# Monetary Policy and Economic Growth: The Case of Kenya

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***Abstract:*** *This paper explores the role played by monetary policy in promoting economic growth in the Kenyan economy over the period 1970-2017. The results have brought forth the interaction of macroeconomic variables whose co-movement has important implications for financial decision making. Also our results indicated that money supply has positive impact on aggregate output in the short run but in the long run it results in increasing the inflation. Although the aggregate output can cause the inflation to rise in the long run, withan effective monetary management they can control it along with highly responsive interest rate movements in Kenya. Therefore, given the proper management of resources mobilization, the financial variables respond to the growth in a manner that can supplement the growth process of the country. Therefore, the economy of Kenya is presenting viable opportunities for financial growth and development that may lead to sustainable economic growth.*
***Key Words:*** *Kenya, Monetary policy, Economic growth, Financial Growth, Interest rate, Inflation rate*

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## I. Introduction

Monetary policy is the most important tool to fulfill the dreams of developing as well as developed economies, to achieve the price stability and sustainable economic growth. Monetary policy is a process in which the monetary authorities (Central Bank) control the supply of money. The tools which are used in monetary policy consist of open market operations, central bank discount rate, bank reserve requirement and printing of new money (Alvarez, et al. 2001). Furthermore, an unpredictable and unexpected event that has significant effect on economic system is called shock. In other words the shocks are unpredictable changes that are occurredfrom exogenous factorsand they areaffecting endogenous variables (Khan &Snhadji, 2001). However, there are some shocks that have a positive effects on economic systems like the technological shocks and the breakthroughs, but mostly the term shocks is used for phenomena that have adverse impact on economic system. During the decade of 1970, the supply shock hits the global economic system and after that the analysis about shocks becomes more popular. However, there are different types of shocks in an economy like supply and demand shocks, external and domestic shocks, nominal and real shocks, country specific and global shocks, nominal and real shocks etc. In addition, these shocks have a significant impact on the economic performance.For example the variable cost of the firms is increasing due to higher increase in oil price and oil is essential input for the production process.As an effect the firm may raise their product prices to protect their profit margins and that is leading to inflation and higher inflation is decreasing the economic growth rate. However, according to the neoclassical theory of demand and supply shocks have inverse effect on output and economic growth, although they have contrasting effect on the price and inflation rate (Kishor&Newiak, 2009). On the other hand the inflationary shocks occur when the prices of commodities increase shortly (like removal of government subsidies) but if the income of the society is not increasing rapidly then the purchasing power of the consumers is decreasingand we have the inverse effect on output. For the economy of Kenya, the State Bank of the countryis using money supply (M2) (currency + demand deposits + time deposits) for policy purposes and is assuming that the demand for money supply (M2) is consistent. Therefore, the purpose of this research to evaluate the effects of monetary policy shocks on economic performance of Kenya.

Initially the monetary policy was controlled by the government through the State Bank of Kenya and was trying to control the economy only with the traditional functions,like theregulation of the monetary and the credit system (Andrle et al 2013).During the period of 1990 and 2000 the policy makers and the government has taken some important measure to reform the monetary policy of the country. The main purpose was to emphasis on these reforms to achieve the objectives of the monetary policy i.e. the price stability and the output maximization. However, during these reforms autonomy was provided to the State Bank of Kenya and it has established domestic bond market, it has launched Kenyan bonds in international market, it has privatized the

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commercial bank, and it has maintained the high foreign exchange reserves. Before these reforms the monetary policy was only the part of fiscal policy. However, before 2005-2006 the monetary policy wasfavorable for growth because the inflation was at low level but after 2005-2006 the monetary policy actions are supporting the inflation (Kinyua, 2001) and high inflation ratesare creating problems for individuals as well as aggregate economic performance. The sustained higher inflation rates have adverse impact on real economic growth in Kenyan economy. Keeping in view this hazardous nature of inflation, the prime responsibility of the central bank to maintain price stability was not achieved (Bernake et al. 2005).  However, it is argued that during the time period of higher inflation the sufficient tight monetary policy is necessary for a long time period to decrease the inflation. In the case of Kenyan expansionary or lose monetary policy was the main reason for the rise of the inflation rates. In the begging the expansionary monetary policy was increasing the real economic growth but after a time period is supporting the inflation. One other argument in favor of contractionary (tight) monetary policy was that to reduce the inflation rate the government must adopt the tight monetary policy (Adam et al 2010). In this context, the State Bank of Kenya has focused on anti-inflation policy which ensures the steady growth in long run (Kamaan, 2014). Therefore, the expansionary monetary policy depreciated the exchange rate and the contractionary monetary policy appreciated the exchange rate (Bernake&Mihov, 1995). The rapid depreciation in exchange rate has inverse impact on economic activities because the imports are more expensive, consumers are worse off due to the loss in the purchasing power and the balance of payment (BOP) is also disturbed due to the depreciation of currency. On the other hand the debt burden is increasing due to the depreciation in exchange rate. However, the contractionary monetary policy is very important to control the inflationary shocks, because the inflationary shocks are creating uncertainty in an economy and is lowering the economic growth. The contractionary monetary policy is appreciated the exchange rate, is increasing the interest rate, and is decreasing the inflation and output in short-run (Agha, 2005 and Asongu, 2014). Therefore, the main objective of this research is to evaluate the effects of monetary policy shocks on gross domestic product.

The effect of monetary policy on economic growth isan important and debatable subject nowadays because higher inflation and exchange rate depreciation affects the aggregate economy as well as the purchasing power of individuals in Kenya (Mishra et al. 2012). The policy makers and the previous literature are relating the higher inflation and depreciation in exchange rate with monetary phenomena. The policy makers have the opinion that the main reason of this higher inflation and depreciation in exchange rate is the excessive money supply (Mumtaz& Zanetti, 2012). Through this paper we will try to understand the mechanism of monetary policy shocks and its effects on gross domestic product, exchange rate, interest rate and inflation. Furthermore, nowadaysKenya is facing huge volatility in exchange rate, and we will try to understand in which extend the monetary policy is responsible for these problems. This study is also very helpful to determine the role of monetary policy shocks in an economy and how the shocks aredeal with major economic variables. Finally, in this paper we are adopting the structural vector auto regressive model (SVAR) with imposition of Sims and Choleski restrictions which are very important in SVAR models. Choleski believed on the recursive ordering of the endogenous variables. According to his theory in the initial ordering we are placing those variables which have the less effect and then we are placing the variables which have stronger effects. Sims (1992) was not agreed with Choleski, and he argued that the restrictions are not mechanical and must be based on economic reasoning although the equations are over identified.The main objective of this study is to analyze the effects of monetary policy shocks on economic growth of Kenya and also to find out what kind of policy implications are helpful to overcome the shocks from the economy.

## II.  Analytical Framework
The Structural Auto Regressive (SVAR) model is better than other VAR models due to its empirical fitness and structural shocks with respect to economic theory. However, it is necessary to isolate the exogenous shocks in which monetary policy must respond for empirical purposes because without properly identifying the policy response to shocks, the relationship between exogenous shocks and policy changes will be unknown. The response of policy variable towards non-policy variables is known as endogenous shocks, on the other hand the other shocks like aggregate demand and supply are knows as exogenous shocks.For example if the shock occurs due to output then the central bank may response through the changing of money supply (Willems, 2010). These exogenous shocks will bring the changes in monetary policy. Cholesky approach is one of the famous approacheswhichare used for identification of monetary policy shocks. According to Cholesky, the identification procedure defined the recursive ordering and precludes simultaneous interactions among some of the variables, leading to a lower triangular matrix. Each variable in the lower triangular matrix is contemporaneously affected by the variables that precede it and is not affected by the variables that succeed it. On the other hand Sims 1980 is not agreed with Cholesky recursive ordering, and he argued that the restrictions should be based on economic reasoning.

## 2.1.Econometric Methodology

Our research is utilized the SVAR (Structural Vector Auto Regressive) model which is similar to Sims (1980). The order of variables gross domestic product $(Y_t)$, exchange rate (EXH), inflation (INF) and interest rate (INT) has contemporaneously effected to money supply (M2). Since it is assumed to be based on some underlying theory the error term is independent and defined as structural innovations. The *n* explains that the lag value start from $\sum_{n=1}^{\infty}$ value. The system of simultaneous equations in SVAR (Structural Auto Regressive) model is given below:-

$$Y_t = A_{10} - \beta_{12}EXH - \beta_{13}INF - \beta_{14}INT - \beta_{15}M2 - \alpha_{11}Y_{t\text{-}n} - \alpha_{12}EXH_{t\text{-}n} - \alpha_{13}INF_{t\text{-}n} - \alpha_{14}INT_{t\text{-}n} - \alpha_{15}M2_{t\text{-}n} - \mu_{1t} \quad (1)$$
$$EXH = A_{20} - \beta_{21}Y_t - \beta_{23}INF - \beta_{24}INT - \beta_{25}M2 - \alpha_{21}Y_{t\text{-}n} - \alpha_{22}EXH_{t\text{-}n} - \alpha_{23}INF_{t\text{-}n} - \alpha_{24}INT_{t\text{-}n} - \alpha_{25}M2_{t\text{-}n} - \mu_{2t} \quad (2)$$
$$INF = A_{30} - \beta_{31}Y_t - \beta_{32}EXH - \beta_{34}INT - \beta_{35}M2 - \alpha_{31}Y_{t\text{-}n} - \alpha_{32}EXH_{t\text{-}n} - \alpha_{33}INF_{t\text{-}n} - \alpha_{34}INT_{t\text{-}n} - \alpha_{35}M2_{t\text{-}n} - \mu_{3t} \quad (3)$$
$$INT = A_{40} - \beta_{41}Y_t - \beta_{42}EXH - \beta_{43}INF - \beta_{45}M2 - \alpha_{41}Y_{t\text{-}n} - \alpha_{42}EXH_{t\text{-}n} - \alpha_{43}INF_{t\text{-}n} - \alpha_{44}INT_{t\text{-}n} - \alpha_{45}M2_{t\text{-}n} - \mu_{4t} \quad (4)$$
$$M2 = A_{50} - \beta_{51}Y_t - \beta_{52}EXH - \beta_{53}INF - \beta_{54}INT - \alpha_{51}Y_{t\text{-}n} - \alpha_{52}EXH_{t\text{-}n} - \alpha_{53}INF_{t\text{-}n} - \alpha_{54}INT_{t\text{-}n} - \alpha_{55}M2_{t\text{-}n} - \mu_{5t} \quad (5)$$

The systems of equations in SVAR (Structural Vector Auto Regressive) model are presented in matrix form which is given below:-

$$\underbrace{\begin{bmatrix} 1 & \beta_{12} & \beta_{13} & \beta_{14} & \beta_{15} \\ \beta_{21} & 1 & \beta_{23} & \beta_{24} & \beta_{25} \\ \beta_{31} & \beta_{32} & 1 & \beta_{34} & \beta_{35} \\ \beta_{41} & \beta_{42} & \beta_{43} & 1 & \beta_{45} \\ \beta_{51} & \beta_{52} & \beta_{53} & \beta_{54} & 1 \end{bmatrix}}_{\beta_0} \begin{bmatrix} Yt \\ EXH \\ INF \\ INT \\ M_2 \end{bmatrix} = \underbrace{\begin{bmatrix} A_{10} \\ A_{20} \\ A_{30} \\ A_{40} \\ A_{50} \end{bmatrix} + \begin{bmatrix} \alpha_{11} & \alpha_{12} & \alpha_{13} & \alpha_{14} & \alpha_{15} \\ \alpha_{21} & \alpha_{22} & \alpha_{23} & \alpha_{24} & \alpha_{25} \\ \alpha_{31} & \alpha_{32} & \alpha_{33} & \alpha_{34} & \alpha_{35} \\ \alpha_{41} & \alpha_{42} & \alpha_{43} & \alpha_{44} & \alpha_{45} \\ \alpha_{51} & \alpha_{52} & \alpha_{53} & \alpha_{54} & \alpha_{55} \end{bmatrix} \begin{bmatrix} Y_{t-1} \\ EXH_{t-1} \\ INF_{t-1} \\ INT_{t-1} \\ M_{2t-1} \end{bmatrix} + \begin{bmatrix} \mu_{1t} \\ \mu_{2t} \\ \mu_{3t} \\ \mu_{4t} \\ \mu_{5t} \end{bmatrix}}_{X_t = T_0 + T_1 X_{t\text{-}1} + \mu_t}$$

Furthermore, to obtain reduce form of structural vector autoregressive model (SVAR) equation, we are rewriting the equation as given below:-

$$\beta X_t = T_0 + T_1 X_{t\text{-}1} + \mu_t \quad (6)$$

We multiply both sides with $\beta^{-1}$ and obtain:

$$X_t = \beta^{-1}T_0 + \beta^{-1}T_1 X_{t\text{-}1} + \beta^{-1}\mu_t \quad (7)$$

We re-substitute the values and we obtained reduced form equation.

$$Z_t = A_0 + A_1 Z_{t\text{-}1} + \varepsilon_t \quad (8)$$

Where

$$A_0 = \beta^{-1}T_0 \qquad A_1 = \beta^{-1}T_1 \qquad \varepsilon_t = \beta^{-1}\mu_t$$

$Z_t$ shows (NX1) vector of endogenous variable at time t. On the other hand $A_i$ shows the (NXN) matrix of parameters here (i=0,1) and $\varepsilon_t$ showing the (NX1) multivariate white noise error process.

$$X_t = [Y_t + INF + INT + M2]$$

## 2.2.Data and Variables

In the line of previous studies about the effects of monetary policy shocks on economic activities, in this study we estimate the structural vector auto regressive (SVAR) with five variables: Interest rate, money supply (M2), gross domestic product (GDP) and inflation. The Money Supply (M2) and interest rate represents the monetary policy variables. The study has taken data set from International Financial Statistics from 1970-2017.

# III. Results

The innovations of interest rate generate a positive response in interest rates that converge to the equilibrium in the fourth period, and remain volatile moderately over the long run. The impact of innovations of inflation on interest rates generate a response that is remains around equilibrium before becoming negative after sixth period. Upon impact, the money supply innovations do not generate a volatile response in interest rate for two periods but then they become positive for about five periods. On the other hand, the impact of interest rate innovations on inflation and money supply generate a response that remains around equilibrium throughout the forecast horizon.

**TABLE 3.1 IMPACT MULTIPLIERS**

| Variables | | SVAR – Levels (Long Run Restrictions) | | | | SVAR – 1st Difference (Long Run Restrictions) | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | GDP | Interest Rate | Inflation Rate | M1 | GDP | Interest Rate | Inflation Rate | M1 |
| GDP due to: | Accumulated | 0.127 | 0.000 | 0.152 | 0.237 | 0.004 | 0.025 | 0.026 | 0.040 |
| | Average | 0.013 | 0.000 | 0.015 | 0.024 | 0.000 | 0.003 | 0.003 | 0.004 |
| Interest Rate due to: | Accumulated | -0.324 | 0.145 | -0.287 | 0.180 | -0.175 | 0.354 | 0.080 | 0.172 |
| | Average | -0.032 | 0.015 | -0.029 | 0.018 | -0.018 | 0.035 | 0.008 | 0.017 |
| Inflation Rate due to: | Accumulated | -0.058 | 0.015 | 0.140 | 0.259 | -0.032 | 0.039 | 0.044 | 0.040 |
| | Average | -0.006 | 0.001 | 0.014 | 0.026 | -0.003 | 0.004 | 0.004 | 0.004 |
| M1 due to: | Accumulated | 0.127 | -0.014 | 0.003 | 0.170 | -0.014 | 0.019 | -0.014 | 0.105 |
| | Average | 0.013 | -0.001 | 0.000 | 0.017 | -0.001 | 0.002 | -0.001 | 0.011 |

The impact of innovations of inflation generates a positive impulse in inflation that last for about eight periods before converging to the equilibrium. Although upon impact the response of money supply is around equilibrium but becomes positive and remains above equilibrium over the entire forecast horizon. On the other hand, the impact of innovations of inflation on money supply generates a response that remains around equilibrium over the entire forecast horizon. The impact of innovations of money supply generates a positive impact on money over entire forecast horizon.

## IV. Conclusion

Monetary policy plays a significant role in the well-being of an economy through its stabilizing role. This paper focuses on investigating the effects of monetary policy on economic growth. Similar to most other economies, in Kenya also, there is a multitude of variables that characterize the monetary policy stance at any given time. The present study analyzed the results of a series of structural vector auto regressive (SVAR) model with five variables: Interest rate, money supply (M2), gross domestic product (GDP) and inflation. Our research brought forth the interaction of macroeconomic variables whose co-movement has important implications for financial decision making. Money supply has positive impact on aggregate output in the short run only, but it results in increasing inflation in the long run. Although aggregate output can cause the inflation to rise in the long run but effective monetary management can control it along with highly responsive interest rate movements in Kenya. Therefore, given the proper management of resources mobilization, the financial variables respond to the growth in a manner that can supplement the growth process of the country. Therefore, the economy of Kenya presents viable opportunities for financial growth and development that may lead to sustainable economic growth.

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