EFFECTS OF MONETARY POLICY ON INFLATION RATE IN KENYA

BY

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DECLARATION

This research project is my original work and has not been submitted for examination to any other university.

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

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DEDICATION

This project is dedicated to my family members for their support and encouragement.

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LIST OF ABBREVIATION

CBK	-	Central Bank of Kenya
CBR	-	Central Bank Rate
CPI	-	Consumer Price Index
GDP	-	Gross Domestic Product
GNP	-	Gross National Product
KES	-	Kenyan Shillings
KNBS	-	Kenya National Bureau of Statistics
MTM	-	Monetary Techniques Mechanism
NBFI'S	-	Non-Bank Financial Institutions
NSE	-	Nairobi Stock Exchange
OECD	-	Organisation for Economic Co-operation and Development
QTM	-	Quality Total Management
SPSS	-	Statistical Product and Service Solutions
VAR	-	Vector Auto Regression

ABSTRACT

Despite the embracing of monetary policies by developing countries, most of them still find themselves entrenched in a never-ending cycle of inflation. The cycles of inflations end up destroying counties' pride, and to some extent, their sovereignty monetary policy actions are followed by movements in real output that may last for two years or more. Monetary transmission mechanism has been a subject of much research over a number of years. This study, therefore sought to determine the effects of monetary policy on inflation in Kenya. The study adapted descriptive survey approach in collecting data from the respondents. The descriptive survey method was preferred because it ensures complete description of the situation, making sure that there was minimum bias in the collection of data and finding out the what, where and how of a phenomenon. This study used secondary data for the specific variables which are inflation, money supply, 91 day-Treasury bill rate and foreign exchange rate. The data on inflation (CPI) was obtained from KNBS while data on 91-day Treasury bill rate, exchange rate and money supply (M3) was obtained from the CBK website which it is public data. The study concluded that there was a positive correlation between inflation rate and the independent variables. In addition, the study concluded that the 91 day T Bills Rate is the main influencer of the inflation rates in Kenya. This is because it represents the risk free investment for investors. In the second place is the money supply. In addition the study concluded that all the variables (91-Day Treasury bill rate, exchange rates and money supply) considered together influence the inflation rate by only 26.1%.The study concluded that monetary policies affect inflation rates. This is because through the monetary policy tools, the monetary Committee influences the amount of money in circulation. The study concluded that the 91 day T Bills Rate is the main influencer of the inflation rates in Kenya. This is because it represents the risk free investment for investors. In the second place is the money supply.

CHAPTER ONE: INTRODUCTION

1.1 Background of the Study

Since time immemorial, inflation has always been an issue of extreme sensitivity. This accrues to the fact that a case of inflation has overall effect on the prices of commodities. An instance of spiraling, uncontrollable inflation is usually a sign of impending catastrophic doom. Thus, the control of monetary policy has turned out to be an essential function of all governments in the world. Abakar (2009) argues that Inflation does not necessarily have to reflect a continued increase in the prices of commodities, the vice versa can also be a reflection of inflation (deflation). However, both situations are more than unhealthy for the economy. In most economic situations, the major reasons for the inception of inflation is a culmination of excessive demand for products. The necessary economic policy would thus be entrenched on looking at the causes of an unnecessary rise.

This way, they can thus be able to come up with the right measures that can aid in controlling the existing overall demand in an economy. An epitome of this can be the control of cost push inflation where cost is deciphered as the sole reason for an increase in demand of both services and goods. The cost of production can then be checked so as to combat problems related to inflation. According to Adam (2009), to this end various researchers have established the ability of monetary policy as a tool for controlling inflation. Gichuki, Oduor and Kosimbei (2012), state that all over the world, in diverse economies, monetary policy has been seen as an approach to effectively control inflation. This is reflected by the ability of monetary policy in controlling the rise in demand by an increase in the available rates of interest. In addition, monetary reduces the

existing real money in the economy. A rise in the interest manages to bring an overall reduction in collective demand in an economy.

1.1.1 Monetary Policy

According to Abakar (2009), monetary policy is defined as a public interventionist action that aims at manipulating the level and array of economic activity to accomplish specific, desired goals. Specifically, monetary policies are aimed to work under two economic variables that affect the level of inflation in an economy. According to Gichuki, Oduor and Kosimbei (2012) the two aggregate variables are supply of money in circulation and the respective interest rate in an economy. Monetary policy is among the few tools that a national government can utilize to control the economy using the given monetary authority in the control of the supply and availability of money. Controlling the availability, leading to a control of access, ultimately influences the demand of products. The law of demand ultimately reflects that an increase in demand for products leads to an increase in prices. Demand is in turn influenced by the availability of money in the economy. Thus, direct or indirect control of money leads to an ultimate control of inflation.

Ndung'u (2010) argues that in most instances, governments try to influence an overall level of economic activities to be in line with individual objectives. Some of these objectives include sociocultural, political, economic and technological objectives. Generally, the main aim of governments is the existence of a macroeconomic stability. Usually, macroeconomic stability encompasses stable prices, economic growth, full employment, balance of external payment and development in a country. Generally, it is the job of the central bank of any nation to come up with, and implement, monetary policies that aim at achieving stability in the expected price level

of products in a country. However, the major aim is to attain stability in prices to be able to sustain the existing value of the currency in a particular country.

1.1.2 Inflation

Inflation refers to a persistent rise in the general price levels in an economy. The most common instance of inflation is usually the creeping form of inflation. Creeping inflation mostly occurs when price levels continue to rise at a level between 1 percent and 6 percent. According to Bernanke, Laubach and Mishkin (1999), in some instances, inflation manages to rise at an alarming rate reflecting a 3 or more digit country. This type of inflation is referred to as hyperinflation. An epitome of hyperinflation was that that occurred in Kenya in the 90s. There existed a perceived three months annualized rate that managed to reach a three-digit figure of 101.1 percent in June 1993 (Government of Kenya, 2005). A case of hyperinflation leads to adverse consequences being witnessed in the capital, commodity and money markets. All these end up affecting the goal of ensuring price stability in a negative form. A case of suppressed inflation refers to a scenario where the existing demand exceeds the supply but an effect on prices is minimized (Government of Kenya, 2005). Normally, minimization of prices, in the case of suppressed inflation, is managed with instruments that include rationing and price control.

Inflation is characterized by an increase in the general level of prices for goods and services. Consequently, the purchasing power of money will fall. In the opinion of Bernanke (2005), most of the countries in the world try to sustain an inflation rate between 2 and 3 percent inflation lowers the rate of savings and diminishes the purchasing power. Inflation takes place, when too much money is in circulation in comparison with the production of goods and services. Inflation is evaluated by changes in the Consumer Price Index (CPI). Bernanke (2005) argues that, it is

essential to know the changes of absolute price and relative price, at the time of determining the inflation rate. The Gross National Product (GNP) is also considered while evaluating the inflation of a country. The main cause behind inflation is the increase of money supply than the demand for money. Alternatively, it can be said that when the supply of money per unit of output increases, inflation occurs. The supply of money per unit of output increases, when "velocity" of money circulation increases. The demand for money depends on the overall economic activities of a country.

1.1.3 Monetary Policy and Inflation

According to Gertler (1995), Inflation and monetary policy are closely related concepts wherein the latter can be used efficiently to reduce the effect of the former. Inflation is thought of as the rise in prices and wages that reduces the purchasing power of money. Burger and Marinkov (2006) suggested that monetary policy is the regulation adopted by the central bank, currency board or other regulatory authority, which stabilizes the prices and maximizes production and employment of the country. The Fisher's equation depicts the proportional relation that exists between money supply and the price level. Monetary policy is a regulation of a central bank or any regulatory authority that ascertains the size and growth rate of the money supply.

Monetary policy directly influences the interest rates, which in turn has a negative relation with the price level. In the face of inflation, the central bank of the country, generally resorts to a rise in the cash reserve ratio, repo rate and reverse repo rate. Therefore, the basic idea is to reduce the money supply in the economy. Gertler (1995) argues that to this end, government securities are also issued to mop up the excess money supply from the mass. This would reduce aggregate demand this reduction would again help reduce the price level. Monetary policy is adopted with

an objective to make the most of production and employment and consequently stabilize the price level of a country. Monetary policy also regulates the interest rate, availability of credit and at the same time promotes the overall economic growth of a country.

According to a study done by Kinyua (2001), monetary policy influences inflation and the economy wide demand for goods and services and, therefore, the demand for the employees who produce those goods and services primarily through its influence on the financial conditions facing households and firms. During normal times, the Federal Reserve has primarily influenced overall financial conditions by adjusting the federal funds rate. Kinyua (2001) states that, movements in the federal funds rate are passed on to other short-term interest rates that influence borrowing costs for firms and households. Movements in short-term interest rates also influence long-term interest rates such as corporate bond rates and residential mortgage rates because those rates reflect, among other factors, the current and expected future values of short-term rates. In addition, shifts in long-term interest rates affect other asset prices, most notably equity prices and the foreign exchange value of the dollar. For example, all else being equal, lower interest rates tend to raise equity prices as investors discount the future cash flows associated with equity investments at a lower rate.

Kiptui, Ndolo and Kaminchia (2005) concluded that, when the federal funds rate is reduced, the resulting stronger demand for goods and services tends to push wages and other costs higher, reflecting the greater demand for workers and materials that are necessary for production. In addition, policy actions can influence expectations about how the economy will perform in the future, including expectations for prices and wages, and those expectations can themselves directly influence current inflation. In 2008, with short-term interest rates essentially at zero and

thus unable to fall much further, the Federal Reserve undertook nontraditional monetary policy measures to provide additional support to the economy. Between late 2008 and October 2014, the Federal Reserve purchased longer-term mortgage-backed securities and notes issued by certain government-sponsored enterprises, as well as longer-term Treasury bonds and notes (Ludi & Ground, 2006). The primary purpose of these purchases was to help to lower the level of longer-term interest rates, thereby improving financial conditions. Thus, this nontraditional monetary policy measure operated through the same broad channels as traditional policy, despite the differences in implementation of the policy.

1.1.4 Monetary Policy and Inflation in Kenya

One current objective of monetary policy is to maintain low rates of inflation. Durevall and Sjö (2012) argue that, the Kenyan economy has never been a high-inflation economy, in the sense that Kenya has never experienced a protracted hyper-inflation. In fact, the inflation rate is below 10%. This certainly is a strong overall performance relative to other developing countries throughout the world. The one exception to this positive experience in Kenya occurred in the early 1990s, when inflation rates soared to approximately 45%. This bout of high inflation corresponded to a devaluation of the shilling associated with the implementation of a series of a measures to liberalize aspect of the economy, including the financial sector, exchange rates, and trade.

In addition, policy responses in Kenya during recent years illustrate the challenges facing monetary authorities. Kenya was not only hit by a commodity-price hike and the financial crisis, but also post-election violence in 2008. As a result, real GDP growth dropped from over 7% in 2007 to below 1.5% in 2008, while inflation increased to over 30%. The monetary policy

response was to reduce interest rates to stimulate economic growth. In spite of lax monetary policy, inflation declined from 2009 until late 2010. Inflation then rose again, but the authorities continued to maintain loose monetary conditions. This resulted in rapid depreciation of the Kenyan shilling (KES); its value dropped from about 80 shilling per US dollar in early 2011 to over 100 shilling per US dollar in October 2011. To prevent further deprecation of KES and rise in inflation, the monetary authorities increased the central bank rate sharply, pushing up the interbank rate to about 17%, from less than 2% in January 2011. The response seems to have been an appreciation of the KES and decline in inflation. The tight monetary policy stance was maintained during the first half of 2012 (Durevall & Sjö, 2012).

1.2 Research Problem

Despite the embracing of monetary policies by developing countries, most of them still find themselves entrenched in a never-ending cycle of inflation. The cycles of inflations end up destroying counties' pride, and to some extent, their sovereignty. According to Mishkin (2000), the loss is derived from the fact that the countries find themselves up to their neck with debts resulting from a weak currency eroded by inflation. In addition, monetary policies end up being inefficient during turbulent times. Some of these times include times of political instabilities like Kenya's Post Election Violence. During this time, prices of commodities soar up to a new level. Other times include instances of economic booms and recessions. This was witnessed in the latest world economic recession. Even economic giants were unable to protect themselves from the scourge that was an economic recession.

Friedman and Schwartz (1963) found out that, monetary policy actions are followed by movements in real output that may last for two years or more. Monetary transmission mechanism

has been a subject of much research over a number of years (Stiglitz, & Weiss, 1981; Bernanke & Gertler, 1995; Christiano, Martin & Charles, 1997). It describes how policy-induced changes in monetary policy actions impact on policy goals e.g. output and inflation. A substantial body of recent literature has focused on these issues for developed and emerging economies looking at the transmission mechanisms and sectoral effects of monetary policy. However, the vast empirical literature on monetary transmission has primarily focused on developed economies. The most distinguishing characteristic of monetary transmission mechanism in developed countries is the focus on prices (interest)

A few studies have been conducted on Kenya to investigate the effectiveness of monetary policy on inflation and economic growth for instance Cheng (2006) concluded that in response to a contractionary monetary policy, output rises initially but falls eventually, though the decline is not statistically significant. In addition, shocks to the interest rate explain a much larger fraction of inflation. Positive shocks to interest rates lead initially to a depreciated exchange rate but the exchange rate eventually appreciates, which suggests the presence of the strong impact of exchange rate pass-through to inflation.

In a similar fashion, Maturu, Maana, and Kisinguh (2010) applied the same methodology as Cheng (2006) to study Monetery Techniques Mechanism (MTM) in Kenya using quarterly data In contrast to Cheng (2006), Maturu, Maana, and Kisinguh (2010) regard M3 as the monetary policy instrument. They find that an exogenous shock to M3, an expansionary monetary policy, has no effect on real output, but leads to rising prices for almost 18 months, which is also statistically significant. A positive shock to the interest rate leads to falling prices, much like

Cheng but the effect is not statistically significant, in marked contrast to Cheng's finding. A shock to M3 explains as much of inflation variability as a shock to interest rate. Both studies apply the non-recursive Vector AutoRegression (VAR) model of Kim and Roubini (2000), and find that results are the same as the recursive model. Neither study explores the relative importance of various channels of MTM.

Ndung'u (1994) also obtain results which indicate that money supply drives inflation. However, according to Ndung'u there is only a short-run relationship between these variables; deviations from equilibrium in the money market do not enter the model and thus money does not determine the price level in the long run. Another result is obtained by Ryan and Milne (1994) who find that exchange rate movements and changes in oil prices are the most important factors determining inflation, while the contribution from monetary variables is small.

However, not all these studies focused on the effects of monetary policy on inflation in Kenya comprehensively. It is for this reason that the current study will tend to answer the following research question: what is the effect of monetary policy on inflation in Kenya.

1.3 Research Objective

The objective of this study was to determine the effects of monetary policy on inflation in Kenya.

1.4Value of the Study

The study will be useful to the government in determination of the economic growth, the Central Bank of Kenya on the appropriate measures to counter the inflation of the country currency, and other Stakeholders who are involved in the formulation of monetary policies. In addition, the

research will come in handy in helping in the management of both monetary and fiscal policies to enable better control of the economy. In this perspective, the research will aid in the elimination of the various operational lags that affect the implementation of monetary policy. On the theory and practice the study will help in reducing the rate of inflation. This will be applicable in a case where there are high levels of inflation. At this situation the economist will strive hard to bring the levels of inflation so that they can strike a balance and facilitate the growth of the economy. This process as referred to as deflation process.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

A literature review discusses published information in a particular subject area, and sometimes information in a particular subject area within a certain time. Therefore, this chapter involved the systematic identification, location and analysis of documents containing information related to effects of monetary policy on inflation in Kenya

2.2 Theoretical Review

Theoretical review has proposed several ways in which monetary policy affects inflation in Kenya; this section is concerned with the literature that deals with effects of monetary policy on inflation in Kenya. To enable us understand the prepositions made, the study analyzed several theories:

2.2.1 The Monetarist Policy Theory

Monetarism is a macroeconomic school of thought that emphasizes long-run monetary neutrality, short-run monetary no neutrality, the distinction between real and nominal interest rates, and the role of monetary aggregates in policy analysis. It is particularly associated with the writings of Milton Friedman, Anna Schwartz, Karl Brunner and Allan Meltzer. Mishkin (2000), states that since money is a direct substitute for all other assets, an increase in the supply of money supply, given a fairly stable velocity of circulation, will have a direct effect on the demand for other assets since there will be more money to spend on those assets.

Robinson (1972) states that, if the total output of the economy is fixed, then an increase in the money supply will lead directly to higher prices. Monetarists therefore reach the same conclusion as the old quantity theory of money that a rise in money supply will lead directly to a rise in prices and probably also to a rise in money incomes, an increase in real output and so an increase in employment. In the long run however, they argue that all increases in the money supply will be reflected in higher prices unless there is a long-term growth in the economy. Monetarist school of economic thought contended that money supply is a key determinant of the level of production in the short run and the rate of inflation in the long run (Sargent, 1987). In order to minimize uncertainty monetarist advocated for the maintenance of a constant rate of growth of money supply. The implication of the theory to the current study is that increasing the money supply in the economy will have a direct effect on the inflation rates.

2.2.2 The Classical Quantity Theory of Money

The Quantity Theory of Money is one of the popular classical macroeconomic models that explain the relationship between the quantity of money in an economy and the level of prices of goods and services. Modern versions of the quantity theory are often associated with (Knut, 1898) and (Fisher & Brown, 1922). Fisher and Brown (1922) states that, money was only used as a medium of exchange to settle transaction involving the demand and supply for goods and services. The quantity theory of money can be developed to a theory of price levels. Fisher, sought to provide a rigorous basis for the quantity theory by approaching it from the quantity equation i.e. MV=PT, P=MV/T. Where V - velocity of circulation, M -money supply, P – Price, and T -quantity of transactions

Assuming that V and T are roughly constant, P will vary directly with increase or decrease in the amount of M and it changes in money supply (M) that causes the prices (P) to change, not changes in price that cause the changes in supply is assumed to be constant as the economy in question is assumed to be operating at full employment. If the velocity of circulation V is more or less constant than any growth in money supply (M) over and above the potential of the economy to increase, T will cause inflation (Fisher & Brown, 1922). This is then consistent with the monetary policy to curb inflation by controlling the money supply in the economy as it leads to inflation. A further notable feature in this theory is that the government monetary policy should allow some growth in money supply if the economy is growing but not let the growth in money supply to get out of hand as if output in the economy (T) is growing and the velocity of circulation (V) is constant then a matching growth in the money supply of money is needed to avoid deflation.

The implication of this policy is that in the long run the price level moves in proportion with changes in the money supply, at least for high-inflation countries therefore the CBK should adopt inflation as its central target variable of its monetary policy in order to achieve macroeconomic objective of price stability.

2.2.3 Keynesian Theory

This theory was developed by John Maynard Keynes in 1936. Keynes argued that inadequate overall demand could lead to prolonged periods of high unemployment. An economy's output of goods and services is the sum of four components: consumption, investment, government purchases, and net exports (the difference between what a country sells to and buys from foreign countries). Any increase in demand has to come from one of these four components. But during a

recession, strong forces often dampen demand as spending goes down. For example, during economic downturns uncertainty often erodes consumer confidence, causing them to reduce their spending, especially on discretionary purchases like a house or a car. This reduction in spending by consumers can result in less investment spending by businesses, as firms respond to weakened demand for their products. This puts the task of increasing output on the shoulders of the government. According to Keynesian economics, state intervention is necessary to moderate the booms and busts in economic activity, otherwise known as the business cycle. (Sarwat, Ahmed & Chris, 2014)

Keith and Howells (2009) argued that the volume of investments' depends heavily on technological changes and business confidence and expectations, hence an increase in the supply of money supply will have a limited effect on aggregate demand and consequently relatively little effect on output and employment. Keynes argues that monetary policy will have limited effect on the economy and national income, because increase in money supply would be neutralized by the reductions in the velocity of circulation leaving PT unaffected. According to Keynes, increase in money supply cannot lead to a proportional increase in the price level.

This theory has both positive and negative implications, the positive being that when there is improved infrastructure and a rise in employment in the overall economy, then inflation level lowers, raising the buying power of the dollar and create greater tax receipts to the government in theory. In addition, the government spending on infrastructure (visible effect/visible hand), there is greater consumer confidence since the government can actually see the work in progress and the end result. The negative implication is that although government spending has a visual

effect, it merely re-arranges jobs temporarily and does not contribute to new job creation (broken window fallacy). Milton Friedman also argued that government does not produce anything and therefore the money it spends comes from taxpayers

2.3 Determinants of Inflation

Kenya has experienced strong economic growth for over nearly a decade. However, inflation, which was thought to be under control, has become a major challenge. High, and volatile, inflation is a threat to good economic performance and has negative effects on many of the poor. It is widely accepted that high inflation is a monetary phenomenon related to excess money supply.

Studies on inflation dynamics in developing countries are often based on some form of Phillips curve approach and the economy's distance to full capacity output. Although sometimes applied to Sub-Saharan Africa countries, as in Barnichon and Peiris (2008) and Kiptui (2009), a Phillips curve approach may not be an adequate characterisation of the inflationary process in Sub-Saharan Africa. Inflation can come from three sectors: i) the money sector, ii) the external sector and iii) the internal sector. Many studies on inflation in sub-Saharan African economies focus on the quantity theory and the supply of money, exchange rates, and sometimes foreign prices;

2.3.1 The Money Supply

Us (2004) states that, Inflation is primarily caused by an increase in the money supply that outpaces economic growth. Ever since industrialized nations moved away from the gold standard during the past century, the value of money is determined by the amount of currency that is in circulation and the public's perception of the value of that money. When the Federal Reserve

decides to put more money into circulation at a rate higher than the economy's growth rate, the value of money can fall because of the changing public perception of the value of the underlying currency. As a result, this devaluation will force prices to rise because each unit of currency is now worth less.

When a government decides to print new currency, they essentially water down the value of the money already in circulation i.e. the more currency there is in the money supply, the less valuable that currency will be (Keith & Howells, 2009). A more macroeconomic way of looking at the negative effects of an increased money supply is that there will be more dollars chasing the same amount of goods in an economy, which will inevitably lead to increased demand and therefore higher prices.

2.3.2 Interest Rates

The influence mechanism of interest rate on inflation can be explained in various ways. One method is to apply user cost of capital. The increased interest rate raises the user cost of capital (Branson, 1979), that results in higher production costs. This changes raise inflation by shifting the aggregate supply curve to the left side. Also, the changing interest rate impacts on inflation through influencing the money volume. In the endogenous money models which money supply is a function of interest rate, the money supply is increased when interest rate goes up.

Another explanation concluded that increased inflation uncertainty results in raising the nominal interest rate (Berumont *et al.,* 1999). Million (2003) has tested long-run relationship between nominal interest rate and inflation rate using U.S. data. He concludes that, Federal Reserve reduces the nominal interest rate when inflation rate is high; and it raises nominal interest rate

when inflation rate is low. He argues that Federal Reserve authorities follow prices fixing policy and regulate its procedures based on inflation. He finally accepts Fisher theory. For the purpose of the study interest rates used will be the 91 day Treasury bill rate since the Central bank rate was not in use during 2005 and the interbank rate.

2.3.3 The National Debt

Johnson (2003) states that, huge national debt is a bad thing that can actually drive inflation to higher levels over time. The reason for this is that as a country's debt increases, the government has two options: they can either raise taxes or print more money to pay off the debt.

A rise in taxes will cause businesses to react by raising their prices to offset the increased corporate tax rate. Alternatively, should the government choose the latter option, printing more money will lead directly to an increase in the money supply, which will in turn lead to the devaluation of the currency and increased prices.

2.3.4 Cost-Push Effect

Essentially, this theory states that when companies are faced with increased input costs like raw goods and materials or wages, they will preserve their profitability by passing this increased cost of production onto the consumer in the form of higher prices (Bernanke *et al.,* 1999). A simple example would be an increase in milk prices, which would undoubtedly drive up the price of a cappuccino at your local Coffee shop since each cup of coffee is now more expensive for Coffee shop to make.

2.3.5 Exchange Rates

According to Johnson (2003), Inflation can be made worse by our increasing exposure to foreign marketplaces. In Kenya, we function on a basis of the value of the dollar. On a day-to-day basis, consumers may not care what the exchange rates between foreign trade partners are, but in an increasingly global economy, exchange rates are one of the most important factors in determining the rate of inflation (Laidemen & Rodriguez, 2006).

When the exchange rate suffers such that the Kenyan currency has become less valuable relative to foreign currency, this makes foreign commodities and goods more expensive to Kenyan consumers while simultaneously making Kenyan goods, services, and exports cheaper to consumers overseas. This exchange rate differential between the Kenyan economy and that of its trade partners can stimulate the sales and profitability of Kenyan corporations by increasing their profitability and competitiveness in overseas markets. However, it also has the simultaneous effect of making imported goods (which make up the majority of consumer products in Kenya), more expensive to consumers in Kenya.

2.4 Empirical Studies

Stilianos (2002) used univariate General AutoRegressive Conditional Heteroskedasticity (GARCH) models of inflation and output growth and monthly data on inflation and output growth in the G7 countries for the 1960-2000 period to examine all possible causal relationships between inflation, output growth, real and nominal uncertainty and hence tested for a number of economic theories. They found that there was strong evidence that inflation is negatively associated with output growth. The effect worked both directly and indirectly via the inflation

uncertainty channel. They also found that in most countries, output growth uncertainty was a positive determinant of the growth rate.

Harris (2001) presented a monetary model of endogenous growth and specified an econometric model consistent with it. The model was to find out if there was a negative inflation-growth effect. Empirical evaluation of the model was based on a large panel of Organisation for Economic Co-operation and Development (OECD) member countries over the years 1961-1997. Time effects and country effects were treated as random variables leading to a random effects approach or as fixed parameters, a fixed effect approach. The economic model utilized, predicted a negative inflation-growth relationship, but more importantly a non-linear one, whereby the marginal effect was stronger at lower inflation rates than at higher ones. The estimation results showed that the reduction of high and medium inflation to moderate single digit figures had a significant positive effect on growth for the OECD countries. It was also clear that the marginal benefit of the deceleration process increased as the inflation ratewas lowered. Both un-observed time and country effects proved to be important in the sense that country effects could, in part, capture differences in tax regimes and time effects represented unexpected inflation.

Abakar (2009) studied the impact of monetary policy on stock prices in Ghana. Abakar examined the long and short-run relationships between monetary policy and stock prices as well as some selected macroeconomic variables as inflation and exchange rates in Ghana for the period 1990-2006 by means of time series analysis. This study used time series monthly data on all the variables and employed the Johansen's multivariate Cointegartion technique (Johansen and Juselius, 1990) in conjunction with the Granger causality test to examine the possible long

and short-run effects among the investigated series as well as the direction of these effects. The stationarity or otherwise of the series were determined by means of the augment Dickey-Fuller (ADF) test.

Pokharel (2009) did a study on the effective role of monetary policy to cope with the current global financial crisis for achieving sustainable economic growth using the experiences of Nepal. Pokharel said that monetary policy rests on the relationship between the rates of interest in an economy, which is the price at which money can be borrowed, and the total supply of money. Monetary policy uses a variety of tools to control one or both of these, to influence outcomes like economic growth, inflation and exchange rates with other currencies and unemployment. Monetary policy can be implemented by changing the size of the monetary base. This directly changes the total amount of money circulating in the economy. A central bank can use open market operations to change the monetary base. The central bank has the ability to alter the money supply and thus influence the interest rate. The primary tool of monetary policy is open market operations. This entails managing the quantity of money in circulation through the buying and selling of various credit instruments, foreign currencies or commodities, but in case of Nepal only with domestic currency through the auction of different treasury bills in the market. All of these purchases or sales result in more or less base money entering or leaving market circulation. Usually, the short-term goal of open market operation is to achieve a specific short-term interest rate target. The other primary means (instruments) of conducting monetary policy include: Discount rate (Bank Rate), Changes in the Reserve Requirement (CRR), Open Market Operations (OMO) and Moral suasion. The different types of policies are also called monetary regimes, in parallel to exchange rate regimes

In kenya, Rotich (2012) did a study on the effectiveness of monetary policy tools in countering inflation in Kenya. The study used treasury bills rate, money supply, and exchange rates as the tools used by the central bank. The study showed Treasury bill rate was found to attract more investors to lend money to the government thus reducing their immediate purchasing power this reduces the amount of money in circulation this was found to reduces inflation. The study also found a correlation between inflation and money supply. It was established that more money supply lead to the increased inflation. This was because increase in money supply leads to people spending the excess of their money supply over the money demand.

Kiptui (2009) examines the oil price pass-through to inflation in order to inform monetary policy decisions. This research uses a model of traditional Phillips curve to derive estimates of oil price pass-through to inflation in Kenya. It is shown that oil prices have been correlated with inflation. This correlation seems to have declined towards the early 90's but started to increase after trade liberalization. The estimation results indicate that changes in oil prices have had significant effects on inflation. Other findings are that inflation has been significantly influenced by exchange rate changes and changes in aggregate demand conditions as captured by the output gap. The measure of oil price pass-through to inflation is found to be 0.05 in the short-run and 0.10 in the long-run much lower compared to exchange rate pass-through of 0.32 in the short-run and 0.64 in the long run. It implies that a 10 per cent increase in oil prices leads to only 0.5 per cent increase in inflation in the short-run and 1 per cent in the long run. Oil price pass-through is therefore low and incomplete, consistent with findings in other studies. In Kenya, evidence is

lacking as regards the relationship between monetary policy and inflation. Therefore, this study will add evidence to the literature about the nature of this relationship in Kenya.

Mutwiri (2013) conducted a study on the relationship between monetary policy tools and inflation in Kenya. The study used time series empirical data on the variables to describe and examine the relationships between monetary policy tools and inflation. The study used secondary data on the Consumer Price Index, the measure for inflation, 91-day Treasury bill rate, exchange rate and money supply (M3). The study established that inflation and the money supply were positively correlate with each other. The study established that the general level of prices increase with the increase of money supply. The study established the 91 Treasury bill rates have an impact on the level of inflation. This is because the treasury bills rate forms the base of commercial banks interest rates. Therefore an increase in treasury bills leads to an increase in commercial banks base lending rate leading to reduction in liquidity therefore reducing the aggregate demand.

Machasio (2012) conducted a study on the effect of monetary policy instruments on stock market returns at Nairobi securities exchange. Causal Research Design was used to analyze data using Statistical Product and Service Solutions (SPSS). The software was run using three monetary policy variables including treasury bill rate, Money Supply(M1) and consumer price index (proxy for inflation) on the Stock Market Returns (proxied by NSE 20 share price index). The general result of the analysis showed a strong correlation between monetary variables and Stock Market Returns. All the explanatory variables are positively related to Stock Market returns except treasury bill rate which has a negative relationship with stock market returns. Increase in CPI and Money Supply M1 causes a corresponding increase in Stock Market returns whereas an

increase in Treasury Bill Rate causes a decrease in Stock Market Returns. The study revealed that monetary policy has made significant influence over the prices of ordinary equities in Kenya and thus effectively on the returns.

2.5 Summary of Literature Review

The contribution that monetary policy makes to sustainable growth is the maintenance of price stability. Since sustained increase in price levels is adjudged substantially to be a monetary phenomenon, monetary policy uses its tools to effectively check money supply with a view to maintaining price stability in the medium to long term. Theory and empirical evidence in the literature suggest that sustainable long term growth is associated with lower price levels. In other words, high inflation is damaging to long-run economic performance and welfare. Monetary policy has far reaching impact on financing conditions in the economy, not just the costs, but also the availability of credit, banks' willingness to assume specific risks, etc. It also influences expectations about the future direction of economic activity and inflation, thus affecting the prices of goods, asset prices, exchange rates as well as consumption and investment. In order to address the issue of monetary policy relevance to the problem of inflation, there is need for an appropriate framework that serves as a reference point in order for us to understand the underlying interrelationships between monetary policy instruments and inflation in an economy like Kenya. Several scholars have looked at the use of monetary policy tools in countering inflation.

Abakar examined the long and short-run relationships between monetary policy and stock prices this study used time series monthly data on all the variables. Totonchi (2011) studied macroeconomic theories of inflation by attempting to review and analyze the competing and

complementary theories of inflation. It appeared that inflation is the net result of sophisticated dynamic interactions of these six groups of explanatory factors. That is to say, inflation is always and everywhere a macroeconomic and institutional phenomenon. Rasche and Williams (2005) studied the Effectiveness of Monetary Policy. Their analysis addressed changing views of the role and effectiveness of monetary policy, inflation targeting as an "effective monetary policy," monetary policy and short-run (output) stabilization, and problems in implementing a short-run stabilization policy.

While the literature reveals that different policy instruments have different effects on output and inflation, most of it contradicts expectations derived from theory. There is lack of consensus as to why some of the monetary policy actions do not affect inflation through some channels. A number of studies have been carried out about various aspects of the monetary policy generally. None of them addresses the effect of monetary policy on inflation comprehensively. Faria and Carneiro (2001) investigated the relationship between inflation and economic growth in the context of Brazil, which has been experiencing persistent high inflation until recent.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

This chapter describes the procedures and methodologies that were used in carrying out the study to establish the effect of monetary policy on inflation in Kenya. The chapter comprised of the research design; target population, sample design, data collection, and data analysis.

3.2 Research Design

The study adapted descriptive survey approach in collecting data from the respondents. The descriptive survey method was preferred because it ensures complete description of the situation, making sure that there was minimum bias in the collection of data and finding out the what, where and how of a phenomenon. The main purpose of this research was to examine the effect of monetary policy on inflation in Kenya.

3.3 Data Collection

This study used secondary data for the specific variables which are inflation, money supply, 91 day-Treasury bill rate and foreign exchange rate. The data on inflation (CPI) was obtained from KNBS while data on 91-day Treasury bill rate, exchange rate and money supply (M3) was obtained from the CBK website which is public data. The data which used covered a period from January 2005 to December 2014 of the respective average quarterly variables. The data used was regressed in order to give the values for further analysis that was carried out in chapter four of this research.

3.4 Data Analysis

Data analysis is the process of bringing order, structure and meaning to the mass of information collected. It involves examining what has been collected and making deductions and inferences (Kombo & Tromp, 2006). The data collected was coded, quantified and analyzed quantitatively. Quantitative data was analyzed by the use of descriptive statistics using SPSS and presented through percentages, means, standard deviations and frequencies. The inputted data was then presented in the form of tables and graphs. This provides for an easier analysis and interpretation of the data inputted. Further the data was regressed to obtain t - values, p-values, specific coefficients and intercepts, standard errors among other values. These values were used for further analysis.

3.4.1 Regression Model

The model used in this study was particularly multiple regression model. Inflation rate which is the dependent is assumed to depend on a three variables independent variables namely, money supply, 91 day-Treasury bill rate and foreign exchange (KES/USD).

The regression equation for the study was:

$Y=\alpha+\beta_1X_1+\beta_2X_2+ \beta_3X_3 + \varepsilon$

Where

Y-represents the rate of inflation

α -this gives the inflation rate when all other variables are zero.

X_1-Total monthly money supply

X_2- the average monthly exchange rate in US dollars

X_3-the 91-day Treasury bill rate

ε -the error term.

Inflation was measured by a change in consumer price index (CPI) that is an average of the change in prices of goods that are representativeness of the economy put together in a market basket. All the items were weighted according to the percentage of income that households spend per category the average of the CPI was quarterly the figures were computed by KNBS. The 91-day Treasury bill rate was measured by applying the average quarterly 91-day Treasury bill rate at which the government borrows from the public, the average quarterly interbank interest rate is the rate charged on short term loans made between banks. Foreign exchange rate was the average quarterly prevailing foreign exchange rate between Kenya shillings and US dollars as at the time covered by the study. Money supply m3 is the money supply figures by the Central Bank of Kenya. The study was tested at 95% confidence level and 5% significant levels.

CHAPTER FOUR: DATA ANALYSIS, FINDINGS AND DISCUSSION

4.1 Introduction

This chapter presents analysis and findings of the study as set out in the research objective and research methodology. The study findings are presented on the effects of monetary policy on inflation rate in Kenya. The data was gathered exclusively from the secondary source which included the records at Central Bank of Kenya (CBK) and Kenya National Bureau of Statistics (KNBS).

4.2 Descriptive Statistics

Descriptive statistics are the measures that define the general nature of the data under study. They define the nature of response from primary data and/or secondary data. Descriptive statistics for this study were: mean, standard deviation, minimum and maximum. Descriptive data analysis was performed on the inflation rates, 91 Treasury bill rates, Money Supply and Exchange Rate (USD). The descriptive statistics results are as shown below

4.2.1: CBK Inflation Rates (%)

Kenya has experienced high levels of inflation in the study period as indicated by a maximum overall annual inflation rate of 19.19 percent. Inflation rates have also fluctuated with time; for instance in the second quarter of 2006 the rate was 4.73%, in second quarter 2012, the rate rose to 11.78% while in the fourth quarter of 2014 the rate reduced to 8.19%.

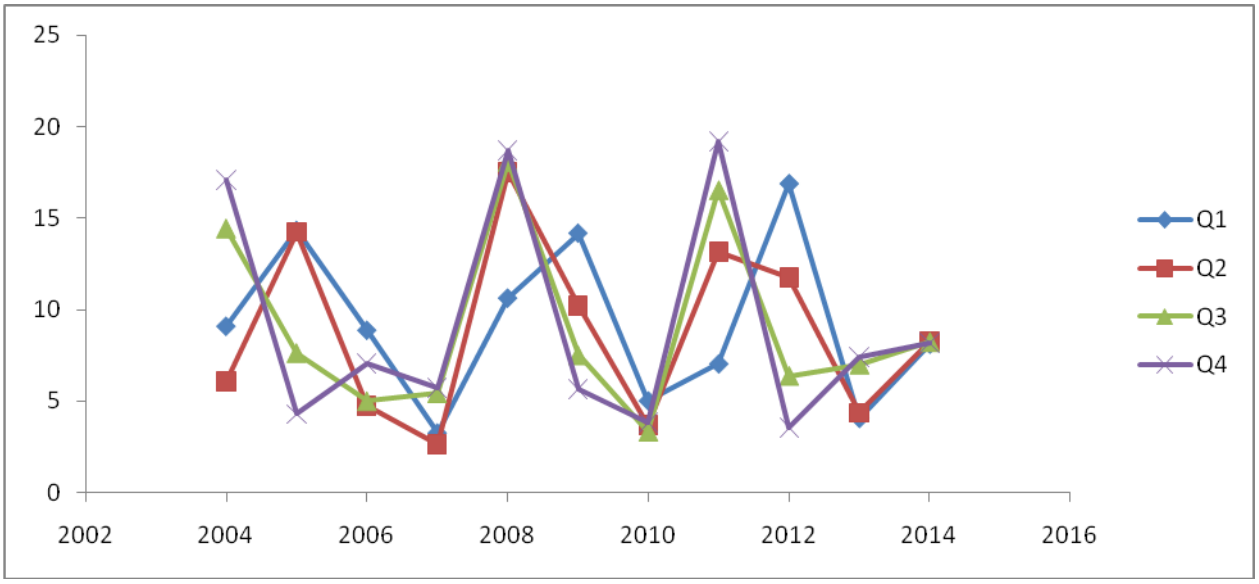

Figure 4.2: CBK Inflation Rates (%)

4.3.2 91-Day Treasury bill rates

The 91 Treasury bill rates in 2004 fluctuated between 2.33% in quarter 2 to 15.01%in quarter 1. In the year 2008 fluctuated between 8.59% and 6.90%. In 2005, the year started with a rate of 10.533 % in the first quarter of the year as the threat of inflation force central to change it monetary policy stance from expansionary to restrictive. The rate remained a little stable during the year by posting little fluctuations between 8.03333% to 10.533% with the highest rate being in quater 1 while the lowest rate was in January quater 4. In 2006 the rate stood at 7.4633% in quarter 1. During the year, the rate reduced slightly to the lowest of 6.1% in Quater 3. In 2007, the year started with 1.58% in first quarter. It increased to the highest in the year of 7.31333% in fourth quarter. In the year 2008, the rate in the first quarter was 8.4933% which reduced to 8.24333%. The rate fluctuated during the year to the lowest of 7.6133% and the highest of 8.49% in quarter 1. In the 2009, the rate started at 7.95% in quarter one then reduced gradually to 7.1% in fourth quarter. In 2010, the year started at 6.18%. The year recorded high fluctuations to reach

the lower of 1.82% in quarter 3. The average for the year was 3.581%. In 2011, the year started with a rate of 7.0433%. However, the rates increased tremendously starting the third and fourth quarters to reach the climax of 16.4133%. In 2012, the year started at 4.3267% which increased to 10.301%. Year 2013 also indicated a tremendous increase from 3.5033% in quater 1 to 10.88% in quater 4. Similarly in year 2014 also indicated a tremendous increase from 2.68% in quater 1 to 11.47% in quater 4.

Figure 4.4: 91-Day Treasury bill rates

4.2.3: Money Supply

The study sought to establish the performance of money supply in Kenya for the study period. From the study findings, the money supply in the country kept on growing from year to year. In 2004 the money supply oscillated between 461,234 and 524,124. In 2006, the money supply oscillated between 569,526 and 646,718. In 2007, the country still witnessed continuous increases in Money supply to reach a high of 754,176 billion in the last quarter of 2007. The

trend continued throughout the study period to reach a high of 1,948,921 in the last quarter of 2014.

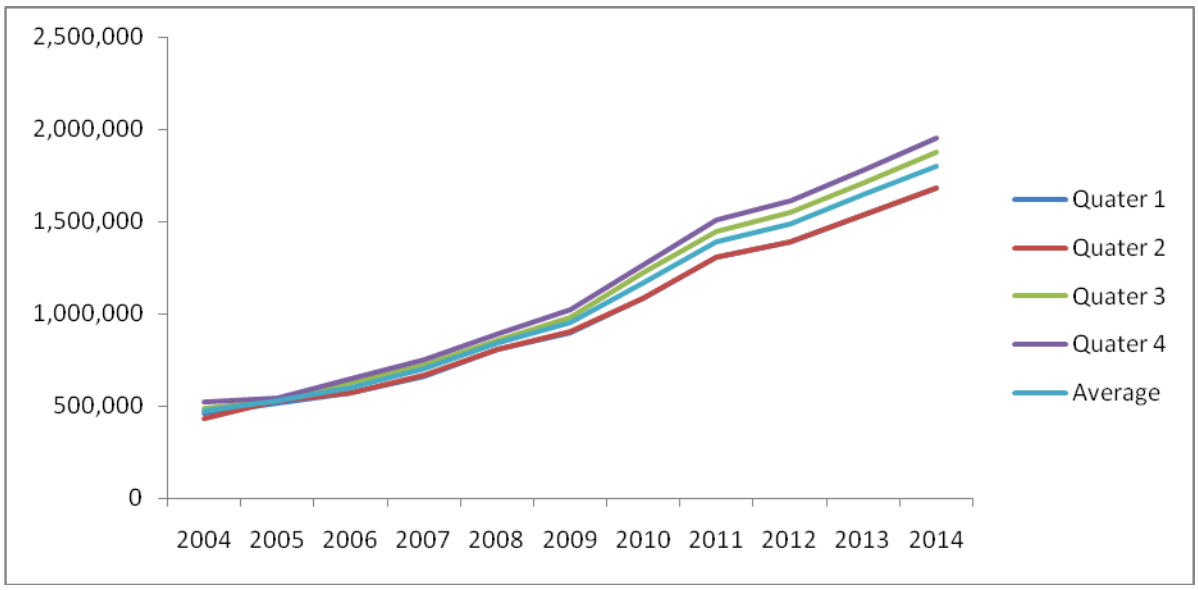

Figure 4.3: Money Supply 2004-2014

4.2.4 Exchange Rates

The study collected data on the recorded average exchange rates against the United States Dollar because it was the major currency in which many transactions were undertaken. At the beginning of the study period in 2004, the exchange rate was 76.89 in first quarter which continued to fluctuate slightly and then closed the year at 79.95. In 2007, the exchange rate started at 69.68 then the local currency appreciated which saw the exchange rates reduce continuously from one month to another until to close the year at 64.74. In 2008, the exchange rates started at 67.46 which dropped greatly to stand at 62.95 second quarter. Starting third quarter the exchange rates started rising as the local currency depreciated continuously to close the year at 78.42. In 2009, the exchange rate started on a high of 79.89 in the first quarter and dropped slightly in subsequent quarter, closing the year at 75.32. In 2010, the exchange rates started at 76.7 then

increased continuously throughout the year to close at 80.84. In 2011, the exchange rates started at 82.21 then recorded high increases throughout the year to hit the highest exchange rate ever of 94.85 in third quarter before easing off to close the year at 91.52. In 2012 the exchange rates started at 83.54 then recorded high increases throughout the year closing at 85.71. In 2014, the exchange rates started at 86.001 then increased continuously throughout the year to close at 87.176.

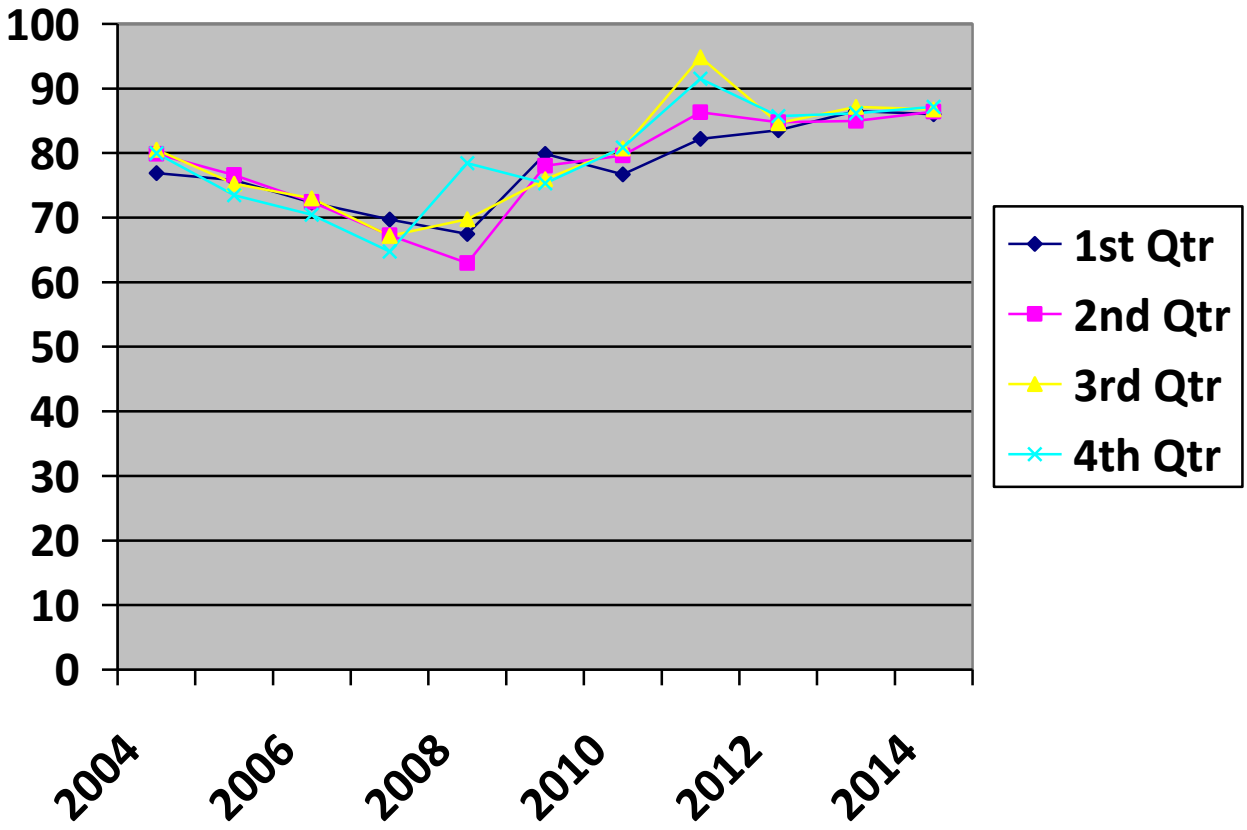

Figure 4.4: Exchange Rates against the United States Dollar

4.3 Correlation Analysis

To quantify the strength of the relationship between the variables, the study used Karl Pearson's coefficient of correlation. 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 less than 0 indicates a negative association, that is, as the value of one variable increases the value of the other variable decreases.

The Pearson's coefficient was used to verify the existence or non-existence 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 of linear correlation between and among the net assets value variables. The findings are presented as follows;

Table 4.1: Correlation Matrix Table

		Inflation rate	Money Supply	Exchange Rates (USD)	91-Days Treasury Bill Rate
Inflation rate	Pearson Correlation	1	.969**	.627**	.762**
	Sig. (2-tailed)		.006	.000	.001
	N	40	40	40	40
Money Supply	Pearson Correlation	.969**	1	-.062	.527**
	Sig. (2-tailed)	.006		.921	.000
	N	40	40	40	40
Exchange Rates (USD)	Pearson Correlation	.627**	-.062	1	.139
	Sig. (2-tailed)	.000	.921		.368
	N	40	40	40	40
91-Days Treasury Bill Rate	Pearson Correlation	.762**	-.078	.287	1
	Sig. (2-tailed)	.001	.613	.059	
	N	40	40	40	40

Source: Author (2015)

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

From the findings, it was clear that there was strong and positive correlation between the; money supply & Inflation rate (.969), 91-Days Treasury bill Rate & inflation rate (.762) and between Exchange Rates (USD) & inflation rate (.627). The significance test indicates that money supply, 91-Days Treasury bill Rate and Exchange Rates (USD) are significant to the inflation rate.

4.4 Regression Analysis

The study further applied general Linear Model to determine the predictive power of the effects of monetary policy on inflation rate in Kenya. This included regression analysis, the Model, Analysis of Variance and coefficient of determination. In order to establish the relationship among the variables (independent), the researcher conducted a multiple regression analysis. The analysis applied the statistical package for social sciences (SPSS) version 21 to compute the measurements of the multiple regressions for the study. The findings were as shown in the Table 4.2below.

4.4.1 Model Summary

Table 4.2: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.511[a]	.261	.206	4.2236

a. Predictors: (Constant), Money Supply, Exchange Rates (USD), 91-Days Treasury Bill Rate

Source: Research data, 2011

Coefficient of determination explains the extent to which changes in the dependent variable (the rate of inflation) can be explained by the change in the independent variables or

the percentage of variation in the dependent variable that is explained by all the four independent variables (91-Day Treasury bill rate, exchange rates and money supply).

The correlation and the coefficient of determination of the dependent variables the rate of inflation when all the four independent variables are combined was measured and tested. From the findings 26.1% of the rate of inflation in Kenya was attributed to combination of the three independent factors (91-Day Treasury bill rate, exchange rates and money supply) investigated in this study. A further 73.9% of the rate of inflation changes is attributed to other factors not investigated in this study.

4.4.2 ANOVA Results

Table 4.3 ANOVA[a] of the Regression

ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	227.3697	3	75.78989	4.248622	0.011418[b]
	Residual	642.1931	36	17.8387		
	Total	869.5628	39			

Source: Author (2015)

a. Dependent Variable: CBK Inflation Rates (%)

b. Predictors: (Constant), KES/USD Exchange Rate, 91-Day Treasury Bill Rate, Money Supply Data

The significance value is 0.0114 which is less than 0.05 thus the model is statistically significant in predicting how 91-Day Treasury bill rate, exchange rates and money supply affect rate of inflation in Kenya. The F critical at 5% level of significance was 2.25. Since F calculated is greater than the F critical (value = 4.248), this shows that the overall model was significant.

4.4.3 Model of Coefficient

Table 4.4: Coefficient of determination

Model	**Unstandardized Coefficients**		**Standardized Coefficients**	**t**	**Sig.**
	B	Std. Error	Beta		
(Constant)	-8.969	9.847		-0.91086	.332
91-Days Treasury Bill Rate	0.745	0.2501	.437	2.9797	.005
Money Supply	2.469	1.8582	-.337	0.1328	.198
Exchange Rates (USD)	0.2077	0.1583	.358	1.3121	.179
a. Dependent Variable: Inflation					

Source: Author (2015)

In order to determine the relationship between consumer price index and the four variables, the researcher conducted a multiple regression analysis. As per the SPSS generated table 4.4, the equation ($Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \varepsilon$) becomes:

$Y = -8.969 + 2.469X_1 + .2077X_2 + .745X_3$

Where Y is the dependent variable (rate of inflation), X_1 is the money supply independent variable, X_2 is exchange rate (USD) variable, X_3 is the 91-day and Treasury bill rate.

As per the regression equation established, if all factors were taken into account (money supply, exchange rates and 91-Day Treasury bill rate) to be constant at zero, rate of inflation would be

-8.969. The data findings analyzed also shows that if all other independent variables are taken at zero, a unit increase in 91-day Treasury bill rate will lead to 0.745 unit increase in the rate of inflation in Kenya. Further, a unit increase in exchange rates will lead to a .2077 increase in rate of inflation in Kenya a unit increase in money Supply will lead to a 2.469 increase in rate of inflation in Kenya.

From the above analysis of the betas, it can be inferred that money supply contributes a lot on the rate of inflation at 2.469 in Kenya followed by 91-day Treasury bill rate. At 5% level of significance and 95% level of confidence, 91 Day Treasury Bill rate had a 0.005 level of significance, Exchange Rates (USD) had a 0.179 level of significance and Money Supply showed a 0.198 level of significant hence the most significant factor was Money supply followed by Exchange rate.

4.5 Summary and Interpretation of the Findings

From the regression analysis conducted in 4.1 above, the study established that the three factors studied here affected inflation up to 26.1% indicating that there were other variables affected inflation that had not been factored in this study.

From the study, the rate of inflation seems to have increased following increase in the money supply, exchange rates and 91-day Treasury bill rate. This indicates that there is a positive relationship between these variables and the rates of inflation recorded in the country. Central Banks are mandated through their monetary policies to check the rate of inflation because inflation can affect economic growth through financial intermediaries and has a direct effect on growth as well. Us (2004) states that Inflation is primarily caused by an increase in the

money supply that outpaces economic growth. Ever since industrialized nations moved away from the gold standard during the past century, the value of money is determined by the amount of currency that is in circulation and the public's perception of the value of that money.

When the Federal Reserve decides to put more money into circulation at a rate higher than the economy's growth rate, the value of money can fall because of the changing public perception of the value of the underlying currency. As a result, this devaluation will force prices to rise because each unit of currency is now worth less. According to Johnson (2003), Inflation can be made worse by our increasing exposure to foreign marketplaces. In Kenya, we function on a basis of the value of the dollar. On a day-to-day basis, consumers may not care what the exchange rates between foreign trade partners are, but in an increasingly global economy, exchange rates are one of the most important factors in determining the rate of inflation (Laidemen *et al.*, 2006).

The study further established that at 5% level of significance and 95% level of confidence, 91 Day Treasury Bill rate had a 0.05 level of significance, Exchange Rates (USD) had a 1.79 level of significance and Money Supply showed a 1.98 level of significant hence the most significant factor was Money supply, similarly Rotich (2012) did a study on the effectiveness of monetary policy tools in countering inflation in Kenya. The study used treasury bills rate, money supply, and exchange rates as the tools used by the central bank. The study showed Treasury bill rate was found to attract more investors to lend money to the government thus reducing their immediate purchasing power this reduces the amount of money in circulation this was found to reduces inflation. The study also found a correlation between inflation and money supply. It was

established that more money supply lead to the increased inflation. This was because increase in money supply leads to people spending the excess of their money supply over the money demand.

CHAPTER FIVE: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter presented the summary of key data findings, conclusions drawn from the findings highlighted and policy recommendations that were made. The conclusions and recommendations drawn were in quest of addressing research objectives of establishing the effects of monetary policy on inflation rate in Kenya.

5.2 Summary

The study set to establish the effects of monetary policy on inflation rate in Kenya. In achieving this, the study used three variables including 91-day Treasury Bill Rate, Money Supply and exchange rates (USD). The independent variable was inflation rate.

From the presentation in chapter four, it was evident that, money supply had an increasing trend while the 91-day treasury bill rates and exchange rates had been fluctuating over the period under study. Money supply had been on an upward trend during the period under review. However, during the first quarter of 2012 there was a slight decline at Kshs. 1,392,857. The 91 day Treasury bill rate had been fluctuating throughout the period hitting the lowest rate ever of 1.58 in quarter one 2006 and the highest rate of 11.47 in the fourth quarter 2014.The exchange rates had been declining steadily from 75.81 in 2005 at to 64.74 in 2007 where the rate began to fluctuate hitting the lowest rate at 62.74 in the 2nd quarter 2008 and the highest in rate at 94.85 in the third quarter 2014.

From the correlation analysis it was noted that there was a strong relationship between the rate of inflation in Kenya and the independent variable of 0.969, 0.627 and 0.762 for Money supply, exchange rate and 91-Days Treasury bill rate respectively. In addition, from the 2 tailed significant test the study showed that there was a statistically significant correlation between inflation rate and the independent variable i.e. an increase in for Money supply, exchange rate and 91-Days Treasury bill rate would cause an increase in the inflation rate.

From the model of the summary it was clear that there was simple correlation of 0.511 which indicates a high degree of correlation between the inflation rate in Kenya and the independent variable. In addition, only 26.1% of the inflation rate can be explained by the independent variables i.e. Money supply, exchange rate and 91-Day Treasury bill which is very minimal. From the analysis of variance the *p*-value was 0.0114 which is less than 0.05 therefore it indicates that the regression model statistically significantly predicts the outcome that is the regression model is a good fit for the data.

From the regressed data the coefficient of determination proved that with all other factors held constant there is negative inflation. With reference to the analysis done in chapter four only 91-day Treasury bill rate contributes statistically significantly to the model and can be used to predict inflation rate since the *p*-value is 0.05. Therefore, the 91-day Treasury bill rate has a 95% chance true relationship in the model. The exchange rate and money supply are no longer predictors of inflation rate since the *p*-values are 0.179 and 0.198 respectively which is greater than 0.05.

5.3 Conclusions and Recommendations

From the study findings in chapter four and the summary above, the study concludes that there was a high correlation between inflation rate and the independent variables in this regard, monetary policies does affect inflation rates. This is because through the monetary policy tools, the monetary Committee influences the amount of money in circulation. In summary all the variables (91-Day Treasury bill rate, exchange rates and money supply) considered together influence the inflation rate by 26.1% only.

The study concludes that 91-day Treasury Bills Rate is the main influencer of the inflation rates in Kenya. In view of the above, the study recommends that the Government evaluate the prevailing levels of inflation rate and set the interest rates on the 91-day Treasury bills because they are majorly treated as risk free rate hence determine other interest rates and inflation levels in Kenya. The study also recommends that the commercial banks and the entire financial sector institutions be careful in their overnight interest because it has some level of effects on the inflation rate.

It was also concluded that, money supply had the 2nd most effect on the rate of inflation prevailing in Kenya. This is largely because money supply affect demand and supply of goods and services. In this regard, as money supply circulating around the economy increases inflation also increases. An increase in money supply leads to people spending the excess of their money supply over money demand. When people have more disposable income to spend on luxury goods aggregate demand also increases hence reduced inflation as the demand for goods and services reduces. To reduce inflation, the Government and its

policy makers need to measure the money supply and use the fiscal policy in order to reduce the amount of money circulating around the economy.

The study further established that exchange rate system has an important role in reducing or minimizing the risk of fluctuations in exchange rates, which will have an impact on the economy. Any changes in exchange rates will have a great impact on the economy. An increase in exchange rates in accompanies by higher rates on inflation. This is partly due to increases in the Diaspora remittances. However, in general, exchange rates have limited effect on the levels of inflation recorded in Kenya.

5.5 Limitations of the Study

The main limitations of this study were: the data used in this study comprised of secondary data collected for other purposes. In addition, due to changing operating environment and increased globalization, the effect of the monetary policy on inflation rates may be changing calling for a change on the application of monetary policy tool.

Another limitation of the study included the fact that the inflation rates existing in the country have forced the country to review the money supply. This may have distorted the relationship between the independent and the dependent variables in this study.

The study was limited to CBK and KNBS. Kenya being a collectivistic country, most of the trends are replicated year in year out. Consideration of other factors might have revealed

interesting findings. The variables used are proxies which are bound to change with passage of time.

The present study has relied largely on quantitative methodology of data collection and is therefore restrictive. Therefore, more of qualitative methodology of data collection should be undertaken in future to provide wider perspective to the present study. For instance, the research design can employ case study methodology or content analysis to provide a holistic picture to the given subject.

5.6 Suggestions for Further Studies

This study set to establish the effects of monetary policy on inflation rate in Kenya. This study considered three variables which included 91-day treasury bills, exchange rate and money supply. This study therefore recommends that another study be done to establish other factors influencing inflation rates in Kenya.

Since this study was limited to the effect of Monetary policy on inflation rate, further research can focus on the effect of both Fiscal and Monetary policy on inflation rate in general. This will bring out the contemporaneous relationship between the two variables. It is highly advisable that the reverse effect of inflation rate on Monetary Policy should also be evaluated to gain an in-depth understanding of capital markets on economic growth.

Some empirical work that disaggregates other variables should be done to capture more accurately the effect monetary policy has on inflation rate. It would be interesting to identify and

establish the relationship between monetary policy and inflation rate to determine if there are similarities or differences in the reactions of inflation rate to monetary policy in Kenya.

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Appendix I: Quaterly variables Data

		CBK Inflation Rates (%)	91-Day Treasury Bill Rate	Money Supply Data	KES/USD Exchange Rate (KES.)
2005	Quater 1	14.32	10.533	514231	75.81
	Quater 2	14.24	8.61333	526123	76.62
	Quater 3	7.63	8.61	531124	75.27
	Quater 4	4.27	8.03333	545123	73.49
2006	Quater 1	8.88	7.4633	569526	72.35
	Quater 2	4.73	6.87667	569526	72.44
	Quater 3	5	6.1	623544	72.97
	Quater 4	7.06	6.32333	646718	70.46
2007	Quater 1	3.28	1.58	664853	69.68
	Quater 2	2.63	6.65	664853	67.28
	Quater 3	5.44	7.05667	725818	67.16
	Quater 4	5.72	7.31333	754176	64.74
2008	Quater 1	10.63	8.4933	807556	67.46
	Quater 2	17.53	7.61333	807556	62.95
	Quater 3	18.06	7.91333	854897	69.76
	Quater 4	18.7	8.24333	891595	78.42
2009	Quater 1	14.17	7.95	900500	79.89
	Quater 2	10.21	7.37333	900500	78.06
	Quater 3	7.51	7.26	981126	75.95
	Quater 4	5.65	7.1	1023270	75.32
2010	Quater 1	5.03	6.18	1086504	76.7
	Quater 2	3.68	4.12	1086504	79.64
	Quater 3	3.33	1.82333	1224547	80.69
	Quater 4	3.84	2.20333	1261646	80.84
2011	Quater 1	7.05	7.0433	1305511	82.21
	Quater 2	13.16	5.85333	1305511	86.33
	Quater 3	16.51	10.05	1444592	94.85
	Quater 4	19.19	16.4133	1505940	91.52
2012	Quater 1	16.87	4.3267	1392857	83.54
	Quater 2	11.78	6.42786	1392857	84.76
	Quater 3	6.38	7.72405	1548520	84.61
	Quater 4	3.53	10.301	1608910	85.71
2013	Quater 1	4.08	3.5033	1536795	86.5
	Quater 2	4.37	6.48321	1536795	84.98
	Quater 3	7	8.02226	1712167	87.17
	Quater 4	7.42	10.8869	1778916	86.15

2014	Quater 1	8.13	2.68	1680733	86.001
	Quater 2	8.27	6.53857	1680733	86.392
	Quater 3	8.23	8.32048	1875814	86.784
	Quater 4	8.19	11.4729	1948921	87.176