

## PUBLIC SECTOR EXPENDITURE AND ECONOMIC GROWTH: EVIDENCE FROM SUB-SAHARAN AFRICAN COUNTRIES BY

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### **Abstract**

This study examined the influence of public sector expenditure on economic growth in Sub-Saharan Africa between 2000 and 2023, using panel ARDL technique. A relationship was established between government expenditure and economic growth within the period of study. In the short-run, government expenditures on health and public debt servicing have negative but significant influence on the economy, while government expenditures on education and defence have insignificant influence on the economy. However, in the long-run, government expenditure on education is positively insignificant. Government expenditures on health and defence have positive significance influence on economic growth (RGDP). Panel granger causality demonstrated a two-way relationship between government expenditure on education and economic growth. In addition, only RGDP granger caused government expenditure on defence and public debt servicing. Therefore, the study recommends that government should increase investments on education in order to enhance workforce productivity and economic performance in Sub-Saharan Africa.

**Keywords:** Public sector expenditure, economic growth, Sub-Saharan Africa, Panel Unit Root Test, Panel Autoregressive distributed lag.

### **1.0 Introduction**

The growth of nations of the world depends on public sector expenditure, which is a driver of economic growth (Keynes, 1936). Public sector expenditure involves government's intervention to influence growth and for the stability of the economy (Kolapo, Azeez, Mokuolu, Oluwaleye, & Alabi, 2021). Both developing and developed countries make use of public sector expenditure to redistribute income and to influence the economic growth to ease the lives of the citizens (Assi, Dimson, Goodman, and Andersen, 2019; Vtyurina, 2020; Aluthge, Jibir, & Abdu, 2021). In developing countries, there are disparities in public sector expenditure which is not

only anticipated to guarantee stability, but also to expand the economy and intensify job opportunities (World Bank, 2015; Aluthge *et al*, 2021).

Public sector expenditure remains an avenue for government in Sub-Saharan Africa (SSA) countries to invest resources to uphold contracts, preserve national security, prevent crimes and provide valuable public goods in order to ensure that markets function adequately to shoot up economic output (Girma, 2023). Meanwhile, most of the government expenditures are funded by the tax revenues collected by the government (Guandong & Muturi, 2016; Poku, Opoku & Ennin, 2022).

Public expenditure increased remarkably in the 20<sup>th</sup> century, as governments across the world have started spending more funds on universal education, universal healthcare and healthcare facilities, as well as on social protection. Government spending in developing countries is accounting for between 15% and 30% of its GDP, which is lesser than expenditure in developed countries (Corporate Financial Institution, 2024). However, general government final consumption (% of GDP) in Sub-Saharan Africa ranged from 18.5% to 15.7% between 1990 and 2023, which resulted in a reduction in government expenditure in the latter year (World Bank Group, 2023).

Economic growth is utilized to identify the growth attained socially and economically by different countries in the World. Economic growth especially in Sub-Saharan Africa can only be facilitated and promoted by the availability and the development of social and economic activities by enhancing public sector expenditure (Fidelis, Obasanmi & Igbata, 2014).

The countries in SSA have witnessed high rate of economic growth recently, but this growth did not aggregate to reduce mass poverty and extreme hunger in the region as indicated that almost 462 million in Sub-Saharan Africa (SSA) were living in abject poverty in 2023 (Global Multidimensional Poverty Index, 2023). Poverty, unemployment, extreme hunger and hardship are the reasons for the various mischiefs in developing countries especially in SSA (Owusu-Mensah, Manu, & Arhenful, 2023). Wagner (1883) found that higher government expenditure is a spontaneous consequence of rising GDP, which is applicable to the economies in SSA (Rahman, Nath, Siddqu & Hossain, 2023).

Some research questions raised in this study are as follows: What is the relationship between public sector expenditure and economic growth in SSA? What is the influence of public sector expenditure on economic growth in Sub-Saharan African countries? What is the causal relationship between public sector expenditure and economic growth in the Sub-Saharan African countries? Hence, the broad objective of the study is to examine the relationship between public sector expenditure and economic growth in Sub-Saharan African countries from 2000 to 2023. Also, the study is to examine the influence of public sector expenditure on economic growth in Sub-Saharan African countries. The study is to investigate the causal relationship between public sector expenditure and economic growth in the Sub-Saharan African countries, using panel granger causality test.

## **2.0 Literature Review**

### **2.1 Theoretical Literature**

#### **Keynesian Theory of Public Expenditure**

According to Keynes, public expenditure can contribute positively to economic growth. He believed that an increase in savings will never help the economy but spending or

investing it. He believed the role of the government to be crucial as it can avoid depression by increasing aggregate demand and therefore, switching on the economy gain by the multiplier effect (Keynes, 1936). But critics attacked Keynes for promoting deficit spending, discouraging private investment and causing inflation (Chen, 2024). Based on Keynes' view, national income has four (4) components in an open economy, including consumption expenditure (C), investment expenditure (I), government expenditure (G) and net export (Export – Import).

## 2.2 Empirical Review

[Nwude, Nwaeze, and Nwude \(2023\)](#) examined the impacts of government expenditure on economic growth of Nigeria from 1981 and 2020, using Johansen cointegration test and Vector Error Correction Model. The study revealed that expenditure on education had short and long-run positive significant impacts on economic growth. In addition, expenditure on health and agriculture had positive and significant impacts, while pensions/gratuities and public debt servicing had negative and insignificant impacts on economic growth in the long run. From Johansen cointegration analysis, a long-run relationship was established between the dependent and independent variables. In contrary, [Girma \(2023\)](#) examined the correlation between government spending and economic growth in Ethiopia between 1980 and 2018, using Johansen cointegration test and the vector error correction model (VECM). Findings showed that government spending on education impacted economic growth both in long and short terms, but government expenditure on agriculture influenced economic growth in the long-run, whereas the effects were negative but significant in short-term. However, defense spending by the government showed a positive and insignificant effect on economic growth in both terms, whereas spending on health revealed a positive and significant impact on economic growth in both short and long terms.

[Michael and Kenneth \(2023\)](#) investigated the impacts of government consumption on economic growth in Tanzania between the period of 1967 and 2020, using Autoregressive Distributed Lag (ARDL) bounds cointegration and Granger causality test. Findings revealed a small but statistically significant positive long-run effect of government size on economic growth. The pairwise Granger causality test rejected the null hypothesis of no unidirectional or bidirectional causality between the government size and economic growth. Findings showed that the effect of private investment on economic growth was positive but insignificant. In addition, [Buthelezi \(2023\)](#) investigated the impacts of long-run government expenditure and economic growth in different South African States between 1994 and 2021, using Vector-error correction (VEC) and Markov-switching dynamic regression. Findings showed that more government expenditure in South Africa has not amounted to the nation's economic growth which is contradictory to the view of Keynes. In addition, government spending shocks were exhibited to be detrimental to economic growth among the States.

[Sinha and Mbulawa \(2023\)](#) examined the relationship between government expenditure on health and economic growth in Botswana, using Johansen cointegration approach. The findings showed that total health expenditure and recurrent health expenditure had a cointegration relationship with economic growth, while no cointegration was established between development health and economic growth. Thus, the study revealed that Error Correction Model (ECM) confirmed a weak cointegration between the variables.

Meanwhile, Akujuobi and Tony-Okolo (2023) examined the effect of government expenditure on economic growth in Nigeria between 1981 and 2021, using ARDL model. Findings showed that government health expenditure has positive relationship with GDP in the short-run. In the long-run, government expenditure on education has a negative significant effect on GDP while health expenditure had a positive significant effect on GDP.

Chindengwike (2023) examined the relationship between public expenditure and economic development in Sub-Saharan African nations from 1970 to 2021, using Vector Error Correction Model (VECM) and Granger Causality approach. The findings showed that government expenditure had a negative impact on economic development in both short and long-run within the period of study. Also, a bidirectional causality was established between economic development and government spending. But then Sulemana and Aloysius (2023) examined the impact of public sector spending and governance on economic growth among 31 selected Sub-Saharan Africa (SSA) countries between 2002 and 2020, using Panel Corrected Standard Errors (PCSE) estimator and Dumitrescu and Hurlin (2012) Panel Non-causality test. Findings showed that spending in the public sectors alone, such as education and health, did not always yield the needed outcome for enhancing economic growth. It was revealed that Government education expenditure stimulated economic growth in SSA, although the effect was statistically insignificant, whereas government health expenditure has a growth-limiting effect in SSA.

Poku, Opoku, and Ennin (2022) examined the relationship between public sector expenditure and economic growth in Ghana between 1970 and 2016, using Autoregressive Distributed Lag (ARDL) estimation technique. The study indicated that government expenditure had a positive relationship with economic growth in the short-run. Also, gross capital formation and foreign direct investment revealed a significant positive relationship with economic growth in both short and long-run, but population growth had a significant negative relationship with economic growth in Ghana. In contrary, Mose (2022) examined the role of public expenditure on economic growth in Kenya between 2013 – 2017, using ARDL and ECM estimation techniques. Findings revealed that spending on recurrent expenditure exhibited a positive and significant effect on economic growth both in short and long-run, which confirmed Keynesian theory, but the effect of capital expenditure on economic growth was insignificant during the period of study.

Yerim, Nymphas, Sani, Auta, Amos, and Abwage (2022) assessed the impact of government expenditure on economic growth in Nigeria between 1986 and 2020. By using Structural Vector Autoregression (SVAR) model and the Pairwise Granger causality test, the findings showed that government expenditure on health and education had an insignificant impact on the economic growth in Nigeria. In addition, Umeh, Ezudike and Anyaegbunam (2022) examined the impact of the government expenditure on economic growth in Nigeria from 1981 to 2019, using Error correction model and Granger causality test. Findings showed that government expenditure has just 24% positive and insignificant impact on economic growth in Nigeria, and there was a mutual cause-effect relationship between government expenditure and economic growth with the study. With reference to Yerim et al (2022) and Umeh et al (2022), Chandana, Adamu, and Musa (2021) investigated the impact of Nigerian government expenditure

(disaggregated into capital and recurrent) on economic growth from 1970 to 2019, using Autoregressive Distributed Lag (ARDL) model and the co-integration analysis. Findings showed that capital expenditure had positive and significant impact on economic growth both in short run and long-run while recurrent expenditure did not have significant impact on economic growth both in the short run and long-run.

Wondimagegne (2021) examined the association between government spending and the economy in Ethiopia, using data from 1975 to 2019. The study utilized panel data regression and Granger causality test. Findings showed that the government of Ethiopia had been spending relatively more on the education sector followed by agriculture, health, and defense sectors sequentially. It was revealed that government spending on education and health sectors had a statistically significant and positive relationship with the economic growth of Ethiopia whereas, public expenditure on agriculture and defense had a positive but insignificant association with the GDP of the country. The study also had a bidirectional causal relationship between GDP and expenditure in an Ethiopian economy, supporting both the Keynesian theory and Wagner's law. In contrary, Samuel and Oruta (2021) examined the effects of various components of government expenditures on the Nigerian economy between 1981 and 2020, using Error correction model and Granger causality technique. Findings showed that the components of government expenditures had insignificant impact on economic growth in the short-run of the study. It was indicated that government capital expenditures on social services were having a negative and significant impact on the economic growth, while government expenditures on economic services indicated a positive and insignificant impact on economic growth in Nigeria within the period of study.

Kolapo, Azeez, Mokuolu, Oluwaleye, and Alabi (2021) investigated the impact of government expenditure on economic growth with special preference to test the Wagner's law in Sub-Saharan Africa between 1986 and 2018, adopting the panel first generation tests, the panel autoregressive distributed lag (ARDL) and pairwise causality techniques. It was revealed that government expenditure caused economic growth rendering the Wagner's law invalid in the Sub-Saharan region. The findings discovered that capital and recurrent expenditure exerted negative effect on economic growth while total expenditure had positive effect on economic growth in the region.

**3.0 Model Specification**

The theoretical review of this study was integrating into Keynesian theory of public expenditure as considered on some social and economic expenditure variables. The model was modified from the work of Girma (2023) into equation 3.1 below:

**Model one:** This model examined the relationship between government expenditure and economic growth in SSA.

$$RGDP_{it} = f(GEXEDU_{it}, GEXHLT_{it}, GEXDEF_{it}, GEXPDS_{it}) \dots\dots\dots 3.1$$

Where;

- RGDP = real gross domestic product
- GEXEDU = government expenditure on education
- GEXHLT = government expenditure on health
- GEXDEF = government expenditure on defence
- GEXPDS = government expenditure on public debt servicing
- i = Cross-sectional series (1 – 16)
- t = Time series (2000 – 2023)

The explicit econometric model of equation 1 was formulated as thus;

$$\ln RGDP_{it} = \beta_0 + \beta_1 GEXEDU_{it} + \beta_2 GEXHLT_{it} + \beta_3 GEXDEF_{it} + \beta_4 GEXPDS_{it} + v_{it} \dots 3.2$$

Where:

- $\beta_1, \beta_2, \beta_3, \beta_4$  = estimation parameters
- $u_{it}$  = error term
- $\ln$  = natural logarithm
- $V_{it}$  = error term

## 4.0 Results

### 4.1. Descriptive Statistics

**Table 4.1:** Descriptive statistics of variables in selected SSA countries from 2000 - 2023.

Variable	Mean	Std. Dev.	Max.	Min.	Skewness	Kurtosis	Jarque - Bera	P-value
RGDP (\$Billion)	43.81	98.70	570.0	0.490	3.252	12.77	3170.073	0.000
GEXEDU	15.94	5.361	35.01	2.877	0.211	3.792	18.50747	0.000
GEXHLT	6.985	3.070	17.51	0.734	0.757	3.372	55.91665	0.000
GEXDEF	6.639	4.555	32.96	0.495	1.980	9.136	1226.657	0.000
GEXPDS	3.558	5.433	46.34	0.166	3.982	23.08	10735.11	0.000

Source: Authors' computation, 2024.

Table 4.1 indicated that the real GDP has a mean of \$43.81 billion with a substantial standard deviation of 98.70, reflecting significant economic inequalities among SSA countries. Government expenditure on education has an average mean of 15.94% with a standard deviation of 5.361%. For government health expenditure, the average mean is 6.985%, with a standard deviation of 3.070. Furthermore, government expenditure on defence in SSA during the period showed an average mean of 6.639% with a standard deviation of 4.555, underlining a substantial variation in defence spending. Expenditure on debt servicing has a mean of 3.558% of GNI, with a high standard deviation of 5.433. The skewness has positive values for all the variables. Also, the kurtosis has positive values although, which include platokurtic, mesokurtic and leptokurtic in nature. The Jarque-Bera has p-values less than 5% level of significance, showing that none of the variables are normally distributed in the data distribution.

## 4.2 Unit Root Test

**Table 4.2** : Summary of the panel unit root test results at level I(0) and first difference I(1).

Variable	Common unit root		Individual unit root			Order of integration
	LLC	BRG	IPS	ADF	PP	
$\ln RGDP_{it}$	-13.10***	-8.331**	-12.39***	217.0***	254.0***	I(1)
$GEFF_{it}$	-1.956**	-2.584***	-2.967***	77.74***	87.15***	I(0)
$GEXEDU_{it}$	-18.34***	-11.55***	-19.06***	342.9***	1070.6***	I(1)
$GEFF_{it}$	-0.733	-4.824***	-0.861	62.22*	71.58**	I(0)
$GEXHLT_{it}$	-18.82***	-7.413***	-17.83***	367.6***	1415.2***	I(1)
$GEFF_{it}$	-8.875***	1.691	-6.332***	142.5***	110.9***	I(0)
$GEXDEF_{it}$	-16.15***	-4.266***	-16.78***	298.0***	1053.4***	I(1)
$GEFF_{it}$	-4.567***	-0.341	-3.310***	86.55***	91.79***	I(0)
$GEXPDS_{it}$	-15.37***	-7.415***	-18.32***	331.6***	1942.2***	I(1)

Note : \*\*\*p<1% \*\*p<5% \*p<10%

Source: Authors' computation, 2024.

Table 4.2 showed that  $\ln(RGDP)$  is not stationary at level. However, after differencing, all tests indicated its significance at 1% level, implying that  $RGDP$  is stationary at 1<sup>st</sup> difference, I(1). Both at level and first difference, government expenditure education on ( $GEXEDU$ ) showed statistical significance, indicating that the variable is mostly stationary at levels. Government health expenditure ( $GEXHLT$ ) after first differencing, showed strong stationarity across all tests, indicating that health expenditure is integrated of order one, I(1). Government expenditure on defence ( $GEXDEF$ ) is largely non-stationary at levels, having mixed results across. However, the first differencing showed high significant level across all tests, which indicated that expenditure on defence achieves stationarity after differencing. For Government Expenditure on Debt Servicing ( $GEXPDS$ ), it was having stationarity after the first difference, I(1). Government effectiveness ( $GEFF$ ) showed no stationarity at levels, I(0). But after first differencing, it became strongly stationary, I(1) across all the tests. However, all variables became stationary after differencing, indicating that these variables are integrated of order one, I(1). Therefore, it was concluded from the results that most variables here are non-stationary at levels but become stationary after first difference, making them integrated of order one, (I(1)), which supports the appropriate use of ARDL technique.

### 4.3 Panel ARDL (Autoregressive Distributed Lag) estimates

**Table 4.3:** Pooled Mean -Group (PMG) estimates between government expenditure and economic growth

Independent Variables	Coefficient	Std. Error	t-Stat.	Prob.
Long -run (pooled) estimates				
GEXEDU <sub>it</sub>	0.012	0.018	0.633	0.527
GEXHLT <sub>it</sub>	0.196	0.043	4.610	0.000***
GEXDEF <sub>it</sub>	0.053	0.025	2.084	0.038**
GEXPDS <sub>it</sub>	-0.075	0.022	-3.342	0.001***
Short -run (mean group) estimates				
$\alpha$ GEXEDU <sub>it</sub> )	0.002	0.003	0.690	0.491
$\alpha$ ( , 4 <sub>it</sub> )	-0.012	0.005	-2.559	0.011**
$\alpha$ GEXDEF <sub>it</sub> )	-0.016	0.013	-1.175	0.241
$\alpha$ ( %\$3 <sub>it</sub> )	-0.020	0.011	-1.803	0.072*
Constant	1.596	0.336	4.752	0.000***
Adjustment coefficient estimate				
Ect <sub>t-1</sub>	-0.069	0.015	-4.731	0.000***

Note: \*\*\* p < 1%, \*\* p < 5%, \* p < 10%

Source: Author's computation, 2024.

Findings in Table 4.3 showed that in the short run that government education expenditure (GEXEDU) is positive (0.002) but statistically insignificant. This shows that government expenditure on education does not have a significant effect on economic growth in the region. This finding challenges the Human Capital Theory, which posits that investments in education should enhance workforce productivity and overall economic performance (Schultz, 1961). In the short-run, government health expenditure (GEXHLT) is negative (-0.012) but statistically significant at 5% level of significance. But in the long run, health expenditure turned positive (0.196\*\*\*) and was statistically significant at 1% level of significance, implying that health spending ultimately supports economic growth in the long-run, as aligned with Bloom and Canning (2000).

Government expenditure on defence (GEXDEF) is negative (-0.016) and statistically insignificant in the short run, passing wrong signal to the economic growth. But in the long run, however, GEXDEF is positive (0.053) and statistically significant at the 5% level, suggesting that defence spending has a positive effect on growth over time. This finding aligns with the positive role of stability and security, supporting economic growth as proposed by FitzGerald (2000). Government expenditure on debt servicing (GEXPDS) in the short-run is negative (-0.020\*) but statistically significant at the 10% level, indicating that higher debt servicing costs can constrain economic growth in the short term. In the long run, the negative effect persists with coefficient of -0.075 but is statistically significant at the 1% level. This submission aligns with Krugman, (1988).

The error correction term (ECT) has a coefficient of -0.069 and the p-value (0.000\*\*\*) which is less than 5% level of significance, showing a long-run causality between the independent variable and the dependent variables. ECT is capable of correcting any deviation of the short-run dynamics to its long-run equilibrium at a speed of 6.9%. Therefore, the variables are cointegrated.

**4.4 Panel Granger causality test**

Table 4.4: Panel Granger causality test result based on Stacked (common coefficient), Dumitrescu Hurlin (individual coefficient), and the panel VAR model.

No	Null Hypothesis	Stacked	D-H	PVAR	Decision
1	GEXEDU does not Granger Cause RGDP	0.305	5.339**	1.065	Bicausality
2	RGDP does not Granger Cause GEXEDU	3.043	4.162	8.388**	
3	GEXHLT does not Granger Cause RGDP	0.168	3.881	0.412	No -causality
4	RGDP does not Granger Cause GEXHLT	0.466	4.633	1.117	
5	GEXDEF does not Granger Cause RGDP	0.292	3.986	1.074	Unicausality
6	RGDP does not Granger Cause GEXDEF	4.220	6.968***	11.53***	
7	GEXPDS does not Granger Cause RGDP	0.698	4.462	1.872	Unicausality
8	RGDP does not Granger Cause GEXPDS	2.781	5.478***	8.474**	

Note: \*\*\*p<1% \*\*p<5% \*p<10%

Source: Authors' computation, 2024.

Table 4.4 displayed the panel granger causality results in Sub-Saharan Africa. The results from the table exhibited the establishment of bidirectional causality between government expenditure on education and economic growth in the region within the period of study. Unidirectional causality was established between government expenditure on defence and economic growth, and between government expenditure on debt servicing and economic growth. However, only RGDP granger caused both expenditure on defence and debt servicing. No causality between government expenditure on health and economic growth.

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**5.0 Conclusion**

The paper examined the influence of government expenditure on economic growth in Sub-Saharan Africa between 2000 and 2023, using panel ARDL technique. Findings showed that a long-run relationship was established between government expenditure

In the short-run, government expenditures on health and public debt servicing have negative significant influence on the economy, while government expenditures on education and defence have insignificant influence on the economy. However, in the long-run, government expenditure on education is positively insignificant. Government expenditures on health and defence have positive significance influence on RGDP, but in case of government public debt servicing, it has negative significance influence on the economy in SSA. Panel granger causality demonstrated a two-way relationship between government expenditure on education and economic growth. In addition, only RGDP granger caused government expenditure on defence and public debt servicing. Therefore, government should encourage collaboration with private sector or NGOs to improve health for all in order to have positive significant influence on the economy of SSA.

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