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Effect of Monetary Policy on Economic Growth in Sub-Saharan Africa

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ABSTRACT :

This study explores the effect of monetary policy on economic growth in Sub-Saharan Africa covering 1996 to 2022. Before using the cointegration test, which shows that there is a long-term link between the variables, the study conducts preliminary tests to accomplish this goal. Using the panel vector error correction model, the study finds that while labour force has a significant short-term but not long-term positive effect on economic growth, monetary policy has significant short-term and long-term negative effect on economic growth in the study area. Additionally, gross fixed capital formation has a major detrimental influence on economic growth over the long term, despite having no discernible influence in the short term. The study comes to the conclusion that while monetary policy plays a major role in economic growth, it has not been effectively implemented in the study area. In order to accelerate economic growth in the region, the study recommends that central banks in Sub-Saharan Africa should maintain efficient monetary policy management, while their national governments diversify their economies, focus on adding value to primary products before exporting, examine the structure of fixed capital formation, and regularly upskill their labour force.

Keywords: Monetary Policy, Economic Growth, Cointegration, Panel Vector Error Correction Model, Sub-Saharan Africa

1.0 Introduction :

The global economy has been grappling with persistent inflation, increasing interest rates and heightened uncertainties, which have adversely affected economic growth in many countries. While a number of emerging markets face uneven recovery, some regions are experiencing stagnation. Furthermore, the Russian-Ukraine conflict has also disrupted global trade, leading to increased living costs that are disproportionately impacting the poor (IMF, 2023; United Nations, 2023; World Bank, 2023a).

Sub-Saharan Africa navigates a complex economic landscape marked by both progress and persistent macroeconomic vulnerabilities. The Sub-Saharan Africa countries have been trying to implement difficult and much-needed reforms to restore macroeconomic stability in the aftermath of repeated negative shocks and the ensuing need for support. Overall, internal and external imbalances have started to narrow, mainly reflecting policy adjustments, but the picture is varied; about half of the countries still exhibit high imbalances. However, challenges persist as inflation still remains in double digits in nearly one-third of countries, with the cost of living and the short-term effects of macroeconomic adjustment causing significant hardships in many countries. Regional growth has also been generally subdued and uneven. The resulting social frustration, worsening poverty and political pressures make it increasingly challenging to implement the required reforms (IMF, 2024b).

Meanwhile, an effective monetary policy is expected to stimulate price stability and drive economic growth, but easing too much too soon or easing too little too late can produce costly outcomes(Musalem,2024).Monetary policy refers to the actions taken by a country's central bank to regulate the supply of money and credit in the economy, with the aim of achieving macroeconomic objectives such as price stability, output growth, and full employment (Central Bank of Nigeria [CBN], 2011), while economic growth is defined as constantly increasing the value of goods produced in an economy over a period of time(Ivic, 2015).

The region's growth has been insufficient to reduce extreme poverty and boost prosperity, hindered by slow investment growth, conflicts, and climate change on one hand and teeming population on the other. Hence, increasing economic growth rate that surpasses the rate of population growth is one of the crucial drivers of sustainable poverty reduction in the region (World Bank, 2024).While the Sub-Saharan Africa's real Gross Domestic Product (real GDP) constituted 2.15% of the world output in 2023, the region's population stood at about 15.5% of the world population (World Bank, 2023c).Hence, there is a need to bridge this gap via research, appropriate recommendations and implementation, among others. Furthermore, monetary policy has been heavily relied on for influencing various macroeconomic variables such as inflation, exchange rates, and economic growth. Also, the number of studies that focuses on monetary policy-economic growth nexus in Sub-Saharan Africa is scanty. Hence, this study tries to answer the following research question: what is the effect of monetary policy on economic growth in Sub-Saharan Africa? Consequently, the specific objective of the study is to assess the effect of monetary policy on economic growth in the study area. The study tests the following hypothesis: monetary policy does not exert significant effect on economic growth in the study area.

The study holds significant value in understanding the relationship between monetary policy and economic growth, particularly within the context of Sub-Saharan Africa. The findings from the study contribute in a number of ways: First, the study provides empirical evidence on the effect of monetary

policy on economic growth in Sub-Saharan Africa. This information will assist policymakers in the region to develop and implement more effective monetary policies. *Additionally, b***y** examining the long run relationship between monetary policy and economic growth, the study highlights the importance of monetary policies in the long term. The insights from this study have practical implications for national governments in designing policies that would promote economic growth and financial stability, which are essential for poverty reduction and improved living standards. Hence, this study investigates the effect of monetary policy on economic growth in Sub-Saharan Africa.

2.0 Literature Review :

A major tool used to control inflation, stabilize the economy and influence economic growth is the monetary policy. Hence, a number of studies have been carried out to investigate the relationship between monetary policy and economic growth across countries and regions, some of which are reviewed in this section.

According to Friedman (1968), the effectiveness of monetary policy is enhanced when it targets stable inflation rates, as uncontrolled inflation can discourage investment and thereby retard economic growth. This work laid the foundation for subsequent studies on monetary policy and economic growth. This study was built on by Fischer (1993) who suggested that effective monetary policy, resulting in modest inflation, facilitates economic growth, while high inflation can retard it. Many other studies had been carried on the relationship between monetary policy and economic growth in a number of countries. For instance, Moh'd AL-Tamim, Jaradat and Aityassinec (2023) assessed the influence of monetary policy on economic growth in Jordan from 2008 to 2022, using multiple linear regression. The study revealed a statistically significant positive relationship between monetary policy and economic growth in the country.

Arayssi and Fakih (2017) investigated the relationship between financial development and economic growth in Kenya between 1960 and 2013 and concluded that financial development interacted with foreign direct investment (FDI) to promote economic growth. Abdulkadr et al. (2024) analyzed the effect of monetary policy on economic growth in Ethiopia from 1993 to 2022. The study employed the Auto Regressive Distributed Lag Model (ARDL) and error correction model. All required pre and post estimation tests were performed and verified that the model was statistically viable. The study found that, in the short run, money supply had a negative and statistically significant effect on real Gross Domestic Product (real GDP) growth, whereas in the long run, money supply had a positive and statistically significant effect on real GDP growth of Ethiopia. This implied that, in the short run, contractionary monetary policy stance was promising, and in the long run, expansionary monetary policy stance was desired for economic growth in the country.

Abille and Mpuure(2020) sought to examine the role of monetary policy as an instrument for growth in the Ghanaian economy. The study was conducted based on yearly data from 1983 to 2017. Economic growth was the regressand in the study, with money supply, inflation, and the lending rate as the regressors. The autoregressive distributed lag (ARDL) bounds test technique was employed to investigate cointegration among the variables. The results confirmed the presence of cointegration among the variables. The results also showed the money supply as having a significant positive effect on growth in Ghana in the long run but a significant negative effect on growth in the short run.

Sena et al. (2021) investigated the role of financial development in enhancing the effect of monetary policy on economic growth in Ghana. Using the Autoregressive Distributed Lag (ADL) estimation technique to analyse the model built with data between 1980 and 2016, the study revealed that financial development facilitates the effectiveness of monetary policy on economic growth in Ghana.

Adegbite and Alabi (2013) examined the impact of monetary policy on economic growth in Nigeria, using secondary data from central bank of Nigeria statistical bulletin covering the period of 1970 to 2010. Multiple regressions were employed to analyze data on variables such as money supply; inflation, exchange rate, interest rate and gross domestic product were all found to have significant effects on economics growth with an adjusted R^2 of 58%. Following the outcome of this study, it was, therefore, concluded that exchange rate stability has played a key role in keeping inflation low for most of the transition period, and that the range of monetary policy instruments available to the authorities has widened in recent years and this has been associated with more stable and predictable changes in money supply and the price level.

Chuku (2009) carried out a controlled experiment using a Structural Vector Autoregression (SVAR) model to trace the effects of monetary policy shocks on output and prices in Nigeria. The study assumed that the Central Bank cannot observe unexpected changes in output and prices within the same period. This places a recursive restriction on the disturbances of the SVAR. Three alternative policy instruments i.e. broad money (M2), minimum rediscount rate (MRR) and the real effective exchange rate (REER) were used. Overall, the study found evidence that monetary policy innovations carried out on the quantity-based nominal anchor (M_2) has modest effects on output and prices with a very fast speed of adjustment. While, innovations on the price-based nominal anchors (MRR and REER) have neutral and fleeting effects on output. The study concluded that the manipulation of the quantity of money (M_2) in the economy is the most influential instrument for monetary policy implementation. Also, Gul, Mughal and Rahim (2012) reviewed how the decisions of monetary authorities influenced the macro variables such as GDP, money supply, interest rates, exchange rates and inflation. The method of least squares was used on the data. The sample was taken from 1995-2010 and included observations were 187. Result showed that interest rate had negative and significant impact on output. Tight monetary policy in terms of increase interest rate also had significant negative impact on output.

Fasanya, Onakoya and Agboluaje (2013) also examined the impact of monetary policy on economic growth in Nigeria. The study used time-series data covering 1975 to 2010. The effects of stochastic shocks of each of the endogenous variables were explored using Error Correction Model (ECM). The study showed that long-run relationship existed among the variables. In addition, the core finding of this study showed that inflation rate, exchange rate and external reserve were significant monetary policy instruments that drive growth in Nigeria.

Chimobi and Uche (2010) examined the relationship between Money, Inflation and Output in Nigeria. The study adopted co-integration and granger-causality tests. The co-integrating result of the study showed that the variables used in the model exhibited no long run relationship. Nevertheless, money supply was observed to granger-cause both output and inflation. The result of the study suggested that monetary stability can contribute towards price stability in the Nigerian economy since the variation in price level is mainly caused by money supply and concluded that inflation in Nigeria was to an extent a monetary phenomenon. In a related study, Onyeiwu (2012) investigated the impact of monetary policy on the Nigerian economy using the Ordinary Least Squares Method (OLS) to analyse data between 1981 and 2008. The result of the analysis showed that monetary policy proxied by money supply exerted a positive impact on GDP growth and Balance of Payment, but negative impact on rate of inflation. Furthermore, the findings of the study supported the money-prices-output hypothesis for Nigerian economy

Also, Abata, Kehinde and Bolarinwa(2012) analyzed the impact of fiscal and monetary policies on economic growth and development in Nigeria. The study identified the problem of fiscal indiscipline as one of the major challenges to achieving sustainable economic growth in Nigeria. The study concluded that the effectiveness of fiscal and monetary policies on economic growth in Nigeria can only be achieved through proper coordination and implementation of these policies, as well as the need for strong political will to address the issue of fiscal indiscipline in Nigeria. Noman and Khudri (2015) also conducted a study on the impact of fiscal and monetary policies on economic growth in Bangladesh, from 1979-80 to 2012-13. The research found that there was a positive correlation between narrow money, broad money, exchange rate, government revenue, and expenditure with real gross domestic product. This implies that an increase in these variables was associated with a corresponding increase in the real gross domestic product.

Also, Adigwe et al. (2015) investigated the impact of monetary policy on the Nigerian economy between 1980 and 2010. The study found that monetary policy, as represented by money supply, had a positive impact on GDP growth. However, the same monetary policy had a negative impact on the rate of inflation. This implies that the effectiveness of monetary policy in Nigeria is dependent on the specific macroeconomic variables being targeted. Specifically, increasing money supply can stimulate economic growth but may also lead to inflationary pressures.

In another study, Nwoko et al. (2016) investigated the effectiveness of the Central Bank of Nigeria's monetary policies in promoting economic growth in Nigeria from 1990 to 2011. The study found that average price and labour force had a significant influence on gross domestic product (GDP), indicating that inflation and employment were determinants of economic growth. However, the study did not find that money supply had a significant influence on economic growth. This implied that the effectiveness of monetary policy in Nigeria might depend on factors other than the amount of money in circulation, and therefore, suggested that the Central Bank of Nigeria might need to consider alternative strategies to promote economic growth.

Furthermore, Ayodeji and Oluwole (2018) investigated the impact of monetary policy on economic growth in Nigeria. The study examined two variables, namely money supply and exchange rate, and their impact on economic growth. The study found that both variables had a positive impact on economic growth, but the impact was fair and insignificant. This implies that the effectiveness of monetary policy in Nigeria may be limited in promoting economic growth, and suggests that additional policies may be necessary to support sustained economic growth in the country.

In a related study carried out by Oseni and Oyelade (2023) on the effect of monetary policy on economic growth in Nigeria using various economic variables. The study observed that gross capital formation, total number of employees, and broad money supply had positive and significant effect on gross domestic product (GDP), while lending rate had a negative and significant effect on GDP. The study recommended that government should facilitate more private investment in Nigeria by lowering the lending rate, which would lead to more borrowing by private investors, and thereby boost investment in the country. Ajayi, Olapade, Oraka and Giwa(2023) investigated the effect of monetary policy on economic growth in Africa. The study adopted the Fully Modified Ordinary Least Squares (FMOLS) and the Dynamic Ordinary Least Squares (DOLS) estimation techniques. The granger causality method was also employed to check the directional flow of causality among the variables. The co-integration test results showed that there was a long run relationship among the variables. Results from this study show the impact of monetary policy on economic growth in Africa was positive and significant.

Additionally, Babatunde and Adeoti (2023) examined the impact of monetary policy on economic performance in sub-Saharan Africa covering the period from 2005 to 2019. The study employed Blundell and Bond system GMM technique for the estimation. Three indicators - economic growth, foreign direct investment and gross domestic savings were used to proxy economic performance. The study reveals that monetary policy was an important factor in the determination of economic performance in the sub-Saharan African countries. The study concluded that sub-Saharan African countries could effectively use monetary policy to improve economic growth, attracts foreign investment and encourages domestic savings, which would ultimately lead to well-being of the citizens.

Furthermore, Awoyemi et al. (2024) investigated the effectiveness of monetary policy in the pre and post COVID-19 periods in West Africa. The panel fully modified ordinary least squares (FMOLS) was used in the study. The findings indicated that monetary policy had negative and significant effects on economic growth in the periods before COVID-19, while it has insignificant effect after the pandemic. Furthermore, monetary policy had 21.01% negative and significant effect on inflation in the pre COVID-19 era, while it had 52.5% negative and significant effect on inflation after the pandemic. This indicated that the effectiveness of the central bank's efforts to affect and control inflation had declined after COVID-19, causes of which could include the pandemic's effect on supply chains, demand, and the weaker economic environment.

Based on the ongoing debate and literature reviewed, limited number of studies investigated the effect of monetary policy on economic growth in sub-Saharan Africa, hence this study.

3.0 Methodology :

Out of 48 countries in Sub-Saharan Africa (United Nations, 2024), a total number of 21 countries are randomly selected from the region. The selected countries are as follows: Nigeria, South Africa, Angola, Benin, Botswana, Burundi, Cameroon, Central African Republic, Chad, Gabon, Gambia, Ghana, Kenya, Lesotho, Madagascar, Mauritius, Namibia, Rwanda, Seychelles, Tanzania, and Zimbabwe. Secondary data are used in this study.

3.1 Theoretical Framework

This study is underpinned by Quantity Theory of Money (Growth Version). The Quantity Theory of Money also called (monetarist theory) originally espoused by Irving Fisher in early 20th century was later expanded and popularised by Milton Friedman in the 1950s. The quantity theory of money relates the money supply to Gross Domestic Product (GDP). It argued that growth in the money supply should correspond to growth in output if inflation (ΔP) is controlled and change in velocity of money (*V)* remains stable. Excessive money supply growth leads to inflation, while its moderate growth can support economic expansion.

Mathematically,

$$\Delta M + \Delta V = \Delta P + \Delta Y \quad (1)$$

Where;
ΔM is the change in money supply
ΔV is the change in velocity of money (change in the rate of turnover at which a single unit of currency is spent in one year)
ΔP is the change in average price level for transactions in the economy (the purchase of goods and services)
ΔY is the change in total quantity of goods and services produced (a measure of economic growth).

However, in a developing country or a region where the economy is not at full capacity (such as in Sub-Saharan Africa) where economies are characterized by significant unemployment and some unused resources, moderate increases in money supply are expected to lead to growth without causing inflation (Dornbusch, Fischer & Startz, 2014; Mankiw, 2018). In other words, increase in money supply can lead to an increase in output (economic growth) if price and velocity of money are stable. That is, changes in money supply are the most important determinants of economic growth" (Friedman, 1974).
Hence,

$$\Delta Y = \Delta M \quad (2)$$

Since monetary policy is the tool used for managing money supply, and Real Gross Domestic Product Growth rate (RGDPGR) can be used to proxy economic growth, we substitute these in equation (2) and add Xi to represent control variables, we have:

$$RGDPGR = f(MP, \text{Xi}) \quad (3)$$

Where;
RGDPGR stands for real GDP growth rate (proxy for economic growth).
MP represents monetary policy (proxied by growth rate of broad money supply)
X_i is a vector of control variables.

It is pertinent to note from the literature that capital and labour have been found to be important factors in the production process which drive economic growth (See Mankiw, Romer & Weil, 1992). Consequently, both are added as control variables. Furthermore, trade openness has been empirically found to be a major driver of economic growth, especially in developing countries (Egbetunde & Obamuyi, 2018; Abinabo & Abubakar, 2023). Hence, by adding the aforementioned control variables, the model becomes:

$$RGDPGR = f(MP, \text{K}, \text{L}, \text{TRO}) \quad (4)$$

Where;
L represents Labour.
K stands for capital.
TRO represents trade openness.

3.2 Model Specification

Using Panel Vector Error Correction Model (PVECM), the estimated model is expressed as follows:

$$\Delta RGDPGR_{it} = ß_0 + \sum_{j=1}^{k} ß_{1j}\,\Delta RGDPGR_{it-j} + \sum_{j=1}^{k} ß_{2j}\,\Delta MP_{it-j} + \sum_{j=1}^{k} ß_{3j}\,\Delta GFC_{it-j} + \sum_{j=1}^{k} ß_{4j}\,\Delta LF_{it-j} + \sum_{j=1}^{k} ß_{5j}\,\Delta TRO_{it-j} + \omega_{1j} RGDPGR_{it-1} + \omega_{2j} MP_{it-1} + \omega_{3j} GFC_{it-1} + \omega_{4j} LF_{it-1} + \omega_{5j} TRO_{it-1} + \omega_{6j} ECT_{it-1} + \varepsilon_{it-1} \quad (5)$$

Where;

$RGDPGR_{it}$ represents real GDP growth rate (as proxy for economic growth) of country *i* over the period of study period.

MP_{it} stands for growth rate of broad money supply (proxy for monetary policy) of country *i* over the study period.

GFC_{it}= Gross fixed capital (as proxy for capital) of country i over the period of study.

LF_{it}, = Labour Force (proxied by total population) of country i over the period of study.

TRO_{it}= Trade Openness of country i over the period of study.

*"$ß_o$"*denotes the intercept term, that is, the mean or average effect on dependent variable of all the variables excluded from the model, especially when all the explanatory variables are set at zero values.

"$ß_{1, \ldots, ß_6}$" are the parameters or partial regression co-efficient of the model, measuring the change in the mean value of the real GDP per unit change in individual explanatory variable, while holding the values of others constant.

"ε_t" is the stochastic disturbances term representing all factors that might have influence on the model but which are not explicitly taken into account and also have well-defined probabilistic properties over the study period.

3.3 Data Sources and Measurement of Variables

The study uses secondary data obtained as detailed in Table 1.

Table 1: Data Sources and Measurement of Variables

Variable	Indicator/Proxy	Variable Description	Measurement	Source
RGDPGR	Real Gross Domestic Product growth rate	RGDPGR as proxy for economic growth	Growth rate of Real Gross Domestic Product (GDP) in percentage	World Bank's World Development Indicators, 2023.
MP	Monetary policy	MP is proxied by broad money supply	Measured as percentage change in broad money supply	World Bank's World Development Indicators, 2023.
GFC	Gross fixed capital formation	Gross capital formation consists of outlays on additions to the fixed assets of the economy plus net changes in the level of inventories. Used as a proxy for nonfinancial capital.	Measured as a percentage of GDP	World Bank's World Development Indicators, 2023.
LF	Labour force	Population growth rate as proxy for labour force.	Growth rate of population in percentage.	World Bank's World Development Indicators, 2023.
TRO	Trade openness	The volume trade between a country and the rest of the world.	The volume imports and exports as a proportion of GDP.	World Bank's World Development Indicators, 2023.

Source: Compiled by Authors, 2024.

3.4 Method of Data Analysis and Analytical Techniques

In order to achieve the objective of this study, both descriptive and inferential statistics are employed. Preliminary tests include correlation analysis to detect multicollineariy, while stationarity test is conducted to determine the level at which the variables become stationary. To assess the effect of monetary policy on economic growth in Sub-Saharan Africa, the study uses Panel Vector Error Correction Model.

3.5 A priori Expectations

A priori expectations are the signs a researcher expects the estimates of parameters to carry in an econometric or statistical relationship between an independent variable and a dependent variable. The sign can either be positive or negative. *A priori* expectations can be determined from theories or previous empirical studies. For instance, if the estimate of a parameter carries a positive sign, it implies that an increase in the independent variable will lead to an increase in the dependent variable, and vice versa. The *A priori* expectations of variables in the study are as outlined in Table 2.

Table 2: A priori Expectations

Variable	Parameter	Sign
RGDPGR	$ß_1$	+/-
MP	$ß_2$	+/-
GFC	$ß_3$	+
LF	$ß_4$	+
TRO	$ß_5$	+

Source: Compiled by Authors, 2024.

4.0 Results and Discussion :

4.1 Descriptive Statistics

Table 3 presents the result of descriptive statistic test carried out in the study. This table shows that sample mean for gross fixed capital (GFC), labour force (LF), monetary policy (MP), real GDP growth rate (RGDPGR), and trade openness (TRO) are0.20928, 0.026749, 0.037295, and 0.716126 respectively. The maximum values for GFC, LF, MP, RGDPGR, and TRO are 0.597 231, 0.204065, 5.281943, 0.336294, and 2.221783 respectively, while the minimum values for GFC, LF, MP, RGDPGR, and TRO are 0.020004, -0.02055, -0.58172, -0.36392, and 0.16535 respectively. The skewness in the result measures asymmetry of the distribution of the variables around its mean. The result in Table 3 shows that GFC, LF, MP, and TRO are positively skewed, that is, the distributions of the series have long right tails, meaning that data for the variables have more higher values than the sample mean. The result also indicates that RGDPGR is negatively skewed, meaning that the distribution of the series has long-left tail. That is, the variable's data have more lower values than the sample mean. Kurtosis measures the flatness or peakedness of the distribution of the series. A variable with normal distribution is said to be mesokurtic. The values of the kurtosis for GFC, LF, MP, RGDPGR, and TRO are greater than 3, which denote that their distributions are leptokurtic (peaked), meaning that the series have more higher values than the sample mean. Jarque-Bera measures the difference of the skewness and kurtosis of the series with those from the normal distribution. Statistically, reject null hypothesis of a normal distribution if Jarque-Bera's p-value < 0.05; which implies that the series are not normally distributed. The study rejects null hypothesis of a normal distribution for GFC, LF, MP, RGDPGR, and TRO, which suggest that these variables are not normally distributed.

Table 3: Descriptive Statistics Test Result

	GFC	LF	MP	RGDPGR	TRO
Mean	0.20928	0.026749	0.19075	0.037295	0.716126
Median	0.203113	0.02934	0.132998	0.04188	0.582579
Maximum	0.597231	0.204065	5.281943	0.336294	2.221783
Minimum	0.020004	-0.02055	-0.58172	-0.36392	0.1635
Std. Dev.	0.078166	0.014478	0.422256	0.048805	0.387713
Skewness	0.497143	4.399331	8.103674	-1.14053	1.338061
Kurtosis	4.107217	56.85535	84.07331	15.52025	4.742453
Jarque-Bera	52.31833	67745.29	155509	3684.586	240.9223
Probability	0.00000	0.00000	0.0000	0.00000	0.00000
Sum	118.6617	14.60489	104.1496	20.36284	406.0435
Sum Sq. Dev.	3.458212	0.114243	97.17356	1.298153	85.08178
Observations	567	546	546	546	567

Source: Authors' Computation, 2024.

4.2 Correlation Test

The result of correlation test is presented in Table 4. The result shows that while some of the variables have positive correlation between each other, others have negative relationships. The degree of correlation between some of the variables fall below 0.50, which indicates that the variables mostly

have low degree of association (no multicollinearity), and they can all be fitted into the same model. Since the degree of correlation between variables does not indicate causal effect of independent variables on the dependent variables, the study employs the panel vector error correction model (PVECM).

Table 4:Correlation Test Result

	C_ID	GFC	LF	MP	RGDPGR	TRO
C_ID	1	0.022912	-0.13852	0.005395	0.011256	0.294762
GFC	0.022912	1	0.055077	0.008876	0.199763	0.374497
LF	-0.13852	0.055077	1	0.057166	0.252212	-0.2603
MP	0.005395	0.008876	0.057166	1	0.005173	0.01879
RGDPGR	0.011256	0.199763	0.252212	0.005173	1	0.000393
TRO	0.294762	0.374497	-0.2603	0.01879	0.000393	1

Source: Authors' Computation, 2024.

4.3 Panel Unit Root Test

Table 5 shows the result of the panel unit root test. The decision criterion is to reject the null hypothesis, which states that a time series is non-stationary (i.e. it has a unit root) if the p-value is ≤ 0.05, which denotes that a variable is stationary. Hence, the study has a mix of level [I(0)] and order one [I(1)] variables; with four [I(0)] and one [I(1)].

Table 5: Panel Unit Root Test Result

Series	Im, Pesaran and Shin- W- Stat		Order of Integration
	Level	First Difference	
GFC	-2.17950**	-13.5109***	I(0)
LF	-2.96015***	-10.8124***	I(0)
MP	-8.40874***	-16.02147***	I(0)
RGDPGR	-8.50859***	-18.7781***	I(0)
TRO	-1.09707	-13.0461***	I(1)

, * mean 5% and 1% significance levels
Source: Authors' Computation, 2024.

4.4 Cointegration Test

The result of the Johansen cointegration test is presented in Table 6.Using both the max-eigen and trace statistics, which indicate P < 0.05, it imply that the null hypothesis of no cointegration among the variables should be rejected at 5% level of significance. This denotes that there is cointegration (long run relationship) among the variables. Consequently, the result shows that there is long run relationship among the variables. In view of the foregoing, the data are amenable to panel vector error correction model (PVECM). Hence PVECM technique is adopted in the study to evaluate both short run and long run causal effect between the dependent and independent variables.

Table 6: Cointegration Test Result

Hypothesized No. of CE(s)	Trace Statistic	Prob**	Max-eigen Statistic	Prob.**
None *	140.000	0.0000	158.500	0.0000
At most 1 *	819.900	0.0000	1167.000	0.0000
At most 2 *	681.900	0.0000	363.400	0.0000
At most 3 *	433.200	0.0000	233.500	0.0000

At most 4 *	264.100	0.0000	155.900	0.0000

Source: Authors' Computation, 2024.

4.5 Effect of Monetary Policy on Economic Growth in Sub-Saharan Africa

The short run PVECM result is presented in Table 7. The result reveals that the real Gross Domestic Product (real GDP) growth rate of two years before has significant negative effect on current economic growth in the study area at 5% level of significance. This implies that 1% increase in real GDP growth rate two years before would lead to 0.11% reduction in the current year's RGDP growth rate. This calls to question the drivers of growth in the study area, which are mostly primary products (mainly commodities being exported) whose prices are determined on the international markets, thereby exposing the Sub-Saharan African economy to external shocks. Furthermore, monetary policy (proxied by annual growth rate of broad money supply) exerts significant negative effect on economic growth at 5% level as 1% increase in broad money supply would generate 0.01% reduction in RGDP growth rate. Meanwhile, labour force has significant positive effect on economic growth at 5% level in the short run. That is, 1% increase in labour force would cause 0.8%increase in real GDP growth rate in the short run.This is in agreement with the finding of Eludire (2023) who finds that labour force has significant positive effect on economic growth in both developing and advanced economies, but the effect is greater in the latter.

However, the result shows that gross fixed capital formation has no significant influence on economic growth in the study area, which is in line with the finding of Onyinye, Idenyi and Ifeyinwa (2017) who finds that gross fixed capital formation has no significant effect on economic growth in Nigeria. Also, trade openness has no significant influence on economic growth in the study area, which suggests the need to turnaround the unfavourable trade pattern in the region. This finding contrasts that of Abinabo and Abubakar (2023), who finds that trade openness has significant positive effect on economic growth in Nigeria.

In the meantime, an ECT(-1) of -0.66604 indicates that previous year's deviation from long run equilibrium in the relationship between monetary policy and economic growth in Sub-Saharan Africa is corrected in the current year at an adjustment speed of about 67%, which is considered high.

Table 8 shows that monetary policy (proxied by growth rate of broad money supply) has significant negative effect on economic growth in the long run at 5% level. That is, 1% increase in broad money supply would cause 0.02% reduction in economic growth in the long run. The short run and long run findings imply that it is only contractionary monetary policy stance that was promising in the region as increase in money supply is detrimental to growth both in the short run and long run. This finding is in agreement with those of Abdulkadir et al. (2024) and Awoyemi et al. (2024) who find that monetary policy has significant negative effect on economic growth in Ethiopia and West Africa respectively. Hence, Sub-Saharan African countries could have effectively used contractionary monetary policy to drive economic growth over the study period.

Finally, gross fixed capital formation (a proxy for capital) has significant negative effect on economic growth at 1% level in the long run. That is, 1% increase in gross fixed capital formation would reduce economic growth by 0.19% in the long run.This calls for a review of capital structure and effective use of capital in the region. This finding contrasts that of Oseni and Oyelade (2023) who find that gross fixed capital formation has positive effect on economic growth in Nigeria. However, labour force and trade openness have no significant effect on economic growth in the long run.

Table7: Short Run PVECM Result on the Effect of Monetary Policy on Economic Growth in the Study Area

Error Correction	**D(RGDPGR)**
ECT(-1)	-0.66604***
	[-10.1083]
D(RGDPGR(-1))	-0.093005
	[-1.58443]
D(RGDPGR(-2))	-0.110996**
	[-2.22933]
D(MP(-1))	-0.012609**
	[-2.15926]
D(MP(-2))	-0.001547
	[-0.24187]
D(GFC(-1))	-0.053145
	[-0.94217]
D(GFC(-2))	-0.009827

	[-0.18005]
D(LF(-1))	0.808240**
	[1.97314]
D(LF(-2))	-0.119019
	[-0.41144]
D(TRO(-1))	0.023680
	[1.06514]
D(TRO(-2))	0.002770
	[0.12111]
C	0.000863
	[0.39752]
R-squared	0.388936
Adj. R-squared	0.374665
F-stat	27.25339***

,,*** mean 10%, 5% and 1% significance level. The figures in parenthesis are t-statistics*.

Source: Authors' Computation, 2024.

Table 8:Long Run PVECM Result on the Effect of Monetary Policy on Economic Growth in the Study Area

RGDPGR(-1)	1.000000
MP(-1)	-0.021974**
	[-2.10019]
GFC(-1)	-0.193862***
	[-3.70721]
LF(-1)	-0.310177
	[-0.86451]
TRO(-1)	0.012369
	[1.13618]
C	0.007958

*,**,*** mean 10%, 5% and 1% significance level. The figures in parenthesis are t-statistics.

Source: Authors' Computation, 2024.

Conclusion :

The purpose of this study is to examine how monetary policy affects economic growth in Sub-Saharan Africa (SSA) in order to provide recommendations that will accelerate regional economic expansion. According to the study, the prior rate of economic growth in the study area is a barrier to the current pace of economic growth. This is explained by the study area's primary products, which are export-oriented and whose prices are set on global markets, making the Sub-Saharan African economy vulnerable to external shocks. Therefore, it may be necessary to significantly add value to primary products before to export. The region's asymmetric trade patterns and the negligible influence of trade openness on economic growth can be partly attributed to the export preponderance of primary products. The study also shows that economic growth is significantly hampered by monetary policy (as measured by the annual growth rate of broad money supply), indicating ineffective monetary policy in the region. This could be ascribed to both the unknown volume of broad money in circulation and political meddling in central bank operations. Therefore, in order to determine the proper monetary policy stance to adopt, central banks in Sub-Saharan Africa may need to forgo politics and ascertain the precise volume of broad money in circulation.

In view of the findings from this study, the following recommendations are hereby put forward:

I. Central banks in Sub-Saharan African countries should accurately capture the volume of broad money in circulation in order to ensure effective monetary policy management with a view to accelerating economic growth in the study area.

II. National governments in Sub-Saharan Africa countries should diversify their economies, reduce focus on primary products and concentrate on adding value to primary products before export with a view to reducing the asymmetric patterns of trade and accelerate sustainable economic growth in the region.

III. Governments in Sub-Saharan Africa countries should re-examine the composition of and ramp up fixed capital formation with a view to ensuring its positive contribution to economic growth in the study area.

IV. Governments in Sub-Saharan Africa countries should stop interfering in the affairs of their central banks with a view to ensuring effective monetary policy.

V. National governments should regularly hone the skill of their labour force with a view to increasing their contribution to economic growth in Sub-Saharan Africa.

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