Monetary Policy Tools and Inflation in Kenya

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Abstract   *Inflation is an critical aspect of every economy and presents a balancing act to most governments through regulatory framework. Inflation can break or break the economy of a nation. Hence policy makers in the government regulating bodies spend considerable time in developing policies aimed at achieving set targets of inflation which are geared to supporting the broader economic objectives of an economy. The Central Bank of Kenya (CBK) has responsibility of formulating and implementing monetary policy to achieve and maintain low inflation. This study set to establish the relationship of 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 obtained secondary data on Price Index for inflation, 91-day Treasury bill rate, exchange rate, money supply (M3)and repo rate for a period of five year (2008- 2012). Analysis on the various variables obtained coefficients of correlation denoted as 'ß' which shows the strength of relationship between monetary policy tools and inflation in Kenya. The study established that inflation and the money supply were positively correlated with each other. The study established that the general level of prices increase with the increase of money supply. The study found that the 91 treasury bill rates have an impact on the level of inflation. The findings of study show that the policy makers need critically evaluate and monitor the levels of money supply in Kenya so as to ensure a stable retail price levels. The findings also support the use 91-day Treasury bills rate in monitoring the level of prices because it has a significant effect on the level of Inflation in Kenya.*

Key words   CBK, CBR, CRR, CPI, GDP, KNBS, MPC, OMO

1. Introduction

1.1. Background of the Study

The major goals of economic policies include high employment, stable prices and increased growth. According to Friedman (1968) although there is no common concession that all the goals are compatible, there is agreement on the roles various instruments can and should play in aiding the realization of these goals. Monetary policy is one of the instruments that policy makers use to achieve these desired economic goals.

Woodford and Eggertsson (2006) argued that monetary policies are formulation and execution policies aimed at guiding bank lending rates to those consistent with supply elasticity with a goal of ensuring there is stable prices and fostering of economic growth. Monetary policy is a major policy adopted in many countries to help counter different economic imbalances. In practice, monetary policies work in coordination with other instruments, in achieving the stable price levels. The effectiveness of monetary policy tools and instruments as a economic stabilization varies across different economies and countries. The difference in effectiveness is caused by variability of economic structures, financial markets, and level of development of capital markets among others (Akhtar, 2006).

Jalali (2011) defines inflation as a progressive rise in price level, usually over a period of time. Inflation is caused by continuous increase in the supply of money, a progressive decrease for money or both. Governments sometimes increase the quantity of money supply. If the demand for money was relatively fixed, the increase in price level would grow at the same rate as money supply. Increase in level of incomes usually causes the demand for money to increase over time. This tempers the inflationary effect of

the money growth and the price levels grows slowly than the money supply. Therefore a higher rate of money supply growth is expected to cause a higher rate of inflation.

1.1.1. Monetary policy

The set of monetary instruments employment will always differ from state to state. This is due to dynamics existing in different economies in respect to economic structures, statutory and institutional procedures, political systems and ideals, the level of developments of capital markets among others. The more advanced the economy, the more instruments the policy makers will have at disposal to bring inflation to the desired levels. In capitalist countries, monetary authorities use among others following instruments: changes in reserve ratio, open market operations, discount rates, exchange rates regulations. Adam (2009) found out that developing countries because of their different economic growth and outlook, different patterns of production structures usually result to qualitative supervision. Whereas the success of monetary policy does not necessarily depend on no of wide range of instruments used, it's beneficial to use several coordinated instruments. Among most frequently used monetary policy tools include: Money supply, repo rate, Open Market operations, Interest rates and Exchange rates (Handa, 2005).

The last few years have been an extraordinary period for many central banks. There has been a great expansion in breadth and scale of operations in many economies. In amidst these developments the financial crisis of 2008 – 2010 brought into questions the stability of markets and the preparedness of unpredicted events in the financial markets in periods of down turns and instability. Events in the last few years of financial crisis have raised questions about how central banks manage tradeoff between price stability, output stability and financial stability in order to meet the macroeconomics objectives King (2013).

1.1.2. Inflation

Inflation is a subject that is most often discussed today. Politicians to economist usually engage in endless debates and discussions with promises to fight inflation. However the inflation is brought about by the same people through money policies and fiscal policies (Hazlitt, 1960). Inflation is a condition of rising prices (Haberler, 1960). Inflation, always and everywhere is caused by an increase in the amount of money in supply. Credit poses critical economic problems of our time inflation management is one of the underlying fact of in any economy setups. It's one aspect that every country and governments have to contend with in the modern Economy. This makes in not only the dreaded but also misunderstood economic phenomena. Inflation has been affecting mankind since the days of barter trade to the developments of medium of exchange, like precious metal (Kasau and Marks, 2011).Whereas it cannot be disputed that there is no full comprehension of inflation, it remains a threat to all economies in the world form the developing nations to the super powers. This has led to development of ways and policies to control inflation.

In periods of inflation there is a general increase in the amount of money in supply. People have more money to offer for goods (Hazlitt, 1960) in the event that the quantity of goods supplied does increase as much as the increase of money the price of goods are will generally go up. This is because each individual unit currency becomes less valuable as there more unit currencies. The price of goods will rise not because there is a scarce of good but because there is surplus money available.

1.2. Research problem

The quantity theory of money explained that increasing quantity of money supply would lead to an almost equal percentage of the increase in price of commodities. The theory asserts that general changes in price are primarily caused by changes in the money in circulation (Ricardo, 1817). The Keynesian theory on the other hand states savings have no positive effect on investment as long as the economy suffers under employment Keynes explained that an increase in the general price level or inflation is created caused by an increase in aggregate demand which is above the aggregate supply. Monetary theory advocates for the idea that market to regulate itself through market efficiency and reject most of government intervention. Monetarist argues that an increase in money supply will only lead to increase in output or production and employment levels in the short run and not in the long run.

Ricardo (1817) study revealed that in the short run expansionary monetary policies will lead to a decrease in the natural rate of unemployment and increase the production but the effectiveness of expansionary policies will be inhabited in the long run because they lead to increase in inflation. Stanislaw *et al.* (1998) concludes that there is there is a positive linear relationship between the money supply and inflation. The study found out that monetary policy tools are very important in ensuring stable markets. Beggs (2010), study on the relationship between the macroeconomic policies and inflation. Found that in Australia. The study however did not find a direct linear relationship between monetary policy and inflation.

Cheng (2006) study on the impact on monetary policy intervention in Kenya showed that there were significant relationship between the monetary policy and inflation. However the study established significant time lags. The Central bank Of Kenya (CBK), just like other monetary controlling institutions in the world is entrusted with the task of formulating and implementing monetary policies geared towards maintaining a relatively low inflation. In additional CBK should ensure that there is regulation to maintain a sound based financial system. In the recent years there has been increasing rate of inflation. Between 2008 and 2012 inflation has fluctuated despite frequent intervention by the central bank monetary Committee. Most prices of goods have sky rocketed in the same period making the cost of living unbearable to most Kenyans. The central bank is tasked with the responsibility to intervene to ensure that inflation is kept at reasonable levels. Whereas CBK has to some extent managed to intervene, mostly the intervention is too late when the damage is already caused or the time lags between response and effect have been big or other adverse effect of monetary policies meant to only controlling inflation. Past studies have showed varying results on relationship between inflation and monetary policies. The central bank has in the last few years has mainly focused on the treasury bill rate, the REPO rate, the exchange rate and the money supply in trying to bring inflation to set levels. In the process of using these instruments CBK has been met with mixed reactions by the markets and its participants. With some questioning the impact of CBK tools on inflation .This paper therefore seeks to answer the question what is the relationship between monetary policy and inflation in Kenya.

1.3. Specific objectives

(i) Determine the relationship between the quantity of money supply and inflation rate in Kenya.
(ii) Determine the relationship between the 91 treasury bills rate and inflation rate in Kenya.
(iii) Determine the relationship between the Repo rate and inflation rate in Kenya.
(iv) Determine the relationship between the Central Bank Rate and Inflation in Kenya.

1.4. Value of the study

This study is valuable to different stakeholders such as academicians, Scholars, the central bank and other monetary policy makers. The scholars will benefit from the above study because it contributes tom the body of knowledge about various monetary policies and their effects on inflation. Policy makers in regard to inflation will get various insights from the study. The study will give a feedback to them on how effective the instruments that they use to manage inflation works. Hence they will be able to narrow down to most effective and reliable instruments.

2. Literature review

This chapter analysis the literature on monetary policy tools and inflation .It evaluates studies and research papers done on both monetary policies and inflation. In the chapter an in-depth study of the theoretical framework on which the study is based, measurements of inflation rates, empirical literature and lastly the chapter summary.

2.1. Theoretical review

2.1.1. Keynesian Theory

This theory was developed by John Maynard Keynes (1883-1946). His ideas referred to as Keynesianism became very influential to economic policy after great depression (Engelhardt, 2009). Keynes argued that increased savings will not lead to lower interest rates, meaning have no positive effect on

investment as long as the economy suffers under employment. He opined that an increase in the general price level or inflation is caused by an increase in aggregate demand which is above the aggregate supply. Keynes argues that if the economy is at full employment output level, an increase in government expenditure(G), an rise in private consumption(C) and a rise in private investment(I) will cause a rise aggregate demand. This leads to a general increase in price levels. Keynes established that there is a positive relationship between consumption(C) and income(Y) as a function C= f(Y).The national output (Ys), which is today measured as Gross Domestic Product (GDP), as the sum of consumer spending (C) and all saving (S)YS=C+S.Keynes urged that governments should play a more active role in the economy .He provides a more specific ways for government to intervene so as to manage the economy targets especially to the level of employment and inflation.

2.1.2. The Quantity Theory of Money

This theory originated in the sixteenth century when Economist form Europe noticed higher levels of inflation associated with gold or silver (Investopidia, 2009). This theory proposes a positive relationship between changes in the money supply and the long- term price of goods. The theory explained that increasing quantity of money supply would lead to an almost equal percentage of the increase in price of commodities. The theory asserts that general changes in price are primarily caused by changes in the money in circulation (Ricardo, 1817). The quantity theory has provided a conceptual framework for interpretation in the contemporary financial events. The theory therefore asserts that if the money supply growth rate is greater than the growth of real output, then velocity moves in the opposite direction in the short run. Excess money supply growth causes velocity to slow down momentarily, until prices can adjust. Cosgrove (2005) explains that in a socialist country, the money is influenced by a large number of economic and political factors; this is more felt when the government is responsible for providing the purchasing power, industrial and agriculture procurements, wage payments to city workers and other state financing. 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 (Cheruyot, 2012).

2.1.3. Monetarism Theory

Monetarists like Milton freedman advocates for the market to regulate itself through market efficiency and reject most of government intervention. Friedman (2000) strongly opposes the Keynesian view that government spending stimulates the national output. The monetarism assume a crowding-out effect of governments spending on private investment, especially if the latter is deficit-financed (Sherman and Evans, 1984). The whole monetarist argumentation will be carefully policy is needed to have been mentioned at this point (Engelhardt, 2009). According to the monetarist, the money supply though important is the not the only exclusively determinant of both the level of output and prices in the short run. However they argue that in the long run the prices are not influenced by the monetary policy. The monetarist theory explains that when the money supply is increased in order to grow or increase production and employment, creating an inflationary situation within an economy. Monetarist argues that an increase in money supply will only lead to increase in output or production and employment levels in the short run and not in the long run (Stanislaw and Yergin, 1998). There is a positive linear relationship between the money supply and inflation. They explain the relationship by the natural rate of unemployment.

2.2. Monetary policy tools

Monetary policy tools refer to the instruments used by the CBK in line with achieving the target inflation rates. CBK used several tools to achieve its economic objectives this include measures aimed at influencing the interest rates and liquidity in the markets.

2.2.1. Interest rates

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. Bernanke (2003) showed

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.

2.2.2. Open market operations

Open market is defined as a perfectly competitive market for securities though congenitally it indicates the institutional framework of purchase and sale of approved securities by the central bank (Dasri, 1991). Open markets Operations have been used by the central banking the Kenya in the implementation of monetary policy interest. Akhtar (1997) argues that monetary policies have undergone significant shifts over the years. The central bank of engage in purchase and sales of eligible securities to regulate the monetary supply and their credit conditions of the economy (Central Bank of Kenya, 2011). OMO are important in stabilizing the short term interest rates. This is because when the central bank buys securities on the open markets, it leads to increase of the reserves of commercial banks, making it possible for them to expand their loans.

2.2.3 Repo agreement rate

Repos are transactions between commercial banks based on signed agreements using government's securities as collateral and have negotiated tenors and yields (Central Bank of kenya, 2011) Commercial banks short of deposits at the CBK, borrow from banks with excess deposits on the security of an appropriate asset, normally government securities. The horizontal repos help banks to overcome the problem of credit limits hence promoting interbank liquidity.

2.2.4. Central Bank Rate

The level of CBR usually is seen to reflect or signal monetary policy stance at the specific time. CBR can be argued to be the base for most monetary policy operations. Whenever the central banks are injecting liquidity through a reverse repo, the CBR is the lowest acceptable rate (Central Bank of Kenya, 2011). On the other hand whenever the bank intends to withdraw liquidity through a Vertical repo, the CBR is the highest rate that the CBK will pay on any bid received (Central bank of Kenya, 2012). When the Monetary Policy Committee reduces the CBR it signals an easing monetary policy and a desire for markets rates to move downwards.).

2.2.5. Foreign Exchange Market operations

CBK intervention in the foreign exchange market is usually motivated by the desire to prevent excess volatility the Kenyan shilling exchange rate against foreign currencies. The bank has used many measures to enhance the stability of the exchange rate. These include, limiting the tenor of swaps and Kenya shilling borrowing where offshore banks are involved to a tenor of not less than one year CBK also reduces foreign exposure ratio requirement of the core capital from 20 percent to 10 percent. This is in addition that local banks obtain supporting documents for all transactions in the nostro accounts of the offshore banks. The banks also suspended the use of the Electronic brokerage System (EBS) by the Central bank Kenya (2012).

2.2.6. Money supply

Money supply can be defined as the sum of currency outside banks and deposit liabilities commercial banks (Central bank of Kenya, 2012). Deposit liabilities are defined in narrow money (M1), broad money (M2) and extended broad money (M3). These are defined below:

M1 this refers to currency outside banking system + Demand Deposits

M2 = M1 + time and savings deposits +certificates of deposits + deposits liabilities of Non- bank financial institutions (NBFIs).

M3 = M2 + Residents foreign currency deposits.

The Central banks majorly targets broad money (M3) in its policy targets and interventions.

2.3. Empirical studies

Several studies have been done on monetary policy and inflation rates (Chicheke, 2009). Studies the relationship between monetary policy, inflation and unemployment. The study showed that the monetary authorities in South Africa put more weight in inflation than on employment. This was because the monetary authorizes were seen to abruptly respond to inflation than to the rate of unemployment. The study suggested that the monetary authorities take more public expectations when it comes to formulation policy statement. The study showed that technological advancement has a bearing on the effectiveness of monetary policy. The fact that technological trend variable was positive and significant. Hence financial engineering was seen as critical in affecting the speed of monetary policy effects.

Vargas (2012) conducted a study on inflation targeting in Columbia through monetary policies concluded that in Colombia, monetary policy converged fully fledged inflation targeting with an independent floating regime. The performance of the strategy was found satisfactory overall. Starting from a deep recession the study found that a policy stance which was expansionary led to decline in inflation along the targets, the output had recovered and international reserves had reached levels that limit the external vulnerability of the economy. However the study found that drawbacks of substantial intervention were difficulty of communicating policy to the public and the market. The study further found that fiscal imbalances posed a credibility and power of the monetary policy through several political channels.
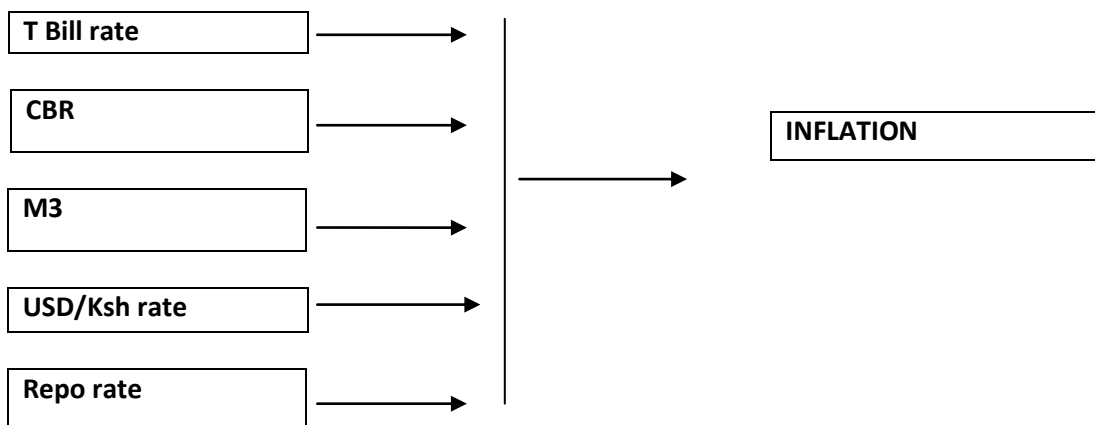
Rasche and Williams (2005) did a study on the effectiveness of monetary policy. In their analysis they addressed changing views of the role and effectiveness of the monetary policy in inflation targeting. The study found out that central banks were successful in hitting targets for on the medium term horizon. However the study revealed that it was not very clear of the marginal contribution of inflation targeting beyond commitment to price stability.. The study also showed that the central banks operate in the environment of many dimensions and uncertainty that it is problematic for consistently short run money stabilization policies. Adam (2009) in his study on the conduct of monetary policy in Uganda, evaluated 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.

Shehu (2008) researched on the open market operations as an instrument of monetary policy in Nigeria in a view to establish the administration problems and prospects. The research concluded that the policy measures and institution reform introduced under structural adjustments programme had a large measure of success. However the study noted that that the poor appetitive by banks towards government treasury was not in consistent with the spirit of the monetary stability. Mishkin (2012) studied about monetary policies in regard to lessons from the financial crisis. The study was done to find out if monetary policies were any relevant and why the established policies did not avert the financial crisis. The study concluded that monetary policy was still effective. However it was noted a stronger case for monetary policy to lean against credit bubbles rather than just cleaning up after the bubble has burst.

Mohanty and Michela (2003) in their study found out that, out of the 13 leading emerging economies, only two had not adopted inflation targeting (IT), a related type of rule- based policy. The study found out inflation targeting leads to a more systematic reaction to inflation. The study mainly concluded 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. Beggs (2010), study on the relationship between the macroeconomic policies and inflation. Found that in Australia financial deregulation was not compatible with monetary targeting; it was quite compatible with monetary policy and further facilitated a policy based on open market operations and setting up of stable instrument for the future. The study found out that monetary policy tools are very important in ensuring stable markets.

Rotich *et al*. (2007) did a study on monetary policy reaction function for Kenya. The study established that the central bank of Kenya has been targeting broad money M3, when making its monetary policy decisions. The results indicate that Central Bank of Kenya has been successful in controlling inflation, at least for the greater period in the sample. The study established that the CBK was found to perform well in the implicit objective of short run interest rate management.

2.4. Conceptual framework


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┌─────────────────┐
│  T Bill rate    │ ──────────►
└─────────────────┘
┌─────────────────┐
│  CBR            │ ──────────►          ┌──────────────────┐
└─────────────────┘                      │   INFLATION      │
┌─────────────────┐          ──────────► └──────────────────┘
│  M3             │ ──────────►
└─────────────────┘
┌─────────────────┐
│  USD/Ksh rate   │ ──────────►
└─────────────────┘
┌─────────────────┐
│  Repo rate      │ ──────────►
└─────────────────┘
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Source: developed for the study

Figure 1. Conceptual framework

3. Methodology of research

This chapter describes the methodology that was undertaken in conducting the study to arrive at the finding regarding the effectiveness of the monetary policy and inflation rates in Kenya. The chapter covers research design, data collection, and data analysis and model specification.

3.1. Research design

The study employed descriptive research design. The studies used time series empirical data on the variables to describe and examine the effectiveness of the monetary policy tools in countering inflation in Kenya for the period 2008 to 2012. This was done by establishing correlation coefficients between the inflation and the monetary policy tools employment by the central bank the period.

3.2. Data collection

The study used secondary data on Money supply (M3), Consumer, Price Index, exchange rate, 91-day treasury rate, Central bank rate and Repo rate. The money supply (M3), 91-day treasury rate, exchange rate and REPO rate will be obtained from the CBK. The date for inflation (CPI) will be obtained from the KNBS. The study will use the USD Kenya Shilling exchange to measure the general strength of the exchange because the USD constitute the main currency exchanged against the Kenya shilling. The study focused on five year period between 2008 and 2012.The five year period date was analyzed on quarterly basis. In the analysis the study will make of monthly data in analysis of the relationship between inflation and monetary policy tools.

3.3. Data analysis

The study used SPSS18 version as well as graphical analysis. Because the study model was a multivariate's one, the study used multiple regression technique in analyzing the relationship between the inflation and the monetary policy tools. The study computed various coefficients of correlation denoted as ß in the model to determine the relationship between the monetary policy tools and inflation countering inflation in Kenya.

3.4. 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= ß0 + ß1X1+ ß2X2+ ß3X3+ ß4X4 + ß5X5 + ε   (1)

CPI(Inflation) = ß0 + ß191-T-billrate + ß2exchange rate + ß3reporate + ß4Money supply + ß5 CBR +error term.

Consumer Price Index (CPI) represents the rate of inflation existing in Kenya for the period under study. The percentage change in CPI will be taken to mean inflation. The KNBS takes into consideration the typical weighted consumer basket. The Consumer price Index (CPI) is a macroeconomic indicator showing the state of the Kenyan economy and the impact of inflation. 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 level. Therefore if the significant values found was less than the set critical values then independent variables was concluded to be relevant in explaining the relationship between the monetary policy and inflation. Otherwise the independent variables were taken to be irrelevant in explaining the changes in dependent variable.

4. Data analysis, findings and discussions

4.1. Introduction

This chapter evaluates the analysis and findings of the study as set out in the research objective and methodology. The study presents a relationship between the monetary policy tools as applied by the central bank and the rate of inflation in Kenya. The data used for the purpose of this study was secondary data from records and publications from Central bank of Kenya (CBK) and Kenya Bureau of Statistics (KNBS).

4.2. Consumer Price Index

Consumer price index data which in the study reflect the level of inflation was obtained from the data banks of the KNBS and is freely accessible. In 2008 Consumer price index fluctuated between 7.9 and 17.6 with the lowest being in the month of January and the highest level in November. In January 2009 the CPI eased to a level of 13.3. In this year the lowest level being in October at 7.1 and the highest in February at 14.6. The year closed at the level at 8.0 at December. The year 2010 CPI started at 7.5 at January which was the highest in the year and closed at 4.5 at December being the lowest in the year hence presenting easing trend. In the year 2011 the level of inflation in January was 5.4 while in December the level was 18.9.Inflation at its highest in November at 19.7. In 2012CPI in January was 18.3 which was the highest while in December the same year while in December it was 3.2 which was still the lowest in the year.

4.3. Money supply

The study established the trend of the money supply in Kenya in the period between 2008 and 2012. In June 2008 the supply was ksh 840 billion while in the same year in December the supply had raised to 901 billion. In 2009 the supply was about ksh 950 billion in June while in December the same year the supply was at ksh 1,045 billion representing a rise. In June 2010 the supply was at ksh 1,1198billions, which increased to Ksh 1,272 billion in December. In 2011 June the supply was Ksh 1,380 billion which increased to Ksh 1,514 billion in December. In 2012 the money supply steadily rose to Ksh 1,594 in June 2012 and Ksh 1,727 billion in December 2012.

4.4. 91-Day Treasury bill rates

The 91 Treasury bill rates in 2008 fluctuated between 8.59% and 6.90%. With the highest rate being in December while the lowest rate was in January. In the year 2009, the rate started at 8.46 in January then reduced to 7.55% in February. The rate then fluctuated at between7.45% 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 lower of 1.60% in July. In 2011, the rate started at low rate of 2.46%.This year was characterized with steady increase with the rate rising to a high of 18.30% in December. The year 2012 was characterized with a relatively steady decline from a high of 19.9% in January to a low of 8.13% In December.

4.5. Foreign exchange rate

The Kenyan shilling started off strong in January 2008 trading at a rate of 63.4 against the USD, in the same month the shilling closed at 70.56 representing a decline in value. In February 2008 the shilling trading between 71.74 at the onset of February while closed at 67.78 on the last trading day in February. The closed edged against the dollar to close at 62.02 at the last trading day in May. The shilling further weakened against the dollar commencing July all the way to December with the shilling closing at 77.11 at the last trading day in December 2008. The shilling started 2009 trading against the dollar at 78.26 fluctuating to 79.54 in the same month. In June the same year the Kenya shilling was trading at 77.15 then appreciated to 75.99 in end of September. The shillings maintained a relatively steady rate through ought the period to close at 75.82 in the last trading day in December 2009.In the year 2010 January the shilling closed at 75.68, it weaken against the doll at 77.33 in March. In June 2010 the shilling was trading at 81.91 and it closed the Year at 80.79 in last trading day in December. 2011 was not any better for the shilling as in March it was trading at 82.98 then weakened to 91.11 at the end of July. It weakened to 105.96 in October before strengthening to the dollar at 85.06 in last day in December. In March 2012 the shilling was trading at 83.05 and further weakened slightly to the dollar to 84.21 towards end of July. In the year 2012 the shilling close at 86.02 against the dollar, in the last trading day in December.

4.6. Central Bank Rate (CBR)

The Central Bank Rate (CBR) as obtained from the CBK over the five years of study fluctuates between 5.75% and 18%. With the lowest being in June 2011 while the highest being a constant rate in December 2011 to June 2012 at 18%. The table below shows the movements in the CBR over the period five years 2008 to 2012.

4.7. Repo Rate

In 2008, The REPO rate was an average of 7.69% in the first quarter, reducing 6.61% in the second quarter. The rate stood at average of 5.96% and6.3% in the third and fourth quarter. The calculated average for the first quarter was 5.66% reducing to 5.07% in the second quarter. The third and fourth quarter the REPO stood at 3.22% and 2.87% respectively. In 2010 the REPO was at its lowest standing at between 2.7% and 1.07% between the first and last quarter in the year. The REPO was 1.5% on the first quarter rising to 5.3% in the second quarter then to 9.3% and finally 22.1% in the last quarter. In 2012 the REPO started at an average of 20.48% then 16.8% in the second quarter. There REPO took a dip to 9.9% and 7.2% in the third and fourth quarter.

4.8. Regression analysis

For the purposes of establishing the relationship among variables, the research conducted a multiple regression analysis. The analysis applied the statistical package for social sciences (SPSS) version 22 to compute the measurements of multiple regressions for the study. The following tables summarises the findings Coefficient of determination explains the extents to which changes in the dependent variable in this case Consumer Price index can be explained by the independent variables. Coefficient of determination will show the percentage of variation in the department that is explained by all the five variables i.e. the money supply(M3), the 91-Day treasury bill rate, exchange rate, repo rate and the Central bank rate.

The correlation and the coefficient of determination of the dependent variables (CPI) when all the five on dependent variables are combined was measured and tested. From the findings the 67.9%.of the Consumer Price Index in Kenya was attributed to combination of the five independent factors (Money supply, Repo, Central bank rate, 91-Day treasury bill rate, exchange rate). This means that 32.1% of the consumer price index changes are attributed to other factors not taken into consideration in this study

CPI (Inflation) = ß0 + ß191-T-billrate + ß2exchange rate + ß3reporate + ß4Money supply + ß5 CBR +error term

The equation now becomes:

Y=4.82+0.7X1 +0.212X2 +0.0033X3+0.006X4 -1.67X5

Whereby by Y is the Consumer price Index, X1 is the 91 treasury bills rate, X2 is the foreign exchange rate against the dollar, X3 is the REPO, X4 represents the money supply while X5 is the Central bank rate.

This means that assuming all other variables are Zero then we would have an inflation or CPI of 4.82. The finding shows that a unit change of treasury bills rate leads to 0.7 increases in CPI. The analysis shows that a unit change in exchange rate leads to 0.21 unit change in CPI.A change in unit change in REPO leads to a 0.003 change in CPI.A unit change in money supply leads to a 0.006 change in CPI. The findings also showed that a unit changes in CBR lead a 1.67 change CPI in the negative direction.

4.9. Summary and Interpretation of the findings

Fluctuations in inflation distort the smooth functioning of the economy because of its effect of the economic value of the local currency. Governments have mandated the Central Banks to put up strategies that will ensure price stability. In Kenya, the inflation 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.

The five factors studied in this project have contributed for about 67% of the reason for the fluctuations of the consumer price index. This means that there other variables which contributes to inflation but have not been considered in this study. From the findings the inflations seems to be increasing with the increase in money supply, exchange rate and 91-day Treasury bill rate. This means that is positive relationship between these variables and inflations. Central bank of Kenya, which has been mandated with formulating strategies to control inflation, therefore, needs align its policies so as to avoid excessive fluctuations which distorts.

5. Summary, conclusions and recommendations

5.1. Introduction

This chapter summarizes the study and makes conclusions based on the results highlighted form the findings. The chapter outlines policy implications from the findings and areas of where more research need to be carried out.

5.2. Summary

The study set to establish the relationship between monetary policy tools and inflation in Kenya. In achieving this, the study used variables such as the REPO rate, Money supply and Exchange rate (USD) and 91-day Treasury Bill rate. The independent variable was the Consumer Price Index (CPI).From the findings outlined in chapter four, the study showed that as that Inflation and money supply correlate with each other. The study showed that as the money supply in circulation increased inflation also increased. This can because increase in money supply leads to people having more disposable income. This causes the amount of demand demanded to exceed the supply of goods hence leading to a rise in prices of goods. The government therefore should in its policy application through the central bank monitor the amount of money in circulation through its monetary policies. The government also through its fiscal policies should ensure that wherever the money supply exceeds the set level, appropriate measures to stimulate production to ensure demand does not exceed supply of goods and services.

5.3. Conclusions

The 91-day treasury bills have been used as a tool by the CBK to wipe out excess liquidity in the country. The study shows that there is Inverse relationship between and the Treasury rate and the level of prices. This can be explained by the fact that when the Governments increases the 91 treasury rates, the commercial banks short term interest rates increase, this reduces the access of funds by the public. In this case even the citizens with more disposable incomes tend to save to attract increasing levels of interest hence this leads to a down ward push on general prices due to reduced aggregate demand.

The study also concludes that REPO rate has the little effect on the level of inflation in the economy. This because the REPO is a short term facility that enables the commercial banks meets their minimum statutory balances. Hence the rate has insignificant effect on the retail prices. 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. The study concludes that exchange rates are critical element of general price levels in Kenya. This is because Kenya has a negative balance of trade, therefore being a net importer which means that in purchases more in foreign currency than it exports. The prices of imported goods heavily correlate with the prevailing rates of foreign exchange.

5.4. Policy recommendations

The study recommends that the policy makers mainly the Central Bank should make a critical analysis of the intended inflation targets when setting the 91 Treasury bills rate. This is because it was found that the rate has a significant impact on the price levels. The Policy makers should align the money supply targets with the medium and long-term economic goals. This is because the level of supply affects aggregate demand a key element in any economical set up.

The study recommends that the policy makers involved in setting economic goals to ensure that that there are geared towards maintaining a stable foreign exchange rate. Thus is because Kenya being a net exporter the fluctuations of the exchange rate significantly affect the general price level. The study focused on relationship between the central bank monetary and inflation in Kenya. Therefore studies need to be carried on other Fiscal policies and their effect on inflation. It is also a common knowledge that there could be black markets and other factors that might affect inflation hence more studies need to be carried to ensure all factors that affect inflation are studied. The study also recommends that because inflation affects many other variables in the economy study of effect of inflation on other elements of economy like economic stability and growth.

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