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Impact and Perspectives of Monetary Policy on Economic Growth in Eastern Africa

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Abstract
The main objective of this research is to study the impact and perspectives of monetary policy on economic growth where growth determinants such as inflation, interest rate, investment, population growth and exchange rate were examined. The study sourced data from World Development Indicators for 7 Eastern African countries from 2010-2020. Fixed effect model based on the results of hausman specification test was chosen as appropriate model for estimation using panel data technique. Logarithm transformation for all variables was adopted since variables were in their nominal form. The established results demonstrated that investment positively impact economic growth as percentage increase in investment increase economic growth, this is consistent with growth in countries like Kenya, Uganda, Tanzania and Ethiopia. The result also indicated that increase in exchange rate decreases economic growth, this therefore need exchange rate stability in these countries. Furthermore, interest rate reduces economic growth; as increase in interest rate reduces the level of investment in Eastern Africa.
Keywords: Impact, Perspectives, Monetary policy, Economic Growth, Eastern Africa
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1. Introduction

Monetary policy is 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 to attain a set of objectives oriented towards the growth and stability of the economy (Rogoff K, 1985). Monetary policy rests on the relationship between the rates of interest in an economy, which is the price at which money can be borrowed and the total supply of money. Monetary policy uses a variety of tools to control one or both of these, to influence outcomes like economic growth, inflation, exchange rates, interest rate and unemployment.

The results of (Anthony 2011) on inflation dynamic in some selected countries in Eastern Africa find that inflation rates in Ethiopia, Kenya, Tanzania and Uganda are in two-digit territory, ranging from close to 18 percent in Tanzania to nearly 40 percent in Ethiopia. Their findings indicate that growth in money supply account for 40 percent and one third of short-run inflation in Ethiopia and Uganda respectively. Anthony further explains that a floating exchange rate regime allows domestic and foreign prices to align. Such movements in the exchange rate should therefore allow the pass-through of external developments into the domestic economy as a one-off adjustment, which may be tempered by appropriate prudent fiscal and monetary policies.

As stressed by (Corsetti and Pesenti 2005, Devereux and Engel 2003), their view rests on two implicit assumptions; a high responsiveness of import prices to the exchange rate, for instance, producer currency pricing, and easy global financial markets auxiliary to the adeptness of elastic price allocation. The desecration or alteration of these traditions originating in empirical research is the matter of a considerable part of the global key monetary policy literature. The policy trade-offs precise to this global viewpoint are threefold. Research by (Gopinath and Rigobon 2008), however, recommends only a fragile exchange rate regime in import prices, lending integrity to the conflicting theory of local currency pricing. The implication is an exodus from the classical view in the form of a trade-off between output gaps and misalignments in global relative prices, changing monetary policy to CPI inflation control and real exchange rate equilibrium. In addition, traditional monetary policy efficiency is influence by other significant factors, but not limited to; a nation's solid association with the external financial markets, a floating exchange rate movement, a large and competitive formal financial sector, highly developed money, bond, and stock markets, highly liquid markets for real assets, such as housing, and a strong institutional environment (Opolot et al., 2013)

2. Literature Review

Conventionally, the main objectives of monetary policy are to maintain price stability, control money supply, achieve economic growth, employment generation and, by extension, nominal GDP, (Le,H.V 2009, Bocuoglu 2020, Nkalu 2020).The means and extent to which monetary policy affect economic activities is referred to as the monetary transmission mechanism (MTM). Four major channels have been identified through which monetary policy decisions affect economic activities in an economy, (Arwatchanakarn 2020).These are the direct interest rate effects, which affect not only the cost of credit to borrowers but also the flow of cash of both

borrowers and lenders. This channel remains the most effective and commonest means by which the effect of monetary policy is transmitted in an economy. From an expansionary monetary policy standpoint, the interest rate is reduced while investment and consumption spending would increase, (Naduisi 2015). These will enlarge the aggregate demand and increase the general output. The second is the exchange rate channel. As a result of the increase in supply of money arising from a reduction in the interest rate, denominated local assets are cheaper relative to foreign goods because of local currency depreciation; therefore, the net exports and output would increase, (Amusa 2019).The third is through its effects on the prices of local assets such as stock markets, bonds and prices of real estate. Finally is the accessibility of a credit links done through bank lending. One main significant implication of this instrument is agency problem through asymmetry information misrepresentation (Mishkin 1995). Several monetary policy mechanisms through which monetary experts exert policy effects in an economy comprise of interest rate, money supply, exchange rate management and mitigation of inflation. (Enock T. Nyorekwa 2014) finds that while monetary policy was largely inactive in the first decade after independence, the Kenyan economy enjoyed the strongest economic performance of high growth levels when compared with the post-independence era. Structural adjustment reforms and post liberalization policies have since yielded modest economic performance and reasonable macroeconomic stability. This has led to important mechanical and financial expansions particularly leading to increased innovations in the financial markets and the economy at large. The research also establish that, though Kenya's financial sector is presently viewed as one of the greatest established in Sub-Saharan African countries, like several other developing economies, the sector still experience several challenges. These challenges include; the complexities accompanying dynamic financial innovations, the fulfillment of these manifold purposes, and the contemporary increasing tendency of national debt. According to (Anthony & Simposa 2011), the main driver of short-run inflation in Ethiopia and Uganda is a surge in money supply, accounting for 40 percent and one-third, respectively. In Kenya and Tanzania, oil prices appear to push inflation, driving from 20 and 26 percent correspondingly, though money growth has also made a momentous influence to the current upsurges in inflation in these two countries. The variation in inflationary impact may be illuminated by dissimilarities in the concentration of expansionary monetary policies. Inflationary pressures in Ethiopia mirror monetization of the fiscal deficit while growth in private sector credit is the central source of broad money growth in Uganda and Kenya, ensuing in an increased monetary expansion.

3. Monetary policy tools

The following monetary policy tools were broadly examined as used by the central bank in an attempt to control money supply and demand and their corresponding effect in experimentation process.

3.1 Open market operations

To ensure that credit is available in quantities and interest rates consistent with its specific objectives, the central bank purchases or sells government securities in open market operations. The safety and high liquidity of Treasury securities make them a superior medium for open market operations; they can be bought or sold quickly and in large amounts without a major disruption of the market. (Havrilesky,T., 1995). Monetary policy can be implemented by changing the size of the economy. Central banks use open market operations to influence the demand and supply of money.

3.2 Reserve requirements

Banks and other depository institutions are required by law to keep a percentage of their deposits on reserve. The central bank's system of fractional reserve enables banks to create money and thus expand the money supply by investing or lending deposit funds after required reserves are set aside. This process helps to create new demand deposits in decreasing amounts to the maximum amount supportable through cash reserves set by the central bank. (Havrilesky,T., 1995). Monetary policy can be implemented by changing the proportion of total assets that banks must hold in reserve with the central bank.

3.3 The Discount rate

This is the rate that the central bank charges depository institutions for direct loans from the bank. It influences the rates that these institutions then charge their customers. By increasing or decreasing the discount rate (the cost of borrowing reserves) relative to borrowing alternatives, the central bank can decrease or increase the amount of borrowing and thus affect the amount of business spending and investment lending in the economy. The discount rate is used primarily to support changes in the monetary policy carried out through open market operations. Central banks usually recommend a discount window, where commercial banks and other deposit accepting banks are able to borrow reserves from the Central Bank to provide for provisional scarcities of liquidity instigated by inner or exterior disruptions. This generates a steady financial atmosphere where savings and investment can happen, permitting the growth of the economy by aggregate manner.

3.4 Moral Suasion

An inducement by oral or informal pressure, approved by central bankers and heads of government agencies to persuade bankers to accept the policy, moral suasion which stops short of legal remedies and formal rule making can at times be highly effective because of the announcement effect central bank policy has on the markets. Finally, **printing of money**: The government does not as a matter of sound economic policy print money or destroys money in order to effect changes in the economy. The power however to do so does exist. If the government prints money it increases the amount of money in circulation and if it destroys money it restricts the amount in circulation. This has a corresponding effect on inflation. An example is the Weimer republic in Germany during the depression when government began to overprint money and this led to hyperinflation and prices skyrocketed and shoppers carried money in wheelbarrows.

4. Data Methodology and Variables

The data was taken from a period of 2010-2020, from World Development Indicators, the source was also supplemented with already existing methodologies which specifically include Moral-(Benito 2012) because of enough elucidation of significant determinants related to growth indicators for instance;

4.1 Population growth: Standard growth theory and the neoclassical growth model each suggests that a higher population growth rate will lower the steady-state level of output per effective worker, because certain level of investment is devoted to workers rather than to increasing the capital per effective worker.

4.2 Inflation rate: The inflation rate is the percentage rate of change in consumer prices. It is measured by the yearly percentage change in CP or consumer price. There are two measures, the Retail Price Index (RPI) and the Consumer Price Index (CPI). In this case, CPI measure was used. Since the seminal work of (Fischer 1993), many authors have used growth model, making the inflation rate as a nonlinear function. (Huyben 1998 and Smith, 1999) illustrate that inflation hampers economic growth by impeding the financial sector resource reallocation, but only if the level of inflation exceeds a certain critical value.

4.3 Investment: In neoclassical growth theory, the ratio of investment to output denotes the rate of saving. This model reveals that a higher saving rate increases the output per effective worker at the steady-state level and thereby increases the rate of growth for a given GDP value.

4.4 Economic growth: Economic growth is measured as the degree of change of nominal GDP. The nominal version of GDP is adopted because; the explanatory variables in this study are in their nominal form. As used in this studies of (Tumusherure, 2015; Ahmed et al.,2016), the variable is determined by money supply (M2), interest rate, inflation rate and exchange rate and investment.

4.5 Money Supply: Is an aggregate quantity of money circulating in an economy at any given time. The money supply measures quantity of money with the general public. This is measurement is done through M2 well-known as broad money or more specifically, quasi money. The M2 measure includes the money supply in circulation as well as bank deposits. The M2 in actuality is through dividing GDP to get the rate of money. (Nibeza & Tumusherure 2015) maintains that M2 is the suitable monetary aggregate in elucidation of economic growth in Sub-SaharanAfrica due to the relatively undeveloped money markets of these countries.

4.6 Exchange rate: Is when currency of another state is stated in terms of one unit of another state's currency. It is expressed as the exchange rate of one currency to the dollar. It is expressed as nominal and real exchange rate. The nominal exchange rate is expressed by quantity one currency needed to purchase one unit of another. The real exchange rate is expressed as the purchasing power of a currency comparative to another at recent exchange rates and prices**.** The exchange rate is essentially the price of a foreign currency. A plunge in the price of aforeign currency relative to a domestic currency is termed as exchange rate appreciation. While a fall in the price of the domestic currency relative to a foreign currency is termed as exchange rat depreciation. Business transactions among countries are done in terms of the exchange rate and depreciating in exchange rate makes foreign products unattractive in a domestic country. In economic logic, this depresses imports and promotes exports. However, if the exchange rate is appreciating, foreign goods become cheaper and therefore make importation creditable while making exportation of domestic goods difficult. The fluctuations of the exchange rate influence on economic growth are much uncertain.

4.7 Interest rate: This is the lending rate by banks on borrowed money by their customers. Nominal interest rates are the rates quoted in loan and deposit agreement. It is measured as real interest rate plus inflation. Real interest rate is expressed by deflating the nominal interest rates that is nominal interest rates minus inflation. A major contribution of (Keynes, 1936) to the theory of aggregate demand is an addition of the interest rate in the national income, which works through the aggregate demand.

5. Theoretical Methodology

To comprehensively examine the impact and perspectives of monetary policy on economic growth in Eastern African countries, we co-opt (Nibeza 2015) proclamation of philiph's conceptual model of economic growth as a: GDP =f (EXR, MS, POPGR,IR, INV, INF). These variables undergo logarithm transformation as demonstrated in

the model specification. Furthermore, in this research, 7 countries in Eastern African Region (Kenya, Ethiopia, Tanzania, Uganda, Somalia, Djibouti and South Sudan) were involved in the study and therefore panel data regression methodology is deemed necessary for an analysis. The choice of panel data method is associated with the fact that it removes the disturbances link to time series effect and cross sectional data problems. In addition, due to usage of greater number of observations, it reduced possibilities of multicollinearity and adequately addresses the heteroscedasticity problems. The purpose for logarithm transformation for all variables in the regression model is to reduce the possibilities of heteroscedasticity. (Gujarati, 2003) is among the proponent of this theory**.**

5.1 Econometrics Specification

$\log(GDP) = \beta_0 + \beta_1 \log POGR_{it} + \beta_2 \log MS_{it} + \beta_3 \log INF_{it} + \beta_4 \log IR_{it} + \beta_5 \log INV + \beta_6 EXCR + \varepsilon_{it}$

Where: lnGDP = the logarithm transformation of GDP, measuring economic growth level of countries
InPOGR = logarithm transformation of population growth rate
lnMS = logarithm transformation of Money supply
lnINF = logarithm transformation of inflation rate
lnEXC = the logarithm transformation of Exchange rate
lnIR = logarithm transformation of Interest rate
lnINV = logarithm transformation of investment
ε_{it} = Represent an error term or disturbance.
B_0 is constant term or intercept.
$\beta 1, \beta 2, \beta 3, \beta 4, \beta 5$ are the model estimating parameters

6. Descriptive Statistics

Under descriptive statistics, we examined the statistical properties of the main variables under investigation in the model between 2010-2020, the important of descriptive statistics is that, it provides comprehensive understanding of the differences which exist between the variables as captured by standard deviation which demonstrate the dispersion of the variables from its mean. The spread is specifically captured by the differences between the maximum and minimum and the outlier in data between the periods under investigation is demonstrated by large standard errors.

Table 1: Descriptive Statistics

Variables	Mean	StD.Dev	Minimum	Maximum
Economic Growth	19.98461	1.714236	19.48502	28.08343
Population Growth	68.14348	10.10823	49.874	85.932
Investment	19.855	2.748543	18.17472	28.04438
Inflation	6.13562	7.158541	-5.26825	36.48429
Exchange rate	1385.244	2423.12	0.634944	20046.35
Interest rate	7.113004	7.911485	-29.4265	32.24885
Money supply	27.44956	18.28424	0.031165	100.81

7. Correlation Matrix

The correlation matrix shows relationships between variables and the results demonstrate weak correlation between economic growth and its determinants. However, the correlation coefficient between economic growth and investment is 89 which reveal strong positive relationship.

Table 2: Correlation matrix

	E.Growth	M.Supply	Interest rate	Exchange rate	Inflation	Investment	Population Growth
E. growth	1.00						
M. supply	-0.15	1.00					
Interest rate	-0.28	0.23	1.00				
Exc rate	-0.04	-0.24	-0.02	1.00			
Inflation	0.21	-0.32	0.08	-0.01	1.00		
Investment	0.89	-0.21	-0.38	-0.05	0.23	1.00	
P. growth	-0.19	0.085	-0.28	0.085	-0.36	-0.19	1.00

8. Hausman Specification Test

The essence of hausman specification test is to remove the conflict between the choice of fixed effect and random effect. The result of hausman test therefore rejected the null hypothesis, that is to say, of no correlation between the regressors and country's heterogeneity disturbance term, for this reason, fixed effect becomes the

best choice over random effect model. And so therefore, the analysis will be based on the results of fixed effect model.

Table 3: Hausman Test

		Coefficient			
		(a)	(B)	(b-B)	(v-b-B))
		FE	**RE**	**Differences**	**StdErrors**
M. Supply		0.07252	-0.00154	0.07406	0.00202
Interest Rate		-0.00898	0.00546	-0.01444	
Exchange Rate		-0.00196	-0.00148	-0.00048	0.00019
Inflation Rate		-0.00845	-0.00564	-0.00281	
Investment		0.43665	0.81145	-0.3748	0.03455
Population Growth		0.01501	0.01236	0.00265	0.00536

b = consistent under Ho and Ha; obtained from xtreg B = inconsistent under Ha, efficient under Ho; obtained from xtreg. Test:
Ho: difference in coefficients not systematic chi2 (6) = (b-B)'[(V_b-V_B)^(-1)](b-B) =18.59.
Prob>chi2 = 0.0038 (V_b-V_B is not positive definite)

9. Discussion of the Results

Fixed effect model is used for research estimation, however due to unavailability of some data, only 110 out of 190 observations for period of 10 years was used to establish the research investigation. The variation in economic growth which is explained by the explanatory variables is represented by the R-square of 0.8182 or 81.82 percent. To discuss the results, the reaction of money supply on economic growth is significantly positive, which mean that, change in money supply leads to dramatic acceleration of economic growth by 0.059 percent. This is consistent with Keynes declaration of (1931) that dramatic increase in money supply can leads to economic but also interferes with cost of doing business. (Frieman 1956) also assert that increase in money supply can lead to economic growth but caution must be taken in its application as monetary policy since it excess can result to enormous inflationary pressure.

Table 4: FE and RE Estimation

	FE Model	**RE Model**
Dependent Variable:	**Economic Growth**	
Variables	(1)	(2)
Money Supply	0.059***	-0.188***
	(0.0045)	(0.0026)
Interest rate	-0.084***	0.0595***
	(0.0038)	(0.0044)
Exchange rate	-0.019**	-0.0215**
	(0.0003)	(0.0002)
Inflation rate	0.0086**	0.0065**
	(0.0058)	(0.00456)
Investment	0.638***	0.6911***
	(0.0541)	(0.0404)
Population Gr	0.01682	0.01535
	(0.0106)	(0.0085)
Constant	8.915***	7.563***
	(1.14565)	(1.3136)
Observations	110	110
R-squared	0.8182	
Number of		
country1	7	7

Standard errors in parentheses*** p<0.01, ** p<0.05, * p<0.1

The result of investment demonstrated that investment positively impacts economic growth. As indicated, the percentage increase in investment increase economic growth by 0.638, this is evident in countries like **Kenya, Uganda, Ethiopia and Tanzania** which are currently undergoing dramatic economic growth due to high investment motive. It is also established that a percentage increase in exchange rate decrease economic growth by 0.02. For countries which are experiencing positive trajectories in economic growth emanating from their growing exportations like **Kenya, Uganda and Ethiopia** to a country which majorly depends on imports like **South Sudan**, there is a great need to work on foreign exchange rate policies in a way that will not impede

economic cooperation in the region. It can be beneficial, although technical challenges pertaining to differences in level of economic growth and productivity can counter such fruitful efforts.

Furthermore, the results of interest rate as expected reduce economic growth by 0.084 percent; therefore increase in interest rate reduced the level of investment among Eastern African countries. This is consistent with economic declaration that increase in interest rate diminishes GDP by reducing investment motives, (Nibeza 2015). In addition, the result of inflation on economic growth is significantly positive, this expectedly consistent with findings of (Nibeza and Tumushrure 2015) who found persistent relationship between output and inflation rate. Meanwhile surprisingly, population is statistically insignificant in influencing economic growth in Eastern Africa. Although countries like **Ethiopia and Kenya** are experiencing huge population growth rate, this do not directly translate to their highest level of economic growth in the region but due to their high investment drive. Perhaps the population growth rate can have positive in influence on economic growth if huge data is used or when time series data may be used.

10. Recommendation

The purpose of this study is to examined and understands the likely impacts and perspective of monetary policy on economic growth among Eastern African countries. The results ascertained in the course of this research are very interesting and deserve to be recommended to any interested policy makers. We recommend money supply as monetary policy application tool to be used to create a sustained conducive investment climate for both domestic and foreign investment; we recommend thoughtfulness since too much supply of money result to inflationary pressure. In general, monetary policies should foster favorable investment conditions, for instance, interest rate and exchange rate must place Eastern African Region in attractive investment position for both domestics and foreign investors. Which mean interest rate must be keep at considerable level which can attract investment since high interest rate reduced investment drive in these countries. Exchange rate must be aligned to the interest of export promotion so that exchange of goods happens among regional countries with much fluctuation.

Furthermore, it's imperative that policy making institutions such as central banks and finance ministries of these nations should formulate and adjust to formidable macroeconomic policies which advance economic stability particularly investment acceleration by keeping macroeconomics issues such inflation, interest rate, exchange rate and economic growth under constant check.

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