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Public Sector Expenditure on Economic Growth in South Sudan

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Abstract

The topic of this study was public sector expenditure on economic growth in South Sudan, the objectives of the study were: to examine the influence of education expenditure on economic growth, to evaluate the relationship between health expenditure and economic growth and to assess the relationship between agriculture expenditure and economic growth. South Sudan's economy remains heavily dependent on government spending and external trade, with gross domestic product (GDP) growth being the key indicator of economic performance (Lual et al., 2022). The study was an explanatory research design, this study adopted a quantitative research design, specifically an explanatory and correlational design, because it sought to examine the relationship and influence of different categories of public sector expenditure on economic growth. This study examined the relationship between public sector expenditure on education, health, and agriculture and economic growth (measured by GDP) in South Sudan from 2012 to 2025. The findings revealed a very strong and statistically significant positive correlation between GDP and both educational expenditure ($r = 0.924$, $p < 0.001$) and health expenditure ($r = 0.918$, $p < 0.001$). These two sectors also showed a very high correlation with each other ($r = 0.967$, $p < 0.001$), indicating that government spending on education and health tends to move together in response to changes in economic performance. In contrast, agriculture expenditure exhibited only weak and statistically non-significant correlations with GDP ($r = 0.155$, $p = 0.306$), education ($r = 0.209$, $p = 0.247$), and health ($r = 0.212$, $p = 0.243$).

Keywords

Public Sector Expenditure, Economic Growth, GDP, Education Expenditure, Health Expenditure, Agriculture Expenditure, South Sudan

1. Introduction

1.1. Public Sector Expenditure on Economic Growth

South Sudan's economy remains heavily dependent on government spending and external trade, with gross domestic product (GDP) growth being the key indicator of economic performance (Lual et al., 2022). In the fiscal year 2011/2012, government expenditure accounted for over 30% of GDP. However, this trend quickly shifted due to internal conflict that erupted in December 2013, leading to a sharp contraction in economic activities and disruption of oil production (Furlan, et al., 2023). As a result, public expenditure fell considerably both in absolute terms and as a share of GDP. By 2015, expenditure had dropped to approximately 15%–20% of GDP, reflecting a constrained fiscal space amid rising security and humanitarian needs (Fadol, 2024). Public sector expenditure, particularly in areas such as; health, education, and security, plays a central role in shaping the economic environment. In South Sudan, government spending is primarily funded by oil revenues, which exposes the economy to global oil price volatility (Nashir, Hungwe, & Guemou, 2024). High levels of military spending, corruption, and weak public financial management have often diverted resources from essential developmental sectors. Consequently, inefficient public expenditure patterns have stifled inclusive growth and deepened poverty across the country (Ahmed, 2024). In attempt to salvage the economic challenges that South Sudan faces the government initiated several trade policies like being member of East African community, IGAD, and also have a trading agreement with neighboring Uganda, Kenya and Sudan. South Sudan government expenditure has increased its expenditure ever since the creating of the state in 2011.

1.2. Statement of the Problem

The public sector expenditure in South Sudan has been increasing since the Comprehensive Peace Agreement (CPA), reaching levels that are quite in excess of those of its East African neighbors (Nyang Both, 2023). The approved budget surged from United States dollars 26,101,800 in 2006 to USD 4.92 million after independence in 2011, almost a twofold increase, while The total proposed expenditure for the fiscal year 2023/2024 was projected to be $16,408,611,199.48 USD., with a budget of $3,503,719,319.63 USD allocated for wages and salaries of civil servants and the army, the vast oil resources that fund almost entirely these expenditures have allowed the newly born South Sudan to sustain public sector expenditures of more than US$ 300 per person a figure that is much higher than its neighbors (Jacobson et al., 2022). Though the public sector of South Sudan is being largely financed by donors and oil proceeds the country continues to face volatile economic growth coupled by high poverty rates of over 80%, this coupled with wide spread insecurity and minimum structural transformation, unemployment rate for 2023 was 12.27%, a 0.12% decline from 2022. South Sudan unemployment rate for 2022 was 12.40%, a 1.47% decline from 2021, South Sudan recorded a trade deficit of 7240.30 SSP Million in 2021 (Raies, 2023). this study there-

fore intends to investigate into Public sector expenditure on economic growth in south Sudan.

1.3. Objectives of the Study

1) To examine the influence of education expenditure on economic growth.

2) To evaluate the relationship between health expenditure and economic growth.

3) To assess the relationship between agriculture expenditure and economic growth.

1.4. Hypothesis

$H0_1$: There is no significant relationship between education expenditure and economic growth.

$H0_2$: There is no significant relationship between health expenditure and economic growth.

$H0_3$: There is no significant relationship between agriculture expenditure and economic growth.

1.4.1. Content Scope

This study included: influence of education expenditure on economic growth, relationship between health expenditure and agriculture expenditure on economic growth.

1.4.2. Geographical Scope

The study was conducted in South Sudan.

1.4.3. Time Scope

For data analysis the researcher considered data from 2013 to 2024, because South Sudan got independence in 2011 so the researcher considered that period when the ministries were now operating, while for the sake of having updated literature the researcher considered literature which are with in the period of 5 years.

2. Literature Review

2.1. Theoretical Framework

Keynesian Economic Theory, developed by John Maynard Keynes, emphasizes the critical role of government intervention, particularly through fiscal policy, in stabilizing and stimulating economic activity. In the context of trade policies and public sector expenditure on the economy of South Sudan, the Keynesian perspective underscores the importance of using government spending and trade regulations to influence aggregate demand, employment, and economic growth. South Sudan, as a developing and post-conflict nation, faces significant economic volatility, infrastructural deficits, and limited industrial capacity. According to Keynesian principles, increased public sector expenditure particularly in infrastructure, health, and education can inject much-needed demand into the econ-

omy, stimulate production, and create employment, thereby fostering economic stability and long-term development. Moreover, trade policies aligned with Keynesian thought would seek to protect nascent domestic industries through tariffs, import restrictions, or subsidies, encouraging local production and reducing dependence on volatile external markets. In South Sudan, where reliance on oil exports and imported goods creates vulnerability to global price shocks and trade imbalances, prudent trade policies can help stabilize the economy and support local enterprises. Keynesians argue that during times of economic downturn or underdevelopment, the government should not prioritize balanced budgets but rather focus on stimulating demand through targeted spending and supportive trade measures. Thus, applying Keynesian economic theory to South Sudan's context suggests that strategic public expenditure and carefully designed trade policies can play a pivotal role in addressing economic challenges, promoting diversification, and accelerating sustainable development.

Keynesian Economic Theory is adopted as the guiding theoretical framework for this study. According to Keynesian economics, government fiscal activities particularly public expenditure play a crucial role in influencing macroeconomic outcomes such as output, employment, and investment. In the context of South Sudan, where the economy is recovering from prolonged conflict and instability, public sector expenditure can be a vital tool for stimulating aggregate demand and promoting economic growth, Study Area,

Simultaneously, trade policies such as tariffs, import/export restrictions, and exchange rate management significantly affect the country's openness to trade and its ability to engage in global markets. Thus, this study assesses how these two economic instruments fiscal policy (expenditure) and trade policy interact to shape economic performance.

2.2. Conceptual Frame Work

Figure 1 above presents the model suggests those expansionary trade policies like; protectionist measures, export incentives and increased government spending contribute to higher aggregate demand and greater domestic production, which in turn lead to improved economic performance. In the short term, these policies create jobs and increase consumption, while in the long term they can stimulate industrial growth and economic diversification both critical for a fragile economy like South Sudan.

2.3. Empirical Literature Review

This section presents discussion of literature review in line with study objectives.

2.3.1. Trade Policies on Economic Performance

Over the past decades, international trade has affected the economic interests of individual segments of the population and entire countries, interests that are intertwined in the most complex manner and conflict with each other. This determines the need for a targeted impact of the government on trade relations with

other countries through tariffs and non-tariff regulatory methods. The general trend in the development of foreign trade policy is a weakening of protectionism and a promotion of liberalization, especially within the framework of integration associations (Aziz & Abid, 2025).

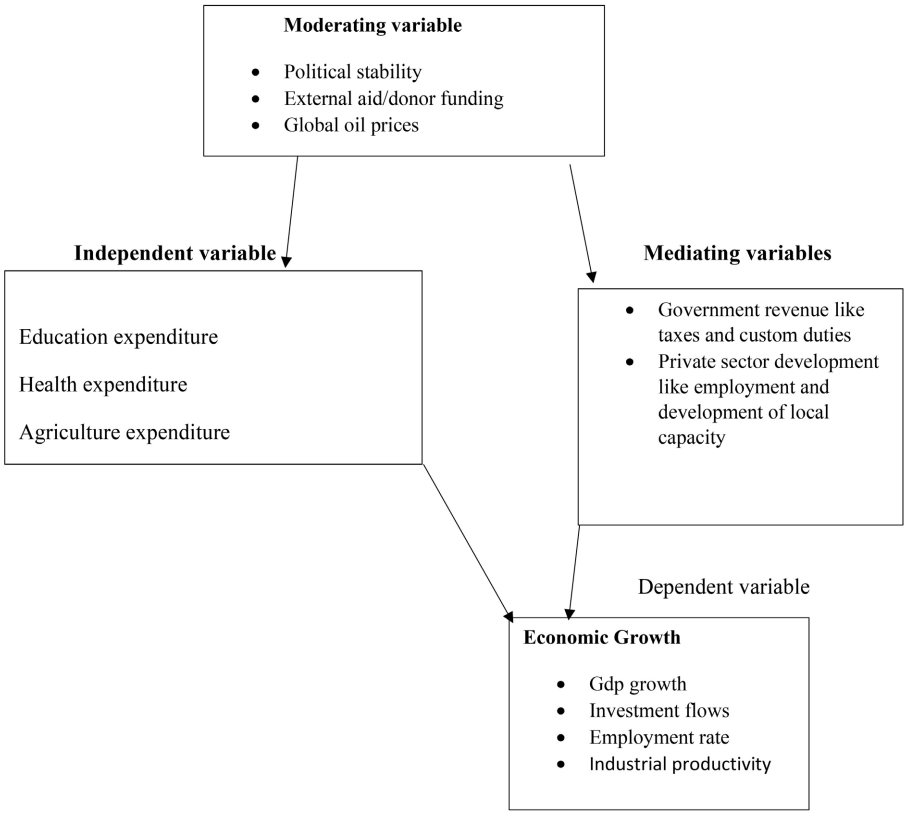

Figure 1. Conceptual frame work.

Tariffs impact both businesses and consumers in several ways. For domestic industries, tariffs act as a protective measure against foreign competition, helping local companies maintain or grow their market share. However, this protection can lead to higher prices for imported goods. When tariffs are placed on imports, the added costs are often passed on to consumers, making imported products more expensive. This can reduce consumer choice and raise overall expenses for buyers who rely on foreign goods (Erixon et al., 2024).

2.3.2. Government Expenditure and Economic Growth

There have been numbers of published studies trying to find the relationship between government expenditure and economic growth in developing and developed countries. These studies have used different theories in specifying the model as well as different research methods, and the result showed that the effect of government expenditure on economic growth can run either negative or positive ways, similar to the economic theories which show two different positions of government expenditure on economic development (Borowicz & Daugėlienė, 2023).

Using pooled time-series and cross-section data for 33 countries in Sub-Saharan Africa for the period 1970-1990 produced evidence that points towards the existence of a negative relationship between government consumption and economic growth. On the same sample region, the relationship of government spending and economic growth in 26 sub-Saharan Africa countries. He developed the model on the basis of neoclassical production function. By using panel data from 1987 to 1997 period and employing both the fixed effect and random effect techniques, he found a different result with Ghura (1995) which suggest that the government spending on capital formation has the expected positive and significant effect on economic growth (Tshimpaka, 2024). Classical and neoclassical economists argue that excessive government spending can lead to inefficiencies, crowding out private investment, and higher taxation, which may hinder economic growth, government expenditure increases due to rising demands for public goods and services. Productive expenditures contribute to long-term growth, while non-productive expenditures may not yield significant economic benefits. (Kaliske, 2024).

2.3.3. Economic Growth

In developed economies such as the United States, the Gross Domestic Product (GDP) growth rate reflects the pace of economic expansion over a specific period. For instance, in the period from 2016 to 2020, the United States experienced a varying GDP growth rate, ranging from 2.9% in 2018 to a decline of −3.5% in 2020 due to the economic impacts of the COVID-19 pandemic (Safi et al., 2024).

Solow (1956) in his neo-classical growth model viewed that there is no long run impact of government expenditures on the economic growth rate (Barro,1990) in his endogenous growth model argues that GDP growth is negatively related to the government consumption expenditure.

The relationship between FDI and economic growth has been widely studied, with evidence suggesting that FDI contributes to capital accumulation, infrastructure development, and increased competition in host economies (Fazaalloh, 2024). In Africa, FDI is seen as a vital tool for bridging investment gaps in critical sectors such as manufacturing, infrastructure, and technology. Countries with stable political and economic environments tend to attract more FDI, leading to long-term benefits for economic growth (Emeka, 2024).

3. Methodology

3.1. Research Design

The study will be an explanatory research design, this study adopts a quantitative research design, specifically an explanatory and correlational design, because it seeks to examine the relationship and influence of different categories of public sector expenditure on economic growth. The explanatory approach is appropriate since the study aims to explain how variations in government spending on key sectors such as education, health, and agriculture affect economic growth. The correlational design enables the researcher to determine the magnitude and direc-

tion of relationships between the independent variables and the dependent variable (economic growth). The study further employs a time-series research design using secondary macroeconomic data over a specified period of years. The research utilizes secondary data obtained from credible national and international sources such as the Ministry of Finance, Planning and Economic Development, the World Bank, the International Monetary Fund (IMF), and national statistical bureaus.

3.2. Data Sources and Collection Methods

This study will rely on secondary data collected from credible sources and it will rely only on data from World Bank Development Indicators (WDI), specifically covering the period from 2013 to 2024, this is because South Sudan is a relatively new country that gained independence on July 9, 2011.

3.3. Data Analysis Techniques

The following will be the data collection and preparation steps.

Step 1: Identify data sources

Trade policies indicators (TPO):

The relevant data for this will be tariff rates, export regulations, trade incentives, trade openness (World Bank, WTO, IMF, UNCTAD).

Public expenditure (GEX)

The data here will include; government spending on infrastructure, health, education, defence, etc. (South Sudan Ministry of Finance, IMF, World Bank).

Economic performance (GDPt)

GDP growth rate, domestic production, employment levels, inflation (World Bank WDI, IMF WEO, African Development Bank).

Step 5: Model Specification and Estimation

3.4. Econometric Model Specification

To examine the relationship between public sector expenditure and economic growth in South Sudan, the study adopts an econometric regression model. The model is designed to estimate the influence of government expenditure on key sectors education, health, and agriculture on economic growth.

The general functional relationship between the variables can be expressed as:

$$EG = f\left(EDU, HEA, AGR\right)$$

where:

EG = Economic Growth;

EDU = Government Expenditure on Education;

HEA = Government Expenditure on Health;

AGR = Government Expenditure on Agriculture.

To make the relationship suitable for empirical estimation, the functional model is transformed into a linear regression model as follows:

$$EG_t = \beta_0 + \beta_1 EDU_t + \beta_2 HEA_t + \beta_3 AGR_t + \varepsilon_t$$

where:

EG_t = Economic growth at time t (usually measured by GDP growth rate or real GDP);

β_0 = Constant term (intercept);

β_1, β_2, β_3 = Coefficients measuring the effect of each type of public expenditure on economic growth;

EDU_t = Education expenditure at time t;

HEA_t = Health expenditure at time t;

AGR_t = Agriculture expenditure at time t;

ε_t = Error term capturing other factors affecting economic growth not included in the model;

t = Time period (year).

Individual Objective Models

To address each study objective, the following sub-models can be specified:

Objective 1: To examine the influence of education expenditure on economic growth

$$EG_t = \beta_0 + \beta_1 EDU_t + \varepsilon_t$$

Objective 2: To evaluate the relationship between health expenditure and economic growth

$$EG_t = \beta_0 + \beta_2 HEA_t + \varepsilon_t$$

Objective 3: To assess the relationship between agriculture expenditure and economic growth

$$EG_t = \beta_0 + \beta_3 AGR_t + \varepsilon_t$$

3.5. Description of Variables

Table 1. Description of variables.

Variable	Description	Measurement
Economic Growth (EG)	Growth of the national economy	GDP growth rate or Real GDP
Education Expenditure (EDU)	Government spending on education sector	Percentage of GDP or total government expenditure
Health Expenditure (HEA)	Government spending on health sector	Percentage of GDP or total government expenditure
Agriculture Expenditure (AGR)	Government spending on agriculture sector	Percentage of GDP or total government expenditure

Table 1 above presents the description of variables and the variables include Economic growth, Education Expenditure, Health Expenditure and Agriculture Expenditure.

3.6. A Priori Expectations

Table 2. A priori expectations.

Variable	Expected Sign	Explanation
EDU	$\beta_1 > 0$	Increased education spending improves human capital and productivity
HEA	$\beta_2 > 0$	Improved health enhances labor productivity
AGR	$\beta_3 > 0$	Agriculture spending increases food production and economic activity

Table 2 above presents A priori expectations of the variables.

The model will be estimated using time-series data and analyzed through econometric techniques such as Ordinary Least Squares (OLS) to determine the magnitude and significance of the relationship between public sector expenditure and economic growth in South Sudan.

3.7. Validity and Reliability

To ensure validity, only reliable data sources will be used, and proper econometric tests will be conducted to confirm the robustness of the models. Data reliability will be enhanced by cross-verifying datasets from multiple international databases.

3.8. Ethical Considerations

Since the study uses publicly available secondary data, no direct ethical risks are posed. However, proper citations and referencing will be maintained to uphold academic integrity.

3.9. Limitations of the Study

- Limited availability of consistent time-series data for South Sudan post-2011.
- Possible endogeneity between government spending and GDP.
- External factors (like conflict, donor aid volatility) may confound results.

4. Data Analysis

This section includes data analysis.

4.1. Correlations Analysis of Education, Health and Agriculture on Economic Growth

Table 3 above indicates a Pearson correlation analysis was conducted to examine the relationship between GDP in billions USD and government expenditure on education, health and agriculture in South Sudan from 2012 to 2025 (N =13 Years).

The results revealed a very strong statistically significant positive relationship between GDP and both educational expenditure ($r = 0.924$, $p < 0.001$) and health

expenditure (r = 0.918, $p < 0.001$), this indicates that increases in GDP were strongly associated with higher government spending on education and health. Educational expenditure and health expenditure were very highly correlated with each other (r = 0.967, $p < 0.001$), suggesting that funding for these two social sectors tended to move together over the years.

Table 3. Pearson correlation matrix showing the relationship between South Sudan GDP and public sector expenditure (Education, Health and Agriculture).

		GDP billion	Educational expenditure	Health expenditure	Agriculture expenditure
Pearson Correlation	GDP billion	1.000	0.924	0.918	0.155
	educational expenditure	0.924	1.000	0.967	0.209
	Health expenditure	0.918	0.967	1.000	0.212
	agriculture expenditure	0.155	0.209	0.212	1.000
Sig. (1-tailed)	GDP billion	.	0.000	0.000	0.306
	educational expenditure	0.000	.	0.000	0.247
	Health expenditure	0.000	0.000	.	0.243
	agriculture expenditure	0.306	0.247	0.243	.
N	GDP billion	13	13	13	13
	educational expenditure	13	13	13	13
	Health expenditure	13	13	13	13
	agriculture expenditure	13	13	13	13

Agriculture expenditure showed only week positive correlations with GDP (r = 0.155, $p = 0.306$), educational expenditure (r = 0.209, $p = 0.247$) and health expenditure (r = 0.212, $p = 0.243$). All these correlations were statistically non-significant. This implies that agriculture spending in South Sudan has been largely independent of economic growth and the funding levels of the education and health sectors during the period under review.

These findings suggest that South Sudan government expenditure has been heavily influenced by economic performance in the social sectors (education and health) but not in agriculture. The strong linkage between GDP and education/health spending may reflect the government's tendency to allocate more resources to these sectors when oil revenue increases. However, the persistently weak and non-significant relationship with agriculture expenditure is concerning given that agriculture remains the primary livelihood for over 80% of the population.

The results highlight a structural imbalance in public spending priorities while education and health appear to benefit from economic growth, agriculture a critical sector for food security and poverty reduction has not received proportional attention, this pattern may partly explain the country's continued heavy dependence on food imports and vulnerability to food insecurity despite its vast agriculture potential, the correlation analysis indicates that economic growth in South

Sudan has not translated into balanced sectoral development, particularly in agriculture. Future fiscal policy should aim to strengthen the link between GDP growth and investment in agriculture to achieve more inclusive and sustainable economic development.

Table 4 presents the model summary indicating the strength of GDP and expenditure on Agriculture, Education and Health Expenditure.

Table 4. Model Summary.

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	0.930[a]	0.865	0.820	2.187	0.865	19.167	3	9	0.000

a. Predictors: (Constant), agriculture expenditure, educational expenditure, Health expenditure; b. Dependent Variable: GDP billion.

The findings from Table 4 of regression analysis indicates that there is a very strong relationship between government expenditure components (agriculture, education, and health) and GDP growth. The model produced a high correlation coefficient (R = 0.930), suggesting a strong positive association between the independent variables and GDP growth. The coefficient of determination ($R^2 = 0.865$) implies that more than 86.5% of the variation in GDP growth is explained by expenditures on agriculture, education, and health. This indicates that model has a high explanatory power, after adjusting for the number of predictors, the Adjusted R^2 (0.820) remains high, confirming that the model is not overly inflated and that the included variables meaningfully contribute to explaining GDP growth. The standard error of the estimate (2.187) is relatively low, suggesting that the model's predictions are fairly close to the observed values of GDP growth, indicating good predictive accuracy.

The change statistics also further explains that the reliability of the model, The R^2 change of 0.865 shows that the inclusion of the three expenditure variables significantly improves the model compared to a model with no predictors. The F-statistic (F = 19.167, df1 = 3, df2 = 9) with a significance level ($p = 0.000$) indicates that the overall regression model is statistically significant. This means that, collectively, agriculture, education, and health expenditures have a significant effect on GDP growth.

Table 5. Anova analysis.

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	275.115	3	91.705	19.167	0.000[b]
	Residual	43.062	9	4.785		
	Total	318.177	12			

a. Dependent Variable: GDP billion; b. Predictors: (Constant), agriculture expenditure, educational expenditure, Health expenditure.

Table 5 presents the Analysis of Variance (ANOVA). Results as presented in Table 5 were used to assess the overall significance and fitness of the regression model in explaining variations in GDP growth based on government expenditures in agriculture, education, and health. The findings show that the regression sum of squares (SSR = 275.115) is substantially higher than the residual sum of squares (SSE = 43.062). This indicates that a large proportion of the total variation in GDP growth (Total SS = 318.177) is explained by the model, while only a small portion remains unexplained. This confirms that the independent variables collectively contribute significantly to explaining changes in GDP growth. The F-statistic (F = 19.167) with degrees of freedom ($df_1 = 3$, $df_2 = 9$) is relatively high, indicating that the model provides a better fit than a model with no predictors. Importantly, the significance value ($p = 0.000$) is less than the conventional threshold of 0.05, meaning that the regression model is statistically significant. This implies that at least one of the independent variables (agriculture expenditure, educational expenditure, or health expenditure) has a significant effect on GDP growth. In other words, the model as a whole is meaningful and reliable for explaining the relationship between sectoral government spending and economic growth.

Table 6. Coefficients of variables.

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B		Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Lower Bound	Upper Bound	Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	1.891	1.545		1.224	0.252	−1.605	5.386					
	Educational expenditure	0.034	0.030	0.549	1.141	0.283	−0.033	0.102	0.924	0.355	0.140	0.065	15.391
	Health expenditure	0.095	0.115	0.397	0.824	0.431	−0.165	0.355	0.918	0.265	0.101	0.065	15.413
	Agriculture expenditure	−0.009	0.025	−0.043	−0.347	0.737	−0.065	0.048	0.155	−0.115	−0.043	0.955	1.047

a. Dependent Variable: GDP billion.

Solution

The coefficients of Table 6 provides that the insight into the individual contribution of each independent variable health, education and agriculture to GDP growth while controlling for the effects of other variables in the model. The constant term (B = 1.891, $p = 0.252$) Is not statistically significantly, indicating that when all independent variables are held at zero, the baseline level of GDP growth is not significantly different from zero.

From the study results educational expenditure shows a positive relationship with GDP growth (B = 0.034, β = 0.549), suggesting that an increase in education spending is associated with an increase in GDP growth. However, this relationship is not statistically significant ($p = 0.283 > 0.05$), and its confidence interval (−0.033 to 0.102) includes zero, further confirming the lack of statistical signifi-

cance. Similarly, health expenditure also exhibits a positive effect on GDP growth (B = 0.095, β = 0.397), implying that increased health spending may contribute to economic growth. Nevertheless, this effect is also not statistically significant ($p = 0.431 > 0.05$), with a wide confidence interval (−0.165 to 0.355) that crosses zero.

In contrast, agriculture expenditure shows a negative relationship with GDP growth (B = −0.009, β = −0.043), indicating that increases in agricultural spending are associated with a slight decrease in GDP growth. However, this effect is very weak and statistically insignificant ($p = 0.737 > 0.05$), and its confidence interval (−0.065 to 0.048) includes zero, suggesting no meaningful effect.

Despite the lack of statistical significance in the individual predictors, the zero-order correlations indicate strong positive associations between GDP growth and both educational (0.924) and health expenditure (0.918), while agriculture expenditure shows a weak relationship (0.155). This discrepancy suggests that the explanatory power observed in the overall model may be due to the combined effect of the variables rather than their individual contributions, more to that the collinearity statistics indicates that serious multicollinearity concerns, specifically for the educational and the expenditure in health which have very low tolerance values (0.065) but they have extremely high Variance Inflation Factor (VIF ≈ 15.4). The results above show a high degree of correlation between these variables, which inflates standard errors and reduces the statistical significance of their coefficients. On the other hand, agriculture expenditure has acceptable collinearity levels (VIF = 1.047), suggesting it is not highly correlated with the other predictors, while educational and health expenditures show positive relationships with GDP growth and agriculture expenditure shows a negative relationship, none of the variables individually has a statistically significant effect, in this study therefore there is the lack of significance is more likely influenced by multicollinearity, particularly between education and health expenditures, from the above therefore although the overall regression model is significant, caution should be exercised when interpreting the individual effects of the predictors.

Table 7. Collinearity diagnostics.

Model	Dimension	Eigenvalue	Condition Index	Variance Proportions			
				(Constant)	Educational expenditure	Health expenditure	Agriculture expenditure
1	1	3.513	1.000	0.01	0.00	0.00	0.01
	2	0.384	3.026	0.09	0.02	0.02	0.13
	3	0.091	6.225	0.90	0.00	0.00	0.86
	4	0.012	16.875	0.00	0.98	0.98	0.00

a. Dependent Variable: GDP billion.

Table 7 presents the collinearity diagnostics were conducted to examine the presence of multicollinearity among agriculture, educational, and health expend-

itures in explaining GDP growth. The results show condition index values ranging from 1.000 to 16.875, with the highest value indicating moderate multicollinearity, as it falls between the threshold of 10 and 30. A closer examination of the variance proportions reveals that in Dimension 4, which has the highest condition index (16.875), both educational expenditure (0.98) and health expenditure (0.98) exhibit very high variance proportions, suggesting that these two variables are highly correlated and may be providing overlapping information in the model. Although agriculture expenditure shows a high variance proportion (0.86) in Dimension 3, the corresponding condition index (6.225) is relatively low and does not indicate a serious issue. Overall, the findings suggest the presence of moderate multicollinearity, particularly between educational and health expenditures, which may affect the precision of individual coefficient estimates by inflating standard errors. However, since the condition index does not exceed 30, the multicollinearity is not severe and does not undermine the validity of the overall regression model. Therefore, the model remains reliable for explaining GDP growth, although caution should be exercised when interpreting the individual effects of educational and health expenditures due to their strong interrelationship.

Figure 2 below presents histogram of the standardized residuals from the multiple linear regression model.

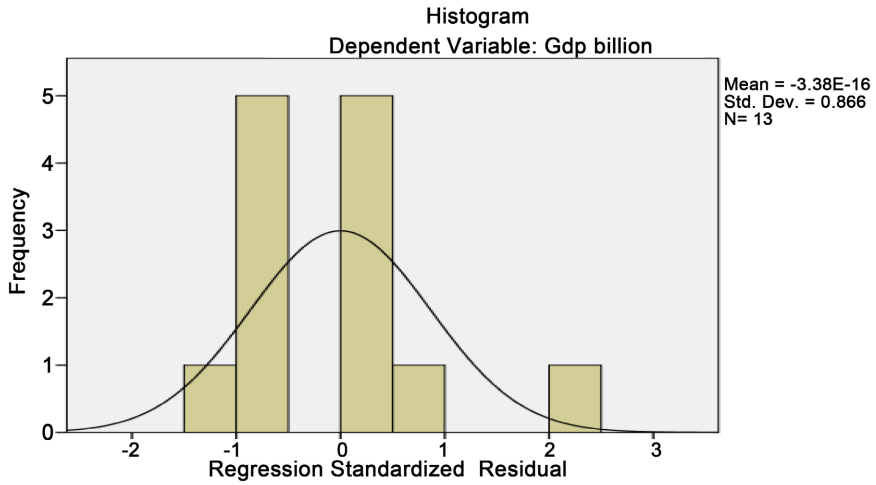

Figure 2. Histogram.

The histogram of the standardized residuals from the multiple linear regression model shows a roughly bell-shaped and approximately normal distribution, with majority of residuals clustered around the mean of nearly zero (−3.38E−16) and a standard deviation of 0.866. The pattern shows that the assumption of normality of residuals is reasonably satisfied, meaning the model's predictions of GDP in South Sudan are generally unbiased and reliable across the years analysed. Most residuals fall between −1 and +1, suggesting that public sector expenditures on education, health, and agriculture explain GDP variations with acceptable accuracy for most observations. The slight right skew and a few larger

positive residuals (up to +3) may reflect specific years when actual GDP growth exceeded the model's predictions, possibly due to external factors such as oil revenue fluctuations or donor aid not captured in the model. In conclusion the histogram supports the validity of the regression model used to examine the relationship between public sector expenditure and economic growth in South Sudan.

Figure 3 and Figure 4 below present the Normal P-P Plot of the regression standardized residuals, with GDP (in billion USD) as the dependent variable, provides further evidence regarding the normality assumption of the multiple linear regression model. The plot shows that the majority of the data points lie reasonably close to the diagonal straight line, indicating that the residuals are approximately normally distributed. This is a positive result, as it suggests that the model's errors do not deviate significantly from normality, thereby supporting the validity of the regression analysis.

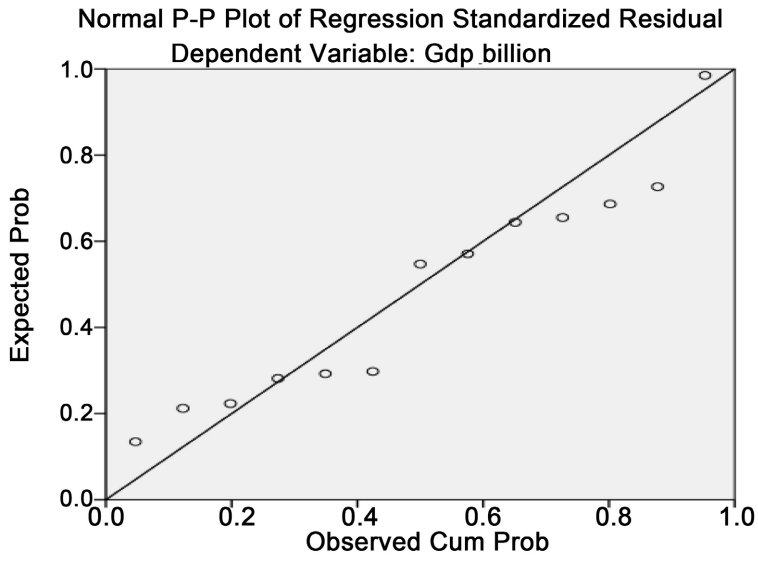

Figure 3. Findings on normality test.

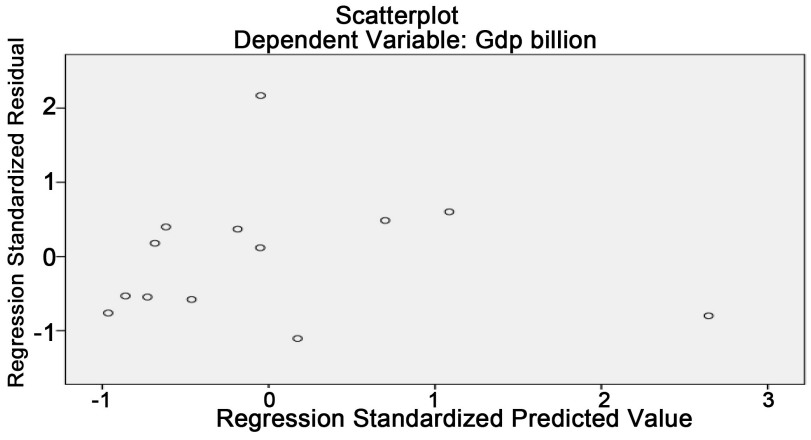

Figure 4. Scatter plot.

However, a slight deviation from the diagonal line is visible, particularly in the lower and upper tails. Some points in the lower tail fall below the line, while a few points in the upper tail lie above the line. This mild S-shaped pattern suggests a minor departure from perfect normality, possibly indicating a slight positive skew or the presence of a few outliers in the dataset. Given the small sample size (N = 13 years), such minor deviations are common and do not necessarily invalidate the model, especially since the histogram of residuals also showed a roughly bell-shaped distribution.

In the context of this study on public sector expenditure on economic growth in South Sudan, the relatively normal distribution of residuals implies that the linear relationship assumed between government spending on education, health, and agriculture and GDP is statistically acceptable. The model can therefore be considered reliable for drawing inferences about how public expenditure influences economic growth. Nevertheless, the slight deviation observed in the P-P plot recommends caution when interpreting extreme values and suggests that future studies with larger sample sizes or additional control variables may further improve the robustness of the findings, the Normal P-P Plot supports the assumption of normality of residuals, confirming that the multiple linear regression model is appropriate for analysing the impact of public sector expenditure on economic growth in South Sudan.

4.2. Conclusion and Recommendation

This study examined the relationship between public sector expenditure on education, health, and agriculture and economic growth (measured by GDP) in South Sudan from 2012 to 2025. The findings revealed a very strong and statistically significant positive correlation between GDP and both educational expenditure (r = 0.924, $p < 0.001$) and health expenditure (r = 0.918, $p < 0.001$). These two sectors also showed a very high correlation with each other (r = 0.967, $p < 0.001$), indicating that government spending on education and health tends to move together in response to changes in economic performance. In contrast, agriculture expenditure exhibited only weak and statistically non-significant correlations with GDP (r = 0.155, $p = 0.306$), education (r = 0.209, $p = 0.247$), and health (r = 0.212, $p = 0.243$).

The multiple linear regression model confirmed that public expenditure on education and health had a significant positive influence on GDP, while agriculture expenditure did not show a statistically significant impact. The normality tests (histogram and Normal P-P Plot) indicated that the residuals were approximately normally distributed, supporting the validity of the regression model despite the small sample size.

In conclusion, the study demonstrates that public sector expenditure in South Sudan has been strongly linked to economic growth primarily through spending on education and health, while investment in agriculture a sector that supports the majority of the population has remained weak and disconnected from GDP performance. This imbalance highlights a structural weakness in fiscal policy,

where economic growth has not translated into balanced and inclusive sectoral development. The heavy reliance on oil revenue and the impact of prolonged conflict have further distorted public spending priorities, limiting the potential for sustainable and broad-based economic growth.

4.3. Recommendations

Based on the findings, the following recommendations are made.

This study inline with the Increase and Stabilization of Agriculture Expenditure; The government should significantly raise the proportion of the national budget allocated to agriculture, aiming for at least 10% - 15% in line with the Maputo Declaration. This should include funding for irrigation, extension services, seeds, and livestock support to reduce food insecurity and diversify the economy beyond oil.

The study results further recommends that there is need to Improve Budget Execution and Transparency and Strengthening public financial management systems to ensure that allocated funds for education, health, and agriculture are actually disbursed and utilized effectively. Regular public expenditure tracking surveys should be conducted to reduce leakages and corruption.

There is need to adopt a Balanced and Pro-Poor Budgeting Approach Future national budgets should move away from the current heavy bias toward education and health when oil revenue increases, and instead adopt a more balanced allocation that prioritizes agriculture and infrastructure development, especially in rural areas.

Enhance Donor Coordination and Domestic Revenue Mobilization, the government should work closely with development partners to align donor support with national priorities, particularly in agriculture. At the same time, efforts to broaden the tax base and reduce dependence on oil revenue should be intensified.

This study further indicates that Institutionalize Evidence-Based Planning the Ministry of Finance and Planning should institutionalize the use of empirical research and regression analysis when preparing annual budgets. Regular studies on the impact of sectoral expenditure on economic growth should inform future fiscal decisions.

Capacity Building for Sector further recommends that Ministries Strengthen the technical capacity of the Ministries of Education, Health, and Agriculture to improve project implementation, monitoring, and evaluation so that increased funding translates into tangible developmental outcomes.

Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

References

Ahmed, M. A. M. A. (2024). Factors Affecting the Inflation in Sudan during the Period from 2000-2022. *International Innovations Journal of Applied Science, 1,* 1-13.

https://doi.org/10.61856/7qg53q05

Aziz, A., & Abid, I. (2025). Gwadar's Displacement Crisis: A Call for Inclusive and Equitable Development Policies. *Advance Social Science Archive Journal, 3,* 1300-1315.

Barro, R. J. (1990). Government Spending in a Simple Model of Endogeneous Growth. *Journal of Political Economy, 98,* S103-S125. https://doi.org/10.1086/261726

Borowicz, A., & Daugėlienė, R. (2023). The Role of EU Trade Agreements in Light of the Sustainable Development Goals. In E. Latoszek, & A. Kłos (Eds.), *Global Public Goods and Sustainable Development in the Practice of International Organizations* (pp. 172-191). Brill. https://doi.org/10.1163/9789004687264_010

Emeka, I. (2024). Foreign Direct Investment (FDI) and Economic Growth in Nigeria. *Journal of Poverty, Investment and Development, 9,* 13-25. https://doi.org/10.47604/jpid.2584

Erixon, F., Guinea, O., Lamprecht, P., du Roy, O., Sisto, E., & Zilli, R. (2024). *Trading Up: An EU Trade Policy for Better Market Access and Resilient Sourcing (No. 08/2024).* ECIPE Policy Brief.

Fadol, H. T. A. (2024). The Response of Macroeconomic Variables to Government Spending Shocks in the Sudanese Economy 1989-2019: Comparing the Structural Shocks (DSGE Approach) and Impulse Response (SVAR Model). *The Journal of Social Encounters, 8,* 202-217. https://doi.org/10.69755/2995-2212.1286

Fazaalloh, A. M. (2024). FDI and Economic Growth in Indonesia: A Provincial and Sectoral Analysis. *Journal of Economic Structures, 13,* Article No. 3. https://doi.org/10.1186/s40008-023-00323-w

Furlan, R., Sinclair, B. R., & Awwaad, R. (2023). Toward Sustainable Urban Development in Doha: Implementation of Transit Villages through a Multiple-Layer Analysis. *Journal of Urban Planning and Development, 149.* https://doi.org/10.1061/jupddm.upeng-3949

Ghura, D. (1995). Macro Policies, External Forces, and Economic Growth in Sub-Saharan Africa. *Economic Development and Cultural Change, 43,* 759-778. https://doi.org/10.1086/452185

Jacobson, M. Z., von Krauland, A., Coughlin, S. J., Dukas, E., Nelson, A. J. H., Palmer, F. C. et al. (2022). Low-Cost Solutions to Global Warming, Air Pollution, and Energy Insecurity for 145 Countries. *Energy & Environmental Science, 15,* 3343-3359. https://doi.org/10.1039/d2ee00722c

Kaliske, M. (2024). *International Trade in the European Union.* Ph.D. Thesis, Technische Universität Dortmund (TU Dortmund).

Lual A, D., Hussien, A. A., & Mayai, A. T. (2022). *Identifying Binding Constraints on Growth in the Context of Fragility: The Case of South Sudan.* African Economic Research Consortium.

Nashir, N., Hungwe, R., & Guemou, P. (2024). Investigating the Main Drivers of Inflation and Policy Measures for Controlling Inflation in Sudan. *Global Journal of Humanities and Social Sciences Research, 4,* 19-39.

Nyang Both, P. (2023). China developmental Peace Doctrine in South Sudan (2017-2022). Doctoral Dissertation, European University Institute.

Raies, A. (2023). Sustainable Employment in Developing and Emerging Countries: Testing Augmented Okun's Law in Light of Institutional Quality. *Sustainability, 15,* Article 3088. https://doi.org/10.3390/su15043088

Safi, S. K., Sanusi, O. I., Abdelkarim, R. A., & Khan, Z. (2024). Examining the Impact of Covid-19 and Economic Indicators on US GDP Using Midas-Simulation and Empirical

Evidence. *Migration Letters, 21,* 878-894.

Solow, R.M. (1956). Critical Introduction of Solow Growth Theory. *Economics, 70,* 65-94. https://doi.org/10.2307/1884513

Tshimpaka, L. M. (2024). "No One Should Be Left Behind": EU and Inclusion of Civil Society in the African Continental Free Trade Area. In L. M. Tshimpaka, & S. O. Oloruntoba (Eds.), *Africa-EU Relations and the African Continental Free Trade Area* (pp. 253-282). Springer. https://doi.org/10.1007/978-3-031-57992-9_12