

**The Role of Monetary Policy on Longrun Economic Growth and the Implication on Kenya's
Vision 2030 Economic Pillar //**

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DECLARATION

This research project is my original work and has not been presented in any other university for any purpose of examination

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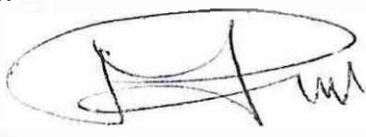
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DEDICATION

This Project is dedicated to my late Grandfather Michael Muchira Mbui for laying a seed of hard work and commitment in my life, my parents for believing in me and my fiance David Murimi for moral support and who constantly kept on reminding me of the need to finalize the work.

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TABLE OF CONTENTS

DECLARATION	ii
DEDICATION	iii
ACKNOWLEDGEMENT	iv
LIST OF TABLES	vii
LIST OF FIGURES	viii
ABSTRACT	ix
CHAPTER ONE	1
1.1 Introduction.....	1
1.1.1 Background.....	1
1.1.2 Overview of Kenya’s Vision 2030	5
1.2 Evolution of Monetary Policy in Kenya	7
1.2.1 Monetary policy in the formative years of Central Banking 1966-1970.....	7
1.2.2 Monetary Policy during 1970- 1992.....	7
1.2.3 The conduct of Monetary Policy in Kenya since liberalization (after 1992).....	10
1.3 Statement of the Problem.....	13
1.4 Objectives of the study.....	15
1.4.1 Specific Research Objectives	15
1.5 Research Questions	16
1.6 Hypothesis.....	16
1.7 Significant of the study	16
CHAPTER TWO: LITERATURE REVIEW	18
2.1 Introduction	18
2.2 Theoretical Literature Review.....	18
2.2.1 The Classical View.....	18
2.2.2 The Classical Quantity Theory of Money	19
2.2.3 The Keynesian Theory	20
2.2.4 Monetarist View	21
2.3 Empirical Literature Review.....	22
2.4 Overview of literature Review	26
CHAPTER THREE: METHODOLOGY	28

3.1 Introduction.....	28
3.2 Model Specification	28
3.2.1 Theoretical framework	28
3.2.2 Empirical Framework.....	29
3.3 Estimation procedures.....	32
3.3.1 Time Series Diagnostic Tests	33
3.3.2 Testing for Co-integration	34
3.3.3 Data type and Source.....	35
CHAPTER FOUR: DATA ANALYSIS AND FINDINGS	36
4.1 Introduction.....	36
4.2 Summary Statistics	36
4.3 Correlation Analysis	37
4.4 Time series diagnostic Tests.....	39
4.5 Cointegration Analysis	40
4.6 Regression Analysis.....	42
CHAPTER FIVE: SUMMARY, CONCLUSION AND POLICY RECOMMENDATIONS	45
5.1 Summary	45
5.2 Conclusion	46
5.3 Policy implications and Recommendations	47
5.4 Limitations of the study and Areas of Further Research.....	48
References.....	49
Annex	53

LIST OF TABLES

Table 4.1: Summary Statistics	36
Table 4.2: Correlation Analysis	38
Table 4.3: Unit root tests using Augmented Dickey-Fuller Test	40
Table 4.4: Johansen Diagnostic Tests	41
Table 4.5: Regression Analysis.....	42

LIST OF FIGURES

Figure 1.1: Trends in Balance of Payment in Kenya from the period 1975 – 2008	9
Figure 1.2: Trends in money Supply (M_2) in Ksh. Mn	10
Figure 1.3: Inflation rates, 91 Day -Treasury Bills interest rates and Economic growth rates from 1980 to 2011	11

ABSTRACT

This study set out to determine the role of monetary policy on economic growth in Kenya over the period 1980 -2011. The objectives were to describe the nature of monetary policy in Kenya and to determine the impact of monetary policy on economic growth and the implications on possibilities of achieving the economic growth of 10 percent as per the Vision 2030.

The study used the Levine and Renelt model to show the impact of monetary policy on economic growth using the time series data. The model was formulated by employing the GDP growth rate as the dependent variable and growth in money supply as the variable of interest. Before the regression analysis using Ordinary Least Square (OLS), the model was subjected to Stationarity and Cointegration tests using the Augmented Dickey Fuller Test (ADF) and the Johansen approach.

The findings revealed increased trends in money supply, interest rates being rigid downwards. There was evidence to suggest nonlinearity adjustment which suggests that although there were a number of years when policies were not coordinated the situation was not potentially dangerous for the economy. Further the findings revealed that, monetary policy plays a key role in economic growth and that there was a positive and significant relationship between money supply and economic growth in Kenya.

The policy implications that can be drawn from the findings are that, the realization of sustainable economic growth calls for a strong macroeconomic framework. In order to realize the aspirations of economic growth rate of 10 percent per annum and sustain it for a longer period, the Government will need to implement measures to strengthen the economic competitiveness through accelerated governance and public sector reforms by increasing government spending, investment, promoting exports as well as maintaining a stable macroeconomic framework.

CHAPTER ONE

1.1 Introduction

This chapter introduces the research area. It includes the background of the research, Government longterm development agenda as outlined in the Vision 2030, statement of the problem and research objectives.

1.1.1 Background

Monetary policy refers to the policies followed by Central Bank or Monetary Authority that controls money supply, availability of money and rate of interest in order to attain set objectives directed towards the growth and stability of the economy. Monetary policy is implemented on the basis of the relationship between the amount of money in supply and the interest rates in the economy. Monetary policy contributes to sustainable economic growth by ensuring price stability which is a necessary condition for sustainable growth using its tools to effectively check money supply with a view to maintaining price stability in the medium to long term.

The impact of monetary policy on economic growth has been of more important in the field of economics drawing concern from economists particularly on the relationship between money supply and output among other macroeconomic objectives (Nouri and Samimi, 2011). Studies on the impact of money supply on economic growth and real macroeconomic variables have resulted into being an area of disagreement among economists with some studies showing its neutrality in long run but not in short run. The disagreement amongst economists on the relationship between money supply and real variables output and employment is due to the belief that money is a veil, in that changes in money volume

affects only the nominal output and it does not have any effect on real variables of economy such as real employment, real production and real economic growth. Other studies claim that, monetary variables can also influence the real variables in short and long run and they escalate economic growth, as there are monetary uncertainties in economic factors. (Lashkary and Kashani, 2011).

Monetary policy is shown to have extensive impact on the financing conditions in the economy which relates to the cost of acquiring money, availability of credit and banks' willingness to assume specific risks. It also influences expectations about the future direction of economic activity and inflation, thus affecting the prices of goods, asset prices, exchange rates as well as consumption and investment. Consumption and investment are shown to affect the levels of economic development by determining the capital accumulation levels as subset of economic growth. A monetary policy decision that reduces interest rates lowers the cost of borrowing, resulting into higher investment activities and purchase of consumer durables. Further, the expectation that economic activity will strengthen may also prompt banks to ease lending policy, which in turn enables business and households to boost spending. In a low interest rate regime, stocks become more attractive to buy, raising investors financial assets. This may also contribute to higher consumer spending, and makes investment projects more attractive. Low interest rates also contribute to reduction of the deficit problems as they tend to cause currency to depreciate because the demand for domestic goods rises while imported goods become more expensive. The combination of these factors raises output and employment as well as investment and consumer spending.

In Kenya, the control of monetary policy is the responsibility of Central Bank (CBK) established in 1966 under the Central Bank Act (CAP 491) of the laws of Kenya. The Act

defines the roles of the CBK, whose main objective is to assist in the development through maintenance of a sound monetary policy framework in Kenya conducive to the orderly and balanced economic development of the country and the external stability of the currency. In addition, the Bank is required to maintain a desirable level of foreign exchange. For monetary policy to be effective, it also requires an effective and accommodative fiscal policy. The Government through National Treasury formulates and implements fiscal policies. Studies on both fiscal and monetary policies have shown that, fiscal policy decisions can affect the appropriate short-term monetary policy stance both directly and indirectly. Directly, the fiscal policy works through its impact on prices by changing taxes and other charges, and indirectly by affecting aggregate demand. Also, the impact of monetary policy on, short term interest rates, inflation expectations and the risk premia incorporated in long-term yields is essential as these are the variables that affect the environment in which fiscal policy operates.

The Central Bank of Kenya recognizes that low and stable inflation is critical for long term and social prosperity. High and variable inflation leads to inefficient allocation of resources and makes planning for the future much more difficult. To avoid adverse effects in the economy, the monetary policy framework objective on inflation is to achieve an underlying rate of 5 percent target. The Central Bank of Kenya pursuit of monetary policy stance consistent with inflation target and the envisaged growth makes the best possible contribution to achieving stable real interests rates is expected to facilitate adequate expansion of credit to the private sector to support the envisioned economic activities.

To attain the objectives of Monetary Policy in Kenya, the CBK uses various instruments that help to attain the desired macroeconomic stability. Among them, the Bank uses the, Open Market Operations, Cash Reserve Ratio, Foreign Exchange Market operations, and Standing facilities as its Monetary policy instruments. To ensure the effectiveness of monetary Policy instruments the Bank issues prudential guidelines from time to time that govern their implementation. The Central Bank Rate (CBR), the rate at which commercial banks borrows money from Central Bank, forms the base for all monetary policy operations. Transmission of monetary policy to the real economy is done through five channels that includes; interest rate, exchange rate, asset prices, credit, and expectations channels (Ndung'u 2012).

A review of Kenya's economic policy priorities for achieving long term economic growth reveals that, there has not been a significant shift in the areas of focus over time. The most notable change in the management of the Kenyan economy was the implementation of the structural adjustment programmes (SAPs) that began to be introduced during the 1980/81 fiscal years. However, SAPs did not become an important part of economic management until after the publication of the Sessional Paper No. 1 of 1986 on Economic Management for Renewed Growth. Other Government Focus was on Sessional paper No. 1 of 1994 on Recovery and sustainable Development to the year 2010 which paved way to the Sessional paper No. 2 of 1996 on Industrial Transformation to the year 2020. Kenya had by this time not attained the desirable economic growth as was experienced in the first two decades after independence. The National Alliance Rainbow Coalition (NARC) Government embarked on restoring the economy through the Economic Recovery Strategy (ERS) for Wealth and Employment Creation 2003-2007 and currently the Vision 2030. During the ERS period

economy recorded good performance with growth rate recorded at 7.0 per cent in 2007. The Economy experienced a major internal shock associated with the Post-Election Violence in December 2007 and early months of 2008. This had detrimental effects in the economy and the resultant economic growth rate was 1.5 percent in 2008 (Republic of Kenya 2009).

The importance of monetary policy on economic growth cannot be overemphasized. It is the desire of every country to achieve sustainable economic growth rates. Currently, the development policies of the government of Kenya are driven by the objective of achieving Vision 2030, under which the key objective in the economic pillar is to accelerate economic growth to an annual rate of 10 percent. The growth objectives underpinning vision 2030 required that, the rate of growth should rise from 6.1 percent achieved in 2006 to 10 percent by 2012/2013 and to sustain it thereafter (Republic of Kenya, 2007).

Achievement of sustainable economic growth in Kenya continues to be elusive. The gains that had accrued during the first two decades after independence have been reversed thus, posing the concern whether it was a policy issue or other factors influence sustainable longterm growth. Achievement of the desired economic growth rate levels is a collective responsibility among the policy players and actors. Thus, the need to undertake a study on the role of monetary policy on economic growth in Kenya and the implication on achieving the aspired sustained longterm economic growth rate of 10 percent by the year 2030.

1.1.2 Overview of Kenya's Vision 2030

Kenya's Vision 2030 is the new long-term development blue print for the Country. It is motivated by a collective aspiration for a better society by the year 2030. It aims to make Kenya a globally competitive and prosperous Country with a high quality of life by the year

2030. It aims to transform Kenya into a newly industrialized middle-income economy providing a high quality of life to all its citizens in a clean and secure environment (Republic of Kenya, 2007).

The vision is anchored on three pillars; economic, social and political pillars. The economic pillar aims to achieve an average economic growth rate of 10 percent per annum and sustain it until the year 2030. The social pillar seeks to create a just, cohesive and equitable social development in a clean and secure environment. The political pillar aims to realize an issue-based, people-centered, result oriented and accountable democratic system.

The Vision was developed after the successful implementation of Economic Recovery Strategy (ERS) for Wealth and Employment Creation, 2003-2007. The ERS restored most of the macroeconomic variables. The ERS fronted a foundation upon which to build a prosperous Kenya with expanded economic opportunities. Kenya's vision 2030 is implemented through series of five year Medium Term Plans (MTPs) with the first and the second being MTP (2008-2012) and MTP (2013-2017) respectively. The MTPs contains flagship projects identified under Vision 2030 as well as other key National Policies and programmes to be implemented. Progress in the year's achievement is reported through the Annual Progress Reports and through Economic surveys which gives the annual economic Performances. The macroeconomic framework upon which the vision was developed favors low inflation rates , low interest rates , a sustainable public sector debt and competitive real exchange rates to support an export led economic growth and help to deliver high and sustainable levels of growth , employment and poverty reduction (Republic of Kenya 2007).

1.2 Evolution of Monetary Policy in Kenya

1.2.1 Monetary policy in the formative years of Central Banking 1966-1970

Before the establishment of the CBK in 1966, the East African Currency Board (EACB) served Kenya, Uganda and Tanzania during the Single Currency period in East Africa and conducted matters relating to monetary policy management. The CBK superseded the EACB and took over the management of monetary Policy management in Kenya after 1966. During the early days of its establishment, the CBK pursued passive monetary policies as by then there were no major macroeconomic problems to contend with. The Bank tended to underpin its monetary policy strategy only on interests rates controls and the volume of credit expansion by banking institutions as its operational target and money supply as its immediate target. The economy grew by an average of 6 to 8 per cent annually, inflation remained as low as possible averaging between 2 to 3 percent while exchange rate was fixed (Kinyua 2001).

1.2.2 Monetary Policy during 1970- 1992

Studies show that, as Kenya entered her second decade of independence, her ability to sustain the annual economic growth of 6 to 8 percent as earlier achieved in the 1960s was eluded as the economy was already experiencing economic challenges. The country started to experience constraints relating to the balance of payments associated with the collapse of Bretton Woods's system of fixed exchange rates in 1971 and the oil crises of 1973. As a result, economic growth slowed down, the balance of payment and domestic prices came under increasing pressure and the overall balance of payment moved into a deficit of 362 million shillings in 1973. In 1974, inflation reached a two-digit level for the first time since

independence mainly due to the oil crisis. The country experienced reduction in real capital inflows contributed by the weakness of the balance of payment.

To respond to the balance of payment crisis the economy experienced, the policy makers at the time undertook various measures to contain the credit expansion and help curb imports by introducing instruments of control rather than those to liberalize the economy. These included selective control on bank lending, licensing of foreign exchange transactions, declining from £sterling pound, quota restrictions on most imports, direct price controls on goods and control on interest rates. The Economy by this time also experienced the first devaluation of its currency in 1975.

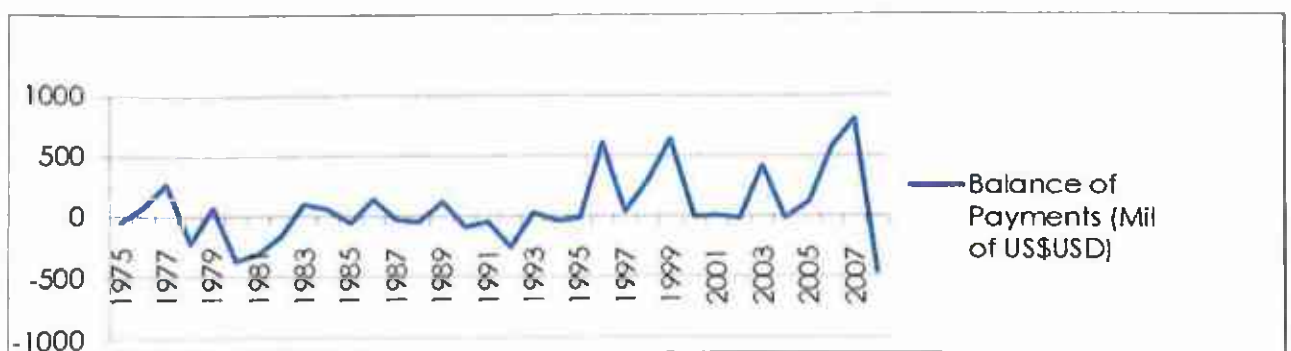
By 1977, terms of trade improved by over 60% due to commodity boom in the major exports crops of coffee and tea (coffee boom period). As a result, the overall balance of payment improved to record a large surplus. In addition, the foreign exchange reserves held by the bank rose from 172 million in 1975 to 529 million US dollars in 1977. Banks also responded to the favorable economic performance by increasing their domestic credit extension. The Government in 1978 undertook several measures to liberalize the economy by issuing restrictions to commercial banks to limit their credit extension to the private sector to 18 per cent per annum and a reduction in government borrowing. In addition, in 1981, the government devalued the shillings and raised interest rates as measures to liberalize the economy.

The efforts put in place to liberate the economy by addressing the economic difficulties did not bear sustainable effects. The economy experienced another second oil crisis of 1979-1980 which adversely affected the economy resulting into a rise in inflation to 12.8% in

1980 from 8.4 % in 1979. In addition, the increase food prices in 1982 increased inflation from 14.3% in 1981 to 22.3% in 1982 (Kinyua 2001).

By 1985, the economic difficulties that the country experienced came to be clearly seen that they were structural in nature and, as such, in addition to the stabilization measures, the government called for extensive structural reforms in the economy. This led to abandonment of price controls. As part of a wide-ranging economic and financial programme, a number of reform measures intended to enhance the effectiveness of monetary policy were put in place from 1986 through the Sessional Paper Number one of 1986. New debt instruments were introduced and a more flexible management of the exchange rate and significant liberalization of other areas of exchange and trade systems were undertaken. In addition, the Government continued with the liberalization efforts by undertaking complete decontrol of interest rates in 1991 and the introduction of open market operations. Despite the efforts put in place to liberalize the economy, balance of payment problem continued to persist. See trends in Balance of Payment in Kenya for the period 1975 – 2008 in Fig 1.1.

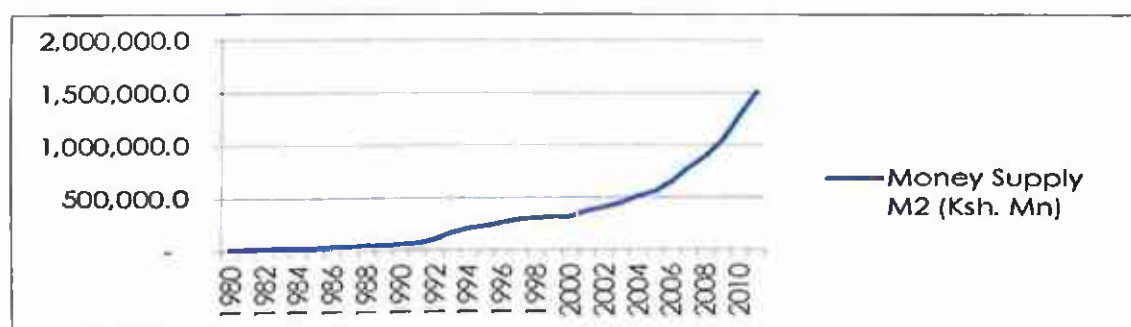
Figure 1.1: Trends in Balance of Payment in Kenya from the period 1975 – 2008



Source: Central Bureau of Statistics (CBS), Kenya

Despite the increase in the number of monetary policy instruments available to the CBK, fluctuations in the growth of domestic credit and the money supply persisted. Domestic credit and money supply expanded much faster than expected in most years between 1987 and 1991. This partly reflected the effect of the expansionary fiscal policy, which made it necessary for the government to resort to more borrowing from the banking system to finance its burgeoning budget deficits (Kinyua 2001). As a result, the task of managing monetary policy became a difficult task for the CBK. See trends of growth in money supply in Fig 1.2 for the period 1980 to 2011

Figure 1.2: Trends in money Supply (M₂) in Ksh. Millions



Source: Author 2013

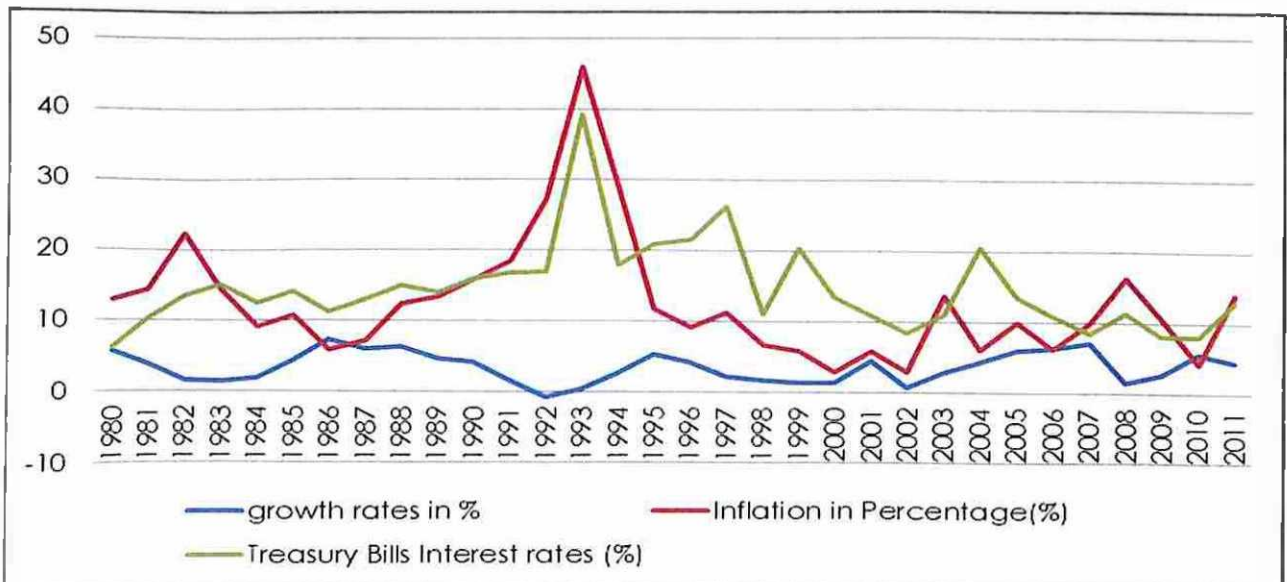
1.2.3 The conduct of Monetary Policy in Kenya since liberalization (after 1992)

The period began by the introduction of wide economic reforms that aimed at allowing market forces more autonomy in decision-making. In the early 1990s, the conduct of monetary policy at the CBK was significantly modified to reflect the objectives of a modern central bank.

In 1993, it was clear that the government needed to reform its role in the economy. The IMF supported the government to undertake various reforms through structural adjustment

facility at the same time tackling fiscal, monetary, structural and external issues. Despite the reforms, there was persistence deterioration of economic performance, which created a crisis on Kenya's economic policy warranting the government to undertake more reforms. The problem was further aggravated by the Goldenberg export compensation scandal, which cost the economy billions of shillings. At the same time, the country entered in Multi- Party democratic elections in 1992. As a result, in 1993, the fiscal and monetary policies were on the verge of collapse. The shilling weakened as a medium of exchange to an extent that people became reluctant to use it as a medium of exchange preferring to use foreign currencies such as the US dollar to transact business. The inflation rate reached a historic record high of 46% and the Treasury bill rate was 39% in 1993 (Economic Surveys, Various issues). The trend in Inflation rates, 91 Day -Treasury Bills interest rates and Economic growth rates for the period 1980 to 2011 are illustrated in Figure 1.3 below).

Figure 1.3: Inflation rates, 91 Day -Treasury Bills interest rates and Economic growth rates from 1980 to 2011



Source: Author 2013

Further reforms took place with the amendment of the CBK Act in 1996 to allow Central Bank more autonomy. This amendment created a new institutional framework for conduct of monetary policy. The Act stipulated the overall objective of the CBK to be the formulation and implementation of monetary policy directed to achieving and maintaining stability in the general level of prices. Further, the Act provides for greater autonomy of the CBK in the conduct of monetary policy where the President appoints the governor, the deputy governor and five other members of the board of directors for a renewable four-year term (Rotich, Kathanje Musa and Maana 2007). With respect to accountability and communication, the law stipulates that the CBK, at intervals of not more than six months, submit to the Minister for Finance a monetary policy statement.

Currently, the CBK has been targeting monetary aggregate (broad money M3) in its policy decisions. The Central bank sets both inflation target and the instruments to ensure the realization of its objectives in formulating the monetary programme to implement for a specific period. To meet its target the bank estimates the demand for money consistent with the target rate of inflation and the gross domestic product growth. This forms the basis of setting the desired path for monetary growth to which the actual money supply had to conform during the policy implementation stage. At times of high inflation, or positive output, the CBK responds by reducing money supply. The Central Bank Rate (CBR) signals the monetary policy stance. Broad money supply (M3) is the intermediate target. The current monetary programme is based on targets outlined of Net International Reserves (NIR) and Net Domestic Assets (NDA) as the quantitative performance criteria measures. Kenya has a floating exchange rate regime. In his report on conduct of Monetary policy in Kenya Njuguna (2012) argues that, recent empirical studies (CBK/IMF) show that interest rate and

exchange rate channels are the main channels of monetary policy transmission in Kenya. He adds that, expectations channel are also becoming significant with increasing Central Bank communications and transparency.

The introduction of Monetary Policy Committee (MPC) in 2008 has enhanced the transparency and legitimacy of monetary policy decisions, as well as information processing and the decision process. In addition, the MPC's communications strategy has ensured a wider dissemination of monetary policy decisions, and enhanced the efficiency of information transmission.

Despite the recent developments, the Kenyan economy has continued to experience economic challenges relating to high inflationary pressure associated with rapid increase in food and fuel prices since 2010, which created a build-up of the current account deficit to an estimated 11.3 percent of GDP by May 2012 and declining economic growth (Economic Survey 2012). This has implications on exchange rate stability in Kenya. A tighter monetary policy stance and regulatory measures in the foreign exchange market were adopted by the CBK in the second half of 2011 to dampen the persistent inflationary pressures and stabilise the exchange rate. The CBR was raised from 6.25 percent to 18.0 percent between September and December 2011 (Economic Survey 2012)

1.3 Statement of the Problem

The Kenyan economy has continued to experience various shocks relating to high levels of inflation, fluctuating exchange rates, high levels of unemployment and highly volatile growth rates. This turn of events naturally leads to the following questions; can monetary policy contribute to the attainment of a high and sustainable rate of growth? Can monetary

policy promote economic growth by maintaining an environment of price stability? And can monetary policy effectively influence the pace of growth over the short and medium term, and thus help stabilize output fluctuations consistently with its overriding objective of macroeconomic stability.

Stable macroeconomic framework is a key ingredient for national growth and development. Kenya's economy did not grow as fast as was envisioned in the MTP 2008-2012 of the Kenya vision 2030. Real Gross Domestic Product (GDP) was projected to grow at 8.3 percent in 2009/10 and to reach a level of 10 percent per annum by 2012. In 2009, the economy registered a below target growth rate of 2.7 percent but expanded by 5.8 in 2010 (Economy Survey 2010).

Concerns have been raised on the suitability of achieving the envisioned economic growth rates of 10 percent per annum in the Kenya vision 2030. The Economic growth rate has not reached the aspired level of 10 percent which is to be sustained till the year 2030. It has been shown that the growth rates declined from 7.0 percent in 2007 to 4.4 percent in 2011 and 4.6 percent in 2012. Projected growth for the year 2013 is 5.8 percent as compared to 4.8 percent in 2012 (Economic survey 2013).

To foster economic growth in Kenya requires both an accurate diagnosis of the factors determining or constraining growth performance and an appropriate policy prescription regarding the macroeconomic policies and structural reforms needed to achieve higher and sustainable growth. In view of Kenya's goal of long-term sustained economic growth, there is need to establish the role of monetary policy in Kenya. The Period from 1980 marks the reform period in Kenya's economy aimed at achieving sustainable higher growth levels as

envisioned in the Structural adjustment programmes, elaborated government development strategies such as Session Paper no. 1 of 1986 , Economic Recovery Strategy for Wealth and Employment Creation and currently the Kenya Vision 2030. This study therefore, investigates the role of monetary policy on economic growth using time series data for the period 1980 to 2011 and assesses the implication of the possible realization of the objective of the Vision 2030 economic growth of 10 percent per annum. The choice of the period is based on the transformative stages that the economy faced marking the decline period of economic growth as compared to the first decades after independence . In 90s, the economy was stretched, started experiencing high population growth, high inflation, breakdown of Bretton woods system of fixed exchange rate , introduction of CBK to regulate the Monetary Policy. The year 2000s characterized by wide global economic challenges the trends can be used to determine the future.

1.4 Objectives of the study

The primary objective of the study was to determine the nature of the relationship between monetary policy and economic growth in Kenya.

1.4.1 Specific Research Objectives

The study was guided by the following specific objectives;

- (i) To describe the nature of Monetary policy in Kenya;
- (ii) To determine the impact of monetary policy on economic growth; and
- (iii) Based on (i) and (ii) above to prescribe policy measures that can be adopted in the realization of long term sustained economic growth in Kenya.

1.5 Research Questions

The study sought to answer the following research questions.

- (i) What is the nature of monetary policy in Kenya?
- (ii) What is the trend of economic growth in Kenya?
- (iii) What is the impact of monetary policy on economic growth?
- (iv) What is the implication of these policies in the realization of the Vision 2030.

1.6 Hypothesis

The hypothesis of the study was that money supply does not influence economic growth in Kenya. The hypothesis was formulated as follows;

$H_0 = \beta = 0$; Money supply does not influence economic growth

$H_1 = \beta \neq 0$; Money supply influences economic growth

1.7 Significant of the study

Recent instabilities in the economy have guaranteed a need to undertake a review of the monetary policy framework. The Vision 2030 is being implemented at a time when the economy is experiencing major shocks both internally and externally associated with rise in oil prices, the ongoing economic toil in euro zones ,slowed growth in emerging markets and developing economies due to weak demand from advanced economies. In addition, the Government of Kenya is in reform process both institutional and policy reforms under the Constitution of Kenya 2010 dispensation. Achievement of long-term sustained economic growth will be supported by the respective policy and institutional reforms.

As outlined in the Vision 2030, the major objective of monetary policies is to achieve macroeconomic stability, a necessary condition for achievement of sustained long-term economic growth. The execution of these policies will matter for this achievement.

Studies on Monetary policies have been conducted in the past focusing on the interest rates, exchange rates, inflation and their interaction with the fiscal Policies. This Study will add value on the existing studies by bringing out a different angle of focus on the relationship between monetary policy and long-term growth.

This study will provide a basis for providing an understanding of various questions regarding to monetary policy especially its contribution to high and sustainable rate of growth and its influence on the pace of growth over the short and medium term, and thus help stabilize output fluctuations consistently with its overriding objective of price stability. The findings of this research paper will inform on the various measures that can be adopted to achieve an economic growth rate of 10 percent per annum as anticipated in the vision 2030 within the context of the ongoing government reforms.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This section reviews the various studies that have been conducted in the past in relation to monetary policies particularly on the role of money in economic activities.

2.2 Theoretical Literature Review

Alexandru and Patrick (2007) argue that, the impact of monetary and fiscal policies on longrun economic growth is an open issue of macroeconomic theory. Studies concerning the relationship between monetary policy variables and economic growth have showed different results. Focus on money supply has been whether changes in the stock of money or in the rate of growth of money can have lasting effects on real economic variables.

Papademos (2003) points that, in examining the effects of monetary policy on economic activity and growth, it is useful, for both conceptual and for policy reasons, to distinguish between long-term and short-term effects or, between permanent and transitory effects.

Monetary policy and economic growth has been a wide area of consideration by economists drawing different views from various groups as discussed.

2.2.1 The Classical View

The classical economists were guided by the Say's law that, "supply creates its own demand". The classical economist argued that, monetary forces do not affect movements of real variables in the economy, that is, output and employment, in the economy. In view of savings, investments and interest rates, the classical economists argued that savings is

generally invested as a result of interest rate mechanism. To explain the fact that money supply does not affect real variables in the economy, they used the following equation.

$$S=S(r)..... (2.1)$$

$$I=I(r)..... (2.2)$$

$$S=I..... (2.3)$$

Where; *S* stands for savings, *I* stands for Investment and *r* denotes the interest rate (a proxy for a range of interest rates).

Equation 2.1 indicates a savings as a function of interest rates, implying that, if *r* rises, *S* rises as people are induced to save. Accordingly equation 2.2 indicates an investment as a function of interest rates also implying that, as *r* rises, *I* falls since the cost of borrowing rises.

2.2.2 The Classical Quantity Theory of Money

The quantity theory of money provides a very simple way to organize the thinking about the relation between money, prices, and output. The classical quantity theory is the proposition that the price level is proportional to the money stock. The classicists assume that, individuals are rational and wish to maximize utility. Money fails to maximize utility and it is only as a medium of exchange that money enables people to acquire goods and services. Therefore, rational individuals should not demand money for its own sake. The relationship is best explained using the Irving fisher's (1911) equation of exchange.

Thus

$$M \times V = P \times Y..... (2.4)$$

$$\text{Thus } M.V = P.Y..... (2.5)$$

Where, M is the quantity of money in circulation may be represented by any monetary aggregate such as M_0 , M_1 or M_2 ; P , is the price level usually measured by GDP deflator or CPI (consumer price index); Y is the real value of aggregate output (GDP). Equation (2.4) links the price level and the level of output to the money stock. This identity usually referred to as the equation of exchange has generated several debates among economists. First it has been debated that MV causes PY or PY causes MV . Second whether velocity (V) and output (Y) are fixed by the central bank or not. In the classical model of economic output is determined by the level of capital and labour. Velocity is assumed fixed therefore any exogenous change in money supply leads to change in price level. Money in this case does not have any impact on the real variables.

In contrast, according to early post - Keynesian economists' money appears in the economy along with production when banks agree to honour debt contracts with the firms. As the economy grows, banks increase their loans to meet the growing needs of the system, either to pay wages or to remunerate other factors of production, in response to the demand through the banking system. Mohammad (2011) argues that, the creation of money supply is thus parallel to, and must not be confused with income.

2.2.3 The Keynesian Theory

Keynes disputed the classical mechanism pointing that it may fail to guarantee full employment equilibrium. He argued that, wages and prices might not be flexible, income rather than the interest rates may determine savings and if the (speculative) demand for money (liquidity preference schedule) is infinitely elastic with respect to changes in interest rates (the liquidity trap), and then no extra investment would end up in unemployment

equilibrium. In the Keynesian analysis, the theory of consumption function plays an important role. Keynes contends that a macro level expenditure (E) determines income (Y). Total expenditure is the sum of consumption expenditure (C) and Investment expenditure (I). Unlike the classical theory, there is no reason to assume that equilibrium output will be at full employment level of income. The investment function depends on the investor's expectations regarding future demand. If investments prospects are gloomy, then investments may fall and this may reduce output to less than full employment. Keynes argues that to restore full employment, it may be necessary to stimulate expenditure by using fiscal policies such as an increase in government expenditure, or a cut in taxes to stimulate demand or both.

In the full Keynesian model of a situation of unemployment, according to Keynes, an increase in money supply would increase the cash balances held by economic agents. People will then be confronted by the choice of keeping money idle, buying plant and machinery or buying bonds. Following the principle of utility maximization, people would tend to buy bonds; this would in turn raise the bond prices and hence drive interest rates down. A fall in the interest rate will stimulate the level of investment and an increase in investment will raise the level of income via the workings of the multiplier. Thus, an increase in money supply could raise the level of output particularly at a less than full employment level without affecting prices.

2.2.4 Monetarist View

The monetarist case is advocated for strongly by a number of economists, among them Professor Friedman of Chicago University. Friedman has stated a modern quantity theory of Money which has its roots in the ancient quantity theory of money. The modern quantity

theory states that, “a change in money supply will change the price level as long as the demand for money is stable”; such a change also affects the real value of national income and economic activities but in short run only (Friedman 1956). The stability in demand for money is illustrated as a behavioral factor which has been proved empirically. Thus as long as the demand for money remains stable, it is possible to predict the effects of changes of money supply on total expenditure and income.

The monetarists argue that, if the economy operates at a less than full employment level, an increase in money supply will lead to an increase in output and employment because of a rise in expenditure, but only in short run. After a time the economy will return to a less than full employment situation which must be caused by other real factors. Thus according to monetarist economists, changes in money supply cannot affect the real variables in the long run. Given the stability in the velocity, central bank can control the volume of spending by controlling the money supply; the stabilization policy should then concentrate on the monetary policy that is controlling the volume of money supply.

2.3 Empirical Literature Review

Several studies about the relationship between economic growth and money supply, interest rates and inflation have been undertaken with the results showing mixed outcomes. Government policies including monetary policies affect the growth of gross domestic product to the extent that they affect the quantity of productivity of capital and labour. Studies have shown that, there are two channels of monetary policy. One is through the effect that interest rate changes have on exchange rate of a currency and the other through the effect the interest rate changes have on demand. Irfan and Ume (2011) argue that, monetary policy through its impact on interest rates affects the production process. Monetary

policy also has an impact on economic activity and growth through the workings of foreign and domestic markets for goods and services.

Papademos (2003) in a conference on the contribution of monetary policy to economic growth points that, over the last forty years, the theories advanced regarding the relationship between money, inflation and growth have refined and extended Tobin's analysis in several ways. These theories have also challenged Tobin's finding that monetary expansion has a positive and lasting effect on growth. In addition, theories have become more complete by incorporating the other functions of money in the real economy. These generalizations, however, have not led to unambiguous and robust conclusions. For example, in the models where economic agents infinitely lived and under certain additional assumptions, monetary expansion cannot affect the real rate of interest and economic growth (the super neutrality of money is valid). The alternative approach using overlapping generations models can provide a formal justification for the Tobin effect in an explicitly optimizing framework. However, the effects of monetary expansion on economic growth under either of these two types of theoretical models also depend on other underlying assumptions in each approach.

Studies on impact of monetary policy on economic growth have undertaken the consideration of the relationship between inflation and economic growth. Papademos (2003) further points that, the relationship depends on whether inflation is initially high or low. Sometimes it is argued that, the estimated negative correlation between inflation and growth is due to the inclusion of high inflation countries, and that it is much harder to find such a negative relationship among countries with relatively low inflation. A number of studies have considered whether there are any non-linearities in the relationship between inflation

and growth by examining the possibility that there are threshold levels in the relationship. It has been found that the effect of an increase in inflation on growth may depend on whether inflation is above or below some threshold level: while higher inflation above this level is associated with lower growth, this does not appear to be the case for inflation rates below the threshold.

Lashkary and Kashani (2011) in a study on the impact of monetary variables on economic growth in Iran using a Monetarists' approach measured the effect of money volume in the economic growth and concluded to the neutrality of monetary policies on Iran's economy. That is money supply does not affect output.

Yamack and Kacukule (1998) researched on the neoclassic money neutrality assumption in Turkey using the seasonal data during the period 1980 to 1990. They applied a self-regression model with five variables including the real production, money volume, government expenses, and exchange rate and general level prices for analysis and concluded that unpredicted element of money does not influence the real production but its predicted element has a significant effect on real production. Also results proved that both predicted and unpredicted elements of monetary policies (government expenses) affect economic activities.

Mehrara M, (1998) investigated the interactions between monetary policies and real sectors in Iran's economy through distributed lag model and found that production in Iran's economy was an exogenous variable and money volume played no role. Nouri and Samimi (2011) examined the relationship between money supply and economic growth in Iran through Ordinary Least Squares (OLS) using Levine and Renelt growth model and found out

that there was a positive and significant relationship between money supply and economic growth in Iran.

Godwin Douglason (2008) undertook a study on impact of monetary policy on the Nigerian economy using Vector Autoregressive (VAR) technique. The results from the simple empirics on monetary policy shocks showed that monetary policy is not completely ineffective in influencing economic activities and particularly that monetary policy shocks affect prices more both in short run and longrun than other indicators. Monetary policy shock via the use of monetary aggregates did not significantly affect exchange rate in the long run. In relation to prices monetary policy shock using money supply affected prices, both in the short run and long run; while it does not affect output in the short run

Gul, Muhhal and Rahim (2012) undertook a study on linkage between Monetary Instruments and Economic Growth. The study involved review of how the decisions of monetary authorities influence the macro variables like GDP , money supply , interest rates , exchange rates and inflation using the time series data . The study concluded that, interest rates have a significant impact on output. A tight monetary policy of increased interest rates has a significant negative impact on output. Money supply has a positive impact on output. The study further revealed that inflation rate and exchange rate have negative impact on output.

Gichuki, Odour and Kosimbei (2012) undertook a study on choice of optimal monetary policy instrument for Kenya between interest rate and reserve money or a combination of both. Using the error correction method, it was observed that there exist a long run relationship between overdraft interest rates and GDP implying that lower interest rates tend to relate to changes in GDP in the long run. The result also indicated that, there exists a long

run relationship between monetary aggregate, GDP and the interest rates meaning that changes in monetary aggregate tracked changes in the GDP and the overdraft rates in the longrun.

Irfan and Ume (2011) carried out a study on impact of monetary policy on gross domestic product in Pakistan using interest rates, money supply (M_2) and inflation rate as the independent variables. The study used time series data in estimation and found that monetary policy played a key role in its overall economic growth.

2.4 Overview of literature Review

Most of the studies on impact of monetary policy on economic growth have shown that, monetary policy played a key role in economic growth. Money supply has a positive impact on output. Inflation rate and exchange rate have negative impact on output. A majority of studies have found that inflation and long-term growth are systematically and negatively related. That is, higher inflation tends to reduce growth in the long run. It has been revealed that interest rates has a significant impact on output. A tight monetary policy of increase in interest rate has a significant negative impact on output.

Further, the studies showed that, money supply has been shown to have no role on real variables but impacted strongly on nominal variables such as interest rates and inflation rates. Results from the simple empirics on monetary policy shocks hold it that monetary policy is not completely ineffective in influencing economic activities and particularly that monetary policy shocks affect prices more both in short run and long run than other indicators. Money supply influences economic activities indirectly through its impact on interest rates and inflation rates.

To contribute to the ongoing debates, the study intended to determine the nature of monetary policy in Kenya and their impact on longrun economic growth by focusing on money supply as a variable of interest to estimate its association with GDP growth. The study incorporated other variables to capture the net effect of economic performance and their impact on GDP growth rate.

CHAPTER THREE: METHODOLOGY

3.1 Introduction

The chapter describes the methods applied in the study. It covers the theoretical and empirical frameworks. It also details the data analysis procedures that guided the study.

3.2 Model Specification

3.2.1 Theoretical framework

Ali, Somia and Ali (2008) echoes the monetarist view that unanticipated change in money supply affects output and growth, that is, if the objective of the central bank is to accelerate growth in the economy it must increase money supply unexpectedly. This move is countered by the Keynesian view through the concept of liquidity trap. The concept demonstrates that, if real interest rate falls to such a low level, an increase in money supply does not accelerate output and growth. This is due to the fact that when interest rate reaches to its minimum level then increased in money supply could not decrease it further which also implies that investment will also not increases due to the interest rate insensitivity.

Studies have shown monetary policy to have impact on output in that; the increase in money supply leads to increased inflation, high inflation leads to increased interest rates. High interests rates affect the investment function leading to a decline in investment activities which in turn, leads to low capital formation hence low output. Gul, Mughal and Rahim (2012) stated that modifying the classical quantity theory of money, the Keynesians believe that money supply through its transmission mechanism affects the real GDP indirectly.

Monetarists in agreeing with Keynesian that in the short run economy does not operate at full employment expansionary monetary policy may work positively to influence output in the long-run, they support classists that rising money supply will increase inflation only. Therefore, they suggest that the policy must accommodate increase in real GDP without changing price level. However, there has been proposition by other studies that monetary policy affect the real gross domestic product in short run.

Nouri and Samimi(2011) noting an absence of a generally agreed public model of monetary policy to economic growth used the Levine and Renelt model to show the impact of monetary policy on economic growth . The model proposed has been used in many studies and takes the following form.

$$Y = \alpha + \beta_1 I + \beta_2 M + \beta_3 Z + U \dots \dots \dots (3.1)$$

Where Y stands for rate of growth of domestic product, I is set of variables always included in the regression, M is the variable of interest, and Z is a subset of important independent variables that have been used in the previous studies and U is the error term or control variable.

3.2.2 Empirical Framework

The study used the Levine and Renelt model to establish the role of monetary policy on economic growth by using the time Ordinary Least Square (OLS) regression analysis. The analysis captured the impact of monetary policy on economic growth (measured by GDP growth rate), as the dependent variable. The empirical equation was modeled as follows;

$$GDP = \beta_0 + \beta_1 EXPO + \beta_2 M_2 + \beta_3 IY + \beta_4 GY + \beta_5 INF + \beta_6 INTR + \mu \dots \dots \dots (3.2)$$

Where,

GDP = The rate of growth of Gross Domestic Product

EXPO = The rate of growth of exports

M_2 = Growth in money supply (M_2)

GY = The ratio of Government expenditure to GDP

IY = The ratio of Investment to GDP

INF = Inflation rate

INTR = Interest rate (91-Day Treasury bill)

β = parameters to be estimated and

μ = the error term

The variables:

The rate of growth of Gross Domestic Product (*GDP*)

This is the overall dependent variable. It is most commonly known measure of National Income, Output and growth. GDP is the value of all goods and services produced within the geographic territory of an economy in a given interval such as an year. GDP is reflected as the total market value of all final goods and services produced in a country in a given year, equal to consumer, investment and government spending, plus the value of exports, minus the value of imports.

The rate of growth of exports

Exports of goods and services represent the value of all goods and other market services provided to the rest of the world. They include the value of merchandise, freight, insurance, transport, travel, royalties, license fees, and other services, such as communication, construction, financial, information, business, personal, and government services. They exclude compensation of employees and investment income (formerly called factor services)

and transfer payments. This variable was included in the study to capture the overall effects of exchange rates movements as a component of monetary policy.

Money supply (M2)

Money supply is the total amount of money available in the economy at a particular time. This component of money supply includes currency outside banking system, demand deposits, time and saving deposits, certificates of deposits and deposit liabilities of non -bank financial Institutions. The study focused on M2 as it's the only attribute of money supply that the government can directly control. To establish the rate of growth in Money supply the raw data of Money supply was subjected to percentage change.

The ratio of Government expenditure to Gross Domestic Product (GY)

This indicator refers to the share of Government expenditure to GDP and includes all government expenditures for purchases of goods and services. It also includes capital expenditure on national defense and security, but excludes government military expenditures that are part of government capital formation. The Indicator is important in the model to capture the government spending in development activities as opposed to recurrent activities.

The ratio of Investment to GDP (IY)

This indicator refers to the share of investment in total production. It is obtained by calculating gross capital formation as percentage of gross domestic product. Investment provides a stimulus to economic development, and the rate of investment reflects the requisite capital to support the development process. Investment is determined by the macro economic conditions which monetary policy plays a crucial role. It is an important element of the sustainable development process in developing countries, aimed at increasing their partnership in the global economy. As a variable in this study, it is an important element as it

captures the magnitude of investment as a ratio to Gross domestic Product. It reflects an objective aimed at accelerating the pace of development.

Inflation rate (INF)

Inflation is a widespread persistent and appreciable increase in general price level of goods and services in an economy over a period of time. The Indicator was included in the model to capture the economic instabilities associated with high price level. The model used consumer price index data.

Interest Rate (INTR)

The official interest rate since August 2005 is the Central Bank Rate (CBR), which replaced the 91-day Treasury Bill (TB) rate. However due to the period involved, the Study is limited to using the 91 – day Treasury Bill rate which applied as the base rate for all Monetary policy operations. The 91- Day Treasury bill rate is taken as a representative of the Market rates as it's considered a short term interest rate in tandem with the CBR and is less volatile as compared to interbank rate.

3.3 Estimation procedures

The empirical analysis was conducted, using time series data for the period 1980 to 2011. The Econometric package that was used to derive the Ordinary least Squares (OLS) estimates of the coefficient of the equation expressed was E-views. In addition, a number of diagnostic tests were conducted to verify the results.

3.3.1 Time Series Diagnostic Tests

Before estimation, the study tested for stationarity to avoid getting spurious regression results. A series is said to be stationary if the mean and variance of that series are independent of time. Stationary series have finite variance, transitory innovations from the mean and a tendency to return to its mean value as opposed to non-stationary series.

The unit root analysis was conducted using the Augmented Dickey Fuller Test (ADF) to determine whether the series had unit root and to establish the order of integration. The study took into account the possible autocorrelation in the error process. If the series under study had more than one unit root, the series was first differenced sufficiently to make it stationary and then an ADF test was applied to the differenced series. A non-stationary series is said to be integrated of order d if it can be made stationary by differencing it d times; expressed as $x_t \sim I(d)$. The left hand side variables are lagged (ΔX_t) as additional explanatory variables so as to approximate the autocorrelation (augmentation). This implies the statistical fit of the equation and r is more efficient with added information.

ADF test takes the following regression

$$\Delta x_t = \alpha_0 + \alpha_1 t + \beta x_{t-1} + \sum_{i=1}^d \delta_i \Delta x_{t-i} + \mu_t \dots \dots \dots (3.3)$$

Where

α is a drift, t represents a time trend; and d is large enough lag length to ensure that μ_t is a white noise process. The hypothesis was stated as;

$H_0: \alpha = 0$, there is a unit root – time series is non-stationary

$H_1: \alpha < 0$, time series is stationary

The null hypothesis that the variable x is nonstationary is rejected if α is significantly negative, using the results of dickey fuller test. Once the study establishes that the variables are nonstationary, cointegration analysis was carried out to establish if and whether a linear combination of the variables was stationary.

3.3.2 Testing for Co-integration

The regression of a non-stationary time series on another non-stationary time series may produce a spurious regression. That is the variables contain unit root. The remedy is to stationarise the data by differencing. Differencing, however leads to loss of long run properties, as the model difference has no long run solution. This can be remedied by measuring variables in the level form while maintaining stationarity in the short run and long run properties. Co-integration helps to capture the equilibrium relationship between the non-stationary series. The common objective of the co-integration test was to determine if there exists a longrun relationship among the test variables. If any relationship existed, the test was also to help in determining nature of the relationship. Variables are said to be co-integrated if they have a long run relationship amongst themselves in which deviations from their long run path are stationary but have their differences (or their linear combination) stationary. Therefore, variables are said to be co-integrated if a linear combination of these variables assumed a lower order of co-integration. The variables are themselves non-stationary but must be of the same order of integration individually.

Where co-integration is rejected, then there is no long run relationship between the non-stationary time series.

3.3.3 Data type and Source

The study used time series data consisting of annual observation on economic growth rate, rate of growth of exports, and growth in money supply, ratio of investment to GDP, Inflation rate, Ratio of Government expenditure to GDP and the 91-day Treasury Bills for the period 1980-2011.

Data used in the Study was obtained from Economic surveys (various issues), National Bureau of Statistics Kenya and World Bank statistics.

CHAPTER FOUR: DATA ANALYSIS AND FINDINGS

4.1 Introduction

In this chapter, findings of the study are presented. The summary statistics, the correlation analysis, the time series diagnostic and cointegration tests are first discussed. The OLS estimation results are then discussed in the last part of this chapter.

4.2 Summary Statistics

Summary statistics include the mean, mode, median and other measures of variation. These statistics are useful as they help us to appreciate the general features of the data. Table 4.1 below provides the summary statistics for the variables used in the study.

Table 4.1: Summary Statistics

	GDP Growth Rate	Ratio of Investment to GDP (IY)	Ratio of Government expenditure to GDP (GY)	Exports Growth to (EXPO)	Growth of Money Supply(M2)	Interest rate (91-day Treasury bill)	Inflation growth rate (INF)
Mean	3.530	18.551	23.172	4.231	16.175	12.847	12.922
Median	4.087	19.005	22.830	3.964	13.340	12.750	11.200
Maximum	6.993	26.400	29.720	18.630	62.740	39.340	46.000
Minimum	-1.080	10.880	19.560	-11.090	0.820	1.520	4.100
Std. Dev.	2.204	4.441	2.678	7.906	11.752	7.655	8.339
Skewness	-0.316	-0.015	0.959	-0.050	2.142	1.282	2.301
Kurtosis	2.112	1.747	3.288	2.233	9.058	5.717	9.176
Jarque-Bera	1.586	2.094	5.018	0.799	73.393	18.604	79.095
Probability	0.453	0.351	0.081	0.671	0.000	0.000	0.000
Observations	32	32	32	32	32	32	32

Source: Author, 2013

From table 4.1, the mean value for the dependent variable (GDP growth rate) is reported as 3.53 percent over the sample period. The maximum value is 6.99 percent while the minimum is negative 1.08 percent, with a standard deviation of 2.20. Growth of money supply (M2) is reported to have a mean value of 16.18 and a median of 13.34 percent over the same period. The maximum value is 62.74 percent while the minimum is negative 0.82 percent, with a standard deviation of 11.75. Inflation rate is reported to have a mean value of 12.92 Percent, a median of 11.20 percent, maximum value of 46.0 percent and a minimum value of 4.10 Percent while the standard deviation is 8.34 percent. Growth in exports is reported to have a mean of 4.23, median of 3.964 and a maximum value of 18.63 respectively. Notably, the statistical values for other variables are as shown in the table 4.1. The Jarque-Bera values for all the variables are greater than their probability showing that they are normally distributed.

4.3 Correlation Analysis

Correlation analysis is useful in determining the strength and direction of correlation among the variables. It is usually a first step prior to regression analysis to help ascertain the correlation among variables. Table 4.2 provides the correlation values for the variables used in the study.

Table 4.2: Correlation Analysis

	GDP Growth Rate	Ratio of Investment to GDP (IY)	Ratio of Government expenditure to GDP (GY)	Exports Growth (EXPO)	Inflation growth rate (INF)	Growth of Money Supply(M2)	Interest rate (91-day Treasury bill)
GDP Growth Rate	1.000	0.458	0.032	-0.149	-0.537	-0.187	-0.206
Ratio of Investment to GDP (IY)	0.458	1.000	-0.070	-0.142	-0.095	0.057	-0.734
Ratio of Investment to GDP (IY)	0.032	-0.070	1.000	0.033	0.130	0.343	-0.143
Exports Growth (EXPO)	-0.149	-0.142	0.033	1.000	0.224	0.242	0.365
Inflation growth rate (INF)	-0.537	-0.095	0.130	0.224	1.000	0.773	-0.157
Growth of Money Supply(M2)	-0.187	0.057	0.343	0.242	0.773	1.000	-0.208
Interest rate (91-day Treasury bill)	-0.206	-0.734	-0.143	0.365	-0.157	-0.208	1.000

Source: Author, 2013

Table 4.2 provides the correlations among the various variables. GDP growth rate is seen to be negatively correlated with growth of money supply (M2) at - 0.187, growth of exports (EXPO) at -0.149, Inflation rate (INF) at -0.537 and the Treasury bill interest rate (INTR) at -0.206. However, the correlation coefficients indicate that these variables are negatively and weakly correlated to GDP growth apart from Inflation rate which is rated highly. For the case of ratio of government expenditure to GDP (GY) and ratio of investment to GDP (IY), these are positively correlated to GDP, with their correlation coefficients being 0.032 and 0.458 respectively. There seems to be positive and negative autocorrelation among the determinants variables. The growth of money supply is positively correlated with growth of

exports (0.242), ratio of government expenditure to GDP (0.343), ratio of investment to GDP, inflation rate (0.773) and negatively correlated to treasury bill interest rates (-0.208). Growth of exports is positively correlated with ratio of government expenditure to GDP (0.033), treasury bill interest rate (0.365) and negatively correlated to ratio of investment to GDP (-0.141). The ratio of government expenditure is positively correlated with growth of exports (0.033) and negatively correlated with ratio of ratio of investment to GDP (-0.070) and Treasury bill interest rate (-0.143). The ratio of investment to GDP is negatively correlated to other variables save for growth in money supply as follows; growth of exports (-0.142), ratio of Government expenditure to GDP (-0.070) and Treasury bill rate (-0.734) respectively. Treasury bill interest rate is negatively correlated to other variables growth in money supply (0.208), ratio of government expenditure to GDP (-0.143), ratio of investment to GDP (-0.734) and positively correlated with growth of exports (0.365143). Further, inflation rate is seen to be negatively correlated to ratio of investment to GDP (-0.095) and Treasury bill interest rate (-0.157). It is positively correlated with other variables as the ratio of government expenditure to GDP (0.130) growth of exports (0.224) and money supply (0.773) respectively.

4.4 Time series diagnostic Tests

The model was subjected to stationarity tests using the Augmented Dickey-Fuller test (Dickey and Fuller, 1974). The results indicate that explanatory non-stationary variables become stationary after taking first and or second differences. The unit root test results on the data are presented in Table 4.3.

Table 4.3: Unit root tests using Augmented Dickey-Fuller Test

Economic indicator	ADF Test Statistics	At 95% Critical level	Order of Integration
GDP Growth Rate	2.999	-1.952	I(2)
Growth of Money Supply(M2	-4.873	-1.952	I(2)
Exports Growth (EXPO)	-3.999	-1.952	I(1)
Inflation growth rate (INF)	-6.408	-1.952	I(1)
Ratio of Investment to GDP (IY)	-3.886	-1.952	I(2)
Interest rate (91- day Treasury bill	-4.441	-1.952	I(1)
Ratio of Government expenditure to GDP (GY)	-5.006	-1.952	I(1)

Source: Author, 2013

From table 4.3, the test reveals that all the variables were non-stationary. They were made stationary after the first or second difference: GDP growth rate became stationary after the second difference, inflation rate became stationary after the first difference, growth in money supply became stationary after the second difference, investment ratio to GDP became stationary after the second difference, export growth rate became stationary after the first difference, interest rate became stationary after the first difference and ratio of government expenditure became stationary after the first difference. Granger and Newbold (1974) noted that the regression results from the VAR models of the Granger causality tests using non-stationary variables will be spurious. To avoid this, the studies run the regression with the stationary variables after differencing.

4.5 Cointegration Analysis

The Johansen approach, named after Soren Johansen, is a procedure for testing cointegration of several time series. The use of the technique is based on several validations. The model was favored due to its advantages when dealing with many variables as opposed to error Correction Method (ECM). The test made assumption of a linear deterministic trend in the

data against the alternative hypothesis of no linear deterministic trend. The results are presented Table 4.4.

Table 4.4: Johansen Diagnostic Tests

Lags interval: 1 to 1						
	Likelihood	5 Percent	1 Percent	Hypothesized		
Eigenvalue	Ratio	Critical Value	Critical Value	No. of CE(s)		
0.659568	135.0325	124.24	133.57	None **		
0.637436	93.00849	94.15	103.18	At most 1		
0.397200	53.44090	68.52	76.07	At most 2		
0.382472	33.70026	47.21	54.46	At most 3		
0.261852	14.90103	29.68	35.65	At most 4		
0.072969	3.060190	15.41	20.04	At most 5		
0.002694	0.105215	3.76	6.65	At most 6		
Un-normalized Cointegrating Coefficients:						
GDP Growth Rate	Exports Growth (EXPO)	Ratio of Government expenditure to GDP (GY)	Inflation growth rate (INF)	Interest rate (91- day Treasury bill)	Ratio of Investment to GDP (IY)	Growth of Money Supply(M2)
-0.045894	0.041012	0.001307	-0.026029	-0.036774	-0.038943	0.010025
0.025251	-0.003605	-0.019394	-0.036491	-0.029429	-0.059061	0.022050
-0.137246	-0.005785	0.024732	-0.028884	-0.007600	0.006855	0.011324
0.015792	0.010677	-0.011341	0.016486	-0.040614	-0.056391	-0.025584
0.068313	-0.013577	-0.002805	0.035881	-0.002865	-0.022383	-0.005015
0.011433	0.004817	0.043332	-0.004565	0.009118	-0.007506	-0.002179
-0.012856	0.016042	0.052521	-0.011843	-0.022001	0.018316	-0.001600

Source: Author, 2013

The Johansen cointegration test was used to estimate the number of Cointegrating equations so as to determine the presence of a long run relationship among the variables. At an Eigen value greater than 5% there is a long run association. The results reveal that there is at most 1 Cointegrating equation and therefore all the variables are cointegrated in the long run.

4.6 Regression Analysis

Regression Correlation analysis is useful in determining the strength and direction of correlation among the variables. It is usually a first step prior to regression analysis to help ascertain the correlation among variables. Table 4.5 below provides the correlation values for the variables used in the study.

Table 4.5: Regression Analysis

Dependent Variable: LNG_GDP				
Method: Least Squares				
Sample(adjusted): 1972 2011				
Included observations: 25				
Excluded observations: 15 after adjusting endpoints				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
Export growth rate	0.053231	0.156339	0.340484	0.7374
Ratio of government expenditure to GDP	0.545746	0.852746	0.639987	0.5302
Inflation rate	-0.362451	0.286154	-1.266630	0.2214
Ratio of Investment to GDP	2.063833	0.803130	2.569739	0.0193
Interest rate (91-day Treasury bill	0.274106	0.241823	1.133500	0.2719
Growth of Money supply	0.302860	0.173029	1.750341	0.0971
Constant	-7.310684	4.577591	-1.597059	0.1277
R-squared	0.728905	Mean dependent var		1.157522
Adjusted R-squared	0.598540	S.D. dependent var		0.753866
S.E. of regression	0.584652	Akaike info criterion		1.995895
Sum squared residual	6.152719	Schwarz criterion		2.337181
Log likelihood	-17.94869	F-statistic		3.650488
Durbin-Watson stat	2.688532	Prob (F-statistic)		0.015080

Source: Author, 2013

The R^2 in the regression of 0.728905 indicate that the model is fairly strong since it explains only 72.8905% of GDP growth rate. The unexplained elements of the model are due to endogeneity problem attributed to omitted variables critical in the model such technological changes, changes in productivity over time and fiscal policies effect. In addition, the Adjusted R-squared (adjusted R^2) which measures the presence of irrelevant variability in the model is 0.598540 therefore indicates the absence of variability. In this case the trend in the regression line is significant in explaining the positive relationship between GDP growth rate and all variables except inflation which had a negative relationship with GDP growth rate. The standard error of the regression, another measure of the fit of the model is 0.584652 indicating a smaller statistic which is desirable for better fit. The Durbin-Watson (D.W.) Statistic measures the serial correlation of the residuals. As a rule of thumb, if the D.W. is less than 2, there is evidence of positive serial correlation therefore, D.W.=2.688532 suggests that the above equation is gives a fairly strong description of the data.

From the regression analysis, growth in export has a positive association with GDP growth rate implying that the government should focus more on export rather than imports as an increase in exports by 1% may lead to an increase GDP growth rate by 0.053%. The ratio government expenditure to GDP and ratio of investment to GDP are shown to have a positive impact on GDP growth rate implying that for more growth to be realized the Government should focus on capital expenditure and investment activities as a percentage increase in both government expenditure and investment would lead to increase in GDP growth rate by 0.55% and 2% respectively. Money supply has a positive association with GDP implying that steady growth in money supply could lead to increase in output. A percentage increase in money supply would result into 0. 3% increase in GDP growth rate.

Interest rate was also shown to have a positive association with GDP growth rate at 0.27% differing from the theoretical framework, where it would be expected to have a negative association. Changes in Interest rates affect aggregate demand due to its interactions with capital availability. The monetary policy implementers should focus on maintaining stable interest rates in the economy. However, the analysis showed a negative association of inflation and GDP growth rate at -0.36% implying that, high inflation is not suitable for macroeconomic stability, a necessary condition for sustainable economic growth. Thus the monetary policy must aim at achieving low levels of inflation.

CHAPTER FIVE: SUMMARY, CONCLUSION AND POLICY RECOMMENDATIONS

5.1 Summary

The objective of this paper was to determine the nature of the relationship between monetary policy and economic growth in Kenya over the period 1980 to 2011. The study was necessitated by lack of consensus among economists on the impact of monetary policy focusing on money supply on economic growth. The analysis improves on the conventional analysis not only by employing the money supply, interest rates and inflation rate but also including the ratio of government expenditure, the ratio of investment to GDP and growth exports as other variables to capture the net effect of economic performance.

Rationalized against the details provided in the introduction and the review of literature a linear regression model was formulated using the model popularized by Levine and Renelt. The correlation analysis revealed the short term relationships of the variables both with the dependent variable and among the independent variables. The stationarity test using Augmented Dickey-Fuller Test (ADF) subjected the variables to stationary after first second difference. To check the existence of longrun relationship amongst the variables Cointegration tests were conducted using the Johansen approach. The test revealed that the variables were cointegrated in the longrun. In addition, employing the Ordinary Least Square (OLS) analysis helped to uncover an economically meaningful relationship. The R-squared (R^2) showed that 72.89 percent of the variations were explained in the model. In addition, the Adjusted R-squared (adjusted R^2) which measures the presence of irrelevant variables in the model was 0.598540 therefore indicating the absence of variability. The standard error of the regression was 0.584652 indicating a smaller statistic which is desirable.

for better fit. The Durbin-Watson (D.W.) Statistic was 2.688532 suggesting that the model gave a fairly strong description of the data.

5.2 Conclusion

The findings revealed increased trends in money supply, interest rates being rigid downwards as they adjusted faster during expansionary monetary policy regime compared to contractionary monetary policy regime. There was evidence to suggest nonlinearity adjustment simultaneously time varying and regime which suggests that although there are a number of years when policies were not coordinated the situation was not potentially dangerous for the economy.

The results showed the average growth rate at 3.53% with the highest levels being at 6.99% far from the envisioned levels of 10% per annum.

The empirical tests revealed that growth in money supply had a negative correlation with GDP growth rate (-0.187) implying that, in short run increase in money supply may lead to a decline in GDP growth. The rate of growth of GDP and the rate of growth of exports have a positive relationship. As such any positive change in exports leads to a subsequent increase in GDP. An increase in the exports by 1% will result in 0.05% increase in GDP. When government expenditure increases by 1% the GDP will increase by 0.05%. The return on treasury bills, investments and the rate of money supply reveal a positive association, with a 1% increase in either, the GDP will increase by 0.02%, 0.2% and 0.03% respectively. However, a decline of 1% inflation will lead to a decline of 0.36% decline in GDP. There exists a positive longrun relationship between the dependent variable GDP growth rate and growth in Money supply. Continuous increase in money supply may impact positively on

economic growth. A test of the hypotheses indicates that we reject the null hypothesis and accept the alternative that money supply influences the rate of economic growth in the long term.

5.3 Policy implications and Recommendations

From the study findings the following policies on the role of monetary policies and their impact on economic Growth are implied; Economic growth is significantly associated with stable macroeconomic framework. Money supply has a positive relationship with Economic Growth and inflation rate. It is however noted that Inflation rate has a negative relationship with economic growth. The realization of sustainable economic growth calls for a stable macroeconomic framework. In order to realize the aspirations of vision 2030 of economic growth rate of 10 percent per annum and sustain it for a longer period, the Government will need to implement measures to strengthen the economic competitiveness through accelerated governance and public sector reforms by increasing government spending, rate of investment, promoting exports as well as maintaining a stable macroeconomic Framework.

In developed economies monetary policy has been used to cushion investors in various capacities therefore in Kenya the central bank should use monetary policy as a macroeconomic tool for regulation of macro-economic factors such as inflation and investment by regulation of money supply and interest rates. As such monetary policy has significant influence in economic growth. It is noteworthy that Vision 2030 has factored in macroeconomic stability as a necessary condition for sustained long term economic growth therefore policy makers, in line with this study should focus their energy on sustained economic growth.

5.4 Limitations of the study and Areas of Further Research

The study encountered limitations that it could not explain the overall impact of the monetary policies in Kenya and its implication on the possible realization of the Vision 2030 due to endogeneity problem associated with critical variables such as technological changes , change in productivity over time , political factors and interactions with the fiscal policies. The possible realization of the Vision 2030 depends on a number of factors including the political stance of the government. A study focusing on these areas will be useful to policy implementers in regard to sustainable longterm economic growth.

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Annex

Annex 1: Data

Year	GDP Growth Rate (GDP)	Inflation rate (INF)	Growth in money Supply (M2)	Interest rates (91 Treasury bill rate) - INTR	Export growth rate(EXP O)	Government expenditure ratio to GDP (GY)	Investment ratio to GDP(IY)
1980	5.572	13.9	12.60	5.70	-0.1	21	23.03
1981	4.1	7.6	13.33	6.00	-4.2	21	24.33
1982	5.052	13.2	16.14	4.37	3.2	21.64	22.05
1983	1.593	11.6	4.88	1.52	1.2	19.56	21.71
1984	1.6	20.7	12.86	6.80	0.9	19.89	20.29
1985	4.073	11.4	6.68	4.60	6.7	20.85	26.4
1986	6.982	10.3	32.52	6.03	9.8	20.46	23.6
1987	5.811	13.0	11.15	10.12	0.9	20.7	24.38
1988	6.091	4.1	7.94	13.48	3.9	21.31	24.66
1989	4.554	7.6	12.93	15.12	7.917	21.82	18.98
1990	4.134	11.2	20.03	12.50	6.505	22.98	23.72
1991	1.339	19.1	23.62	14.14	-4.988	21.99	20.99
1992	-1.08	27.3	38.40	11.15	11.68	23.54	15.07
1993	-0.095	46.0	62.74	39.34	16.6	25.31	16.69
1994	2.531	28.8	27.37	15.00	10.85	25.14	14.9
1995	4.287	15.8	12.55	14.00	-10.01	23.18	14.71
1996	4.011	8.9	15.62	15.93	-2.046	22.92	12.53
1997	0.22	11.9	9.79	16.77	-5.215	23.4	13.46
1998	3.33	6.7	3.30	16.96	-4.925	22.56	12.79
1999	2.407	5.8	2.75	13.00	18.63	20.21	10.88
2000	0.599	9.6	0.82	17.90	11.04	20.57	14.68
2001	4.726	5.7	16.99	20.90	4.028	22.37	16.76
2002	0.299	11.2	9.96	21.53	8.782	23.47	12
2003	2.785	9.8	11.46	26.36	15.7	23.32	13.13
2004	4.616	11.8	13.35	11.07	-0.071	22.74	14.43
2005	5.981	9.9	9.06	20.47	17.12	24.28	16.91
2006	6.326	6.0	17.08	13.47	3.747	24.72	17.95
2007	6.993	9.8	19.07	10.81	-6.258	26.16	19.03
2008	1.528	16.2	15.88	8.38	6.147	27.12	19.21
2009	2.645	10.5	16.05	8.59	-11.09	27.92	19.4
2010	5.552	4.1	21.61	6.82	6.9333	29.66	21.87
2011	4.4	14.0	19.07	2.28	12	29.72	23.08

Multiple Sources: Economic Survey (various issues), Kenya National Bureau of Statistics and World Bank statistics