

THE IMPACT OF MONETARY POLICY ON ZAMBIA'S ECONOMIC GROWTH

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Abstract

This paper explores the part played by monetary policy in supporting economic development in Zambia's economy over the period 1985-2015. The study used the multiple linear regressions to discover what impact monetary policy had on economic growth in the period 1985 to 2015. The study engages the Augmented Dickey-Fuller test to test for stationarity in the time series. The Johansen co-integration was engaged to categorize the long-run and short-run dynamics amongst the variables. The study demonstrates that a long run association and short run association occurs among the variables. Also, the fundamental finding of this study, demonstrates that, broad money supply is inconsequential monetary policy tool, while exchange rate and inflation rate, are important monetary policy tools that determines growth in Zambia. The study consequently commends that monetary policies should be used to generate a favorable speculation climate that attracts both domestic and foreign investments thus encouraging justifiable economic growth. GDP was used as the dependent variables against the explanatory monetary policy variables: monetary policy of exchange rate and inflation rate. The time series data is the market-controlled period covering 1985 to 2015. The study adopted the Vector error correction model and also conducted the unit root and co-integration tests. The study showed that long run relationship exists among the variables. Furthermore, the main finding of this study revealed that monetary policy rate, interest rate, and inflation rate have significant positive effect on economic growth in Zambia.

Keywords: Monetary Policy, Economic Growth, Ordinary least square, multiple linear regression, Zambia.

CHAPTER ONE: INTRODUCTION

1.0. Background.

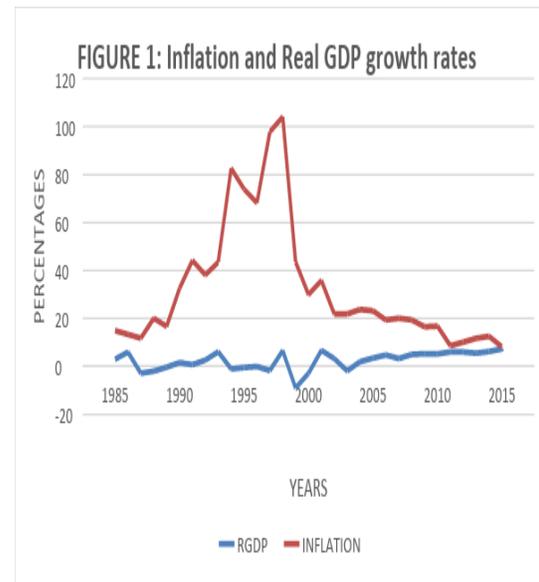
According to Adefeso and Mobolaji (2010:13), One of the greatest trials facing nations is how to attain justifiable economic growth and expansion. Official pronunciation of how money upsets monetary growth dates back to the time of Adams Smith. A few of the most important ones are; firstly, economic growth raises the general living standard of the population as measured by per capita national income; secondly, economic growth makes many kinds of income distribution easier to achieve; thirdly, economic growth enhances the time frame of accomplishing the basic necessities of man, for example shelter, food, clothing, etc., by a considerable mainstream of the population (Lipsey, 1982:693).

Zambia being an import dependent economy is confronted with deteriorated growth, unstable business cycles and economic fluctuation. This typically results to unemployment, inflation,

unproductivity and balance of payment disequilibrium. Government has in one way or the other measured and controlled the economy to exploit the welfare of the citizens by way of ensuring that the resources are efficiently allocated and used.

This study examined the extent to which variations in money supply had been and can be used to influence output in Zambia.

The performance of the economy, as measured by the rate of growth of Gross Domestic Product (GDP), averaged at an yearly rate of 3.5% in the 1980's and 4.3% per annum in the 1990s. Due to the outside shocks, activated by the deterioration in the world market prices of Zambia's major export commodity, copper returns on GDP growth where concentrated from 4.4% in 1999 to 3.7% in 2000. From 2001 onwards, however, growth began to accelerate and reached a high of 7.3% in 2008, which is the second highest growth rate in the past three decades after the 8.6% recorded in 1984. In the wake of the global financial crisis and economic breakdown in 2007/2008, the real GDP growth rate declined to 4.7% in 2009. The deceleration in growth in 2009 was largely on account of equilibrium measures accepted in the year to capture fiscal and trade deficits that emerged in 2007 and 2008 with intimidating consequences for macroeconomic stability. Also, Zambia recorded a GDP growth of 8%, 14.385% and 7.1% in 2010, 2011, and 2012 respectively; averaging 9.83% for the period (Computed from the World Bank Development indicators, 1985-2015). Fiscal and monetary policies are the main instruments of attaining the macroeconomic objectives and could also trigger swings in the growth of GDP.



Source: World Bank Development Indicator, 2015

However, the newest figures stipulate that GDP raised by 2.8 percent in 2015 and 3.3 percent in 2016, much slower than the average 7.4% between 2004 and 2014 (Zambia Budget, 2016). These rates are far below the target of 10% growth per annum

1.2 Statement of the Problem

The study assessed the impact of monetary policy on economic growth by investigating the effect of the basic economic factors such as interest rate, inflation rate, and exchange rate on Zambia's economic growth over the years 1985 to 2015.

1.3 Objectives of the study

Assess the impact of monetary policy on Real GDP with respect to Interest Rate, Exchange rate and Inflation rates on economic growth in Zambia forecasting the period 1985 to 2015.

1.3.1 Specific Objectives

- i) To establish the effects of interest rate on economic growth in Zambia.
- ii) To establish the effects of exchange rate on economic growth in Zambia.
- iii) To establish the effects of inflation on economic growth in Zambia

1.4 Research Questions

- i) Does Interest rate affect economic growth in Zambia?
- ii) Does Exchange Rate affect Economic growth in Zambia?
- iii) Does Inflation affect economic growth in Zambia?

1.5 Significance of the Study

The study intended to reveal the factors that influence the monetary on economic growth. Secondly, the purpose of this study is to fill the gap by testing the comparative effect of the monetary policy variables in the case of developing economy like Zambia. Thirdly, also brought up the importance of banks and financial institutions in carrying out the macroeconomic objectives of the country where they are operating. The study suggest ways through which the regulatory authorities can manipulate exchange rates and other monetary policy tools to achieve the desired objectives.

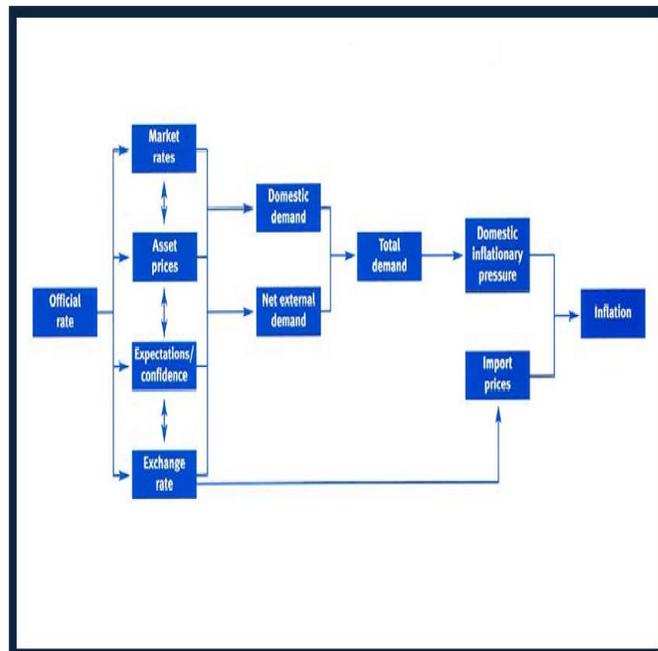
1.6 Scope of the Study

Investigated the impact of monetary policy on economic growth in Zambia, the study covers the period 1985 to 2015. Present

study will attempt to investigate how the monetary policy effects the Zambia's economic growth through inflation, interest rate, exchange rate and money supply. These monetary instruments are the most researched topics in the modern era because they have very serious implications for growth and income distribution. However, the study did not involve other monetary policy instruments such as government budgetary operations, average reserve money national debt development and the like

1.7 Theoretical framework

There are a number of channels that demonstrates how monetary policy stand is communicated into the actual economy, specifically: asset price channel, interest rate channel, exchange rate channel, credit channel, and expectations channel: as revealed in figure below



After the literature review, it is obvious that there occur numerous channels through which monetary policy activities are conveyed to production and inflation in the economy

(McCarthy, 2009). Equally, the exchange rate channel, most writers are in agreement that the exchange rate channel has a consequence on the economic development except a few see McCarthy who determined that the exchange rate channel does not play an important part in economic development. (McCarthy, 2009). As for the interest rate channel, most of the studies specify that there is no association between speculation spending and the market interest rate, which proposes that the result of monetary policy on economic development through the interest rate channel is obstructed. Though the literature discloses that dissimilar policy tools have dissimilar effects on production and inflation, most of it challenges prospects resulting from philosophy. There is absence of general agreement as to why some of the monetary process activities do not affect economic development through some channels. Henceforth, this study purposes to bridge this gap.

1.8 Operational Definitions of Concepts

1.8.1 Real Gross Domestic Product (GDP)

Real Gross Domestic (GPD is an inflation-adjusted quota that reflects the value of all possessions and facilities produced by an economy in a given year. Real gross domestic product is a dimension of economic output that accounts for the effects of inflation or deflation. It will provide a more truthful assessment of growth than nominal GDP. Without real GDP, it could seem like a country is producing more when it is only that prices have gone up.

1.8.2 Interest Rate

Interest rate is the cost of borrowing or price paid on loanable reserves? Interest rates seriously affect the country's plan in satisfying its capital needs, either by issuing equity securities or bonds. Low interest rates will lead to lower borrowing costs, since the borrower (the country) is charged to pay less interest. He also specified in his journal that low interest rates, will inspire the investment and economic activity, which generates a higher stock price as the result (Thobarry 2009).

1.8.3 Exchange Rate

Exchange rate is the quantity of Kwacha per unit Dollar. Thobarry (2009) stated that the foreign exchange rate is a reasonable value of one country's currency towards another country's currency. For example, one American dollar has the same value of 11,000 Indonesian Rupiah.

1.8.4 Inflation

Inflation is the development rate in the aggregate price level in the economy Friedman 1987 stated that inflation is always and everywhere a monetary awareness. Thobarry, 2009 further cited that it is also associated with a decrease in the purchasing power of individuals and companies. While Dimitrova, 2005 quoted that inflation is seen as negative news by the stock market, because it tends to curb customer spending and therefore country's earning.

1.8.5 Money Stock

The total quantity of money in movement or in presence in a country.

1.8.6 Gross Domestic Product

Is the total value of all final goods and facilities produced in the economy throughout the development of a year (By selecting a base year we will emphasis on real GDP)

CHAPTER TWO:

LITERATURE REVIEW

2.1 Introduction

The monetary policy in unindustrialized countries is mostly meant for development of economic evolution whereas alleviating prices. For attaining steadiness, it is usually deliberated essential to save the progress of money supply in phase with its ultimatum, which is anticipated to be exclusively associated to the countrywide revenue, at any rate over the medium-term.

2.1.1 Monetary Policy and Long-Term Economic Growth

In investigating the effects of monetary policy on economic activity and growth, it is convenient, both for conceptual and for policy reasons, to differentiate between long-term and short-term effects or, alternatively, between permanent and transitory effects. The first step, was to consider whether and how monetary policy may effect economic growth in the long run, revising first the theoretical arguments on the links between monetary expansion, inflation and economic

growth, and then assessing the obtainable pragmatic evidence.

2.1.2 Theoretical propositions

A key issue in monetary philosophy is whether changes in the standard of money or in the rate of growth of money can have lasting effects on real economic variables. In particular, the question regarding the so-called super impartiality of money - whether a permanent change in money growth has no long-term effects on the real interest rate, capital buildup and output growth - has been the subject of extensive theoretical analysis since the early 1960s.

In an influential contribution, James Tobin (1965) presented that in a simple model with agents saving for future consumption only out of current income, by either holding money balances or capitalizing in real capital assets, an increase in monetary growth can lead to higher growth. Thus, Tobin's examination contested the super impartiality of money by relying on a fairly straight forward instrument connected to the role of money as an asset and a store of wealth. An increase in money growth leads to a higher rate of inflation that reduces the own rate of return on money and induces a collection shift in favour of real capital. This produces an increase in the capital stock and a higher level of output per person in the long run. In an earlier contribution, Robert Mundell (1963) had also emphasized a link between expected inflation and the real interest rate. His examination, however, examined the short-term positive effect of a perpetual increase in inflation on real saving and the demand for capital and not the long-term effects of inflation on the real rate of interest and economic growth.

Therefore, I have concentrated on the associations between money, inflation and growth resulting from traditional growth models in which the rate of technical advancement is the essential factor of long-term growth. The more current "endogenous growth" philosophies permit for the purpose of the long-term growth rate endogenously, for example by human capital or speculation in R&D.

The theoretical analyses which employ more general and truthful assumptions regarding: (i) the role of money in the economy, (ii) the endogenous determination of factors responsible for long-term growth, and (iii) the existence of nominal established rigidities in the economy, suggest on the entire presence of a negative association between monetary expansion and inflation, on the one hand, and economic growth, on the other. It must also be pointed out that the presence of a optimistic association between inflation and long-term growth subsequent from the models of Tobin and others must be limited to moderately low rates of inflation, else we would reach the ridiculous conclusion that hyperinflation would importantly increase the actual economy's performance.

2.2 Empirical Evidence

What can the obtainable authentication to tell us about the link between monetary expansion and economic development? A strong conventional of lessons find that inflation and long-term growth are methodically and adversely related. In other words, higher inflation inclines to decrease growth in the long run. The result is not acknowledged, as some papers find no association between long-term growth and inflation. There are very few experiential

investigations that have identified, a positive and stable long-term relationship between inflation and growth, but this association holds only for low rates of inflation.

Akerlof et al. (1996, 2000) who have calculated that, in the face of descending nominal wage inflexibility, an effort to decrease inflation from 3% to zero would increase US equilibrium joblessness by 2.6 percentage points have further industrialized these suggestions. Therefore, a lastingly higher rate of joblessness can arise at a very low rate of inflation. The indication, however, for the presence of such rigidities is mixed and it may well be the case that they are removed or moderated under low inflation. Moreover, inflation in the existence of nominal rigidities can also "put gravel in the mechanisms" of the labour market. The presence of "menu costs" and fixed nominal agreements suggests that changes in the over-all price level may not be consistently conveyed throughout the economy and may consequently lead to unintentional and troublesome changes in relative prices.

2.3 The Effect of Interest Rate and Currency Supply on GDP

Different to the previous scholars, Kuttner and Mosser (2002) stated that monetary policy effects the economy through many transmission instruments such as the interest rate channel, the exchange rate channel, Tobin's q theory, the wealth effect, the monetarist channel, and the credit channels including the bank loaning channel and the balance-sheet channel. However typically monetary policy plays its role in monitoring inflation through money supply and interest rate. Money Supply (M2) would have an effect on actual GDP absolutely because an

increase in real quantity of money affects the nominal interest rate to decline and real productivity to raise (Hsing, 2005). Taylor (1995) emphasized the importance of the interest rate channel in this respect.

2.4. Interest Rate

The word interest rate typically means any bank-lending rate. Nevertheless, the rates don't continuously move fast since they are determined by dissimilar forces. Rates on longer-term loans are determined by 3 months, 6 months, and 12 months treasury bills in Tanzania. On treasury notes, like any loan, the interest rates are static. Nevertheless, Treasury notes remain auctioned to the utmost buyer. Dependent on the demand at sale, the note could cost more or less than face value. Nevertheless, at the conclusion of the note's term, the Government compensates full face charge to the buyer. In effect, bidders are lending the offered amount to the Government. In response, they get the interest rate and the full face worth.

Throughout the year ending December 2010, yearly average interest rates on domestic money denominated monetary products displayed a mixed tendency. The general Treasury bills profit reduced marginally to a yearly average of 6.32 percent in December 2010, from 6.91 percent in the year ending December 2009. A similar pattern was experiential in the Treasury bond market, where average yields deteriorated transversely on all maturities. Generally inter-bank cash market rate augmented to an average of 5.26 percent in the year ending December 2010, from 1.57 percent documented in a comparable period during the previous year (Ministry of finance, 2011)

2.5. Inflation Rate

Steady inflation is acknowledged as an integral element of sound macroeconomic policies. Inflation refers to the insistent increase in overall price level. Inflation affects the circulation of both revenue and prosperity. Nominal revenues of some personalities tend to increase with inflation, while those of others continue continuous thus causing a change in the spreading of revenue in courtesy of the previous group. Complex and multi-dimensional problem of inflation requirements a methodical and scientific thoughtful, investigation, examination and inquiry. The extra money supply development and inflation in Zanzibar are certainly related with each other. This offers the source to inspect the effect of monetary policy by regulating inflation on economic development. Four dissimilar price indices can be used to measure inflation rate: the consumer price index (CPI), the wholesale price index (WPI), the sensitive price index (SPI) and the GDP deflator. In Zanzibar, the primary focus is engaged on the CPI as a measure of inflation as it is more illustrative with a broader analysis of food and non-food items in 71 markets of 35 towns round the country. Likewise, it furthestmost thoroughly signifies the cost of living. Consequently, this study undertakes yearly CPI for the era 2000- to 2013 as an indicator of inflation in the economy.

2.6. Nominal and Real Exchange rate

Agreeing to MacDonald (2007) has classifies the nominal exchange rate in to two kinds, specifically spot and forward exchange rate. The mutual spot exchange rate, S , is the rate at which foreign exchange can be purchased for instant distribution, conservatively 1 or 2 days (MacDonald, 2007).

The mutual forward rate, F , is that rate discussed now (time t) at which foreign exchange can be purchased and traded for delivery sometime in the future (once a variable seems minus a time subscript it is indirectly expected that it is a period- t variable). The most commonly dealt forward contract has a maturity of 90 days and agreements beyond 1 year are comparatively rare. Forward contracts are commonly discussed amid separately for instance, a private client or commercial institute and a bank and the separate has to take distribution of the agreement on the stated date. (Ickes, 2004) The actual exchange rate is the serious variable (alongside with the rate of interest) in influencing the capital account; this is because the actual exchange rate is the comparative price of goods across countries. Henceforth, variations in the actual exchange rate disturb the effectiveness of traded goods. The nominal exchange rate, S , denotes to the dollar price of foreign exchange. By way of with greatest variables in economics, we differentiate between the nominal and actual values. The actual exchange rate measures the cost of foreign goods in relation to domestic goods. It offers a magnitude of effectiveness, and it is a valuable variable for clarifying trade conduct and countrywide revenue (Ickes, 2004).

2.7. Definition of Monetary Policy

Monetary policy is concerned with unrestricted control of currency supply by the monetary experts (Central Bank with Central Government) in order to attain specified or anticipated monetary objectives. Governments try to control the currency supply since most governments trust that its rate of development has a consequence on the rate of inflation. Henceforth, monetary policy includes government activities intended to

encourage the conduct of the monetary segment.

Monetary policy is an instrument used by the monetary specialist of a country, the central bank, in order to control actual economy. In other words, it affects all types of economic and financial choices that are made by people in the country. More precisely, the monetary policy effects the enactment of the economy's critical issues such as inflation, output and occupation and also prices of goods, asset prices, exchange rates, and consumption and investment choices.

CHAPTER THREE

METHODOLOGY

3.0 Introduction

The data on the variables were attained from Bank of Zambia, the IMF's International Financial Statistics and the Central Statistics Office. The data used in the empirical analysis was mainly secondary data collected from the period, 1985 to 2015 containing 36 yearly observations for each variable. The data set has five variables. These are: Real Gross Domestic product (in constant 2010 Zambian Kwacha); Inflation (i.e. year on year inflation) measured as the rate of change in the yearly CPI (2010=100); inflation (measured in millions of Zambian Kwacha); The lending rate of interest in actual terms and an index for actual real exchange rate (2010=100).

3.1 Research Design

It provides insights about "how" to conduct research using a particular methodology. (Sawyer, 1996). This research study used a of both quantitative method of data collection.

Primary data was obtained through questionnaires and interviews. Secondary data was obtained from publications and books.

3.2 Sample size and sampling Procedure.

This research used 30 observations of all variables that were incorporated in the study from 1985 to 2015.

3.3 Data collection methods and procedures.

Secondary data was collected from reliable statistical institutions of world bank and central statistical office.

3.4 Data Analysis.

The data was analyzed using Stata as it is a broadly used and efficient analytical package.

CHAPTER FOUR DATA ANALYSIS AND EMPIRICAL RESULTS

4.0 Presentation of Pre-Estimation Tests

4.1. Descriptive statistics of the data under study

The table below shows the descriptive statistics for the data used before presenting the empirical results

Summary of rgdp inf ir exr

Variable	observation	Mean	Std.Dev	Min	Max
rgdp	31	3.2290	3.8437	-8.6	7.6
	32		13		
inf	31	42.568	46.392	6.4	185.
		06	19	4	89
ir	30	33.166	21.337	9.5	113.
		33	34	2	31
exr	31	71.266	21.510	45.	110.
		77	51	26	11

From the data, the mean values indicate the average values for each of the variables. On the other hand, the median shows the middle value for each of the variables after arranging them from the lowest to the highest or vice versa whereas the maximum and the minimum for each of the variables show the highest and lowest values respectively. In addition, standard deviation indicates the dispersion/spread of each of the variables.

4.1.2 Unit Root test

The stationarity properties of the variables are defined by means of two tests of unit roots, specifically the Augmented Dickey-Fuller (ADF) and the Phillips-Perron Tests. Although the ADF technique is possibly the most universally used test, it however needs homoscedastic and uncorrelated errors in the fundamental structure. The PP non-parametric test simplifies the ADF technique, letting for less restrictive expectations for the time series in query. Consequently, we used both tests of unit root (ADF and PP) in order to insure that our implications concerning the significant subject of stationarity are not likely determined by the selection of the testing procedure used. The effects of the tests are offered in table 1. The effects from ADF and PP demonstrate that all variables are incorporated of order one this is because their p- values in both tests are lower than 0.05 henceforth denying the null hypothesis of non-stationary.

Table 4.1 Unit Root test results Dickey Fuller Test

Variable	Coefficient	1 st Diff.	Oder of integration	Prob.
L_rgdg	-0.6078175		I(1)	0.012
L_exr	-0.0841278		I(1)	0.297
L_ir	-0.3664708		I(1)	0.000
L_inf	-0.2281544		I(1)	0.081

Therefore, the results in the table indicate that the natural logarithms of real gross domestic product(L_GDP) and interest rate (L_IR) are stationary since their p-values are less than 5%. Otherwise, the probability values of the natural logarithms of exchange rate (L_EXR) and inflation (L_INF) indicate that the two variables are not stationary since the p-values are greater than 5%.

Table 4.3 The Effect of Monetary Policy on Economic Development: Vector Error-Correction Model

Sample: 1987 - 201 Number of obs = 29

AIC = 21.79144

Log likelihood = -298.9758 HQIC = 22.04246

Det (Sigma_ml) = 180844.2 SBIC = 22.59295

Equation Parns RMSE R-sq chi2 P>chi2

D_rgdg 5 2.49712 0.7445 69.92681 0.0000

D_inf 5 30.3869 0.1530 4.33403 0.5024

D_exr 5 8.71729 0.1801 5.270706 0.3837

| Coef. Std. Err. z P>|z| [95% Conf. Interval]

D_rgdg |
 _cel |
 L1. | -1.717058 .2423497 -7.09 0.000 -2.192055 -1.242062
 rgdp |
 LD. | .3751228 .1565362 2.40 0.017 .0683174 .6819282
 inf |
 LD. | .0599378 .0188096 3.19 0.001 .0230716 .0968039
 exr |
 LD. | -.0514534 .0566437 -0.91 0.364 -.162473 .0595662
 _cons | .5545138 .4773634 1.16 0.245 -.3811013 1.490129

D_inf |
 _cel |
 L1. | -5.083961 2.949102 -1.72 0.085 -10.8641 .6961732
 rgdp |
 LD. | .9161569 1.904857 0.48 0.631 -2.817293 4.649607

inf						
LD.	.2832217	.2288899	1.24	0.216	-.1653943	.7318376
exr						
LD.	-.1633981	.6892852	-0.24	0.813	-1.514372	1.187576
_cons	.0036556	5.808935	0.00	0.999	-11.38165	11.38896

D_exr								
_ce1								
L1.	.5609349	.8460278	0.66	0.507	-1.097249	2.219119		
rgdp								
LD.	.4051412	.5464584	0.74	0.458	-.6658975	1.47618		
inf								
LD.	-.0487405	.0656631	-0.74	0.458	-1.774378	.0799568		
exr								
LD.	-.2131327	.1977397	-1.08	0.281	-.6006953	.1744299		
_cons		1.730535	1.666446		1.04	0.299	-1.535639	4.99671

L_RGDPt = Cons+ -0.05145L_EXRt – 0.599L_INFt

Guideline is that, when the error correction term (coefficient) is significant at 5% level and the sign of the coefficient is negative, then there is a long run causality running from the independent variable to the dependent variable.

On the other hand, when the error correction term (coefficient) is significant at 5% level and the sign of the coefficient is positive, then there is no long run causality among the variables.

Therefore, since the error correction term (coefficient= -1.717058) is significant at 5% level (0.0000<0.005) and the sign is negative, then it can be concluded that there is a long run causality running from exchange rate, interest rate and inflation to real GDP implying that the lags of the independent variables (exchange rate, interest rate and inflation) are significant to explain the dependent variable real gross domestic product (D_rgdp) individually at 5% level of significance.

4.1.4 The Response of Economic Growth to Shocks in Monetary Policy Instruments

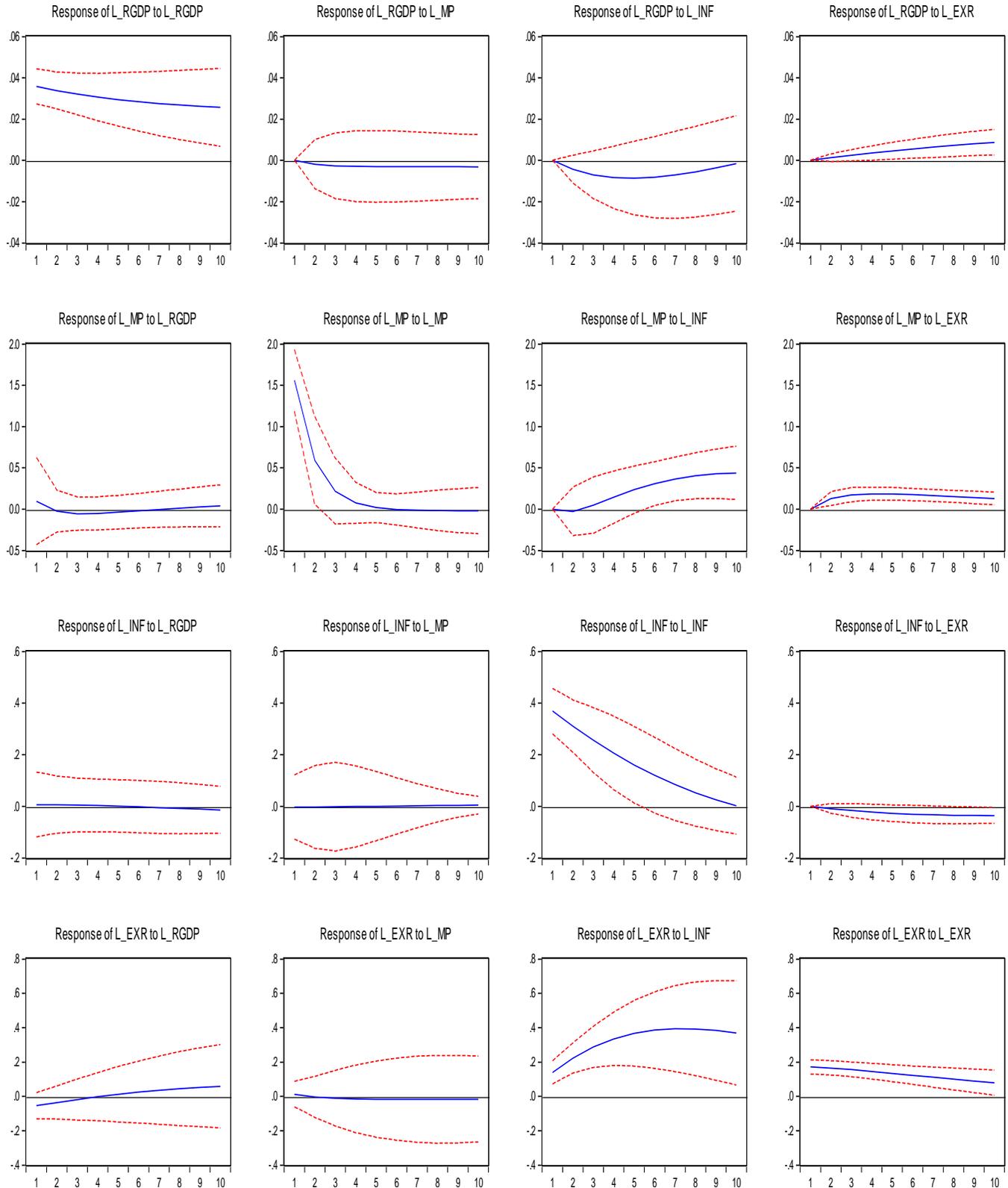
In determining the response of economic growth

to shocks exhibit by monetary policy instruments, we present an impulse response function analysis, as in figure 1.

The graphs below show the impulse response functions of gross domestic product and monetary variables indicators. In the graph the variables are defined as Gross Domestic Product (L_GDP) proxy for Economic growth, Broad Money Supply (L_MP), Inflation rate (L_INF), and Exchange Rate (L_EXR). The one S.D. innovation shown on top of the graph represents a unit structural shock of the variables. Thus, the impulse result shows that GDP has the shortest response to the impulse of Broad money supply (as can be observed in the first row of the plots). The next monetary variable that GDP has short period of response to its shocks is L_EXR. As shown by the picture below in row 1 of the impulse response result, GDP responded, within the same year, to the shocks in both Broad money supply and Exchange rate (L_INF). Also the result shows that GDP respond to shocks in exchange rate after the first period. That is GDP will start responding to changes in exchange rate after the period of the changes.

Figure 4.1: Graph Showing the Impulse Response Function

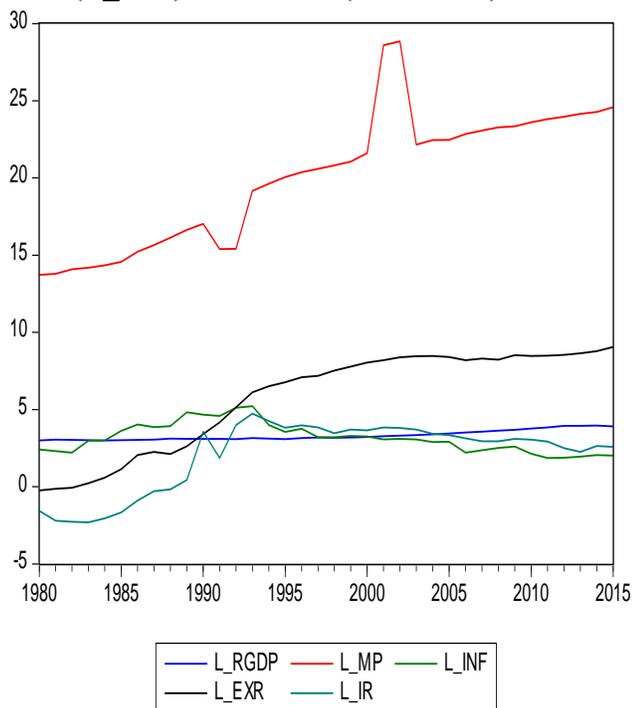
Response to Cholesky One S.D. Innovations ± 2 S.E.



4.2. Economic Criteria

The result of the model shows that all the variables, except Broad money supply are statistically significant in explaining the impact of monetary policy on economic growth. This is surprising since it is expected that a rise in Broad money supply leads to a rise in economic growth. As indicated by the result a unit decrease in Exchange rate will bring about 0.05145 units increase in gross domestic product in long-run while a unit increase of inflation rate will bring about 0.599 units reduction in gross domestic product in long run. Again, the graph has clearly shown that exchange rate and inflation rate among other variables included in this model, have significant impact in stimulating economic growth in Zambia.

Figure 4.4: Trend Showing Movements of GDP (L_RGDP) proxy for economic growth, Broad Money Supply (L_MP), Exchange rate (L_EXR), Interest rate (L_IR) and Inflation rate (L_INF) in Zambia (1985-2015)



Source: Authors' Compilation

4.3 Evaluation of working hypothesis

The results of the model indicate that all the variables except Broad money supply are significant. However, monetary policy impact positively to economic growth and negatively through inflation rate. Again, it is expected that a rise in Broad money supply leads to a rise in economic growth but this is not so because the coefficient of Broad money supply is negative and it is statistically insignificant meaning it has no impact on economic growth whatever. More so, a rise in Exchange rate is expected to lower economic growth but according to the findings the coefficient is positive and significant which means the increase in exchange rate leads to increase in economic while increase in inflation rate leads to reduction in economic growth because its coefficient is negative and significant. More so, R-squared tests depict that there is goodness of fit. This also implies exchange rate, Broad money supply and inflation rate contributed in explaining about 74.03% (for R-squared) and/or 71.6% (for adjusted R-squared) of the total variations in Zambia's economic growth.

Furthermore, the test for the overall significance of the model (F-test) shows that the variables combined together has a significant impact in explaining the stimulation in economic growth in Zambia. Consequently, given the working hypotheses that Broad Money supply has positive significant impact on economic growth of growth, the study rejected the first null hypothesis and conclude that in the short run Zambia's economic growth is partially determined by inflation rate and exchange rate. But looking at the coefficient and significant value in the main model one will quickly believe that inflation rate and exchange rate are seriously

monetary policy instrument that requires attentions of policy makers in controlling the growth of output in Zambia. Moreover, the results suggest that there is no direction of causality between L_MP and L_RGDP, L_INF and L_RGDP, L_EXR and L_RGDP, L_INF and L_MP, and L_EXR and L_MP since their estimated P-values are not statistically significant at 5% level of significance. This suggests the existence of independence among these variables. However, the results given in table 4 also suggest that L_EXR Granger causes L_INF and L_INF Granger causes L_EXR this true since their estimated P-values are statistically significant at 5% level of significance. This suggests the existence of bilateral causality among these variables.

CHAPTER FIVE

SUMMARY, CONCLUSION AND POLICY IMPLICATIONS

5.1 Summary of the Findings

The empirical evidence of the study suggests that increasing exchange rate played a significant role in increasing Zambia's economic growth in the period 1985 to 2015. It also found that changes in the economic growth in Zambia are also driven by changes in inflation rate. The findings of this study contradict see McCarthy's.

5.2 Conclusion and Lessons for Policy Issue

Finally, in order to establish the causal relationship between monetary policy variable and economic growth, the Granger causality test was adopted.

The L_INF Granger causes L_EXR. The key lessons for policy issues can be derived from the results.

5.3 Policy Recommendation

Zambian government through its monetary experts should perfect the economy by including other policies that will encourage economic development not only in the long run but also, in the short run period. This will go a long way in contributing to higher maintainable economic development.

Furthermore, monetary policy can also be made by the monetary expert to impact the pace of development in the short and medium term that is skilled of motivating production growth. When the application of the appropriate economic policies is forced, say by political complications to operational reform, monetary policy becomes unsuccessful in inspiring economic development. Again, since there are stages to which economic development (GDP), replies to itself but does not react to other shocks in monetary policy variables such as L_INF, L_EXR and L_MP determinations should be geared by the Zambian government to withstand the growth, alleviate the shocks of the monetary policy variables, as this will make monetary policy to accomplish efficiently in its alleviating role in the economy. This will also go a long way in contributing to higher maintainable economic development.

Finally, since the study established that there occurs independence amongst some of the variables of interest (i.e., there is no way of causality between some variables encompassed in the model). It suggests that some of the monetary policies are possible to be less effective in attaining economic development. Therefore, the monetary experts should indulge in reforms undertakings that could assist to raise confidence in the Zambian kwacha (ZMK), with constructive effects on aggregate demand and

economic action in the short run. More so, the enactment of fiscal consolidation policies and structural improvements in Zambia will enable the conduct of the monetary policy to foster growth combined with the maintenance of price constancy.

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TABLES/ APPENDICES

DATA

YEAR	RGDP	INF	MP	IR	EXR
1985	1.6	50	2101810	18.6	47.67
1986	0.7	55.91	4061780	27.4	45.26
1987	2.7	47.24	6265590	21.2	46.87
1988	6.3	51.08	10125770	18.39	51.61
1989	-1	119.13	16727500	18.39	66.42
1990	-0.5	113.19	24736400	35.1	54.18
1991	-1.3	99.34	4880660		50.13
1992	-2.5	162.25	4957309	54.57	47.93
1993	6.5	185.89	208559400	113.31	54.53
1994	-8.6	61.92	331999800	70.56	52.34
1995	-2.8	34.81	516169494	45.53	50.19
1996	6.9	43.49	696874796	53.78	54.83
1997	3.3	24.78	871509569	46.69	63.43
1998	-1.9	24.35	1094740854	31.8	59.17
1999	2.2	26.95	1397914140	40.52	59.29
2000	3.6	25.93	2429052730	38.8	60.72
2001	4.9	21.69	2.64E+12	46.23	69.41
2002	3.3	22.17	3.38E+12	45.2	71.14
2003	5.1	21.51	4229863050	40.57	62.8
2004	5.4	17.96	5581585246	30.73	64.92
2005	5.3	18.35	5763264004	28.21	79.33
2006	6.2	9.06	8301871608	23.15	103.77
2007	6.2	10.69	10399460434	18.89	95.62
2008	5.7	12.4	12815112055	19.06	110.11
2009	6.4	13.46	13796907419	22.06	94.5
2010	7.6	8.2	17916536369	20.92	100
2011	6.8	6.44	21804779575	18.84	97.38
2012	7.3	6.56	25698988306	12.15	100.57
2013	6.5	6.98	31042213893	9.52	104.26
2014	5	7.78	34959146921	11.57	100.02
2015	3.2	10.1	47262134734	13.25	90.87

1.1 VAR Lag Order Selection Criteria

Endogenous variables: L_MP L_INF L_EXR

Exogenous variables: L_RGDP

Date: 09/16/17 Time: 13:10

Sample: 1985 2015

Included observations: 29

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-157.7522	NA	13.10254	11.08636	11.22780	11.13065
1	-55.57435	176.1686*	0.021322	4.660300	5.226078*	4.837495
2	-45.95212	14.59925	0.020919	4.617387	5.607498	4.927478
3	-34.01562	15.64092	0.018127	4.414870	5.829314	4.857857
4	-26.34992	8.458705	0.022345	4.506891	6.345668	5.082773
5	-11.90078	12.95440	0.018916	4.131088	6.394199	4.839866
6	3.204332	10.41732	0.017796*	3.710046	6.397490	4.551720
7	17.08850	6.702702	0.023887	3.373207*	6.484984	4.347777*

* designates lag order selected by the benchmark

LR: sequential amended LR test statistic (each test at 5% level)

FPE: Final Prediction error

SC-Schwarz information criterion

HQ-Hannan-Quinn information

Criterion

AIC-Akaike information criterion