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Achieving Sustainable Economic Growth in Sub-Saharan African Countries Using the Tool of Monetary Policy Effectiveness

Abstract: The issue of achieving and sustaining a nation's economic growth is an issue that is of concern to many nations of the world, especially the sub-Saharan African (SSA) nations. This was in line with the United Nations Sustainable Development Goal (SDG) 8 of Economic Growth. This study, therefore, examines how monetary policy tools can help the SSA governments achieve the SDG 8 goal and also sustain it. Relevant secondary data on sustained economic growth (GDPPC) (dependent variable) and interest rate, exchange rate, money supply, and inflation rate (independent variable) were gathered from the annual report of the Central Banks of the 48 SSA nations. The panel data year covers the period from 2016 to 2022. The unit root test confirms the variables to have a level integration order. The Hausman test suggests the use of fixed effect regression. The fixed effect regression shows that for the 48 SSA nations, interest rate, inflation rate, and money supply were positively significant in impacting GDPPC while exchange rate was negatively significant in impacting GDPPC. The study, therefore, recommends that import promotion, for example, should be avoided because it raises the exchange rate and lowers the value of currencies of the SSA nations.

Key words: Sustainable Development Goal, Sub-Saharan Africa, Sustainable Economic Growth, Inflation, GDP Per Capita, Exchange Rate.

JEL Code: E52, E58, O10.

1.1. Introduction

Many sub-Saharan African nations like Nigeria have experienced a variety of economic difficulties, including sluggish development and economic instability, despite its abundance of natural and mineral resources (Osakwe, Ibenta, & Ezeabasili, 2019). As a result, unemployment, inflation, non-productivity, and a balance-of-payments deficit remained the norm. Despite the SSA governments' best efforts, the desired results have yet to materialize. However, among the SSA governments' preventative measures, the implementation of monetary policy looks to have a lot of potential.

Monetary policy is an economic management method that tries to promote long-term economic growth and development (Omankhanlen, Ilori, & Isibor, 2021). According to Osakwe et al. (2019), since the introduction of monetary policy's role in influencing macroeconomic objectives such as job creation, price stability, GDP growth, balance of payments equilibrium, and a slew of others, monetary authorities have been charged with the primary responsibility of formulating and implementing policies that gear toward its drive (Srithilat & Sun, 2017; Anowor & Okorie, 2016). Treasury bills, a financial instrument utilized for open market operations and the issuance of government debt, have grown in volume and value as a result of this position, becoming an important earning asset for investors and a source of market balancing liquidity (Okoro, 2018). Monetary policy's main goal was to ensure that money supply was proportional to economic growth (Fabris & Lazić, 2022).

Focusing on Nigeria, as one of the SSA member nation, inflation management, also known as price stabilization of goods and services by consumer demand and producer supply, is the most effective area of monetary policy. Under the 1958 CBN Act, the Central Bank of Nigeria (CBN) was entrusted with regulating the economy through monetary policy (CBN, 2019). The amount and movement of money in the economy at the time have an impact on the decision to implement monetary policy.

According to Adigwe, Echekeba, and Onyeagba (2020), notwithstanding the Central Bank of Nigeria's many monetary regimes over the years, inflation remains a serious threat to Nigeria's economic growth. Nigeria's inflation has been quite volatile. Over the years, there have been fluctuating inflation rate in Nigeria. Also, because money growth was often quicker than real economic development, this period of high inflation is tied to money supply expansion.

The dualism nature of Nigeria's monetary and commodity markets is once again the key obstacle to monetary policy design and implementation. The creation of a strong informal loan market and exchange rate market in Nigeria has major implications for the transmission mechanism of monetary policy because the informal sector accounts for about 30% of Nigeria's GDP. The country's mechanism of payment is largely cash-based, and using cash for transactions increases the amount of money/currency in circulation, making monetary regulation more difficult. Effective monetary policy management, according to Nasko (2016), is required to ensure adequate financial system liquidity and the allocation of sectoral loans to the economy's most vulnerable sectors.

This accurately indicates that the monetary control has discretionary authority in order to maintain control over the money supply and interest rates which make money more expensive or less expensive, depending on current economic conditions and policy stances aimed at maintaining price stability. Monetary policy has been highlighted by Guillermo (2020) as an essential instrument that may be used to preserve the viability of domestic prices and exchange rates. It is critical for long-term economic growth and international viability (Adegbite & Alabi, 2018). Recommendations must be developed annually in order to assist, improve, and develop the performance of monetary institutions and aid in the achievement of macroeconomic goals.

Despite the benefits of monetary policy implementation among the SSA nations, there have been numerous setbacks that have hampered the correct implementation of monetary policies in the SSA nations that would have assisted in elevating the SSA countries' economic structure. For example, the capacity to adhere to the stated rules that would bring the policy to fulfillment, as well as the ability to satisfy depositors and shareholders, are all obstacles to the successful implementation of monetary policies in the SSA nations (Twinoburyo & Odhiambo, 2018).

The bank rate, open market operations (OMO), selective credit control, required reserve ratio (RRR), moral suasion, and liquidity ratio are all used by the Central Bank of Nigeria to control monetary policy (Asli, 2021), and while some of them are strict policies like the required reserve ratio, others like moral suasion are flexible. They are, however, all aimed toward price stability (Isibor et al. (2022). Similarly, the economy of the SSA countries has seen ups and downs. Although progress has been achieved in the SSA's economic growth, this progress has not been sustained, resulting in citizen poverty (Okwo, Eze, & Nwoha, 2017).

As a result, the purpose of this study is to examine how monetary policy can be used to influence Nigeria's economic growth, and also sustain such growth with

respect to the Goal eight (8) of economic growth of the United Nation's Sustainable Development Growth. This study will be crucial in determining the amount to which these monetary policies have influenced the SSA nation's growth process, using key monetary policy tools as yardstick.

1.2. Research Hypotheses

The research will test the following hypotheses:

H_{01} : Interest rate has no significant impact on sustainable economic growth of the SSA countries.

H_{02} : Exchange rate has no significant impact on sustainable economic growth of the SSA countries.

H_{03} : Inflation rate has no significant impact on sustainable economic growth of the SSA countries.

H_{04} : Money supply has no significant impact on sustainable economic growth of the SSA countries.

2.1. Conceptual Framework of Monetary Policy

The deliberate use of monetary instruments (direct and indirect) available to monetary authorities such as central banks to achieve macroeconomic stability is known as monetary policy. It refers to a government's explicit attempts to control money in its economy in order to achieve specific economic objectives. It is, in fact, a tool for achieving monetary and price stability goals.

According to the Central Bank of Nigeria (CBN, 2019), monetary policy refers to any policy action made by the federal government through the CBN to regulate credit availability and pricing. It is also known as the (CBN) regulation of the money supply and interest rates in order to control inflation and keep the economy's cash flow stable. CBN (2019) also defined monetary policy as a collection of activities aimed at keeping the value, supply, and cost of money in an economy in accordance with expected levels of economic activity. Monetary policy is a set of actions performed by monetary authorities, usually the central bank, to control and regulate the availability of money to the public as well as the flow of credit in order to achieve stated macroeconomic goals (Okoro, 2018).

According to Ogbulu and Torbira (2017), monetary policy refers to a country's central bank credit policies. Monetary policy, according to Suleiman, Yusuf, & Suleiman (2019), is one of the macroeconomic instruments employed by a country's monetary authority to govern its economy and achieve desired goals. Osakwe et al. (2019) defined monetary policy as the central bank's actions targeted at impacting the availability of credit and cost. According to Adigwe et al. (2020), the three basic forms of monetary policy decisions that can be made are the amount of money in circulation, the level of interest rates, and the activity of credit markets and the banking system.

Combining these indicators has the purpose of managing the value, supply, and cost of money in an economy depending on economic activity. Monetary policy, according to Anyanwu (2014), is only effective in a highly commercialized economy. Unless the economy is not monetized, the effectiveness of monetary policy is limited. Money supply is independent in a growing economy when a huge portion of production is produced in the subsistence sector. As a result, monetary policy would be a weaker tool for economic management and bank performance (Isibor, Omankhanlen, Mathias, Komolafe, and Okereke, 2020).

A closer look at these definitions indicates that monetary policy fundamentally entails changing the amount of cash in the wealth of the economy in order to gain some mix of output stability and inflation. It is assumed that output, as measured by GDP, will remain steady over time; therefore, changes in the supply of money will solely result in price changes. Changes in money supply, on the other hand, may have an immediate influence on the real production of goods and services since prices and wages do not typically adjust rapidly (Koshy, 2017). Hence, one of the techniques monetary authorities use to control the money supply in any economy and attain the proper degree of economic development is monetary policy (Adegbite & Alabi, 2018).

2.1.1. Concept of Sustainable Economic Growth

Sustainable economic growth can be defined as a consistent increase in the output of goods, services, and job opportunities with the purpose of enhancing residents' economic and financial well-being (Adigwe et al., 2020). The keyword here is "consistent". Sustainable economic growth consists of an increase in a country's productive potential as measured by a steady increase in real national revenue and divided by the total population figure of the nation. It is a significant topic in economics and finance because it is seen as one of the preconditions for achieving improved social welfare outcomes, which is the primary goal of eco-

conomic policy. As a result, it is a critical component of long-term growth. Two, it is one of the United Nation's Sustainable Development Goals, specifically the goal eight of economic growth.

The Gross Domestic Product (GDP) per capita measures the progress of a country's economy (GDP) against its total population. As a result, the monetary value of all commodities and services generated in an economy during a given time period, usually a year, is established and divided by the total population per year to measure the sustainable economic growth in this study.

2.2. Theoretical Framework

2.2.1. Keynesian View of Monetary Policy

The assumption that money and price have a direct and proportionate relationship was challenged by the Keynesian theory. According to the Keynesian viewpoint, monetary policy has a substantial influence on economic activity. The viewpoint asserted that changes in money supply can have a long-term impact on variables including the interest rate, exchange rate, inflation, aggregate demand, employment, production, and income (Antonio, 2019).

Keynesians also refuted the notion that the economy is constantly at or near its natural level of real GDP (Y), implying that Y in the exchange equation remains constant. They also refuted the notion that money circulation velocity is constant. According to Keynesians, expansionary monetary policy increases the quantity of loanable money accessible through the banking system, lowering interest rates. When interest rates fall, collective spending on investment and interest-sensitive consumer items rises, causing real GDP to rise (Antonio, 2019).

As a result, monetary policy can have an indirect impact on real GDP. In the face of rising unemployment, Keynes (1973) advocated for a low-interest-rate policy. As a result, when the amount of money increases, the first effect is a decrease in the interest rate. A fall in interest rates will boost investment because of capital's marginal efficiency.

Keynes (1973) focused primarily on two types of assets: money and bonds. Bonds pay an explicit rate of interest, whereas money does not formally yield anything. As a result, people choose to keep bonds rather than liquid money since bondholders are paid. According to Keynes, when the interest rate rises, the demand for money drops. The lesser the demand for money, the higher the interest rate,

and vice versa. Money supply variations are linked to the amount of economic activity because of the inverse connection between money demand and interest rates. The efficacy of Keynes' monetary policy was then questioned in many circumstances (Antonio, 2019).

2.2.2. The Monetarist View of Monetary Policy

The monetarist school of thinking was created by Milton Friedman. Traditional macroeconomics is interpreted in a modern way in this school of thought. They developed a more advanced and practical version of the money quantity theory. Friedman (1968), like any other school of thought, acknowledged the importance of money availability in affecting the economy's well-being and the need for an effective monetary strategy to stabilize an economy.

Friedman also believed that the money supply should expand at a steady rate rather than being regulated and modified by the monetary authorities in order to encourage continuous growth. He went on to say that because money is needed for reasons other than planned transactions, it may be kept in a variety of forms, including money, bonds, stocks, physical goods, and human capital. Each form of riches has its own set of features as well as a unique return. These effects will eventually increase aggregate money demand and increase output (Friedman, 1968).

Monetarists recognize that the economy may not always be at full employment in terms of real GDP. As a result, monetarists contend that expanding monetary policy will raise real GDP in the short run by raising aggregate demand. However, they believe that, in the long run, when the economy is at full employment, the quantity theory is a plausible approximation of the link between money supply, price level, and real GDP. Furthermore, in the long run, expansionary monetary policy does nothing but cause inflation and has no effect on real GDP.

2.3. Empirical Framework

Osakwe et al. (2019) looked into how monetary policies implemented between 1986 and 2016 affected Nigeria's manufacturing sector performance. Interest rates, currency rates, and foreign reserves all had a negative impact on the manufacturing industry, but broad money and inflation rates influenced it positively. Only the exchange rate and the foreign reserve, according to the Granger causality test, produce industrial production.

Okoro (2018) discovered that interest and inflation rates are inversely proportional to economic production, whereas the foreign exchange rate, money supply, and total credit are directly proportional, and these characteristics are linked to long-term economic growth.

From 1975 to 2018, Fasanya, Onakoya, and Agboluaje (2017) looked at Nigeria's growth process as it was impacted by the country's monetary policies. The findings demonstrated that monetary variables (external reserve, money supply, interest rate, exchange rate, and inflation rate) had a long-term relationship with economic growth. Furthermore, it was demonstrated that the money supply and interest rates have no significant impact on economic growth.

The influence of the CBN's monetary policy on Nigerian commercial banks was investigated by Akanbi and Ajagbe (2019). From 1992 through 1999, data was collected from a sample of three commercial banks. According to the findings, an increase in interest rates resulted in a drop in lending rates, whereas liquidity and cash ratios were statistically significant to the profit of the selected banks.

Isibor, Olokoyo, Arogundade, Osuma, and Ndigwe (2018) looked at how monetary policy influenced the growth of Nigerian sectoral output from 1986 to 2018. According to the study, the industrial sector is insensitive to monetary policy, whereas the agricultural sector is sensitive to exchange rate movements. Furthermore, it was determined that interest and exchange rates have the biggest impact on the mining industry's performance, and that exchange rate volatility and total bank loan given are essential elements in projecting the construction/building sector's behavior. The exchange rate is the most important monetary metric in general.

In their study of how money and inflation are linked to output in Nigeria, Chimbobi and Uche (2017) discovered bidirectional causality between output and money, as well as inflation. It was also observed that expanding the money supply led to economic growth.

Chuku (2019) examined how monetary policy implementation shocks affect output and prices in Nigeria using the actual effective exchange rate, the minimum rediscount rate, and broad money (M2), and concluded that M2 is the most significant of the three policy instruments.

According to Ayodeji and Oluwole (2018) comparative study, monetary policy has a greater influence on economic activity in Nigeria than fiscal policy, and the government's focus on fiscal policy has resulted in increased economic volatility.

Studies conducted outside of Nigeria are also reviewed in order to have a better understanding of how monetary policy influences the economy. Chipote and Makhetha-Kosi (2017) looked at how monetary policy affects economic growth in South Africa.

The study discovered that the variables have a long-term relationship and that the money supply, repo rate, and exchange rate are minor monetary policy instruments that drive growth, while inflation is significant.

Chaudhry, Qamber and Farooq (2017) studied the connections between monetary policy, inflation, and economic development in Pakistan from 1972 to 2014. Loans to the private sector, financial depth, the real exchange rate, and the budget deficit were all shown to be elastic and substantial in terms of influencing real GDP, according to the research. It also showed a one-way directional relationship between real GDP and financial depth, domestic credit, and the budget deficit, as well as a bidirectional relationship between real GDP and the real exchange rate.

2.4. Gaps in Literature

Various economic changes and trends were noticed in recent times, and their impact on economic growth has not been thoroughly considered in previous studies like Srithilat and Sun (2017). A bigger percentage of research work on this topic were done in the past, which can be assumed to be old in comparison to the current era of high inflation, increased unemployment, economic slump, and devaluation of the local currency (which is against the macroeconomic goals specified). However, this study aims to investigate and analyze these trends.

Furthermore, none of the studies evaluated like Srithilat and Sun (2017) also indicated any sustainability principles or guidelines that the Nigerian financial sector may apply to ensure sustained economic growth. However, this research established sustainability criteria that can be used to ensure sustained economic growth in SSA nations.

3.1. Data Source

For the years 2016 to 2022, data from the Central Bank annual report of the 48 SSA nations and also data from www.indexmundi.com were used to measure the following variables: Inflation (INF), Interest Rate (INT), Exchange rate (EXR), money supply (MS), and Gross Domestic Product per Capita (GDP pc) are the

study's main variables. Hence, the study used a panel data series. Sustainable economic growth was quantified using the Gross Domestic Product per capita when operationalizing the research dependent variable (GDPPC). The Hausman test was also conducted to establish which between the fixed effect and random effect regression to adopt in interpreting the result.

3.2. Model Specification

To assess the link between monetary policy and economic growth, the model as adopted and modified from the study of Galadima & Ngada (2017) was stated in implicit form as:

$$GDP_{pc} = f(INF, INT, EXR, MS) \quad (3.1)$$

Where:

GDP_{pc} = Gross Domestic Product per Capita

INF = Inflation

INT = Interest rate

EXR = Exchange rate

MS = Money Supply

Therefore, the explicit model form with values without rates transformed to logarithm forms is:

$$LGDP_{pc} = \beta_0 + \beta_1 (INF) + \beta_2 (INT) + \beta_3 (EXR) + \beta_4 (LMS) + \mu \quad (3.2)$$

With

LGDP_{pc} = Log of Gross Domestic Product per Capita

LMS = Log of Money Supply

μ = White noise or error term

$\beta_1, \beta_2, \beta_3$ are parameter estimates of INF, INT, and EXR

β_0 = constant parameter

4.1. Descriptive Statistics of Variables

The descriptive analysis provided useful information about the variables as regards to their median, mean, minimum and maximum values, standard deviations, kurtosis, skewness, probability, Jarque-Berra, and the sum of square deviations. The variables examined were sustained economic growth (dependent variable) and monetary policy variables of interest rate, exchange rate, money supply and inflation rate (independent variable)

From table 4.1 LGDPPC had the highest mean and median figures of 24.45400 and 24.34005, respectively. This showed the importance of the variable as a dependent variable. The maximum showed the variable with the highest value and minimum showed the variable with the lowest value. LGDPPC had the highest maximum value of 25.11289 while INT had the lowest minimum value of 9.944014. This showed the importance of both variables also in the model. Standard deviation is a measure of the variations in a set of values. Standard deviation is given as the addition of squared deviations from the mean. From table 4.1 LMS had the highest figure of 1.368775 while INT had the lowest value of 0.102788. The skewness of a normal distribution is usually between 0 and 1. Therefore, all the variables from the result in table 4.1 had a normal distribution as the value of their skewness was between 0 and 1 and with values of 0.581423, 0.213648, 0.091542, 0.272852, and 1.077724, respectively. Kurtosis showed the flatness or peakness of the spreads of the series. The variable is said to be peaked to the normal if the kurtosis is 3 or exceeds 3, and this is good for the distribution. Also, the distribution is said to be flat to the normal if the kurtosis is below 3. From the table 4.1, the kurtosis of all the variables were 3 and above with values of 2.468521, 3.606125, 2.963953, 2.939989, and 4.410056, respectively to prove that all the variables were peaked to the normal. Jarque-Bera is also used to determine if the series were distributed normally. The null hypothesis of the normal distribution is rejected when the probability value of the Jarque-Bera is less than 10% (0.10). Examining the Jarque-Bera Probability figures for all the variables, the probability figures were all statistically significant at 10% level of significance with values of 0.003715, 0.070394, 0.023042, 0.034329, and 0.001145, respectively.

Table 4.1: Summary Statistics

	LGPPC	INT	EXR	INF	LMS
Mean	24.45400	10.13804	21.85941	20.67080	21.11482
Median	24.34005	10.15984	21.72364	20.71677	20.84600
Maximum	25.11289	10.35618	22.55231	23.37430	24.76964
Minimum	24.07209	9.944014	21.13514	18.27846	18.68742
Std. Dev.	0.330178	0.102788	0.421560	1.339243	1.368775
Skewness	0.581423	0.213648	0.091542	0.272852	1.077724
Kurtosis	2.468521	3.606125	2.963953	2.939989	4.410056
Jarque-Bera	4.532222	1.122854	2.259949	2.902056	13.54485
Probability	0.003715	0.070394	0.023042	0.034329	0.001145
Sum	1198.246	496.7637	1071.111	1012.869	1034.626
Sum Sq. Dev.	5.232837	0.507135	8.530206	86.09146	89.93017
Observations	335	335	335	335	335

Source: Researchers compilation using E-views 9 (2023)

4.2. Panel Unit Root Test

The null and alternate hypothesis for the panel unit root test is:

H_0 : There is the presence of a unit root.

H_1 : There is no unit root.

The probability values of the Levin, Lin & Chu t-statistics and the Augmented Dickey-Fuller - Fisher Chi-square (ADF - Fisher Chi-square) would be examined to determine the stationarity at both levels and first difference. If the probability values are less than 0.10 or significant at 10 per cent level of significance, then the null hypothesis would be accepted and it would be agreed that there is the presence of a unit root and the data is stationary. Examining the panel unit root result in table 4.2, all the variables were stationary at levels and therefore integrated to the order of 0. Thus, we accept the null hypothesis and reject the alternative hypothesis.

Table 4.2: Panel Unit Root Test

Variable	Levin, Lin & Chu t* statistics	Levin, Lin & Chu t* statistics (probability value)	ADF - Fisher Chi-square	ADF - Fisher Chi-square (probability value)	Stationarity	Intercept/ Trend and Intercept	Remark
LGDPCC	-8.84009	0.0000	17.1187	0.0000	Stationary at levels	Trend and Intercept	I(0)
INT	7.27093	0.0000	4.02922	0.0000	Stationary at levels	Trend and Intercept	I(0)
EXR	-1.54166	0.0443	1.31490	0.0261	Stationary at levels	Trend and Intercept	I(0)
INF	-4.05394	0.0000	22.5850	0.0000	Stationary at levels	Trend and Intercept	I(0)
LMS	5.53127	0.0000	12.2817	0.0000	Stationary at levels	Trend and Intercept	I(0)

Source: Researchers Compilation using E-views 9 (2023)

4.3. Fixed-Effect Regression Analysis of Data

4.3.1. Fixed-effect Regression

This technique was used to check if there was a significant impact between the dependent variable GDPPC (gross domestic product per capita) and all the independent variables which were INT (interest rate), EXR (exchange rate), INF (inflation rate), and LMS (log of money supply).

From the presented result in table 4.3 and examining the coefficient signs, it was evident that there existed a negative relationship between EXR with the dependent variable LGDPPC. This was because its coefficient values of -0.011369 carry negative sign. This implied that an increase in the independent variable would lead to a decrease in the dependent variable. However, INT, INF, and LMS had a positive coefficient signs of 0.026495, 0.076709, and 0.078162, respectively to prove that an increase in the variables would lead to an increase in LGDPPC.

Beyond the nature of the relationship, the fixed-effect regression output in table 4.3 also showed the significance of each independent variable in the model, which was used to test the study hypothesis. Based on the rule of thumb and the significant level of 0.05, the probability value of INT, EXR, INF, and LMS were statistically significant with probability (P) values of 0.0337, 0.0196, 0.0010, and 0.0000, respectively which were below the 0.05 significance level (5%).

In summary, INT, INF, and LMS were positively significant in impacting LG-DPPC while EXR was negatively significant in impacting the same LGDPPC.

Furthermore, the coefficient of determination (R-squared) of the model under consideration which measures the goodness of fit of the model had an approximate value of 0.78. This indicated that all the independent variables explain about 78% of the variations in the dependent variable (LGDPPC). After adjusting for degree of freedom, the adjusted R-squared was 0.70 (55%).

Moreover, the F-statistics showed the joint significance of all the independent variables together in impacting the dependent variable LGDPPC. The probability value of the F-statistics (Prob(F-statistic)) value must be statistically significant at 10% level of significance to prove that all the independent variables together jointly impact the dependent variable (LGDPPC). From table 4.3, Prob(F-statistic) value was 0.001965 and was statistically significant at 10% level of significance to prove that all the independent variables together jointly impact the dependent variable (LGDPPC).

Finally, the durbin-watson test was used to show the presence or absence of autocorrelation in the model. Autocorrelation means that all or some of the independent variables are related this makes the regression result spurious. The value of the durbin-watson variable must be estimated at 2 to ensure that there is no autocorrelation in the model. The durbin-watson approximate value of 1.92 was approximately 2 to show that there was no autocorrelation in the model.

Table 4.3: Fixed-Effect Regression (LGDPPC)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	23.50465	1.017094	23.10963	0.0000
INT	0.026495	0.030703	0.862932	0.0337
EXR	-0.011369	0.028437	-0.399784	0.0196
INF	0.076709	0.021454	3.575598	0.0010
LMS	0.078162	0.013400	5.833109	0.0000
$R^2 = 0.78$	Adjusted $R^2 = 0.70$	Prob(F-stat) = 0.001965	Durbin-Watson Test = 1.92	

Source: Researchers' computation using E-views 9 (2023)

4.4. Post-Estimation Tests

4.4.1. Hausman Test

To determine the right regression to examine between the fixed effect model and the random regression model, the Hausman test was adopted. The null and alternate hypothesis adopted to test the Hausman test was:

H_0 = Random Effect (Probability greater than 0.05)

H_1 = Fixed Effect (Probability less than 0.05)

From table 4.4 below, the Chi-Square Statistic probability value of 0.0004 was significant at 5 per cent level of significance. The significant result showed that the null hypothesis would be rejected and this means that the fixed-effect model was appropriate for this study.

Table 4.4: Hausman Test Result to determine the best regression output to use

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	3.509722	7	0.0004

Source: Researchers' computation using E-views 9 (2023)

4.4.2. Redundant Fixed Effects Test

This test was used to examine the joint significance of all the independent variables on the dependent variable. It was used to corroborate the f-statistic significance figure of the regression. The probability values of the cross-section F must be significant at 10% level of significance to show that the F-statistics is significant and all the independent variables were jointly significant in impacting the dependent variable. The F in the cross-section F of table 4.5 represents F-statistics and its probability value of 0.0558 was significant at 10% level of significance to show that all the independent variables were jointly significant in impacting the dependent variable LGDPPC.

Table 4.5: Redundant Fixed Effects Test Result

Effects Test	Statistic	d.f.	Prob.
Cross-section F	0.763516	(4,37)	0.0558
Cross-section Chi-square	3.886298	4	0.0216

Source: Researchers' compilation using E-views 9 (2023)

4.4.3. Breusch Pagan LM Test

This was used to test for autocorrelation and was also used to confirm the durbin-watson. The null hypothesis showed no presence of autocorrelation and vice versa.

H_0 : There is no presence of autocorrelation in the model

H_1 : There is the presence of autocorrelation in the model

From the result in table 4.6, the probability value of 0.1200 was not significant at 10% level of significance to show that there was no autocorrelation in the model.

Table 4.6: Breusch Pagan LM Test Result

Test	Statistic	d.f.	Prob.
Breusch-Pagan LM	79.66861	10	0.1200

Source: Researchers' compilation using E-views 9 (2023)

4.5. Hypotheses Testing

Hypothesis 1

H_{01} : Interest rate has no significant impact on sustainable economic growth of the SSA countries.

Table 4.3 showed the result of the fixed effect panel regression for sustainable economic growth of the SSA countries which was measured by gross domestic product per capita (GDPPC). INT was statistically significant positively in impacting it with probability value of 0.0337. The criteria to take the decision was to reject the null hypothesis if the probability value was higher than 0.05 (5% level of significance) and to accept the alternative hypothesis if the probability value was lesser than 0.05. Based on this decision and the probability value of 0.0337, which was statistically significant at 5% level of significance, the null hypothesis was rejected and it was accepted that interest rate had a significant impact on sustainable economic growth of the SSA countries.

Hypothesis 2

H_{02} : Exchange rate has no significant impact on sustainable economic growth of the SSA countries.

Tables 4.3 showed that EXR was statistically significant though negatively in impacting sustainable economic growth with probability value of 0.0196. The criteria to take the decision was to reject the null hypothesis if the probability value was higher than 0.05 (5% level of significance) and to accept the alternative hypothesis if the probability value was lesser than 0.05. Based on this decision and the probability value of 0.0196, which was statistically significant at 5% level of significance, the null hypothesis was rejected and it was accepted that exchange rate had a significant impact on sustainable economic growth of the SSA countries.

Hypothesis 3

H_{03} : Inflation rate has no significant impact on sustainable economic growth of the SSA countries.

Table 4.3 revealed that INF was statistically significant positively in impacting it with probability value of 0.0010. The criteria to take the decision was to reject the null hypothesis if the probability value was higher than 0.05 (5% level of significance) and to accept the alternative hypothesis if the probability value was lesser than 0.05. Based on this decision and the probability value of 0.0010, which was statistically significant at 5% level of significance, the null hypothesis was rejected and it was accepted that inflation rate had a significant impact on sustainable economic growth of the SSA countries.

Hypothesis 4

H_{04} : Money supply has no significant impact on sustainable economic growth of the SSA countries.

Table 4.3 revealed that LMS was statistically significant positively in impacting LGDPPC with probability value of 0.0000. The criteria to take the decision was to reject the null hypothesis if the probability value was higher than 0.05 (5% level of significance) and to accept the alternative hypothesis if the probability value was lesser than 0.05. Based on this decision and the probability value of 0.0000, which was statistically significant at 5% level of significance, the null hypothesis was rejected and it was accepted that money supply had a significant impact on sustainable economic growth of the SSA countries.

4.6. Discussion of Result and Policy Implication

The result from the panel unit root revealed that all the variables were stationary at levels, hence, the use of the fixed effect and the random effect panel regression. The Hausman test suggested the adoption of the fixed effect panel regression only. The reason was that its probability value of 0.0004 was significant at 5% level of significance to accept the null hypothesis of using fixed effect and reject the alternate hypothesis of using the random effect. For the fixed effect panel regression result on table 4.3, there was a statistically significant relationship between INT, EXR, INF, and LMS with the dependent variable LGDPPC.

The implication of the findings was that all the independent variables were vital in boosting economic growth both in the time period and the next time period. Therefore, the importance of monetary policies cannot be over-emphasized in impacting a sustained economic growth in the sub-Saharan African (SSA) nations. Therefore, the monetary policy variables of interest rate, exchange rate, inflation rate, and money supply are macroeconomic variables which impact the economic variables like pricing, foreign exchange, international trade, and so on, and all these would in turn help the SSA nations boost and sustain their economic growth and development.

5.1. Conclusion

The importance of monetary policy in an economy cannot be overrated as its practicality and efficacy as a tool to improve a sustained economic growth depends on the country and the economic situation it is being utilized. The study assessed the validity of the monetarist and the Keynesian theories under the economic scenarios of 48 sub-Saharan African nations and explained that while the Monetarists believe that monetary policy was better than the fiscal policy, the Keynesians argued that it had a negative effect on economic growth. Monetary policy variables of interest rate, exchange rate, inflation rate, and money supply were examined against sustainable economic growth variable of GDP per capita. Findings revealed that while interest rate, inflation rate, and money supply were positively significant in impacting GDP per capita, exchange rate was negatively significant in impacting the same GDP per capita. This meant that government through the Central Bank would take monetary policies seriously as it would affect the workings of the economy as a whole. Therefore, the impact of monetary policies on the economy is a cause for concern to stakeholders and government. This showed that monetary policies can help the nation achieve the United Nation's Goal 8 of economic growth.

5.2. Recommendations

The following policy recommendations have been proposed as a result of this study's findings:

1. The governments through the Central Banks of the SSA nations should be wary of high inflation rate as high inflation rate would destabilize economic growth, therefore, policies like increase in export that would regulate inflation rate should be made and maintained.
2. Policies like import promotion, for example, should be avoided because it raises the exchange rate and lowers the currency value of the SSA nations.
3. The Central Banks of the SSA nations should create a forward contract exchange rate market where industry participants may easily purchase future contracts of their foreign exchange needs early enough to reduce the risk of a currency depreciation on their company. This is one of the most widely used strategies in mitigating exchange rate risk in developed nations.
4. The Central Banks of the SSA nations adopt monetary easing strategies that force interest rate to a single digit rate. Double digit interest rate constrains bank lending to manufacturing companies who need to invest in their businesses in order to ramp up production which brings about economic growth.
5. The governments of the SSA nations should adopt more protectionist policies to ensure that the prices of their locally made products are more competitive with their foreign substitutes. This would protect the exchange rate.
6. Policies to regulate money supplied to the economy should be formulated and implemented by the SSA nations' Central Banks.

5.3. Contributions to Knowledge

1. The study contributed to monetarist theory by demonstrating how monetary policies may be utilized to promote economic growth and development. Monetarists claimed that expanding monetary policy would improve real GDP in the near run by raising aggregate demand. The outcomes of the study demonstrated the importance of monetary policy on economic growth.
2. The study contributed to existing literatures on monetary policy by proving that the policy is not only vital for financial growth and other sectoral growth but also on growth of the economy as a whole.

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