

## **EXAMINING HOW MONETARY POLICY EFFECTS THE PRODUCTIVITY GROWTH IN SOMALIA**

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### **ABSTRACT**

Productivity and output growth are influenced by money factors including technological progress, capital accumulation and population growth. Macroeconomic policies especially monetary policy effect of these factors interacts to each other.

The purpose of this study is to evaluate the impact of monetary policy on output growth in Somalia in the light of monetarist view using the equation of exchange proposed by Irvin Fisher. The study adopts ordinary least square (OLS) technique and also uses data obtained from World Bank, SESRIC, and World development indicators during 1970-2010. GDP is measured economic growth, is dependent variable. Money supply, inflation, exchange rate are independent variables the findings of this study reveal that there is a positive significant relationship between money supply and economic growth, while a negative significant relationship between inflation and exchange rate on economic growth.

**Keywords:** Monetary policy, output, money Supply and Inflation

### **1. INTRODUCTION**

Monetary policy can be traced back in the time of Adam Smith. The role of monetary policy is to influence macroeconomic objectives such as economic growth, price stability and stability in balance of payments. Monetary authorities are therefore given the responsibility of using monetary policy to improve the economy of the given country

In Somalia, monetary policy plays a very little important role in the management of the economy. The principle objectives of central bank are Price stability, Formulating and implementing monetary and exchange rate policies, Maintaining and enhance the value of

The local currency, maintain financial stability, and Harmonize and coordinate Government Fiscal policies with monetary policies (Central Bank, 2017).

The growth of Somalia is projected to be 3.4 percent and 2.5 percent, in 2016 and 2017, respectively. The economic downturn caused the effect of the drought that hit on the agriculture sector, which will be partially set-back by activities in the construction, telecommunications, and service sectors (IMF, 2017).

Many studies inscribe the issue of monetary policy and economic. These studies includes, Lut, and Moolio (2015), Celina C (2014), Chipote, and Makhetha-KosiPalesa (2014), Ahmad, Afzal, and Ghani (2016), Nwoko, Nnenna M., IHEMEJE, J. C., Anumadu, E., (2016). The purpose of this study is to measure the impact of monetary policy on the output growth in Somalia.

This study will be of great importance to the Central bank in achieving the macroeconomic objectives of price stability and a well sustained economic development and also will suggest ways through which the regulatory authorities can manipulate monetary policy tools to achieve the desired objectives. It will be also importance to banks and financial institutions in carrying out the macroeconomic objectives of the country where they are operating. Lastly, students and indeed the general public who are carrying out studies on this subject matter will find this study very useful.

The paper is organized as follows: Second section reviews related literature. Third section of study gives theoretical frame work and the model. Fourth section gives study findings and discussion and the final section is devoted to conclusion.

## **2. LITERATURE REVIEW**

Chipote, Makhetha-Kosi (2014) examined Impact of Monetary Policy on Economic Growth. The study therefore seeks to assess the impact of monetary policy on output growth with reference to the South African economy. Findings of the study show that in South Africa, adjusting the monetary policy through the repo rate and money supply has an insignificant impact on economic growth. Although all variables indicate a positive impact on GDP, only inflation is significant.

Nijmanted, Akume, and Mukete (2016) investigated Impact of Key Monetary Variables on the Economic Growth. The study aimed at providing answers to the following research question: how does money supply, inflation and interest rate systematically influence the output growth of the CEMAC zone. This is done by examining the effect of money supply, inflation rate, and interest rate on the output growth in the CEMAC region. The findings of the study reveal that M2 has a positive effect on output growth in the CEMAC zone, the inflation equation reveals that, the two-period-lagged GDP term has a negative significant effect on current year inflation rate, the interest rate regression for the CEMAC zone presented the past years interest rates have positive significant influenced on current year interest rate.

Hameed and Ume (2011) studies Impact of monetary policy on gross domestic product. The study will attempt to investigate how the changes in the monetary policy, through inflation, the output growth of Pakistan. The study proved that the interest rate has minor relationship with GDP but the Growth in Money Supply greatly affects the GDP of an economy, obviously various unknown factors also affects the GDP. Growth in Money Supply has a huge impact on GDP.

Celina C (2014) examined Monetary policy and output growth .the main objective of the study was to determine empirically the impact of monetary policy instruments on output growth in Nigeria. The findings of the study is that the Vector Error Correction Mechanism (VECM) test which was used to determine the impact of the independent variables (M2, INT, EXR and LR) on the dependent variable (GDP) showed that only broad money supply had a positive though statistically insignificant relationship with GDP. Liquidity ratio has negative relationship with GDP while exchange rate and interest rate have positive relationship with GDP contrary to economic expectation. Equally, the coefficient of ECM indicated that the speed of adjustment of the model does not conform to the expected negative sign.

Anwar, Muhsin, Saboor (2016) studied impact of monetary policy on output growth in Pakistan. The purpose of the study is to evaluate the impact of monetary policy on the economy of Pakistan in the light of Monetarist and Keynesian views. The empirical results of the analysis of this study, concluded that economic growth, GDP, was not significantly influenced by money supply M2t, and the domestic level of inflation but it is significantly influenced by real exchange rate and interest rate.

Onyeiwu (2012) examined Monetary Policy and Economic Growth. The objective of this study is to assess the impact of monetary policy in Nigeria, specifically, if it has facilitate growth or not and examine the effect of other co-operant factors in bringing about the desired sustainable economic development in Nigeria. Major findings of the study was found that overall, CBN's monetary policies play crucial role in influencing the level of productivity in the country. This result gives weight to the place of Central bank in the national development process of a nation, the regression analysis also revealed that the adoption of various monetary policy measures by the Central Bank of Nigeria has no significant impact on the inflation rate in the country. This suggests that the problem of inflation in Nigeria is not a monetary phenomenon but is rather attributable to the structural rigidity in the country.

Lut, and Moolio (2015) investigated Impact of Monetary Policy on Economic Growth. The purpose of the study is to examine the impact of monetary policy on output growth to see if any increase in the amount of money supply over the period from 2000 – 2012 could contribute to GDP growth in Cambodia. To learn, besides money supply, if interest rate also plays any role in influencing the GDP growth over the period from 2000 – 2012. This study is conducted in an

attempt to examine if there is a significant effect of money supply and interest rate on output growth of the nation covering period from 2000 to 2012. As a result, money supply is found to have a significantly positive relationship with GDP, while an increase or decrease in interest rate over the period have no effect on GDP of Cambodia. However, the relationship between GDP and money supply is relatively weak since only 5.7% of GDP growth is explained by money supply.

Ahmad, Afzal, Ghani (2016) investigated Impact of Monetary Policy on Economic Growth. The purpose Focus of study is to estimate how monetary policy influence output growth as following objectives. i. Examine the contribution of monetary policy in output growth of Pakistan. ii. Analyze the short-run and long-run relationship among variables. The findings of the study stated as positive impact of money supply and exchange rate on output growth while Consumer price index referred as inflation positively but insignificantly affect the output growth and Call money rate referred as Interest rate negatively affects the economic growth.

Alavinasab (2016) examined impact of monetary policy on economic growth. this study intends to investigate the impact of monetary policy on output growth with reference to the Iranian economy. The result of the regression model shows that in long run, the effects of all explanatory variables are found with the expected sign. Further, money supply has positive significant impact on output growth and variables of exchange rate and inflation rate have negative significant impact on economic growth. While, the effect of interest rate is negative and statistically is insignificant on gross domestic product. In short run, the coefficient of ECM has expected negative sign and significant. The estimate of Error Correction Model shows that money supply and exchange rate both have significant effect on economic growth. Also, findings show that stability of estimates in the long run and diagnostic tests indicate that no serial correlation, no heteroskedasticity, and the residuals are normality distributed.

### **3. METHODOLOGY**

Monetary policy can be defined as the process by which the government, central bank, or monetary authority of a country controls the supply of money, availability of money, and cost of money or rate of interest, in order to attain a set of objectives oriented towards the growth and stability of the economy (Hameed & Ume, 2011). Where output growth refers to the rise in the value of everything produced in the economy. It implies the yearly increase in the country's GDP or GNP, in percentage terms (Surbhi, 2015).

#### **Monetarist view of monetary policy**

Monetarists believe that “money matters”, thereby advocating for the use of monetary policy in influencing economic growth. They argue that there is a direct link between the monetary sector and the real sector of the economy. This view was introduced by Milton Friedman

### **Equation of exchange into quantity of money theory**

Monetarists to support their argument of the effectiveness of monetary policy in impacting on output growth using the equation of exchange proposed by Irvin Fisher. They do convert this equation of exchange into quantity of money theory, which is stated as follows:

$$MV = \text{Nominal GDP} \quad (1)$$

The equation of exchange shows that the money supply  $M$  times its velocity  $V$  equals nominal GDP. Velocity is the number of times the money supply is spent to obtain the goods and services that make up GDP during a particular time period.

To see that nominal GDP is the price level multiplied by real GDP, the implicit price deflator  $P$  equals nominal GDP divided by real GDP:

$$P = \frac{\text{Nominal GDP}}{\text{Real GDP}} \quad (2)$$

Multiplying both sides by real GDP, we have

$$\text{Nominal GDP} = P \times \text{real GDP} \quad (3)$$

Letting  $Y$  equal real GDP, we can rewrite the equation of exchange as

$$MV = PY \quad (4)$$

Where  $M$  denotes the supply of money,  $P$  denotes the price level,  $Y$  denotes the level of output and  $V$  denotes velocity of circulation. Monetarists assume that velocity is constant, and when  $V$  is constant equation (4) indicates a one-to-one relationship between changes in the stock of money and changes in the value of national income. As a result, equation (4) will be transformed into equation (5) below, where  $k$  represents a constant.

$$MkV = PY \quad (5)$$

As the velocity  $V$  is constant, and we make output  $Y$  dependent the equation can be written

$$Y = \frac{M}{P} \quad (6)$$

According to equation (6) changes in output can only be brought through changes in money supply. Therefore, the direct link between the monetary sector and the real sector of the economy comes from the argument of a constant velocity. This explains the basis for the monetarist’s argument that changes in monetary policy will impact economic growth.

If we use logarithm in both sides of the equation, the equation can be

$$\ln Y = \ln M - \ln P \tag{7}$$

**Data Description**

The data were collected principally from World Bank, Central bank of Somalia, and World development indicators data. The balance time series data were collected from 1970 to 2010. GDP is measured economic growth, is dependent variable. Money supply, inflation, exchange rate and interest rate are independent variables. GDP Deflator is used as proxy of inflation.

**Model Specification**

As equation (7) shows that the output Y is functional to Money supply and price level. By adding important variables in to the equation the model is specified as follows:

$$\ln GDP = \beta_0 + \beta_1 \ln M2 + \beta_2 \ln GDPD + \beta_3 \ln EXR \tag{8}$$

Where GDP is gross domestic product, M2 is Money supply, GDPD is GDP Deflator proxy of inflation rate, and EXR is exchange rate.  $\beta_0$  is the Intercept, while  $\beta_1 - \beta_4$  are Coefficient of the independent variable

**4. FIND AND DISCUSSION**

**Table 1: Description of the variables**

<b>Variable 1970-2010</b>	<b>Mean</b>	<b>Stand Dev.</b>	<b>Max</b>	<b>Mini</b>
Output growth Million	2,200	306	2,670	1,670
MoneySupply Million	165,000	199,000	534,000	390
Inflation GDPD	51.34512	29.28614	104.17	19.89
Exchange	5954.998	7814.197	31900	6.2815

### Descriptive statistics

With the dependent variable, the descriptive result in Table 4.1 show the mean of the GDP is (2,200), and its standard deviation is (306). The highest GDP is (2,670), while the lowest is (1,670). The independent variables include Money supply, Exchange rate and GDPdeflator proxy of inflation. The money supply mean is (165,000) its standard deviation is (199,000) the highest is (534,000) and the lowest is (390,000). The GDPdeflator mean is (51.34512) its standard deviation is (29.28614) the highest is (104.17) and the lowest is (19.89). The exchange rate mean is (5954.998) its standard deviation is (7814.197) the highest is (31900 ) and the lowest is (6.2815).

Output growth of Somalia between (1970-1990) was smoothly growing because the government of Somalia was reorganized milk-processing plant to make it more productive; established tomato-canning, wheat flour, pasta, cigarette, and matches factories; opened a plant that manufactured cardboard boxes and polyethylene bags; and established several grain mills and a petroleum refinery. For these reasons, they led the highly increase of employment and export of the country. From (1991-1997) the output growth was decline because of the country was began civil war. From (1998-2010) the output growth began to rise again because of the country has had a temporary government that regulates the economy.

Figure: Gross Domestic Product

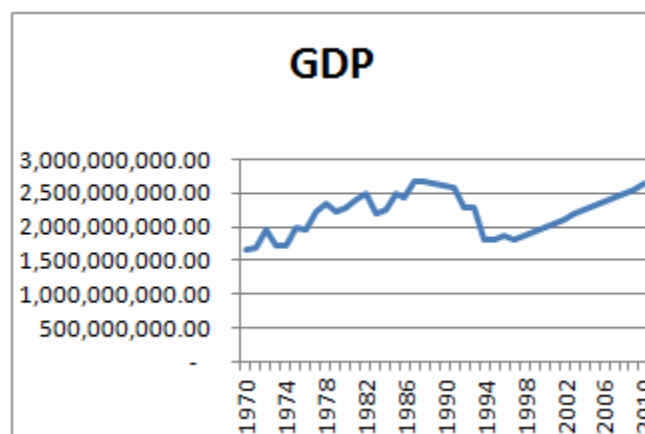
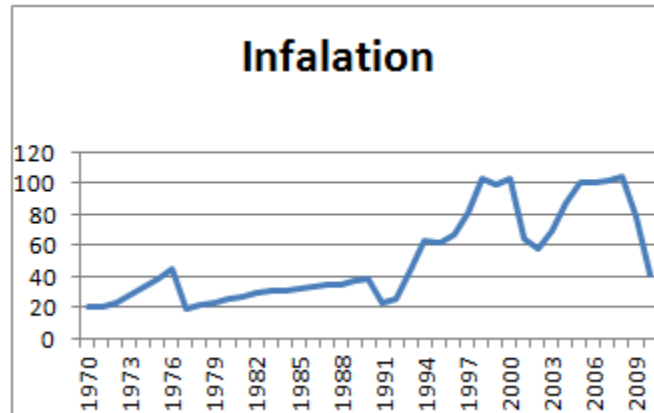


Figure: Inflation Rate



The Money supply of Somalia between (1970-1987) was fixed because the central bank was active. From (1988-1990) the money supply was increased because of the government issued the 500 shilling and 1000 shilling. From (1991-1999) the money supply goes up and down due to lack of government and monetary authority. From (2000- 2004) the money supply goes up because of Puntland state and private banks issued money.(2005-2010) the money supply declined little because of the government elected in Nairobi has reopened the central bank of Somalia.

The inflation rate of the Somalia between (1970-1976) was growing smoothly because of the revolutionary military government increased the employment and export. From (1977-1978) the inflation was declined because of the country was in war against Ethiopia. (1979-1990) the inflation of the country began to grow due to ended of the war and the economy of the country has become stable.(1990-2000) the inflation was high because of the country was began civil war the employment was decrease as well as the export of the country.(2001-2007) the inflation was fluctuated due to lack of effective government.



Figure: Real Exchange Rate

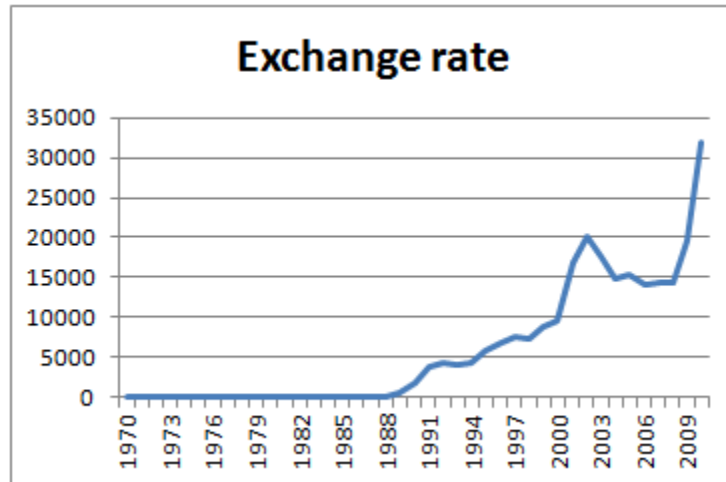
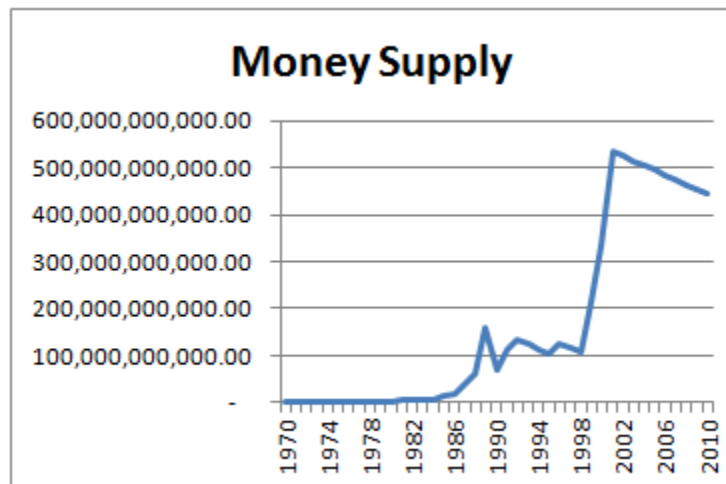


Figure: Money supply



The exchange rate of Somalia between (1970-1989) was fixed because the central bank of Somalia had worked effectively. Form (1990-2002) the exchange rate was high because the country faced civil war and the central bank was not active.(2003-2008) was declined because of the temporary government reopened the central bank.(2009-2010) was high due to the war between government and al-shabab and most society was migrated different countries.

**Estimation of the model parameters**

**Table 2: Estimation of the model**

<b>Variable</b>	<b>Coefficient</b>	<b>Std. Error</b>	<b>t-Statistic</b>	<b>Prob.</b>
MSP	0.156	0.01816	8.588938	0.0000
Inflation	-0.1395	0.03853	-3.61981	0.0009
Exchange rate	-0.0845	0.01407	-6.0046	0.0000

Table 2 show OLS result of the model that all explanatory variables are statistically significant in explaining the impact of the monetary policy on the output growth in Somalia. From our findings, the relationship between money supply and GDP is positive, the coefficient of money supply is 0.155999 which imply that if one percent increases in money, other things being equal, it will cause to increase GDP by 0.155999 percent. The relationship between GDP Deflator proxy of inflation and GDP is negative. the coefficient of GDPD is -0.13948 which imply that if one percent increases in money, other things being equal, it will cause to decrease GDP by -0.13948 percent.

The relationship between Exchange rate and GDP is negative. the coefficient of Exchange rate is -0.0845 which imply that if one percent increases in exchange rate , other things being equal, it will cause to decrease GDP by -0.0845 percent. The model R-Square is fit because R- Square is 0.704371, when R-square is 0.70 is nearly 1 we can say the best value of R square is between 0.6 till 0.99 . So, in this study R square of 70% is considered acceptable. And Durbin-Watson stat: is 0.897143. so that this good of fitness. The F-statistic shows overall significance of the model. It was found to be significant as the probability value of (0.00) has shown. Therefore, all the independent variables (money supply GDPD and EXC) can jointly explain GDP.

Null hypothesis tells the data is normally distributed while alternate hypothesis tells the data is not normally distributed, in the decision rule we do not reject null hypothesis if p-value become insignificant and we reject alternate and vise verse. In this data is normally distributed and we accept null hypothesis because p-value is insignificant and more than 0.05.

The correlation matrix is based on the correlation coefficient, a number between -1 and +1 if there is perfect positive linear relationship between two variables the correlation will be +1. If

there is perfect negative linear relationship between the two variables, the correlation coefficient of zero means that there is no linear relationship between the variables.

Since the p-value (0.763) of Obs\*R-squared is more than 5 percent ( $p > 0.05$ ), we fail to reject null hypothesis meaning that residuals are free from Heteroskedasticity which is desirable for a regression model. Since the p-value (0.1923) of Obs\*R-squared is more than 5 percent ( $p > 0.05$ ), we fail to reject null hypothesis meaning that residuals are not serially correlated which is desirable for a regression model.

The main finding of this study reveals that there is a positive significant relationship between money supply and economic growth. Which means if increase one percent of moneys supply leads increase 0.155999% in economic growth. As well, from our findings, there is a negative relationship between GDP deflator proxy of inflation and economic growth. This implies that if one percent of inflation increases leads decrease is -0.13948 % in economic growth. In conclusion, from our findings of the results of this study indicates, there is a negative relationship between exchange rate and economic growth. Which imply that if one percent increases in exchange rate, will cause to decrease -0.0845% economic growth.

The results of the study is same with the studies of Nijmanted, Akume, and Mukete (2016), Nwoko, Nnenna M., Ihemeje, J. C., Anumadu, E., (2016). The study supports the monetarist view of monetary policy which believe that “money matters”, thereby advocating for the use of monetary policy in influencing economic growth.

## **5. CONCLUSION**

The purpose of this study is to measure the impact of monetary policy on the output growth in Somalia, the study utilizes secondary data which is extracted from World Bank, world development indicators and SESRIC, and it begins from 1970 to 2010. The study uses equation of exchange into quantity of money theory as the chosen approach in the study; also, Ordinary least Square method is the chosen method of estimation in our study.

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