EFFECTIVENESS OF MONETARY POLICY TOOLS IN COUNTERING INFLATION IN KENYA

BY

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DECLARATION

This Research project is my original work and has not been submitted for examination in any other University.

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

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DEDICATION

I dedicate this research project to my wife and children – for your steadfast love and encouragement throughout my pedagogical endeavours

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To all, I remain forever grateful

ABSTRACT

The effect of monetary policy actions affects the general levels of retail prices prevailing in the Country from time to time. Through its monetary policy tools the Government of Kenya is able to control the levels of inflation reported in Kenya. The Central Bank of Kenya (CBK), like most other central banks around the world, is entrusted with the responsibility of formulating and implementing monetary policy directed at achieving and maintaining low inflation as one of its two principal objectives; the other being to maintain a sound market-based financial system. This study set to establish the effectiveness of monetary policy tools in countering inflation in Kenya.

The study employed correlational research design. The study used time series empirical data on the variables to describe and examine the effectiveness of monetary policy tools in countering inflation in Kenya by establishing correlation coefficients between the inflation and the monetary policy tools. The study used secondary data on the Consumer Price Index for inflation, 91-day Treasury bill rate, exchange rate, money supply (M3) and repo rate. The analyses entailed the computation of the various coefficients of correlation denoted as 'β' in the model to determine the effectiveness of monetary policy tools in countering inflation in Kenya.

The study established that inflation and the money supply were positively correlate with each other. 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. The study also established that exchange rate policyhas 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.

The study recommends that the policy makers need to keenly consider the levels of money supply in Kenya so as to ensure a stable retail price levels. The study also recommends that the Government evaluate the prevailing levels of retail prices 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.

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ABBREVIATIONS

CBK	Central Bank of Kenya
CBR	Central Bank Rate
CPEs	Centrally Planned Economies
CPI	Consumer Price Index
CRR	Reserve Requirement
EAC	East African Community
ECCU	Eastern Caribbean Currency Union
GDP	Gross Domestic Product
IT	Inflation Targeting
KNBS	Kenya National Bureau of Statistics
LIBOR	London Inter- Bank Offered Rate
MCI	Monetary Conditions Index
MPC	Monetary Policy Committee
NBFIs	Non Bank Financial Institutions
OMO	Open Market Operations
QTM	Quantity Theory of Money
REPO	Repurchase Agreement

CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

Monetary policy can be defined broadly as any policy relating to the supply of money. The Central Bank of Kenya's monetary committee defines monetary policy as the measures taken by the monetary authorities to influence the quantity of money with a view to achieving stable prices, full employment and economic growth. The ultimate objective of monetary policymakers is to promote the health of their economy by pursuing their mandated goals of price stability and maximum sustainable output and employment. Hence, monetary policy can also be defined in terms of formulation and execution of policies by the Central Bank, aimed at guiding bank lending rates to levels consistent with aggregate supply elasticity, all of which are set on the attainment of low inflation and high sustainable economic growth (Bernanke, 2003).

Monetary policy is a type of stabilization policy adopted by countries to deal with different economic imbalances. Monetary policy covers the monetary aspect of the general economic policy which requires that a high level of co-ordination between monetary policy and other instruments of economic policy be maintained at all times (Akhtar, 2006). The effectiveness of monetary policy and its relative importance as a tool of economic stabilization varies from one economy to another, due to differences among economic structures, divergence in degrees of development in money and capital markets resulting in differing degree of economic progress, and differences in prevailing economic conditions (Bernanke, 2005).

The effects of the policy instruments such as the short-term interest rate, on the goal variables are indirect at best. Monetary policy actions have their most direct and immediate effects on the broader financial markets, including the stock market, government and corporate bond markets, mortgage markets, markets for consumer credit, foreign exchange markets, and many others (Mishkin, 2000). If all works out as planned, the changes in financial asset prices and returns induced by the actions of monetary policymakers lead to the changes in economic behaviour that the policy attempted to achieve. Thus, understanding how monetary policy affects the broader economy necessarily entails understanding both how policy actions affect key financial markets, as well as how changes in asset prices and returns in these markets in turn affect the behaviour of households, firms and other decision makers (Ioannidis and Kontonikas, 2006).

Inflation is a continuous increase in the price level, sustained over a period of time. Inflation may be caused by a continuous increase in the supply of money, a continuous decrease in the demand for money, or a combination of the two. Government might very well and often do increase the money supply continuously (Jalil, 2011). If the demand for money were fixed, then the price level would grow at the same rate as money supply. Rising real incomes usually cause the demand for money to rise over time. This tempers the inflationary effect of money supply growth, and so the price level typically grows more slowly than the money supply. Even so, a higher rate of money supply growth is expected to cause a higher rate of inflation (Jalil, 2011).

Inflation is defined as a time of generally rising prices for goods and factors of production. In any economy inflation is undesirable. This is because of the specific economic costs associated with inflation. First, when inflation is high, currency and non-interest-bearing checking accounts are undesirable because they are constantly declining in purchasing power. Secondly, there are tax distortions, for example, when inflation rages, the actual value of these deductions are much less than it should actually be (Ludi and Ground, 2006). There are also unfair gains and losses. When inflation hits, some people gain and some lose for example people whose pensions are fixed in shilling terms lose. People see inflation as a breakdown of the basic government responsibility to provide a stable unit of purchasing power. Some people may not understand the relation between their own incomes and rising prices. To them, higher prices represent diminished real income. The marginal social cost of unemployment is higher when unemployment is high. Since labour supply is inelastic, the marginal value of time in other uses falls if unemployment rises, and rises if unemployment falls below normal levels. Therefore, the economy is better off with stable output at optimal employment levels as against fluctuating output and employment (Rasche, 2005).

1.1.1 Monetary Policy Tools

The set of instruments available to monetary authorities may differ from one country to another, according to differences in political systems, economic structures, statutory and institutional procedures, development of money and capital markets and other considerations. In most advanced capitalist countries, monetary authorities use one or more of the following key instruments: changes in the legal reserve ratio, changes in the

discount rate or the official key bank rate, exchange rates and open market operations (Abaker, 2009).

In many in-stances, supplementary instruments are used, known as instruments of direct supervision or qualitative instruments. Although the developing countries use one or more of these instruments, taking into consideration the difference in their economic growth levels, the dissimilarity in the patterns of their production structures and the degree of their link with the outside world, many resort to the method of qualitative supervision, particularly those countries which face problems arising from the nature of their economic structures (Adam, 2009). Although the effectiveness of monetary policy does not necessarily depend on using a wide range of instruments, coordinated use of various instruments is essential to the application of a rational monetary policy. Some of the commonly used monetary policy tools include: Open Market Operations (OMO), Repo rate; Interest rates; Money supply; Exchange Rates; Balance of Payment (Handa, 2005).

1.1.2 Consumer Price Index (CPI) in Kenya

The mandate of calculating inflation numbers vests in the Kenya National Bureau of Statistics (KNBS). In October 2009 the Bureau revised the methodology of calculating inflation from the arithmetic to the geometric mean method. This was followed by a revision of the weights of the respective baskets in February 2010 to reflect changes in households' behavioral patterns due to changes in consumption patterns and introduction of new products. For example the Food and non-alcoholic beverages' price index now account for 36.04 percent of the total weight, down from 50.05 percent in the previous

basket (Kinyua, 2001). The KNBS also increased the data collection centers and extended the regions covered into all provinces and expanded the CPI baskets from 216 commodities to 234. The survey now captures new items such as expenditure on internet services, airtime and boda boda (bicycle/motorcycle) services to reflect the changing consumption patterns of Kenyans. The classifications by commodity categories were also increased from ten to twelve categories to harmonize with the agreed classifications among the East African Community (EAC) partner states (Kinyua, 2001).

1.1.3 The relationship between Inflation and monetary policy tools

While economists are largely agreed that money supply is the ultimate determinant of the general level of prices and that, therefore, by extension, excess money supply is the ultimate cause of inflation, the monetary policy transmission mechanism, which is the sequence of events starting with a change in the value of the monetary policy instrument and culminating in a change in real output and inflation, is not clear in many countries. For most of these countries, Bernanke and Gertler (1995)'s characterization of the monetary policy transmission mechanism as "a black box" remains true. For effective application of monetary tools in the control of inflation in an economy, a central banks needs to know the elasticity of inflation with respect to monetary policy shocks in order to determine the amount by which it should change the value of the policy instrument so as to obtain a desired amount of change in inflation. It should also know the average amount of time taken for the full impact of a monetary policy shock on inflation to materialize (Keith and Howell, 1990).

Studying the exchange rate pass-through effect to domestic prices in Kenya, Kiptui (2005) show that there is partial exchange rate pass-through to domestic prices and that therefore importers did not shift forward to domestic consumers the full exchange rate effect on import prices. The exchange rate pass-through is estimated at 20% and 70% in the short- and in the long-run, respectively. The results show that a necessary condition for an operational exchange rate channel holds. As a sufficient condition, and therefore further to the existence of a strong exchange rate pass-through to domestic prices, the elasticity of the exchange rate with respect to a monetary policy shock should be consistent and sufficiently large. The latter aspect was beyond the scope of Kenya (Kiptui, 2005).

In South Africa, liquid asset ratio-based system with quantitative controls over interest rates and credit over the period (1960–1985) system, interest rate played a minor part as a corrective instrument whereas the main form of monetary control was achieved through liquid asset requirements. Performance of monetary policy was poor during this period and inflation remained high and volatile. During the period 1986 up to 1998, pre-announced monetary targets were used for the first time, with the main policy emphasis on the central bank's discount rate in influencing the cost of overnight collateralized lending and hence market interest rates. These money targets worked very efficiently while South Africa was in a period of economic isolation during the 1980s and early 1990s, but were very difficult to control in the 1990s when the South African economy gradually began to "open up" (Ludi and Ground, 2006).

1.2 Research Problem

Monetary policy attempts to achieve a set of objectives that are expressed in terms of macroeconomic variables such as inflation, real output and employment (Ioannidis and Kontonikas, 2006). However, the effect of monetary policy actions such as changes in the central bank rate (CBR) on these goal variables are indirect at best with a more immediate and direct effect on the broader financial markets such as the stock market, government and corporate bond markets, foreign exchange markets and mortgage markets which are quick to incorporate new information. While a relatively large number of central banks have adopted a formal inflation target, it is by no means universal. One of the charges sometimes imposed against having an inflation target is that it pays insufficient attention to economic objectives other than inflation. This is coupled with doubts on the mechanisms to decide on how much weight a central bank faced with a dual mandate should put on each mandate.

The Central Bank of Kenya (CBK), like most other central banks around the world, is entrusted with the responsibility of formulating and implementing monetary policy directed at achieving and maintaining low inflation as one of its two principal objectives; the other being to maintain a sound market-based financial system (Kinyua, 2001). The country has experiences increasing rate of inflation over the past three years with the general level of commodity prices increasing despite the frequent interventions by the Central Bank's Monetary Committee. The price of various commodities doubled in less than a year.

The effect of monetary policy on inflation and other variables has been the subject of macroeconomic research and debates for quite a long time. Some studies have analyzed how monetary policy affects nominal and the real economy (Aron and Muellbauer (2001), Ludi and Ground (2006), Burger and Marinkov (2006)). Their focus was mainly on different channels of the transmission mechanism through which monetary policy affects the economy. Opati (2009) did a study on casual relationship between inflation and exchange rates in Kenya where it was established that an increase in inflation leads to the depreciation of the local currency. Wamucii (2010) studied the relationship between inflation and financial performance of commercial banks in Kenya. He established that the performance of commercial banks seemed to improve with the increases in inflation. Nyambok (2010) studied the relationship between inflation rates and liquidity of companies quoted at the NSE. Nyambok Noted that increases in inflation had mixed effects on the liquidity of firms quoted at the NSE. The effects varied across different segments at the stock exchange. From the above discussion, it is clear that further study needs to be done on the effectiveness of monetary policy tools in countering inflation in Kenya. This study therefore sought to answer one question: how effective are the monetary policy tools in countering inflation in Kenya?

1.3 Research Objective

1.3.1 Main Objective
To establish the effectiveness of monetary policy tools in countering inflation in Kenya

1.3.2 Specific Research Objectives
   i.   Determine the effect of 91 Day Treasury bill rate on inflation rates in Kenya

ii.   Determine the effects of exchange rates on inflation rates in Kenya

iii.   Determine the effect of REPO rate on inflation rates in Kenya

iv.   Determine the effects of money supply on inflation rates in Kenya

1.4 Value of the Study

This study would be of value to different stakeholders including: scholars and academicians, government through its relevant agency, and the policy makers in Kenya.

To scholars and academicians, this study would increase body of knowledge on monetary policy transmission in the Kenyan Market. It will also suggest areas for further research so that future scholars can pick up these areas and study further. The KNBS would find the findings of this study important in informing their computation of inflation and what commodities to include in their CPI index basket for accurate computation of inflation.

The study would be important to the government especially the Ministry of Finance and the Central Bank of Kenya for making policy decisions whose overall objectives is to influence the level of economic activity and manage the monetary policy. It also would help to facilitate better monetary policy transmission and stable prices that support economic growth in the country.

CHAPTER TWO

LITERATURE REVIEW

2.1   Introduction

This chapter looks at the literature on monetary policy and inflation effects on economic growth. It reviews studies by other scholars especially studies touching on monetary policy and inflation. The chapter addresses the theoretical framework on which the study will be build, measurement of inflation rates, empirical literature and chapter summary.

2.2 Theoretical Review

2.2.1 Quantity Theory of Money

The quantity theory of money is one of the oldest surviving economic doctrines. It asserts that changes in the general level of general prices are determined primarily by changes in the quantity of money in circulation. The quantity theory of money formed the central core of 19th century classical monetary analysis, provided the dominant conceptual framework for interpret in contemporary financial events and formed the intellectual foundation of orthodox policy prescription designed to preserve the gold standard. Hume (1711-76) provided the first dynamic process from one sector of the economy to another, altering relative price and quantity in the process. He provided considerable refinement, elaboration and extension to the quantity theory of money

Ricardo (1772-1823), the most influential of the classical economists, thought such disequilibrium effects ephemeral and unimportant in long-run equilibrium analysis. As leader of the Balloonists, Ricardo charged that inflation in Britain was solely the result of the Bank of England's irresponsible over issue of money, when in 1797, under the stress

of the Napoleonic Wars; Britain left the gold standard for an inconvertible paper standard. Ricardo discouraged discussions on possible beneficial output and employment effects of monetary injection.

Fisher (1947) spelled out his famous equation of exchange viz. MV=PT. This and other equations, such as the Cambridge cash balance equation, which corresponds with the emerging use of mathematics in neo-economic analysis, define precisely the conditions under which the proportional postulate is valid. Fisher and other neo-classical economists, such as Arthur Cecil Pigou (1877-1959) of Cambridge, demonstrated that monetary control could be achieved in a fractional reserve-banking regime via control of an exogenously determined stock of high power money.

Empirical studies of the quantity theory of money (QTM) have focused directly on the relationship between the rate of change of the money stock and inflation. In monetary economics, the quantity theory of money is the theory that money supply has a direct, proportional relationship with the price level. The theory was challenged by Keynesian economics, but updated and reinvigorated by the monetary school of economics. While mainstream economists agree that the quantity theory holds true in the long run, there is still disagreement about its applicability in the short run. Critics of the theory argue that money velocity is not stable and, in the short-run, prices are sticky, so the direct relationship between money supply and price level.

The quantity theory of money, despite its affinity with monetarism in Western economics, has long been one of the accepted doctrines of the socialist monetary authority. The version of the quantity approach adopted is of course the classical,

transactions-based, one rather than the modern, Friedmanite extension which includes considerations on interest rates, assets and wealth, and adaptive expectations, among other variables. An idealized scenario of using the theory in centrally planned economies (CPEs) is as follows: given the constancy of (or reliable information on) the velocity of monetary circulation (V) and the level of real output (y), the government could then automatically supply the appropriate amount of money (M) to the economy to facilitate transactions and maintain stability in the price level (P). Hence money is endogenous and passive, driven by socialist planning.

In a socialist country, the issue of money is often influenced by a large number of economic and political factors, particularly when the government is responsible for the lion's share of providing the population with purchasing power: wage payments to the city workers, agricultural procurements from farmers and the financing of the operation of the state enterprises among other government expenditures on its citizens. Much as the government wants to constrain it, this kind of distribution often has its own logic and cannot be totally compromised for the sake of macroeconomic stability.

2.2.2 Keynesian Theory

The Keynesian view on inflation was introduced in a book titled The General Theory of Employment, Interest and Money published in 1940. According to Keynes, an increase in general price levels or inflation is created by an increase in the aggregate demand which is over and above the increase in aggregate supply. If a given economy is at its full employment output level, an increase in government expenditure (G), an increase in private consumption (C) and an increase in private investment (I) will create an increase

in aggregate demand; Leading towards an increase in general price levels. Such an inflationary situation is created due to the fact that at optimum or full employment of output with maximum utilization of scarce resources, a given economy is unable to increase its output or aggregate supply in response to an increase in aggregate demand.

Keynes intended government to play a much larger role in the economy. His vision was one of reformed capitalism, managed capitalism—capitalism saved both from socialism and from itself. Fiscal policy would enable wise managers to stabilize the economy without resorting to actual controls. The bulk of decision making would remain with the decentralized market rather than with the central planner. Keynes provided both a specific rationale for government's taking a bigger role in the economy and a more general confidence in the ability of government to intervene and manage effectively. Despite Keynes's fascination with uncertainty and his speculative talents in the marketplace, Keynesians deemed "government knowledge" to be superior to that of the marketplace.

2.2.3 Monetarism Theory

Monetarism refers to the followers of Friedman (2006) who hold that "only money matters", and as such monetary policy is a more potent instrument than fiscal policy in economic stabilization. According to the monetarists, the money supply is the "dominate, though not exclusive" determinant of both the level of output and prices in the short run, and of the level of prices in the long run. The long- run level of output is not influenced by the money supply.

The monetarists emphasized the role of money. Modern quantity theory led by Milton Friedman holds that "inflation is always and everywhere a monetary phenomenon that arises from a more rapid expansion in the quantity of money than in total output. Its earliest explanation was to be found in the simple quantity theory of money. The monetarists employed the familiar identity of exchange equation of Fisher.

The monetarists theory states that when the money supply is increased in order to grow or increase production and employment, creating an inflationary situation within an economy. A monetarist believes increases in the money supply will only influence or increase production and employment levels in the short run and not in the long run (Yergin and Stanislaw, 1998). Accordingly, there will be a positive relationship between inflation levels and money supply. The monetarists explain this relationship using the theory of natural rate of unemployment.

The theory of natural rate of unemployment suggests that there will be a level of equilibrium output, employment, and corresponding level of unemployment naturally decided based on features such as resources employment, technology used and the number of firms in the country, the unemployment level decided in this manner will be identified as natural rate of unemployment. In the short run, expansionary monetary policies will result in the decline in the natural rate of unemployment and increase the production but the effectiveness of the expansionary policies will be limited in the long run and lead to an inflationary situation (Yergin and Stanislaw, 1998).

2.3 Monetary policy tools

In the monetary policy process, variables play important roles, namely as instruments, goals, indicators and targets. The formulation of monetary policy by the monetary authorities requires appropriate variables on which it can focus as indicators of the need for such a policy (Handa, 2005). Such variables should provide information on the current and future state of the economy, especially of goal variables, also known as policy guides. A monetary policy indicator, since it reflects the state of the economy, its value must also change if a policy changes that state so that the indicators are directly or indirectly functions of the policy instruments.

The set of tools available to monetary authorities may differ from one country to another, according to differences in political systems, economic structures, statutory and institutional procedures, development of money and capital markets and other considerations. In most advanced capitalist countries, monetary authorities use one or more of the following key instruments: changes in the legal reserve ratio, changes in the discount rate or the official key bank rate, exchange rates and open market operations. In many in-stances, supplementary instruments are used, known as instruments of direct supervision or qualitative instruments. Although the developing countries use one or more of these instruments, taking into consideration the difference in their economic growth levels, the dissimilarity in the patterns of their production structures and the degree of their of their link with the outside world, many resort to the method of qualitative supervision, particularly those countries which face problems arising from the nature of their economic structures. Although the effectiveness of monetary policy does not necessarily depend on using a wide range of instruments, coordinated use of various

instruments is essential to the application of a rational monetary policy. Open Market Operations (OMO) is where the CBK buys and sells Government securities in the money market in order to achieve a desired level of money in circulation. When the Central Bank sells securities, it reduces the supply of money and when it buys securities it increases the supply of money in the market (CBK, 2012).

2.3.1 Open Market Operations (OMO)

Open market operations are the Central Bank's principal tool for implementing monetary policy, Sargent and Smith (1987). These purchases and sales of government Treasury and government agency securities largely determine the Central Bank rate (CBR) which is the interest rate at which depository institutions lend balances at the Central Bank rate to other depository institutions overnight. CBR in turn affects monetary and financial conditions, which ultimately influence employment, output, and the overall level of prices.

Central banks in most industrial countries conduct monetary policy mainly via open market operations, where money is supplied in exchange for securities discounted with a short run nominal interest rate, Wallace (1981). Hence, the costs of money acquisition depend on the current discount rate and the availability of collateral. In macroeconomic theory, however, is has often been claimed that open market operations are irrelevant in the sense that they are equivalent to lump-sum money transfers, Eggerston and Woodford (2003). The Central Bank buys or sells (on behalf of the Fiscal Authorities (the Treasury) securities to the banking and non-banking public (that is in the open market). One such security is Treasury Bills. When the Central Bank sells securities, it reduces the supply of

reserves and when it buys (back) securities-by redeeming them-it increases the supply of reserves to the Deposit Money Banks, thus affecting the supply of money.

2.3.2 Repo Rate

Repo rate is the interest rate at which the central bank sells and or repurchases government securities to or from commercial banks (www.centralbank.go.ke). In Repo transactions, securities are exchanged for cash with an agreement to repurchase the securities at a future date. The securities serve as collateral for what is effectively a cash loan and, conversely, the cash serves as collateral for a securities loan. There are several types of transactions with essentially equivalent economic functions: standard repurchase agreements, sell/buy-backs and securities lending defined as repos. A key distinguishing feature of repos is that they can be used either to obtain funds or to obtain securities (Brunetti, Filippo and Harris, 2009). This latter feature is valuable to market participants because it allows them to obtain the securities they need to meet other contractual obligations, such as to make delivery for a futures contract. In addition, repos can be used for leverage, to fund long positions in securities and to fund short positions for hedging interest rate risks (Ewerhart and Tapking, 2008). As repos are short-maturity collateralized instruments, repo markets have strong linkages with securities markets, derivatives markets and other short-term markets such as interbank and money markets which are important monetary policy tools.

Repos are useful to central banks both as a monetary policy instrument and as a source of information on market expectations. Repos are attractive as a monetary policy instrument because they carry a low credit risk while serving as a flexible instrument for liquidity

management. In addition, they can serve as an effective mechanism for signaling the stance of monetary policy (Hördahl and King, 2008). Repo markets can also provide central banks with information on very short-term interest rate expectations that is relatively accurate since the credit risk premium in repo rates is typically small. In this respect, they complement information on expectations over a longer horizon derived from securities with longer maturities (Eggerston and Woodford, 2003).

2.3.3 Interest Rates

Modigliani and Cohn (1979) presented the money illusion effect in which markets tend to be depressed when nominal interest rates are high even though the real interest rate is not high. They argued that stock markets react inappropriately to inflation due to investors' ignorance that interest rate rise is to compensate for the rise in inflation.

Howells and Keith (2000) argue in their book that, equity prices just like the price of all assets will respond to changes in interest rates. That is to mean, if the Central Bank raises the interest rates, for instance, the rate available on the risk-free assets goes up and if more can be earned on risk-free assets, then the holders of risky shares will want a higher return as well. The share prices will also fall if the equity market as a whole becomes more risk averse and demand a higher premium for any level of risk. However, Bernanke and Kuttner (2003) concluded that very little of the market's reaction can be attributed to the effect of monetary policy on the real rates of interest. Robinson (1952) argued that the financial system does not spur economic growth and that, instead financial development simply responds to developments in the real sector. Thus, many influential economists give a very minor role, if any, to the role of financial system, particularly the stock

market in economic growth. The interest rate that concerns the central bank as a monetary policy is the 3 months' short-term interest rate also called the Treasury bill rate which it influences through the sale of short term government securities and forms the basis for the setting of commercial bank lending rates.

2.3.4 Money Supply

Money supply is the sum of currency outside banks and deposit liabilities of commercial banks, CBK (2012). Deposit liabilities are defined in narrower and broader senses as follows: narrow money (M1); broad money (M2); and extended broad money (M3). These aggregates are defined as follows:

M1= Currency outside banking system + demand deposits

M2 =M1 + time and savings deposits + certificates of deposits + deposit

Liabilities of Non-Bank Financial Institutions (NBFIs)

M3= M2 + residents' foreign currency deposits.

The CBK has been targeting monetary aggregate (broad money M3) in its policy decisions, Rotich et al. (2007) implying that at times of high inflation, or positive output, the CBK responded by reducing money supply.

2.3.5 Exchange Rates

Basically stock exchange market serves as a channel through which surplus funds are moved from Lender-Savers to Borrower-Spenders who have shortages of funds (Mishkin 2000). Based on this premise, volatility in stock prices can significantly affect the

performance of the financial sector as well as the entire economy. The financial position of an economy that is mainly determined by the capital market is susceptible to its foreign exchange volatility. Hence, this makes foreign exchange market developments to have cost implications for all the economic agents. Empirical evidence on the influence of foreign exchange market volatility on stock market is largely inconsistent. Mishra (2004) admitted that there is no theoretical consensus on the interaction between stock prices and exchange rate. For instance, Solnik (1987) is of the opinion that there is a negative correlation between stock market and local currency.

2.4 Empirical Studies

Several studies have been conducted on monetary policy and inflation rates. Abakah (2009) studied the impact of monetary policy on stock prices in Ghana. Abaksh 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

Totonchi (2011) studied macroeconomic theories of inflation by attempting to review and analyze the competing and complementary theories of inflation. The theoretical survey in this research work yielded a six-blocked schematization of origins of inflation; monetary shocks, Demand side, supply-side (or real) shocks, structural and political factors (or the

role of institutions). 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.

Other researchers such as Ball (1999) have suggested that in an open economy the central bank could use a weighted average of the nominal interest rate and the exchange rate as an instrument. As to the choice of policy instrument in conducting monetary policy in emerging economies, Ball states that given the specific nature of markets in developing countries, the policy instrument could be not only short-term interest rate, but also the monetary base or some other monetary aggregate. Furthermore, he stresses the importance of exchange rates in monetary policy rule setting in developing countries and argues that the inclusion of the exchange rate in the central bank reaction function does not contradict the objectives of central banks, since in emerging economies sometimes exchange rate stabilization is a precondition for output stabilization and bringing down inflation to a targeted level. Taylor (2001) further argues that even though the effect of monetary policy on real variables through the financial markets is limited, because of the less developed nature of these markets, still monetary policy could have significant impacts through changes in wages and property prices. Thus, a predictable behaviour of central banks in emerging economies considerably improves the transmission and effectiveness of monetary policy.

Mohanty and Klau (2003) indicate that, out of 13 leading emerging economies in their study, only two had not adopted inflation targeting (IT), a related type of rule-based policy. Since inflation targeting leads to a more systematic response by the central bank

to inflation, the interest rate setting process in these economies has been guided by such a rule-like policy. The main conclusion of their study is that, in emerging economies, central banks, most of the time, change short-term interest rate in response to deviations in inflation and exchange rate movements. They also note that although price stabilization remains a main objective of central banks in emerging countries, other objectives such as output stabilization, stability of the exchange rate and in few cases, stability of asset prices and current account deficit have been highlighted as central bank objectives.

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. In their conclusions, they found that inflation targeting by central banks appeared to have an admirable record of consistently hitting targets on a "medium run" horizon. However, it was not clear what the marginal contribution of inflation targeting beyond a credible commitment to price stability was, since the Federal Reserve, which eschews an inflation targeting framework, has accumulated a comparable record of low and stable inflation. Secondly, it was not clear what would happen to low and stable inflation if "bad shocks" were realized and the "going got tough." Finally, the case for consistently effective short-run monetary stabilization policies is problematic – there are just too many dimensions to uncertainty in the environment in which central banks operate.

Adam (2009) studied the conduct of monetary policy in Uganda using an assessment. The study discussed aspects of the conduct of monetary policy in Uganda with the starting point being the perception held by some that while Uganda had been amongst the most consistently successful countries in Africa in controlling inflation since the early 1990s, this had come at a high fiscal cost and that the conduct of monetary policy had stifled rather than encouraged the development of the financial sector.

Rotich, Kathanje and Maana (2007) did a study on monetary policy reaction function for Kenya. Their study reviewed the then conduct of monetary policy and the Central Bank rule-based behaviour in Kenya. Using both backward and forward-looking policy rules with appropriate modification to take into account the characteristics in developing countries, they tested whether the Central Bank of Kenya (CBK) reacted to changes in inflation, GDP growth and the exchange rate in a consistent and predictable fashion. Their results indicate that during the period after liberalization (1997-2006), CBK had used monetary aggregates as a main policy instrument in conducting monetary policy. The estimate of the coefficient on the inflation gap implied that a rise in expected annual inflation of one percent induced the CBK to lower the expansion of broad money (M3) by 4.2 percent. Similarly, the coefficient of inflation with respect to repo rate was 2.4 which was consistent with Taylor's non-accommodative policy. The results indicate that CBK followed a rule to target inflation with some allowance for output stabilization. We also find a statistically significant reaction to exchange rate, perhaps explaining the relative stability of exchange rate during the greater part of the sample period.

2.5 Chapter Summary

As far as macroeconomics and the conduct of monetary policy in an economy are concerned there are areas where there is disagreement, as well as puzzles about how the economy functions and how monetary policymakers should seek to achieve their ends. While a relatively large number of central banks around the world have adopted a formal inflation target, it is by no means universal. One of the charges sometimes imposed against having an inflation target is that it pays insufficient attention to economic objectives other than inflation. 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. Abaksh examined the long and short-run relationships between monetary policy and stock prices. 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

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. Adam (2009) studied the conduct of monetary policy in Uganda using an assessment. The study discussed aspects of the conduct of monetary policy in Uganda with the starting point being the perception held by some that while Uganda had been amongst the most consistently successful countries in Africa in controlling inflation since the early 1990s, this had come at a high fiscal cost and that the conduct of monetary policy had stifled rather than encouraged the development of the financial sector.

From the above discussion, it is evident that limited studied if any have been conducted on the effectiveness of monetary policy tools in countering inflation in Kenya. this study therefore seeks to fill this research gap by investigating the effectiveness of monetary policy instruments in countering inflation in Kenya.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter describes the procedures and methodologies that were undertaken in conducting the study to arrive at conclusions regarding the relationship between the monetary policy and inflation rates in Kenya. Specifically, the chapter covers: research design; data collection, data analysis and model specification.

3.2 Research Design

The study employed correlational research design. The study used time series empirical data on the variables to describe and examine the effectiveness of monetary policy tools in countering inflation in Kenya by establishing correlation coefficients between the inflation and the monetary policy tools.

3.3 Data Collection

The study used secondary data on the Consumer Price Index for inflation, 91-day Treasury bill rate, exchange rate, money supply (M3) and REPO rate,. The data on inflation (CPI) was obtained from KNBS while data on 91-day Treasury bill rate, exchange rate, money supply (M3) and REPO rate was obtained from the CBK. For the exchange rate, the study focused on the US dollar rate since it is the most commonly used currency to settle international. The data is public data as it is published in the websites of the relevant government agencies including CBK and KNBS. The period of study for

which data was obtained focused on a ten year period between 2006 and 2011. The study made use of monthly data.

3.4 Data Analysis

The study employed computer software 'e-views' version 5.0 to analyze the data. Given that the study model was a multivariate one, the study used multiple regression technique in analyzing the relationship between the inflation and the monetary policy tools. The analyses entailed the computation of the various coefficients of correlation denoted as 'β' in the model to determine the effectiveness of monetary policy tools in countering inflation in Kenya.

3.5 Model Specification

The variables of the study comprised the Consumer Price (CPI) index as the dependent variable and 91-day Treasury bill, exchange rate, REPO rate and Money Supply as the independent variables. The regression model was a multivariate model stating the CPI index as a function of the stated monetary policy tools as follows:

Thus, the regression equation will appear as:

$Y = ß_0 + ß_1X_1 + ß_2X_2 + ß_3X_3 + ß_4X_4 + \varepsilon$

CPI = ß_0 + ß_191-T-billrate + ß_2exchange rate + ß_4reporate + ß_5Money supply + error term.

To simplify, Let:

Y =Consumer Price Index;

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X_1 = 91-day Treasury bill rate;

X_2 = exchange rate (US dollar);

X_3 = repo rate;

X_4 = Money Supply (M3),

ε =be error term.

Consumer Price Index (CPI) represents the rate of inflation existing in Kenya for the period under study. The percentage change in CPI measures inflation. To compile the Consumer Price Index, a predetermined set of goods, forming a typical basket of goods bought by an average urban consumer, is selected. All the items were weighted according to the percentage of income that households spend per category. An average of the change in the prices of these items is calculated on a monthly basis. The study adopted CPI figures already computed by the KNBS for the period 2006-2011.

The 91-day Treasury bill rate will be measured by applying the average monthly 91-day Treasury bill rate at which the government borrows from the public. The exchange rate will be measured by taking the average applicable exchange figures for the United States Dollar because it is the mostly used common currency. For REPO rate, the study applied figures available from the Central bank of Kenya for the period 2006-2011. For the Money Supply (M3), the study took into consideration the money supply figures by the Central bank of Kenya.

The error term stands for the effect of other factors other than monetary policy tools on the CPI and helps in stabilizing the model. The data on above variables was collected

from secondary data contained in Central Bank reports. The study tested at 95% confidence level and 5% significant levels. If the significance number found is less than the critical value (α) set 2.4, then the conclusion will be that the independent variables were relevant in explaining the relationship with the dependent variable. Else the independent variables will be regarded as non significant in explaining the changes in the dependent variable.

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 effectiveness of monetary policy tools in countering inflation 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 91-Day Treasury bill rates

The study collected data on the prevailing rates on the 91 day Treasury bills for the study period. In January 2006 the rate stood at 8.23%. During the year, the rate reduced slightly to the lowest of 5.73% in December. For this year, the rates started at a high of over 8% then reduced to reach 6% in the months of July and august before slightly t0 7% then reducing to close the year at 5.73. In 2007, the year started with 6% in January. It increased to the highest in the year of 7.55% in October. In the year 2008, the rate in January was 6.95% which increased to 7.28%. The rate fluctuated during the year to the lowest of 6.90% and the highest of 8.59% in December. In the year 2009, the rate started at 8.46 in January then reduced to 7.55% in February. The rate then fluctuated at between 7.45% and 6.82% for the rest of the year. In 2010, the year started at 6.56%. The year recorded high fluctuations to reach the lowest of 1.60% in July. In 2011, the year started with a low rate of 2.46%. However, the rates increased tremendously starting the month

of September to reach the climax in December at 18.30%. These details are well illustrated in the figure 4.1 below.

Figure 4.1: 91 Day Treasury bill Rate
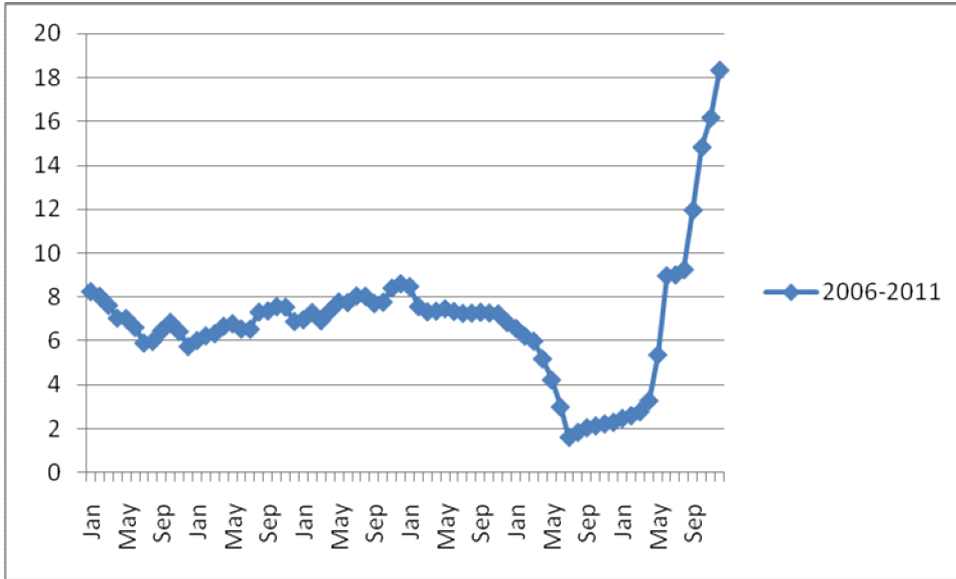
4.3   REPO Rate

The study also collected monthly data on the REPO rate from the year 2006 to 2011. The year 2006 started at 7.81% in January which dropped slightly to 7.78% in February. The REPO rate continued with a downward trend to reach an all time low of 5.73% in July before starting an upward trend to reach 6.34% in December. The average for the year was 6.64%. In 2007, the REPO rate started at 6.43% followed with increase up to 7.81% in September. The REPO rate then started to increase slightly to record 7.13% in December. The annual average REPO rate was 7.02%. In 2008, The REPO started trading at 7.75%. Then dropped for three consecutive months to reach 6.67% before increasing to slightly above 7%for three months then getting back to 6.06% in September. The calculated average for the period was 6.78%. In 2009, The REPO started

at 5.10% then prevailed for four other months in the year with the low of 4.05% and the highest of 6.18% giving an annual average of 5.01%. The year 2010 did not have REPO activities hence there was no REPO rate. The year 2011 also recorded limited REPO activities. The rate in March was 1.66% which increased to reach a high of 18.89% in October before settling at 17.75% in December. The annual average was 9.04%. These findings are well illustrated in the table 4.5 below

Table 4.1: REPO Rate

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2006	7.81	7.78	7.50	6.78	6.68	6.39	5.73	5.94	6.16	6.23	6.33	6.34
2007	6.43	6.75	6.70	6.84	7.03	7.07	7.19	7.49	7.81	7.44	6.42	7.13
2008	7.75	6.90	6.46	6.67	7.42	7.61	7.41	6.35	6.06	6.03	6.27	6.36
2009	5.10	5.08	4.62	4.05	6.18	-	-	-	-	-	-	-
2010												
2011	-	-	1.66	4.50	5.72	5.73	-	-	-	18.89	-	17.75

4.4 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 2006, the money supply oscillated between 560,051 and 653,036. In 2007, the country still witnessed continuous increases in Money supply to reach a high of 777,596 billion in December, 2007. The trend continued throughout the study period to reach a high of 1,514,412 in December, 2011. The findings were as shown in the figure 4.2 below:

Figure 4.2: Money Supply 2006-2011
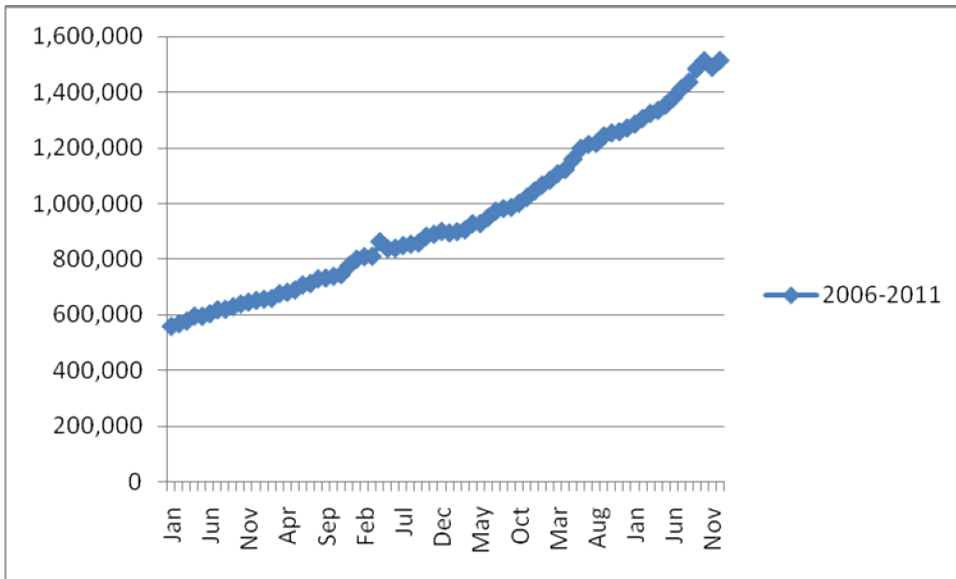
4.5 Exchange Rate (USD)

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 2006, the exchange rate was 71.98 in January 73.20 in February, 71.87 in March which continued to fluctuate slightly and then closed the year at 69.39. In 2007, the exchange rate started at 70.537 then the local currency appreciated which saw the exchange rates reduce continuously from one month to another until June before increasing slightly and then starting a downward trend to close the year at 62.541. In 2008, The exchange rates started at 70.561 which was maintained in February at 70.639 before dropping greatly to stand at 62.766 in March, 62.136 in April and 62.029 in May. Starting June, the exchange rates started rising as the local currency depreciated continuously to close the year at 77.711. In 2009, the exchange rate started on a high of 79.544, increased slightly to 79.687 in February, 80.431 in March and 78.662 in April. Starting May, the exchange rates started dropping slightly to 77.0221 in

June, 76.607 in July, 76.233 in August and 74.999 in September. Starting October, the rates rose slightly to 75.239 then dropped to 74.907 in November and then 75.689 in December. In 2010, the exchange rates started at 75.886 then increased continuously throughout the year to close at 80.752. In 2011, the exchange rates started at 81.272 the recorded high increases throughout the year to hit the highest exchange rate ever of 99.832 in September before easing off to close the year at 85.0681. These findings are well illustrated in the figure 4.3 below:

Figure 4.3: Exchange Rates against the United States Dollar
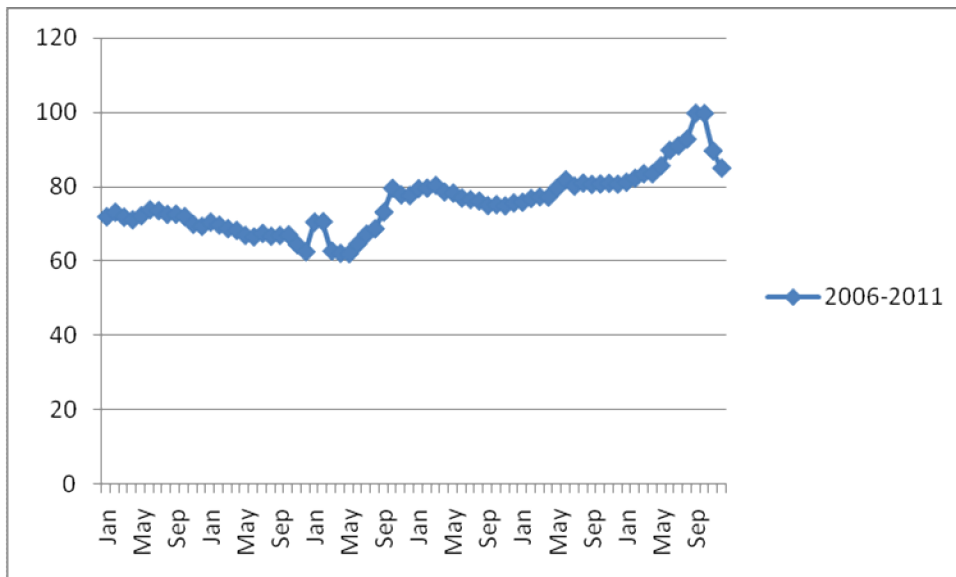
4.6 Consumer price Index

The study also collected data on the prevailing consumer price index for the study period. In 2006, the consumer price index fluctuated between 4.4 and 6.0. In January, the index was 5.5 which fell to 4.4 in February then increased to 5.30 in March. The up and down trend continued to the end of at 5.70 in December. In 2007, the index opened at 4.7 then recorded small changes during the year to close at 4.60. In 2008, the index opened at 5.7

then increased all through the year to 10.90 in November before easing to 8.90 in December. In 2009, the consumer price index opened at 7.40 which was maintained stable until April before recording a drop to 5.90 in May and continued on a downward trend to reach an all time low of 3.00 in September but closed the year at 4.10. In 2010, the inflation rate opened at 4.60 increased in February to 5.90 then dropped again in March to 5.30. The up and down movements continued throughout the remaining part of the year to close at 2.70 in December. In 2011, the consumer price remained low following the revision of goods making up the basked used in the computation of inflation. The index opened at 4.70 in January which fluctuated throughout the year to close record the lowest of 3.6 in March and a high of 13.00 in November. The index closed the year at 5.50. These findings are well illustrated in the figure 4.4 below:

Figure 4.4: Consumer Price Index (2006-2011)
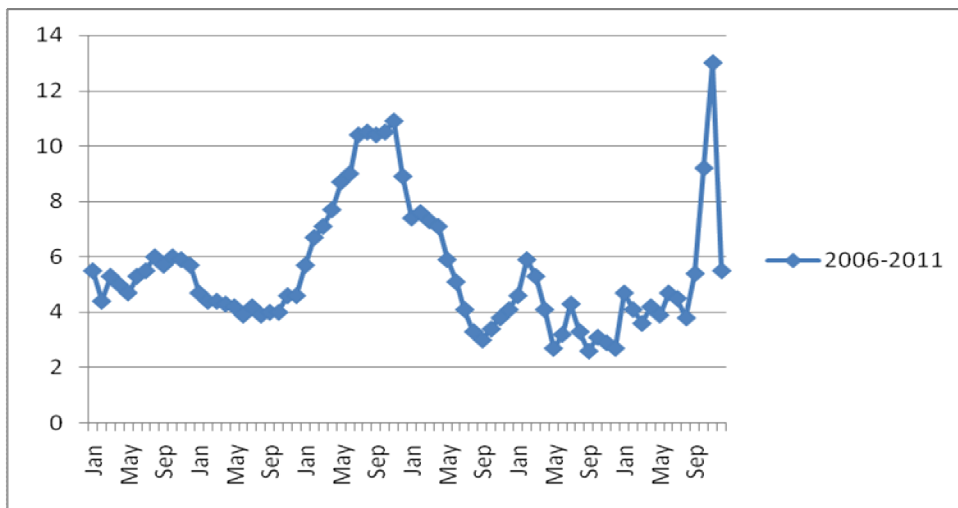
4.7 Regression Analysis

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 4.2 below.

Table 4.2: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.744[a]	.553	.542	1.55059
a. Predictors: (Constant), Money Supply, Repo Rate, 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 (consumer price index (CPI)) 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, Repo rate and money supply).

The correlation and the coefficient of determination of the dependent variables (CPI) when all the four independent variables are combined was measured and tested. From the findings 54.20% of consumer price index in Kenya was attributed to combination of the four independent factors (91-Day Treasury bill rate, exchange rates, Repo rate and money supply) investigated in this study. A further 45.80% of consumer price index changes are attributed to other factors not investigated in this study.

Table 4.3: Coefficient of determination

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	1.528	4.155		-2.366	.023
91-Days Treasury Bill Rate	1.405	0.215	0.907	6.528	.0001
Exchange Rates (USD)	1.026	0.049	0.066	5.528	.0600
Repo Rate	0.045	0.102	0.055	3.443	.0660
Money Supply	1.315	0.000	0.431	3.159	.003
a. Dependent Variable: Inflation					

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 4.3, the equation ($Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon$) becomes:

$Y = 1.528 + 1.405 X_1 + 1.026 X_2 + 0.045 X_3 + 1.315 X_4$

Where Y is the dependent variable (Consumer Price Index), X_1 is the 91-Day Treasury bill rate independent variable, X_2 is exchange rate (USD) variable, X_3 is REPO rate and X_4 is Money Supply variable.

As per the regression equation established, if all factors were taken into account (91-Day Treasury bill rate, exchange rates, REPO rate and money supply) to be constant at zero, consumer price index would be 1.528. The data findings analyzed also shows that if all other independent variables are taken at zero, a unit increase in 91-dat Treasury bill rate will lead to 1.405 unit increase in the consumer price index in Kenya. Further, a unit increase in exchange rates will lead to a 1.026 increase in consumer price index in Kenya whereas a unit increase in REPO rate will lead to 0.045 increase in consumer price index in Kenya and a unit increase in money Supply will lead to a 1.315 increase in consumer

price index in Kenya. From the above analysis of the betas, it can be inferred that 91-day Treasury bill rate contributes a lot on the consumer price index in Kenya followed by money supply at 1.315. The exchange rates at 1.026 and the REPO rate at 0.045.

At 5% level of significance and 95% level of confidence, 91 Day Treasury Bill rate had a 0. 0001 level of significance, Exchange Rates (USD) had a 0.0600 level of significance, Repo Rate showed a 0.0660 level of significant and Money Supply showed a 0. 003 level of significant hence the most significant factor was 91-Day Treasury Bill rate followed by Money supply. The t critical at 5% level of significance at k = 4 degrees of freedom is 2.245. Since all t calculated values were above 2.245 then all the four variables were significant in explaining the consumer price index changes in Kenya.

4.8. Summary and Interpretation of the Findings

High and variable inflation distorts the smooth functioning of the economy because of its effect of the economic value of the local currency. To mitigate this many countries have given their respective Central Banks the objective of price stability. As Bernanke (2006) noted, a high inflation complicates long-term economic planning, creating incentives for households and firms to shorten their horizons and to spend resources in managing inflation risk rather than focusing on the most productive activities while low and stable inflation brings stability to financial systems and fosters sustainable economic growth over the longer run. In Kenya, the inflationary rate as measured by the consumer price index has fluctuated over the period of study. There are several factors that can be attributed to this cause. From the regression analysis conducted in 4.7 above, the study

established that the four factors studied here affected inflation up to 54.20% indicating that there were other variables affected inflation that had not been factored in this study.

From the study, the rate of inflations seems to have increased following increases 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.

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 effectiveness of monetary policy tools in countering inflation in Kenya.

5.2 Summary

The study set to establish the effectiveness of monetary policy tools in countering inflation in Kenya. In achieving this, the study used four variables including 91-day Treasury Bill Rate, REPO rate, Money Supply and exchange rates (USD). The independent variable was Consumer Price Index (CPI). From the findings presented in chapter four above, the study showed that as Treasury bill increased, the rate of inflation reduced meaning that following increased Treasury bill rate attracts more investors to lend money to the Government thus reducing their immediate purchasing power. As a result, this reduces the amount of money in circulation this reduces inflation.

From the presentation in chapter four, REPO had the least effect on the rate of inflation prevailing in Kenya. This is largely because Repo rate is the rate at which banks borrow from the Central Bank of Kenya and their fellow commercial banks. This facility is for short term measure and meant to fill gaps between demand and supply of money in a bank. When a bank is short of funds they borrow from bank at repo rate and if bank has a surplus fund then they deposit the funds with the Central Bank of Kenya and earn at

Reverse repo rate. This in effect does not influence to a great extent the amount of money in supply hence little affects on the prevailing rates of inflation. The little effect is attributed to the fact that it only controls the balance in each individual bank's balances.

From the findings in chapter four, inflation and the money supply correlate with each other. 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.

5.3 Conclusions

From the presentations in chapter four and summary of findings above, this study concludes that the monetary policy in Kenya are relatively effective in controlling the levels of inflation recorded in Kenya. Through the 91-Day Treasury Bills, the Government of Kenya is able to borrow money from the public thus reducing the amount

of money in the hands of its citizens for expenditure. This is further elaborated by the effect of 91 day Treasury bill rate influence on the levels of interest rates charged by commercial banks. If the 91 Day Treasury bill rate increases, it prompts an increase in the short term interest rates which then reduces the borrowing level of citizens as loans will have become more expensive. Even for the households with surplus income, they will be attracted to save to earn a higher interest hence bring down the levels of general retail prices in the country.

The study also concludes that the REPO rate has little effect on the level of prevailing retail prices in an economy. This is partly because it is a rate that is generally lower than the lending interest rate besides its short term nature because it is normally executed by commercial banks majors on an overnight window so as to meet the minimum statutory balances.

The study also concludes that through the money supply, the Central Bank is able to influence the amount of Money in circulation in Kenya. Through money supply, the Central Bank of Kenya is able to control the amount of money in circulation thus control the general retail prices of the prevailing rates of retail prices. The Monetary committee holds money supply as an important variable in controlling the level of general retail prices in an economy.

The study also concludes that exchange rates are very important element of the general levels of retail prices in Kenya. This is because Kenya is a net importer which means that it purchases more in foreign currency than it exports. This therefore means that imported goods and services heavily rely on the prevailing rates of foreign exchange. As such it is

important that the foreign exchange rates stability is maintained to maintain the general retail prices in Kenya.

5.4 Policy Recommendations

From the summary of findings and conclusions above, the study makes the following recommendations: First, money supply is an important variable in influencing the general retail prices prevailing in Kenya. As such, the study recommends that the policy makers need to keenly consider the levels of money supply in Kenya so as to ensure a stable retail price levels.

The study also recommends that the Government evaluate the prevailing levels of retail prices 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 prevailing rates of interest and by extension to inflation rates.

5.5 Limitations of the Study

A limitation for the purposes of this study was regarded as a factor that was present and contributed to the researcher getting either inadequate information or if otherwise the response given would have been totally different from what the researcher expected. The main limitations of this study were: the data used was secondary data generated for other purposes. The measures used may keep on varying from one year to another subject to the prevailing condition. For example the inflation rate depends heavily on the base year statistics which may lead to different consumer price indices being obtained.

Another limitation of the study included the fact that the inflation rates existing in the country have forced the country to review the basket of goods making up the consumer price index computations. This may have distorted the relationship between the independent and the dependent variables in this study.

5.6 Suggestions for Further Studies

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

The study further recommends that another study be conducted in Kenya on the relationship between inflation rates and economic growth to establish the impact of inflation on economic growth. This is because inflation affects many parameters in an economy

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APPENDICES

Appendix I: Data for the 91-Day Treasury bill rate

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2006	8.23	8.02	7.60	7.02	7.01	6.60	5.89	5.96	6.45	6.83	6.41	5.73
2007	6.00	6.22	6.32	6.65	6.77	6.53	6.52	7.30	7.35	7.55	7.52	6.87
2008	6.95	7.28	6.90	7.35	7.76	7.73	8.03	8.02	7.69	7.75	8.39	8.59
2009	8.46	7.55	7.31	7.34	7.45	7.33	7.24	7.25	7.29	7.26	7.22	6.82
2010	6.56	6.21	5.98	5.17	4.21	2.98	1.60	1.83	2.04	2.12	2.21	2.28
2011	2.46	2.59	2.77	3.26	5.35	8.95	8.99	9.23	11.93	14.80	16.14	18.30

Appendix II: Money Supply Data

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2006	560,061	569,590	578,926	597,097	595,931	605,214	619,259	620,994	630,379	640,273	646,844	653,036
2007	657,262	659,949	677,349	682,168	690,543	708,392	713,613	730,511	733,329	739,663	745,268	777,596
2008	801,247	810,207	811,214	864,105	839,239	840,679	850,412	854,952	859,328	883,497	890,233	901,055
2009	895,397	900,031	906,071	928,839	928,604	950,239	973,623	982,854	986,901	1,001,814	1,022,339	1,045,657
2010	1,067,271	1,084,345	1,107,896	1,122,790	1,159,595	1,198,930	1,213,212	1,216,829	1,243,601	1,254,488	1,258,812	1,271,638
2011	1,285,452	1,306,395	1,324,685	1,334,898	1,354,029	1,380,732	1,412,702	1,436,877	1,484,198	1,513,656	1,489,751	1,514,412

Appendix III: Data on Consumer Price Index

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2006	5.50	4.40	5.30	5.00	4.70	5.30	5.50	6.00	5.70	6.00	5.90	5.70
2007	4.70	4.40	4.40	4.30	4.20	3.90	4.20	3.90	4.00	4.00	4.60	4.60
2008	5.70	6.70	7.10	7.70	8.70	9.00	10.40	10.50	10.40	10.50	10.90	8.90
200	7.4	7.6	7.3	7.1	5.90	5.1	4.10	3.30	3.00	3.40	3.80	4.1

9	0	0	0	0		0						0
2010	4.60	5.90	5.30	4.10	2.70	3.20	4.30	3.30	2.60	3.10	2.90	2.70
2011	4.70	4.10	3.60	4.20	3.90	4.70	4.50	3.80	5.40	9.20	13.00	5.50

Appendix IV: Data on Exchange Rates (USD)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2006	71.982	73.198	71.872	71.158	72.27	73.88	73.617	72.624	72.679	72.02	69.948	69.397
2007	70.537	69.733	68.781	68.306	66.966	66.564	67.509	66.748	66.971	67.114	64.424	62.541
2008	70.561	70.639	62.766	62.136	62.029	64.694	67.318	68.733	73.219	79.653	77.861	77.711
2009	79.544	79.687	80.431	78.662	78.348	77.021	76.607	76.233	74.999	75.239	74.907	75.689
2010	75.886	76.897	77.331	77.266	79.745	81.917	80.23	81.071	80.682	80.787	80.974	80.752
2011	81.272	82.364	83.551	83.551	85.704	89.864	91.1	92.849	99.832	99.778	89.7208	85.0681

Appendix V: Data on REPO Rate Data

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2006	7.81	7.78	7.50	6.78	6.68	6.39	5.73	5.94	6.16	6.23	6.33	6.34
2007	6.43	6.75	6.70	6.84	7.03	7.07	7.19	7.49	7.81	7.44	6.42	7.13
2008	7.75	6.90	6.46	6.67	7.42	7.61	7.41	6.35	6.06	6.03	6.27	6.36
2009	5.10	5.08	4.62	4.05	6.18	-	-	-	-	-	-	-
2010												
2011	-	-	1.66	4.50	5.72	5.73	-	-	-	18.89	-	17.75