Monetary Policy and Economic Performance in sub-Saharan Africa

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Abstract
This study examines the impact of monetary policy on economic performance in sub-Saharan Africa covering the period from 2005 to 2019. The study employs 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 is an important factor in the determination of economic performance in the sub-Saharan African countries. The study concludes that sub-Saharan African countries could effectively use monetary policy to improve economic growth, attracts foreign investment and encourages domestic savings, which ultimately lead to well-being of the citizens.

Keywords: Monetary Policy; Economic Growth; Investment; Savings; System GMM

JEL Classification Codes: E55, O47, O16, C13

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1.0 Introduction

Sub-Saharan Africa comprises of 49 countries in Africa with a population of approximately 1.14 billion people, which makes it the second most populous region in the world after Asia with 4.64 billion population (2020 estimate). These countries are diverse in scale, size and economic development. This region accounts for about 12% of the world total population but contributed only 2% of the global GDP (UNCTAD, 2020). Despite enormous human and natural resources in sub-Saharan Africa, the region is still characterized with inadequacy of basic necessities like water, electricity, good health care services, housing and employment opportunities which are vital indicators of economic performance (UNCTAD, 2020).

It is evident from the above that very pertinent issue affecting development in most of sub-Saharan Africa is the underutilization of both human and natural resources, as well as misappropriation of financial resources meant for infrastructure development by the political office holders. Economic performance especially economic growth, is an important objective of every country both developed and developing, and how monetary policy could be effectively used to achieve this objective has always been an area of concern among researchers and policy makers. Barro (1991) argued that economic growth is facilitated by fixed capital accumulation which believed to stimulate productivity. The capital accumulation is enhanced by developed and efficient financial system. Thus, financial and monetary factors are crucial to attainment of economic performance.

Monetary policy stance often determines the direction of economy of any nation, since economic actors like: economists, analysts, investors, and financial experts usually await outcomes of the monetary authorities' meetings involving monetary policy decision-making. Considering the existing empirical literature, especially in the context of monetary policy and economic performance, much research works have not been done in the sub-Saharan Africa. While some focused West African Monetary Zone (Balogun, 2007; Gnahe and Huang, 2020), the few studies on sub-Saharan Africa used either economic growth or inflation to capture economic performance (Ubi-Abari and Ekere, 2018; Gnahe and Huang, 2020). Therefore, this study aims to fill this gap by empirically examine the impact of monetary policy on economic performance using three different indicators, and also evaluate the extent of regional variation of the impact of monetary policy on economic performance of sub-Saharan African countries.

The remainder of this study is organized as follows. Section 2 contains review of theoretical and empirical literature that are relevant to the study. Section 3 presents the model specification and methods of estimations. Section 4 presents estimated results and analysis, while Section 5 concludes the study.

2.0 Literature Review

Monetary policy as a stabilization policy, has been the formal articulation of how money influences economic variables since the time of Adam Smith. It was later championed by monetarists, who see it as a tool of economic management for achieving sustainable economic growth and development. For instance, Adam Smith recognizes capital accumulation as an important determinant of economic growth in addition to supply of land, growth of labour force, and institutional changes. The classical economists believe that expansionary monetary policy can only lead to proportional change in inflation, while contractionary policy will lead to price deflation. Thus, monetary policy does not affect real variables. The view of the Keynesians on monetary policy indicates that money and value are not direct and proportion as believe by the classics. Keynesians opine that expansionary monetary policy will have

indirect impact on real gross domestic product through interest rate, investment and aggregate demand (Igbafe, 2022).

To the monetarists, monetary policy is a key factor that influences the activities of the economy. Monetarists argue that steady growth in money supply will promote steady economic growth rate. It was also argued that since money supply can be substituted for both bonds and goods and services, increase or decrease in money supply will have direct and indirect effects on the spending and investment decisions, which in turn have significant effect on growth and development of a nation (Udude, 2014).

On the importance of monetary policy in financial stability and economic performance, Mishkin (2007) argues that economic performance of any nation or region would be incomplete without effective monetary policy. This is because monetary policy is very important for not only financial stability but also overall performance of the economy. This implies that expansionary monetary policy through transmission mechanism stimulates investment, creates employment opportunities, more output, hence, improves economic performance. In his view, Petursson (2001) opines that the first stage of transmission mechanism of monetary policy is through interest rate, asset prices and exchange rate of the domestic economy which he called financial system channel. The second stage is the transmission to the rest of the economy, where the effects of the monetary policy are felt on the spending decision, aggregate demand and inflation.

Mwega (2003) argues that raising long-term capital through monetary policy to finance government and business activities serves as impetus for improved investment and stimulate growth. He maintains that sub-Saharan Africa often find it difficult to achieve this objective when compared to the developed world, probably due to difference in the level of financial development.

Moreover, Masson and Pattillo (2004) opine that the influence of monetary policy on the ultimate targets operates through four main channels. The first channel is through interest rate which has direct effect on investment decision and also on decision whether to consume now or later. The second channel is through indirect effect via other asset prices like: prices on equities; bonds; and real estate. The exchange rate effect is the third channel which affects the relative prices of goods (domestic and foreign), net imports, and value of foreign currency denominated assets. The forth channel of transmission mechanism is the credit availability effects which concerns with credit rationing, especially to productive activities. In line with the channels of monetary policy mechanism, Bokosi (2022) argues that one of the major channels through which economic growth can be achieved is industrialization. He further opines that improvement in industrialization and diversification can lead to more production of goods and services, which can facilitate growth and development of the economy. Mehar (2022) argues that the growth rate of nominal GDP should not be less than the inflation rate for a desirable monetary policy outcome. That is, an effective monetary policy indicator is when the real rate of GDP growth is positive.

However, several empirical studies have been conducted on the relationship between monetary policy and economic performance using different indicators with different results. For instance, Balogun (2007) examines the impact of monetary policy on economic performance of West African Monetary Zone countries using quarterly data covering the period 1991:1 to 2004:4. The study used GDP and inflation to proxy economic performance, and money supply and credit to government to proxy monetary policy. The empirical results reveal that monetary

policy hurts real domestic output of the studied countries. The results for the individual country show that monetary policy has negative impact on economic growth in Nigeria, but exhibits positive impact in other countries (Sierra Leone, Gambia, Ghana and Guinea). Based on the country by country comparison of the results for both single and simultaneous models, the study concludes that expansionary monetary policy has greater impact on prices than it does to growth.

Gnahe and Huang (2020) also investigate the effects of monetary policy on economic growth of West African Economic and Monetary Union countries covering the period from 1988 to 2018. The study employed panel cointegration structure for the estimation and the results show that monetary policy has a significant effect on economic growth. The study suggests that monetary policy measures should be well coordinated to achieve the desire behavioural changes in the real sector of the economy.

Ali and Irun (2008) investigate the relative effectiveness of monetary and fiscal policies for South Asian countries covering the period from 1990 to 2007. The study employed ARDL approach and the results show that monetary policy is more effective because, it has significant impact on economic growth both in the short-run and in the long-run.

However, Ozer and Karagol (2018) examine the relative effectiveness of monetary and fiscal policies on output growth in Turkey for the period 1998 to 2016. The study employed ARDL Bounds testing, Structural break unit root tests, and Granger causality techniques for the estimation. The results show that monetary policy has only short-run effect on growth but does not granger cause growth. On the other hand, fiscal policy has long-run significant effect on growth and also granger cause growth. The study concludes that fiscal policy is more effective than monetary policy in Turkey during the period of investigation. Similarly, Ubi-Abari and Ekere (2018) also examine the effects of monetary and fiscal policies on economic growth of 47 sub-Saharan African nations for the period of 1996 to 2016. The study employed dynamic panel General Method of Moment and Dumitrescu Hurlin causality techniques for the analysis. The findings reveal that both policies have significant positive effects on economic growth, with fiscal policy having greater effect. The study recommends that the countries in this region should focus more on fiscal policy to achieve sustainable long-run economic growth.

Senbet and Wodajo (2022) investigate the factors that determine economic growth in Ethiopia using time series data covering the period of 1950 to 2017. The study employed production function and growth accounting models for the estimation. The findings show that capital accumulation is the main source of economic growth in Ethiopia for the period under investigation. They opine that economic growth could be transformed to inclusive growth so as to achieve economic development. They further argue that, this could be achieved through appropriate policies and initiatives that can promote pro-poor and labour-intensive investments, which can further improves labour productivity, increases income, and enhance well-being of citizens.

Mehar (2022) investigates the role of monetary policy in economic growth and development for 186 developing countries covering the period 2001 to 2018. Using Panel Least Square technique for the estimation, the results show that monetary policy, proxied by domestic credit to private sector as percentage of GDP, has negative significant impact on economic growth which implies that monetary policy does not transform into economic growth in these countries.

Igbate (2022) empirically examines the effectiveness of monetary policy in stimulating economic growth in Nigeria covering the period 1990 to 2019. The study employed error correction mechanism (ECM) and the results show that monetary policy is not a significant factor in stimulating economic growth in Nigeria. The author attributes this result to the underdeveloped nature of the financial institutions in the country. However, despite a myriad of empirical studies on the role of monetary policy in promoting economic performance, the direction of relationship and the impact still remain vague. In addition, there are dearth empirical evidences in this area as regards sub-Saharan African countries studies. Therefore, this study did not examine only the impact of monetary policy on economic performance, but also evaluate the regional variation of the impact of monetary policy on economic performance in sub-Saharan Africa.

3.0 Methodology

3.1 Model Specification

In this study, three indicators – economic growth, foreign direct investment, and gross domestic savings were used to proxy economic performance. Thus, three models were specified as follows.

Model 1: Economic Growth Model

Following theoretical review, capital and labour are the fundamental determinants of economic growth.

$$rgdp = f(cap, lab) \quad (1)$$

Where rgdp, cap, and lap represent economic growth, capital, and labour respectively. It can also be deduced from the empirical review that, interest rate and inflation rate can also influence economic growth. Incorporating these variables and money supply variable into equation 1 gives:

$$rgdp = f(cap, lab, intr, inf, ms) \quad (2)$$

Expressing equation 2 in regression equation form yields:

$$lnrgdp_{it} = \alpha_0 + \alpha_1 lnrgdp_{it-1} + \alpha_2 cap_{it} + \alpha_3 lab_{it} + \alpha_4 intr_{it} + \alpha_5 inf_{it} + \alpha_6 ms_{it} + \mu_i + \psi_{it} \quad (3)$$

where:
$lnrgdp$ is log of real gross domestic product
cap is capital formation
lap is labour size
$intr$ is interest rate
inf is inflation rate
ms is broad money supply
$\mu_i$is country/cross-sectional error term
ψ_{it} is combined time/country/cross-sectional error term
It is expected that: $\alpha_1,\ \alpha_2, \alpha_3,\ \alpha_5, \alpha_6,\ >;\ \alpha_4\ < 0$.

Model 2: Foreign Direct Investment Model
Major macroeconomic variables that can influence FDI according to Keynes includes: gross domestic product, government expenditure, interest rate, inflation rate, and market size. This can be expressed in equation form as follows:

$$fdi = f(rgdp, govexp, intr, inf, msize) \quad (4)$$

If money supply is included as part of explanatory variables, equation 4 can be specified in econometric form as

$$lnfdi_{it} = \delta_0 + \delta_1 lnfdi_{it-1} + \delta_2 lnrgdp_{it} + \delta_3 govexp_{it} + \delta_4 intr_{it} + \delta_5 inf_{it} + \delta_6 msize_{it} + \delta_6 ms_{it} + \mu_i + \psi_{it} \quad (5)$$

Where:
fdi = foreign direct investment
rgdp = real gross domestic product
govexp = government expenditure
intr = interest rate
inf = inflation rate
msize= market size
ms = money supply
It is expected that: $\delta_1,\ \delta_2,\ \delta_3,\ \delta_4,\ \delta_5,\ \delta_6,\ \delta_7 > 0$.

Model 3: Savings Model
Theoretically, saving is a function of level of income and interest rate. The higher the income level, the higher the saving. Interest rate is also expected to have positive influence on the level of saving. Thus

$$sav = f(pcin, intr) \quad (6)$$

Gross domestic product can also influence level of saving in an economy. An increase in level of output is expected to lead to an increase in saving. Incorporating this variable and money supply variable into equation 6, and expressing it in regression equation form gives:

$$lnsav_{it} = \beta_0 + \beta_1 lnsav_{it-1} + \beta_2 pcin_{it} + \beta_3 intr_{it} + \beta_4 rgdp_{it} + \beta_5 ms_{it} + \mu_i + \psi_{it} \quad (7)$$

Where:
sav = domestic saving
pcin = per capita income
other variables were as defined above.
It is expected that: $\beta_1,\ \beta_2,\ \beta_3,\ \beta_4,\ \beta_5 > 0$

Model 4: Regional Variation Models

$$lnrgdp_{it} = \alpha_0 + \alpha_1 lnrgdp_{it-1} + \alpha_2 ms_{it} xCAd + \alpha_3 CAdummy + \mu_i + \psi_{it} \quad (8)$$

$$lnrgdp_{it} = \alpha_0 + \alpha_1 lnrgdp_{it-1} + \alpha_2 ms_{it} xEAd + \alpha_3 EAdummy + \mu_i + \psi_{it} \quad (9)$$

$$lnrgdp_{it} = \alpha_0 + \alpha_1 lnrgdp_{it-1} + \alpha_2 ms_{it} xSAd + \alpha_3 SAdummy + \mu_i + \psi_{it} \quad (10)$$

$$lnrgdp_{it} = \alpha_0 + \alpha_1 lnrgdp_{it-1} + \alpha_2 ms_{it} xWAd + \alpha_3 WAdummy + \mu_i + \psi_{it} \quad (11)$$

Where:
CAdummy = Central Africa dummy
EAdummy= East Africa dummy
SAdummy = South Africa dummy
WAdummy = West Africa dummy

Table 1: Sources and Measurement of Data

Variable	Definition	Measurement	Source
rgdp	Real gross domestic product	Measured in constant 2010 US dollar.	World Bank, WDI (2021)
cap	Capital formation	Measured in current US dollar.	World Bank, WDI (2021)
lab	Labour size	Measured as the number of people actively seeking for job.	International Labour Organization (2021)
intr	Interest rate	Measured as deposit interest rate (%)	World Bank, WDI (2021)
inf	Inflation rate	Measured as the consumer price index	World Bank, WDI (2021)
ms	Money supply	Measured as the broad money supply as a % of GDP.	World Bank, WDI (2021)
fdi	Foreign direct investment	Net inflow of FDI in US dollar	World Bank, WDI (2021)
govexp	Government expenditure	Government current expenditure on goods and services including transfer payment in US dollar	World Bank, WDI (2021)
sav	Gross savings	Measured as national income less total consumption plus net transfers in current US dollar.	World Bank, WDI (2021)
msize	Market size	Measured as total number of people in millions	World Bank, WDI (2021)
pcin	Per capita income	Measured as gross domestic product divided by population.	World Bank, WDI (2021)

Source: Authors' computation 2022

3.2 Estimation Techniques

The dynamic panel models based on a Generalized Method of Moments (GMM) developed by Arellano and Bond (1991) were employed to achieve the objectives of this study. This method is considered superior over the conventional static panel data methods of fixed effects and random effects models. This is because GMM model takes into cognizance the time series dimension of the data thus, considers the short run effects. It also considers the non- observable county specific in the models. Another important advantage of this method is the consideration of all the explanatory variables as endogenous, which accounts for the problem of endogeneity that may result from the correlation between the error term and the lagged dependent variable.

However, out of the two variants of GMM models (First difference GMM estimator and System GMM estimator), System GMM estimator developed by Arellano and Bover (1995) and Blundell and Bond (1998) was adopted because, the estimators in System GMM are drawn from the estimation of a system of two simultaneous equations. One equation in levels with lagged first differences as instruments, and the other in first difference with lagged levels as instruments. Invalidity of the lagged difference of the explanatory variables as instruments is one of the possible problems that may arise in adopting the system GMM estimators. In order to take care of this problem, two diagnostic tests (Sargan test and Arellano and Bond test) were employed. The Sargan test was adopted to check the constraint of over-identifying restriction and the validity of instruments. That is, the instrumental variables are exogenous and uncorrelated with the disturbance term in the first difference equation. Also, Arellano and Bond (AB) test was used to test the existence of second order serial autocorrelation process in the residual.

4.0 Presentation and Analysis of Results

The correlation results for the variables used in this study are presented in Table 2 Starting from the first column, the economic growth variable (rgdp) has positive relationship with all the variables except interest rate variable (intr). It has strong significant correlation with gross capital formation (cap) and government expenditure (govexp). In the second column, the capital formation variable (cap) is positively related with all the variables in the column except interest rate variable (intr), but has strong significant correlation with government expenditure (govexp).

Table 2: Correlation Matrix of Variables

	rgdp	cap	Lab	intr	inf	ms	fdi	govexp	sav	msize	pcin
rgdp	1.0000										
cap	0.9636	1.0000									
	0.0000										
lab	0.6647	0.7078	1.0000								
	0.0000	0.0000									
intr	-0.0067	-0.009	0.0563	1.0000							
	0.8728	0.8442	0.1898								
inf	0.1054	0.1346	0.2738	0.3730	1.0000						
	0.0092	0.0011	0.0000	0.0000							
ms	0.1175	0.1072	-0.111	-0.084	-0.122	1.0000					
	0.0025	0.0088	0.0062	0.0447	0.0029						
fdi	0.6063	0.6377	0.5251	0.0161	0.0191	0.0364	1.0000				
	0.0000	0.0000	0.0000	0.6990	0.6380	0.3504					
govexp	0.8905	0.8709	0.4732	-0.020	0.0619	0.2280	0.6063	1.0000			
	0.0000	0.0000	0.0000	0.6571	0.1372	0.0000	0.0000				
sav	0.7292	0.0724	0.7468	0.0514	0.1464	-0.125	-0.062	0.7304	1.0000		
	0.0000	0.0647	0.0000	0.2167	0.0008	0.0012	0.0989	0.0000			
msize	0.7276	0.7523	0.9804	0.0482	0.2365	-0.129	0.5414	0.4839	0.7983	1.0000	
	0.0000	0.0000	0.0000	0.2552	0.0000	0.0013	0.0000	0.0000	0.0000		
pcin	0.1173	0.1236	-0.149	-0.149	-0.131	0.3094	0.0546	0.1723	-0.155	-0.157	1.0000
	0.0020	0.0020	0.0002	0.0003	0.0012	0.0000	0.1532	0.0000	0.0000	0.0001	

Source: Authors' computation 2022

The correlation results in column three show that, labour size variable (lab) has a strong positive significant correlation with market size (msize) and no relationship with interest rate (intr). It also has negative correlation with money supply (ms) and per capita income (pcin), and has positive correlation with the remaining variables in the column. In the fourth column, the interest rate variable does not have strong significant correlation with any variable. Although, it has positive relationship with inflation, foreign direct investment, savings, and market size, and negative relationship with money supply, government expenditure, and per capita income. The fifth column shows that the inflation rate does not have strong significant correlation with any variable in the column. It has negative relationship with money supply, per capita income, and positive relationship with savings and market size. It does not correlate with foreign direct investment and government expenditure.

In the sixth column, money supply has negative relationship with savings and market size, and positive relationship with government expenditure and per capita income. It has no relationship with foreign direct investment. This result indicates that money supply does not have strong significant correlation with any variable in the column. The results in column seven reveal that there is no strong significant correlation between foreign direct investment and any of the variables in the column. It has positive relationship with government expenditure and market size, and no relationship with savings and per capita income. Column eight shows that government expenditure has positive relationship with saving, market size and per capita income. But none of them has strong significant correlation with government expenditure. Saving has positive and negative relationship with market size and per capita income respectively in column nine. Column ten reveals that market size and per capita income are not significantly related.

4.2 Regression Results for Economic Growth Model

The result of the two-step system GMM model for equation 3 is presented in Table 3. The results reveal that last period economic growth has significant positive impact on the current period economic growth. This implies that one percent point increase in previous economic growth will lead to 0.3 percent increase in current period economic growth. The results also show that capital formation is a significant factor that influences economic growth in Nigeria. The result indicates that a percent point increase in gross capital formation will lead to increase in economic growth by 0.65 percent.

Table 3: Blundell and Bond System GMM Results for Economic Growth Model

Variable	Coefficient	Stand. Error	Z	p>|z|
*lnrgdp*L1.	0.2952161	0.0358121	8.24	0.000
cap	0.6496642	0.0766794	8.47	0.000
lab	-0.0127746	0.0921088	-0.14	0.890
intr	0.0492907	0.0124118	3.97	0.000
inf	0.0031222	0.0059389	0.53	0.599
ms	-0.0123546	0.0049942	-2.47	0.013
Constant	-0.0031523	1.361822	0.00	0.998
Observation	415			
Number of Countries	42			
Wald Chi-square	300.12***			
	(0.0000)			
Sagan test	30.64			
	(0.2011)			
AB test	2.75			
	(0.1660)			

Source: Authors' computation 2022

The result for interest rate variable indicates a significant positive relationship with the economic growth variable. It shows that a percent point increase in interest rate will lead to increase in economic growth by 0.049 percent. Although, the result of money supply variable is statistically significant but came out with negative sign which contradicts a *priori* expectation. However, this finding corroborates the results of Balogun (2007), who found negative and significant impact of money supply on real output. The result contradicts the findings of Ali and Irun (2008), who found significant positive impact on economic growth for Eastern African region. The remaining independent variables, labour size and inflation, were not significant determinants of economic growth in this study.

The diagnostic tests results show that Wald Chi-square is statistically significant, which implies that the model is of good fit. The AB test result indicates that the null hypothesis of no evidence of high order serial correlation in the regression cannot be rejected. The result of the Sargan test was not significant indicating that the validity of over-identifying restriction cannot be rejected.

4.3 Regression Results for FDI Model

The result of the two-step system GMM model for equation 5 is presented in Table 4. The results reveal that all the explanatory variables in the model are statistically significant except the previous value of foreign direct investment and inflation rate. The insignificance of previous year foreign direct investment could be attributed to the political instability, insecurity, unfavourable tax laws, and high cost of production in most of the countries in sub-Saharan Africa.

Table 4: Blundell and Bond System GMM Results for the FDI Model

Variable	Coefficient	Stand. Error	Z	p>|z|
InfdiL1.	-.0,00185	0.0012	-1.53	0.127
Inrgdp	0.000437	0.0011	9.50	0.000
govexp	-0.006332	0.0005	-2.33	0.000
intr	-0.000258	0.0058	-7.52	0.000
inf	-0.000325	0.0021	-1.26	0.209
msize	0.006332	0.0026	2.98	0.000
ms	0.002641	0.0118	8.21	0.000
Constant	1.78639	0.2480	5.53	0.000
Observation	525			
Number of countries	42			
Wald Chi-square	424.65***			
	(0.0000)			
Sagan test	15.55055			
	(0.9276)			
AB test	1.4168			
	(0.1565)			

Source: Authors' computation 2022

The real gross domestic product variable came out with positive sign and statistically significant. This shows that a percent point increase in real gross domestic product will stimulate the inflow of foreign direct investment by 0.0004 percent. Table 4 also reveals that government expenditure variable appeared with negative sign and statistically significant. This implies that a percent increase in government expenditure will lead to decrease in foreign direct investment by 0.006 percent. This result contradicts the a priori expectation of positive relationship between gross domestic product and foreign direct investment. Furthermore, interest rate variable shows negative significant impact on foreign direct investment which also contradicts the a priori expectation of positive relationship. The market size and money supply are positively significant in determining foreign direct investment. While an increase in market size will lead to increase in inflow of foreign direct investment by 0.006 percent, an increase in money supply will induce foreign direct investment by 0.003 percent.

The Wald Chi^2 is statistically significant for the entire estimated model which means that the model is in good fit. The diagnostic test result for Sagan test was not significant, meaning that over identifying restriction is valid. Also, Arellano – Bond AB test for Autocorrelation (order 2) result shows that there is no evidence of high order serial correlation in all the regressions.

4.4 Regression Results for Savings Model

The result of the two-step system GMM model for equation 7 is presented in Table 5. The results show that all the explanatory variables are statistically significant except money supply variable. The previous gross domestic savings has significant positive impact on the dependent variable, which implies an increase in the gross domestic savings of the last period will increase the current domestic savings by 0.62 percent. The per capita income variable is also significant and has positive impact on the gross domestic savings. This result is in line with the a priori expectation, and also in tandem with Keynes' Absolute Income Hypothesis, that increase in income will lead to increase in savings in the economy.

Table 5: Blundell and Bond System GMM Results for the Savings Model

Variable	Coefficient	Stand, Error	Z	p>|z|
InsavL1.	0.6163325	0.01445	42.56	0.000
pcin	0.0002026	0.00002	9.38	0.000
intr	0.0298929	0.00402	7.43	0.000
Inrgdp	-0.0383265	0.00991	-3.87	0.000
ms	0.0022945	0.00225	1.02	0.309
Constant	8.187935	0.30293	27.03	0.000
Observation	413			
Number of Countries	43			
Wald Chi-square	6340.03*** (0.0000)			
Sagan test	23.0173 (0.5242)			
AB test	-0.0679 (0.9459)			

Source: Authors' computation 2022

The interest rate also has significant positive impact on gross domestic savings, which means that a percent point increase in interest rate will increase gross domestic savings by 0.03 percent. This result corroborates the classical proposition that, interest rate is the reward for saving, which implies that high interest rate will stimulate savings.

The results for real gross domestic product shows negative significant impact on gross domestic savings, which contradict the a priori expectation of positive impact. The money supply is not a significant variable in determining gross domestic savings as revealed in the results presented in Table 5. The Wald Chi-square result with coefficient 6340.00 and p-value 0.0000 indicates that the model is of good fit. The result of the Sagan test shows that it is not significant, which implies that the validity of over identifying restriction could not be rejected. Also, the result of the Arellano – Bond test for Autocorrelation (order 2) shows that there is no evidence of high order serial correlation in all the regressions.

4.5 Regional Variation of the Impact of Monetary Policy on Economic Performance

In order to assess whether or not regional variation exists in how monetary policy influences economic growth amongst the sub-regions in sub-Saharan Africa, equations 8, 9, 10 and 11 were regressed and the results are presented in Table 6.

Table 6: Empirical Results for the Extent of Regional Variation

Variable	Model 8	Model 9	Model 10	Model 11
lnrgdp L1.	0.4509463***	0.475687***	1.005452***	0.4871762***
	(0.0272)	(0.0305532)	(0.0002816)	(0.0294864)
ms x CAd	-0.00843396***			
	(0.0013069)			
CAdummy	-0.037523*			
	(0.0165176)			
ms x EAd		-0.0115547***		
		(0.0018138)		
EAdummy		0.0026591		
		(0.0076097)		
ms x Sad			-0.0016935***	
			(0.0002349)	
SAdummy			0.0006162***	
			(0.0002329)	
ms x Wad				-0.0140406***
				(0.0003071)
WAdummy				0.0184237***
				(0.0057292)
Constant	10.5936***	10.31757***	10.3596***	10.87509***
	(0.5589905)	(0.5450557)	(0.5789905)	(0.5247881)
Observation	530	530	530	530
Number of countries	43	43	43	43
Wald Chi-Square	334.72***	303.04***	314.50***	384.18***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Sargan Test	34.83403	32.37861	29.09434	29.69178
	[0.11]	[0.26]	[0.22]	[0.28]
AB Test	2.9927	3.034	2.1067	2.9989

NB: ***, ** and * indicate statistical significance at 1%, 5% and 10% respectively.
Standard error in parenthesis.

The results of the interactive terms for all the regions are statistically significant. In terms of the regional dummies, the results reveal positive significant impact for Southern and Western regions. While the results show negative significant impact for central region, it shows insignificant impact for Eastern region. This implies that money supply has the tendency to influence economic growth in the Western, Central, and Southern regions. Affirmatively, a percentage point increase in money supply will increase economic growth, approximately by 0.02 percent in West Africa and by 0.006 percent in Southern Africa. A negative coefficient was recorded for Central Africa, which implies that an increase in money supply in this region will decrease economic growth by 0.038 percent point.

The diagnostic test results for the Wald Chi square indicate that, the entire estimated models are in good fit because, the results are significant for all the models. The Sargan test results for all the models are not statistically significant based on the p-values, which indicate that the validity of over identifying restriction cannot be rejected. Equally, the Arellano-Bond (AB) test for autocorrelation shows that there is no evidence of high order correlation in all the regressions.

5.0 Concluding Remarks

Good economic performance is a major desire of any nation because it does not attract only capital inflow, expertise, and foreign investment, but also improves the well-being of the citizens in the concerned country. The economic performance of any nation or region depends on many factors in which monetary policy is inclusive. This study examined the importance of monetary policy in achieving economic performance. In achieving this objective, economic performance was proxy by economic growth, foreign direct investment, and gross domestic savings. The study revealed that monetary policy is an important factor in the determination of economic performance in sub-Saharan African countries. It is therefore, recommended that sub-Saharan African countries should effectively employed monetary policy, using appropriate transmission channels, to achieve sustainable growth, attract foreign investment, and encourage domestic savings so as to improve overall performance of their economies.

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