
Inflation rate	30	16.5270	1.78000	.56289	29.361	.000
External debt	30	48.8280	13.25102	4.19034	11.653	.000

Inferential Analysis
Correlation Results

		Monetary policy	Balance of payment	Interest rate	Inflation rate	Externa l debt	Exchange rate
Monetary policy	Pearson Correlation	1					
	Sig. (2- tailed)	0.000					
	N	30					
Balance of payment	Pearson Correlation	0.742	1				
	Sig. (2- tailed)	0.000	0.000				
	N	30	30				
Interest rate	Pearson Correlation	0.842	0.542	1			
	Sig. (2- tailed)	0.000	0.000	0.000			
	N	30	30	30			
Inflation rate	Pearson Correlation	0.771	0.664	0.732	1		
	Sig. (2- tailed)	0.000	0.000	0.000	0.000		
	N	30	30	30	30		
External debt	Pearson Correlation	0.421	0.342	0.341	0.232	1	
	Sig. (2- tailed)	0.047	0.038	0.037	0.413	0.000	

	N	30	30	30	30	30	
Exchange rate	Pearson Correlation	0.811	0.532	0.691	0.789	0.352	1
	Sig. (2- tailed)	0.000	0.000	0.000	0.000	0.170	0.000
	N	30	30	30	30	30	30

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

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

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.831[a]	.690	.303	5.37539

b. Predictors: (Constant), External debt, Interest rate, Monetary policy, Balance of payment, Inflation rate Source;

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	272.606	4	68.151	7.786	.000[b]
	Residual	323.870	37	8.753		
	Total	596.476	41			

a. Dependent Variable: Exchange rate

b. Predictors: (Constant), External debt, Interest rate, Monetary policy, Balance of payment, Inflation rate

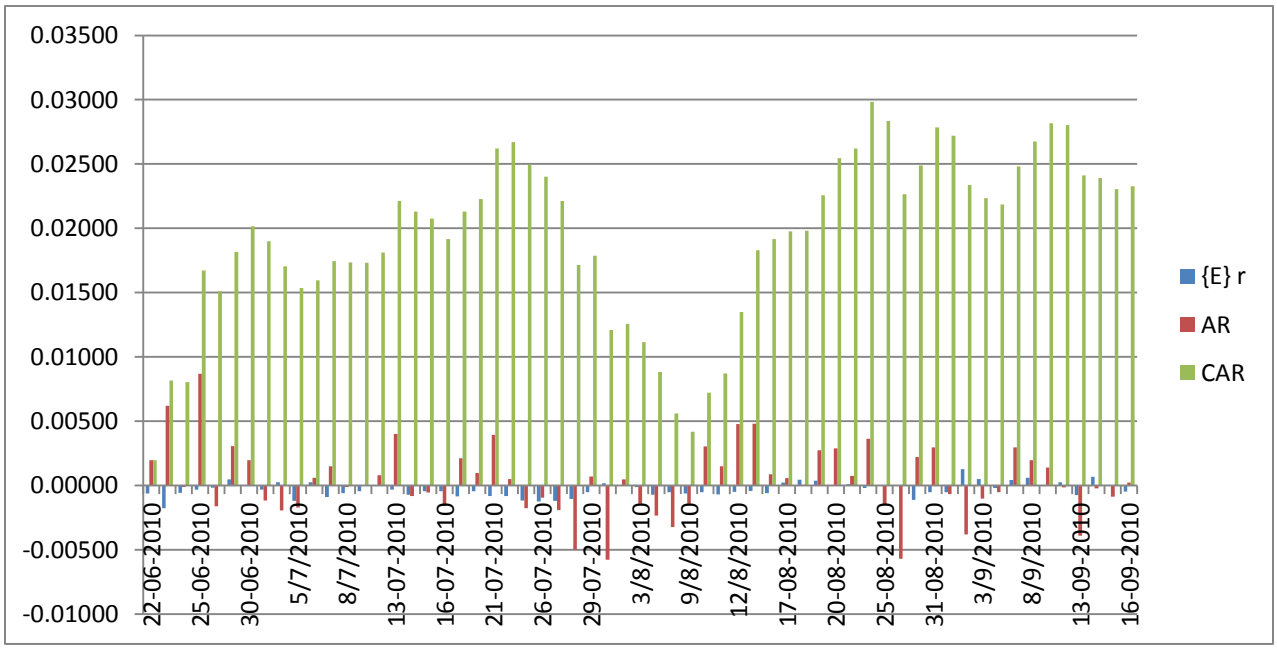
Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.207	2.948		.410	.685
	External debt	.245	.115	-.332	2.134	.003
	Interest rate	.330	.126	.473	2.620	.000
	Monetary policy	.357	.123	.412	2.900	.000
	Balance of payment	.278	.119	.411	2.872	.002
	Inflation rate	.298	.123	.390	2.321	.002

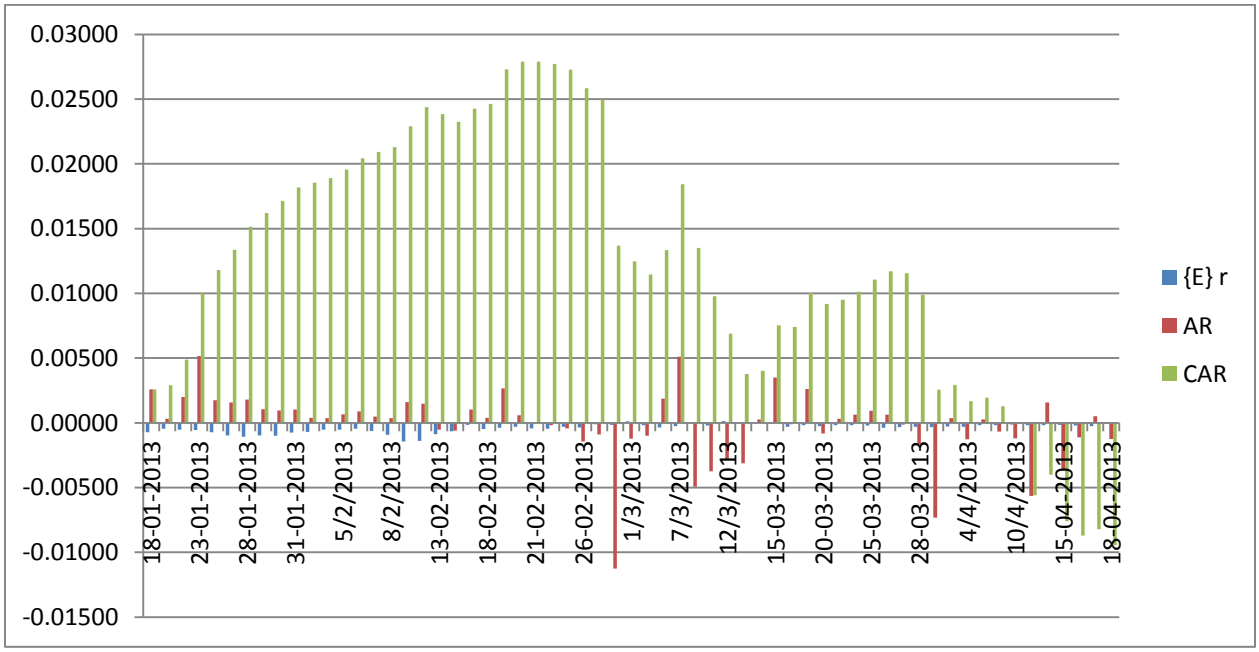
a. Dependent Variable: Exchange rate

III: Exchange Rates Variance

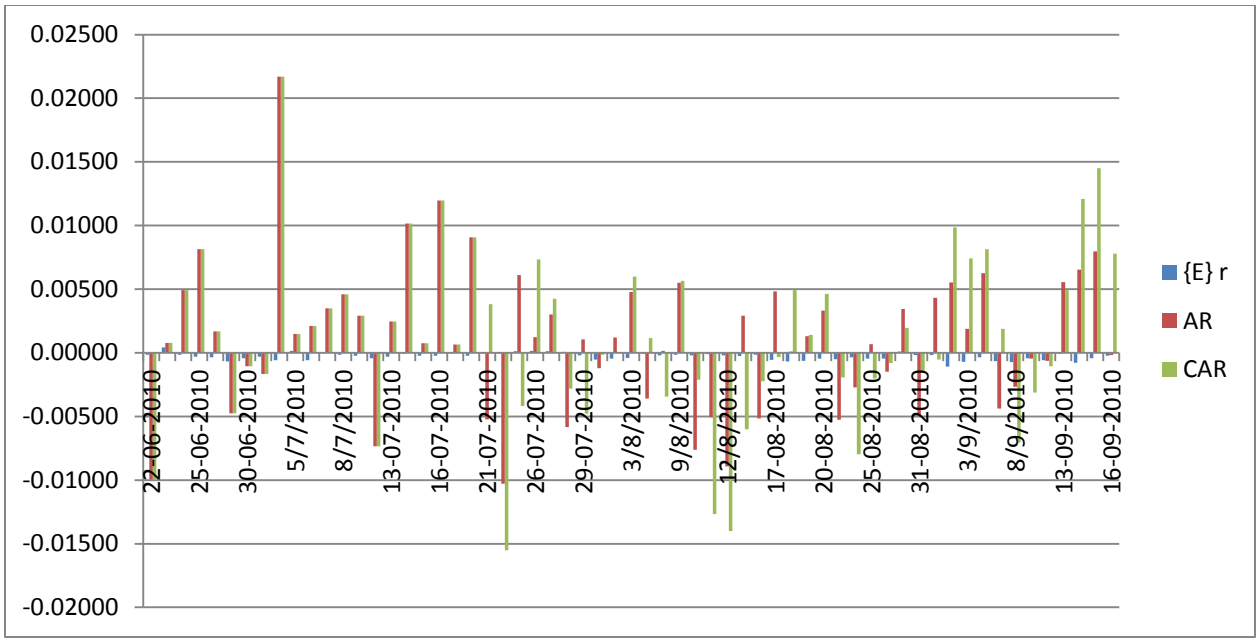
GRAPH 1: USD RETURNS 2010



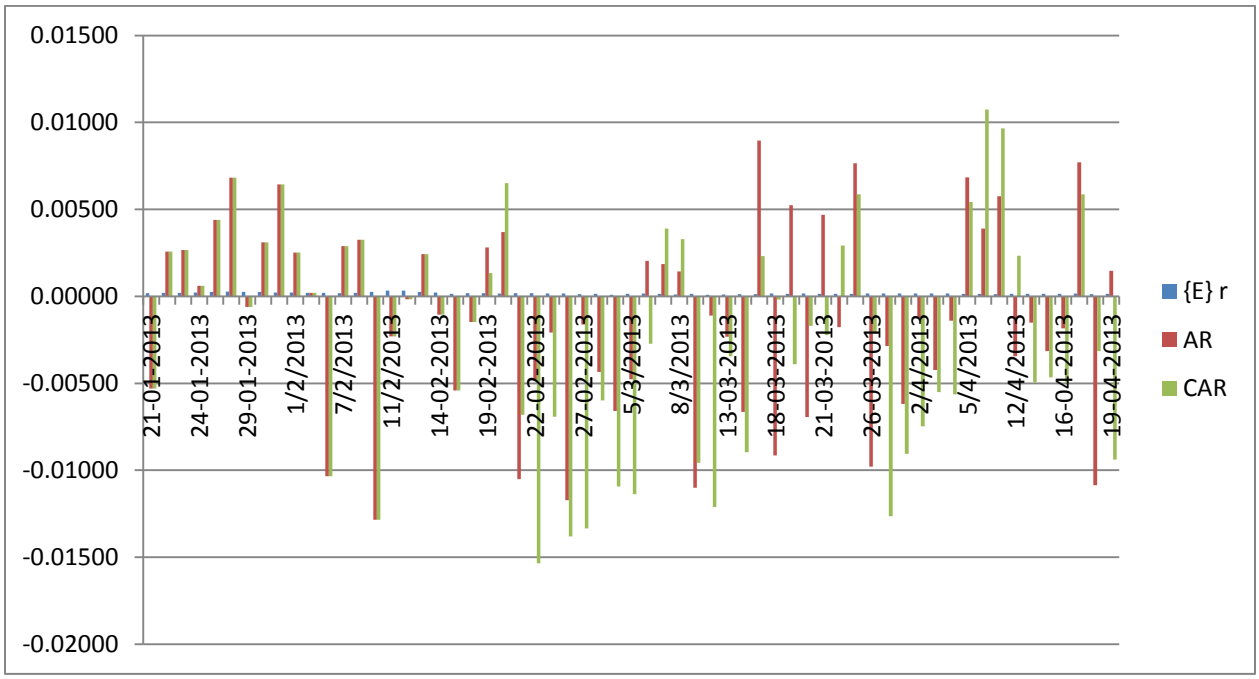
GRAPH 2: USD RETURNS 2013



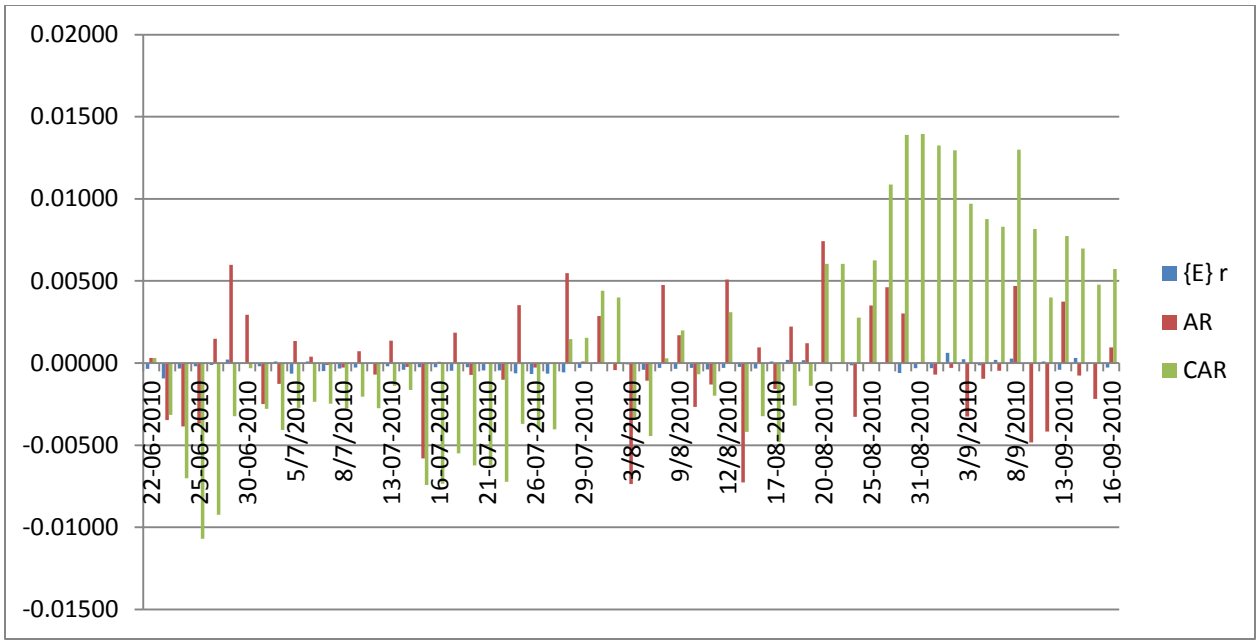
GRAPH 3: EURO RETURNS 2010



GRAPH 4: EURO RETURNS 2013



GRAPH 5:USH RETURNS 2010



GRAPH 6: USH RETURNS 2013