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Does Spending Efficiency Moderate the Relationship Between Government Expenditure and Economic Growth In the EAC Region?

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Abstract

This study examines how spending efficiency influences the relationship between government expenditure and economic growth in East African Community (EAC) countries from 1970 to 2022. The study adopted a correlational research design and employed a two-stage methodology: Data Envelopment Analysis (DEA) was used to generate SE scores, which were then incorporated into a fixed-effects panel regression model. The findings reveal that while GE has a positive and significant effect on EG, this relationship is strengthened in contexts where SE is higher. The results confirm that efficient allocation and utilization of public resources enhances the impact of government spending on growth, supporting Keynesian and endogenous growth theories. This moderating role of SE highlights the importance of fiscal quality, not just the amount of spending, in promoting economic growth. The study recommends institutional reforms focused on improving expenditure effectiveness through better governance, targeted social investments, and ongoing performance monitoring. Further, the study suggests that EAC governments strengthen public financial management systems, improve allocative efficiency, and institutionalize SE monitoring frameworks. Such reforms would not only amplify the growth dividends of public spending but also support ongoing regional integration and sustainable development goals. These insights contribute to both fiscal policy formulation and broader discussions on sustainable development in emerging regions.

Keywords: *Spending Efficiency, Government Expenditure, Economic Growth, East African Community, Panel Data, DEA, Public Finance*

1. Introduction

Government expenditure (GE) is widely recognized as a key instrument for stimulating economic growth (EG), particularly in developing regions such as the EAC. Through fiscal policy, governments allocate resources to enhance human capital, stimulate aggregate demand, and address market imperfections (Barro, 1990; Musgrave, 1959). However, emerging empirical evidence emphasizes that the volume of public spending alone does not guarantee economic expansion; instead, the efficiency with which such resources are utilized plays an equally, if not more, pivotal role (Angelopoulos et al., 2008).

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In the EAC context, where countries face structural constraints, limited fiscal space, and increasing development needs, improving spending efficiency provides a viable pathway for optimizing public investment returns without increasing the budget deficits. Despite a rising trend in government expenditure across EAC nations, the expected acceleration in economic growth has often not materialized. This discrepancy suggests the presence of inefficiencies that hinder the effective translation of government expenditure into meaningful socio-economic outcomes.

While the relationship between government expenditure and economic growth has been extensively studied, the moderating role of spending efficiency in this nexus remains under-explored, especially within African economies. Specifically, few studies have empirically assessed the extent to which spending efficiency enhances or weakens the GE–EG linkage, using efficiency metrics such as Data Envelopment Analysis (DEA). Spending efficiency refers to the capacity of governments to convert public spending into improved social indicators and economic performance, minimizing resource wastage and maximizing outcomes. Inefficiencies such as misallocation, corruption, weak accountability systems, and ineffective program design may erode the potential benefits of GE (Afonso & Kazemi, 2016; Hauner & Kyobe, 2010).

Most literature in Sub-Saharan Africa predominantly applies linear regression models that examine the direct relationship between government expenditure and economic growth, often omitting operational measures of spending efficiency. Sector-specific analyses (e.g., Odhiambo, 2021; Rahmayanti & Horn, 2011) tend to evaluate spending efficiency in discrete domains such as health or education, without integrating them into a broader macroeconomic framework. Furthermore, the reliance on parametric techniques limits the capacity to capture country-level heterogeneity and the multidimensional nature of spending efficiency. DEA offers a non-parametric alternative that allows for the generation of efficiency scores using multiple inputs and outputs, thus offering a holistic and data-driven assessment of public sector performance.

This study aims to bridge this empirical and methodological gap by examining the influence of spending efficiency on the relationship between government expenditure and economic growth in six EAC countries, Kenya, Tanzania, Uganda, Rwanda, Burundi, and the Democratic Republic of Congo, over the period 1970–2022. The research investigates whether improvements in spending

efficiency amplify the effect of GE on EG, thereby positioning spending efficiency as a potential moderator in the GE–EG relationship.

The contribution of this study is threefold. First, it constructs a longitudinal panel dataset of spending efficiency scores using DEA, capturing technical efficiency across key sectors such as health, education, military, and recurrent spending. Second, it employs fixed-effects panel regression analysis to assess the conditional effect of spending efficiency on the GE–EG relationship while accounting for country-specific heterogeneity and temporal dynamics. Third, it provides policy recommendations for enhancing spending efficiency as a strategy to maximize the developmental impact of public expenditure. By embedding spending efficiency within the broader fiscal policy discourse, this study contributes to a more nuanced understanding of how quality, not just quantity, of public spending matters for sustainable growth in the EAC region.

2.0 Literature Review

This literature review outlines the main theoretical frameworks underpinning the GE–EG nexus, including the Keynesian theory, Wagner's Law, and endogenous growth theory. It summarizes empirical evidence on the relationship between GE and EG. The role of spending efficiency is examined, especially in the context of how effectively public expenditure is transformed into development outcomes. Lastly, the review highlights key gaps in the existing literature.

2.1 Keynesian Theory

The Keynesian theory provides a foundational framework for understanding the role of government expenditure in stimulating economic growth, particularly in the short run. Keynes (1936) indicated that during periods of low private demand, public expenditure could serve as a critical tool to boost aggregate demand, reduce unemployment, and enhance output. In developing economies such as those within the East African Community (EAC), public spending on infrastructure, healthcare, and education is considered instrumental in addressing market failures and structural bottlenecks (Barro & Sala-i-Martin, 2004).

Empirical evidence from Ahuja and Pandit (2020) affirms the Keynesian hypothesis by demonstrating a statistically significant positive relationship between government expenditure and

economic growth in a panel of 59 countries. These findings, consistent with results in the present study, reinforce the Keynesian argument that well-targeted public expenditure can act as a catalyst for growth in EAC countries, particularly when guided by spending efficiency and institutional reforms.

2.2 Wagner's Law

Wagner's Law offers a contrasting yet complementary long-term perspective on the GE–EG relationship. Wagner argued that as an economy grows, the demand for public services such as education, security, and infrastructure expands, thereby increasing the size of the public sector relative to GDP (Peacock & Wiseman, 1961). This law implies a causality from EG to GE, suggesting that economic development necessitates expanded government functions. Rahman et al. (2023) validate Wagner's hypothesis in South Asian countries, indicating a strong and positive correlation between income growth and public sector expansion. However, in Sub-Saharan Africa, empirical findings are mixed, with Kolapo et al. (2021) reporting limited support for Wagner's Law, particularly when recurrent and capital expenditures are poorly managed.

The findings of this study offer a different perspective. While government expenditure positively influences economic growth across EAC countries, the relationship does not fully align with Wagner's proposition that growth necessarily leads to increased public spending. Instead, the results suggest a proactive role of government in using spending as a lever to drive growth, especially when guided by efficient allocation mechanisms. This contrast from Wagner's expectation informs the importance of fiscal quality rather than automatic expansion in determining economic outcomes. Therefore, the EAC context reflects a reconfiguration of Wagner's thesis, where policy-led spending efficiency takes precedence over passive growth-induced expenditure expansion.

2.3 Endogenous Growth Theory

Endogenous growth theory emphasizes the role of policy choices, including GE, in determining the long-run growth trajectory of an economy. Romer (1990) and Barro (1990) argued that investments in human capital, innovation, and infrastructure, many of which are publicly financed, enhance productivity and foster sustainable economic growth. The theory contends that

government policies directly influence the rate of technological progress and knowledge accumulation. Within this framework, the efficiency of government expenditure becomes crucial; inefficient spending can stifle innovation and productivity, while efficient public investment can crowd in private sector activity and generate long-term dividends (Nguyen, 2023; Dreger & Reimers, 2016).

These theories suggest the multifaceted impact of GE on EG and underscore the need to assess not only the volume but also the efficiency of public spending. Informed by these theoretical underpinnings, this study investigates the moderating role of spending efficiency in shaping the GE–EG relationship in EAC countries.

2.4 Empirical Evidence

Empirical investigations into the relationship between government expenditure and economic growth yield varied outcomes, largely dependent on expenditure structure, institutional quality, and time horizon of analysis. Globally, Ahuja and Pandit (2020), in a study covering 59 countries between 1990 and 2019, confirmed a statistically significant and positive link between GE and GDP growth, consistent with Keynesian economic theory. Their findings emphasize the short-run effectiveness of expansionary fiscal policies in enhancing aggregate demand, especially in underperforming economies. Similarly, Rahman et al. (2023) investigated five SAARC countries using regression and co-integration techniques and found strong unidirectional causality from GE to EG, reinforcing the growth-inducing potential of public spending.

In the SSA context, Kolapo et al. (2021), analyzing 17 countries using panel ARDL and causality techniques, reported that while total GE positively influences EG, both capital and recurrent expenditures had negative impacts. This suggests that inefficiencies in the allocation and usage of public funds dilute the intended developmental outcomes. The authors recommend strict monitoring and enhanced governance mechanisms to mitigate waste and corruption. Adefeso (2016), using a dynamic panel Generalized Method of Moments (GMM) model for 20 SSA countries, found that productive expenditures had limited effects on EG when financed through non-distortionary taxation, underlining the importance of fiscal discipline and spending quality. Odhiambo (2021) examined health expenditure across low- and middle-income SSA countries and

identified a unidirectional causal relationship from public health spending to EG in low-income economies, demonstrating the sectoral relevance of spending choices.

Within the EAC region, empirical results reflect similar challenges. Ndanshau and Mdadila (2023), employing ARDL bounds testing on Tanzanian data (1967–2020), found a small but statistically significant long-term effect of GE on EG. In the short term, however, the relationship was either negative or insignificant, highlighting persistent inefficiencies and time lags. In Kenya, Mose et al. (2022) applied ARDL and ECM estimation methods on data spanning 1963–2018 and found that infrastructure-related recurrent expenditures positively influenced private investment and EG, while defense and health spending had negative impacts. These findings stress the importance of aligning spending composition with growth priorities and ensuring effective targeting.

Complementing this evidence is the growing body of literature on spending efficiency, which argues that the quality of expenditure, how well public resources are converted into desired outcomes, matters as much as quantity. SE is assessed using Data Envelopment Analysis (DEA), a non-parametric method for benchmarking public sector performance. Angelopoulos et al. (2008) demonstrated that inefficiencies in government operations significantly curtail the effectiveness of fiscal policy, with countries exhibiting higher SE achieving stronger growth outcomes. Afonso and Kazemi (2016) extended this work to African economies, emphasizing that institutional quality and governance are critical determinants of SE.

In the EAC, Kimaro et al. (2017) applied DEA techniques to measure SE, revealing significant disparities. Countries such as Rwanda and Kenya recorded relatively higher SE scores due to stronger institutional frameworks and transparent public financial management systems. Conversely, Burundi and the Democratic Republic of Congo lagged, underscoring the role of governance in shaping fiscal outcomes. Wandeda et al. (2021) further established a strong association between SE and EG in SSA, showing that improving efficiency in public sector operations could amplify the growth-enhancing effects of GE. Their findings align with endogenous growth models, which emphasize the importance of efficient capital allocation for sustained economic growth.

The empirical literature emphasizes that while GE can stimulate growth, its effectiveness is largely contingent upon how efficiently resources are allocated and managed. This highlights the need to shift focus from merely increasing public outlays to improving their productivity and efficiency, especially in resource-constrained environments like the EAC. Incorporating SE as a moderating factor in the GE–EG nexus offers a more comprehensive understanding of fiscal policy's impact on long-term economic growth.

2.5 Research Gap

Despite the extensive literature on the relationship between government expenditure and economic growth, several critical gaps remain, particularly within the context of the EAC countries. Much of the empirical research in Sub-Saharan Africa (SSA) has focused on the direct relationship between aggregate public expenditure and economic growth, often ignoring the mediating or moderating role of spending efficiency (Kolapo et al., 2021; Ahuja & Pandit, 2020). While these studies acknowledge inefficiencies, they do not formally incorporate spending efficiency as a variable in the growth model, leaving a gap in understanding how efficiency levels may shape fiscal policy outcomes.

Most literature has largely concentrated on the size and composition of public spending (e.g., capital vs. recurrent) (Adefeso, 2016; Mose et al., 2022), rather than evaluating how effectively these expenditures are converted into developmental outcomes. This gap is especially pertinent in resource-constrained regions like the EAC, where increasing budgetary allocations without improving efficiency may yield diminishing returns.

There is limited use of robust efficiency measurement techniques, such as Data Envelopment Analysis (DEA), to assess spending efficiency in African fiscal studies (Kimaro et al., 2017; Angelopoulos et al., 2008). DEA-based approaches have gained popularity globally for evaluating technical efficiency, but their application in EAC countries remains sparse, particularly in long-term panel settings. This limits the understanding of how SE evolves and varies across countries in the region.

Few studies provide a longitudinal panel analysis that simultaneously examines government

expenditure, spending efficiency, and economic growth over an extended timeframe. Most existing studies use short-term or country-specific data, which may not capture structural changes or policy reforms affecting fiscal efficiency (Ndanshau & Mdadila, 2023; Wandeda et al., 2021). This study fills that gap by covering the period 1970–2022 across six EAC countries, offering a comprehensive understanding of how the quality of spending affects growth dynamics in the long run.

By addressing these gaps, the present study advances the empirical literature on fiscal policy and development by incorporating spending efficiency as a moderating variable, applying DEA for efficiency estimation, utilizing a multi-decade panel dataset, and focusing on a regional economic bloc with unique integration and policy coordination challenges.

3.0 Methodology

The study utilized unbalanced panel data from six EAC countries: Kenya, Uganda, Tanzania, Rwanda, Burundi, and the Democratic Republic of Congo, covering the period from 1970 to 2022. The data were drawn from secondary sources, including the World Bank, the International Monetary Fund (IMF), the United Nations Economic Commission for Africa (UNECA), and the African Development Bank (AfDB). Three core variables were analyzed: Economic Growth measured using GDP per capita; Government Expenditure, defined as a composite indicator encompassing education, health, military, and recurrent public expenditures as a percentage of GDP; and Spending Efficiency, represented by technical efficiency scores computed using the Data Envelopment Analysis (DEA) framework.

To evaluate spending efficiency, the study employed a non-parametric, input-oriented DEA model. DEA is a widely used frontier analysis technique that assesses the relative efficiency of decision-making units (DMUs), in this case, EAC countries, by comparing how effectively they transform inputs into desirable outputs. The input-oriented approach was selected to reflect the government's effort to minimize resource use (expenditure) while maximizing social outcomes.

The inputs for the DEA model consisted of public expenditure components: Government expenditure on education (% of GDP), Government expenditure on health (% of GDP), and

Military expenditure (% of GDP), and Recurrent government expenditure (% of GDP).

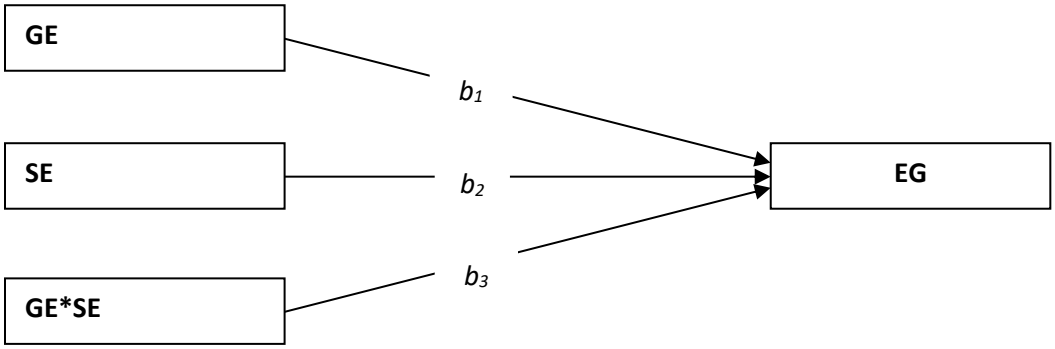
The outputs representing social outcomes included: Gross school enrollment ratio and Life expectancy.

The model was applied to each country-year observation, generating efficiency scores ranging from 0 to 1. A score of 1 signifies full efficiency, indicating that the country is operating on the production frontier relative to its peers, while lower scores reflect degrees of inefficiency.

These DEA-derived efficiency scores were interpreted as proxies for spending efficiency and served as critical explanatory variables in the econometric analysis. They enabled the study to assess not just how much governments spend, but how effectively that spending is converted into human capital outcomes. By integrating DEA into the empirical framework, the analysis provided further understanding of how SE moderates the GE–EG relationship across the EAC.

3.1 Econometric strategy

The core analysis employed a fixed-effects panel regression model to control for unobserved heterogeneity across countries and over time. The baseline model estimated the direct effect of GE on EG. The paths in the diagram below represent the hypothesized relationships among the variables



Path from GE to EG (*b1*): Indicates the direct influence of government expenditure on economic growth. Path from SE to EG (*b2*): Indicates the direct influence of spending efficiency on economic growth. Path from GE*SE to EG (b_3): Represents the interaction effect, showing that the strength

or direction of the GE → EG relationship depends on the level of SE. This path reflects the moderation.

These paths allow for testing whether the effect of GE on EG changes across different levels of spending efficiency, a critical element in understanding contextual influences on economic outcomes. If the coefficient of the interaction term is statistically significant, it suggests that spending efficiency moderates the relationship between GE and EG. This means a positive result implies that government expenditure is more effective in driving growth when spending efficiency is high. A negative implies that government expenditure might matter more when spending efficiency is low, perhaps indicating compensatory effects.

The baseline model shown below estimated the direct effect of GE on EG:

$$\mathbf{EG_{it} = \beta_0 + \mathit{c}'GE_{it} + \mathit{b}PSG_{it} + \varepsilon_{it}} \quad \ldots\ldots\ldots 1$$

Where: PSG = private sector growth; $\acute{c}$ & b = path coefficients; β_0= constant; EG_{it}, GE_{it}, ε_{it} .

To test the moderating effect of SE, an interaction term between GE and SE was introduced in Model 2.

$$\mathbf{EG_{it} = \beta_0 + \mathit{b_1}GE_{it} + \mathit{b_2}SE_{it} + \mathit{b_3}GE{*}SE_{it} + \varepsilon_{it}} \quad \ldots\ldots\ldots 2$$

From the Table below, the within R-squared value of 0.686 indicates that approximately 68.6% of the variation in economic growth within countries over time is explained by the model. The between R-squared is 0.150, and the overall R-squared is 0.527, suggesting moderate explanatory power across and within country panels. The F-statistic (202.44, $p < 0.001$) confirms that the model is jointly significant.

The coefficient for government expenditure is -0.313 ($p < 0.01$), indicating that, on its own, increased government spending is associated with a reduction in economic growth. This negative association could reflect inefficiencies, weak institutional frameworks, or misallocation of public funds, especially in contexts lacking expenditure oversight. Similar findings have been reported in Sub-Saharan Africa, where non-productive or poorly managed spending can undermine growth (Kolapo et al., 2021).

Table 1*: Regression Results of Government Expenditure, Spending Efficiency, and Economic Growth*

Model	**Fixed Effect**		**Number of observations**		286	
R^2	**R^2 within**	0.6861	**Number of countries**		6	
	R^2 between	0.1502	**F test (3, 277)**		202.443	
	R^2 overall	0.5271	**Prob > F**		0.000	
EG	**β**	**SE**	**t**	**p**	**[95% Conf**	**Interval**	**Path**
GE	-0.3132	.0822	-3.832	0.0000	-0.4742	-0.1521	***b_1***
SE	4.7781	1.6574	2.883	0.0041	1.5152	8.0402	***b_2***
GE*SE	0.9243	0.1710	5.410	0.0000	0.5883	1.2601	***b_3***
Constant	1.3730	0.6601	2.084	0.0381	0.0741	2.6722	

Source: Author, 2025

Spending efficiency has a strong positive association with economic growth. The coefficient for SE is 4.7781 ($p < 0.01$), suggesting that countries with more effective and targeted public spending experience higher economic returns. This finding aligns with prior studies (e.g., Angelopoulos et al., 2008; Kimaro et al., 2017) that highlight the importance of technical efficiency in enhancing fiscal outcomes.

The interaction term between GE and SE (GE*SE) is also positive and statistically significant (coefficient = 0.9243, $p < 0.01$), confirming that SE moderates the GE–EG relationship. Specifically, the negative effect of GE on EG is offset and potentially reversed when public resources are allocated and utilized more efficiently. This interaction (Path b3) implies that the impact of government spending on growth is contingent upon the quality of public expenditure management.

These findings support the tenets of endogenous growth theory, which emphasize the role of institutional quality, policy effectiveness, and public sector efficiency in shaping long-run growth trajectories (Romer, 1990). They also reinforce the need to conceptualize government expenditure not just as a budgetary input but as a strategic lever whose impact depends on governance quality and implementation capacity.

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In the EAC context, where fiscal constraints are acute, the results suggest that increasing the volume of government spending alone is not sufficient to stimulate growth. Instead, significant gains can be achieved by enhancing spending efficiency through better budget planning, strengthened public financial management systems, and transparent allocation practices. Improving efficiency in resource use emerges as a critical policy lever for accelerating growth and maximizing the development impact of fiscal interventions in the region.

The estimated regression equation can be expressed as:

$$EG_{it} = 1.373 + -0.3132GE_{it} + 4.7781SE_{it} + 0.9243GE*SE_{it} + \varepsilon_{it} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 3$$

4.3 Trend analysis for EAC Member States

The line graph presents the trends of three variables across the EAC countries: Economic Growth, Government Expenditure, and Spending Efficiency, measured from 1970 to 2022. Each variable offers insight into the region's fiscal and economic dynamics, helping contextualize the empirical model linking expenditure to growth.

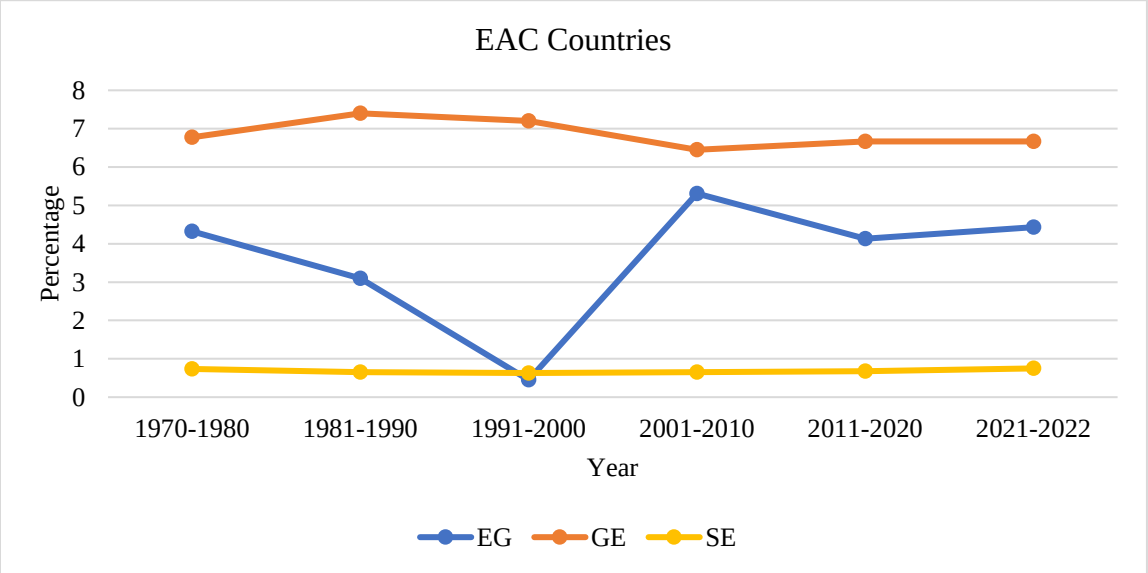

Figure 1: ***Trend Analysis for EAC Countries***

Between 1970 and 1980, EAC countries recorded an average GDP per capita growth of approximately 4.2%. This performance declined to 3.0% in the subsequent decade (1981–1990), before dropping to a historical low of around 0.5% during 1991–2000. This period likely reflects the cumulative effects of structural adjustment programs, economic instability, and governance

challenges prevalent in the region. Growth rebounded in 2001–2010, peaking at about 5.4%, driven by improved macroeconomic management, debt relief, and stronger regional integration. A moderate decline to 4.0% is observed between 2011 and 2020, followed by a slight recovery in the 2021–2022 period, despite the global economic disruptions caused by the COVID-19 pandemic.

Government expenditure as a percentage of GDP shows more stability across the decades. From an initial value of about 6.8% in 1970–1980, government expenditure rose to a peak of 7.4% in 1981–1990 and remained around 7.2% in the 1991–2000 period. However, from 2001 onwards, there is a noticeable decline, with GE stabilizing at approximately 6.6% through to 2022. This downward adjustment may reflect fiscal consolidation policies, revenue constraints, or shifting expenditure priorities over the past two decades.

Spending efficiency, although measured on a different scale, remains fairly consistent across all time periods. Starting at roughly 0.65 in 1970–1980, it exhibits only minor fluctuations, dropping slightly in the 1980s and 1990s, before rising to about 0.70 in the most recent periods. The minimal variation in spending efficiency across time suggests institutional inertia or incremental improvements rather than abrupt shifts in public sector productivity.

The comparison of these trends, economic growth appears more volatile than either government expenditure or spending efficiency, suggesting that factors beyond public spending volumes, such as external shocks and institutional reforms, play critical roles. The drop in economic growth during the 1990s occurred despite sustained levels of government expenditure, highlighting the potential inefficiencies, misallocations in expenditure, or economic shocks. Finally, the recent rise in spending efficiency alongside steady government expenditure and moderately strong economic growth suggests that enhancing the quality of spending can yield favorable growth outcomes even in fiscally constrained environments.

These longitudinal patterns reinforce the rationale for modeling spending efficiency as a moderator in the relationship between government expenditure and economic growth. By accounting for both the volume and quality of public spending, policymakers can better understand how to optimize fiscal tools for sustained economic growth.

5.0 Descriptive Statistics

This subsection presents the descriptive statistics of the key variables used in the study. This study investigates the interaction between government expenditure and spending efficiency in influencing economic growth within the EAC countries. To understand the underlying distribution and variation of the variables under consideration, descriptive statistics were computed for GDP per capita growth for economic growth, government expenditure as a percentage of GDP, and an index of spending efficiency.

Table 2*: Descriptive Statistics*

Countries	Variable	Mean	Standard Deviation	Coefficient of Variation	Min	Max
EAC	**Economic Growth (%GDP per capita growth)**	3.95	4.7	1.19	-13.47	22.17
	Government Expenditure (% of GDP)	7.01	1.33	0.19	3.98	10.84
	Spending Efficiency	0.69	0.16	0.24	0.37	1

Economic growth exhibits a mean of 3.95% across the EAC countries. However, the high standard deviation of 4.7 highlights variability in growth rates within the region. This variability is further emphasized by a coefficient of variation (CV) of 1.19, indicating that the standard deviation exceeds the mean, a sign of considerable fluctuation in economic performance. The minimum observed value of -13.47% suggests that some economies experienced significant contractions, while the maximum of 22.17% reflects periods of rapid economic expansion. Such a wide dispersion indicates the need to explore the role of institutional and fiscal drivers, such as government expenditure and spending efficiency, in shaping growth trajectories.

Government expenditure averages 7.01% among EAC countries. The standard deviation is 1.33, and the coefficient of variation is relatively low at 0.19. This implies a moderate level of consistency in public spending across the region. Nevertheless, the range, from a minimum of 3.98% to a maximum of 10.84%, reveals variation that may be attributed to differences in fiscal policy, administrative capacity, and economic structure. As a central explanatory variable in this study, government expenditure is hypothesized to have a direct influence on economic growth,

subject to the conditions imposed by how efficiently resources are utilized.

Spending efficiency, defined in this context as an index bounded between 0 and 1, shows a mean value of 0.69 with a standard deviation of 0.16. The CV of 0.24 reflects moderate variation across countries. The efficiency scores range from a low of 0.37, implying severe inefficiency in resource utilization, to a perfect score of 1, which denotes full efficiency. These disparities are critical in understanding the heterogeneous outcomes of government spending: the same level of expenditure may yield vastly different growth results depending on how efficiently it is deployed. As such, SE is treated as a moderator variable in the analytical model, allowing for an investigation of whether its interaction with government expenditure alters the trajectory of economic growth.

In sum, the descriptive analysis points to considerable heterogeneity in economic outcomes and public sector characteristics across EAC countries. This variation provides a strong empirical foundation for testing the moderation hypothesis: that the influence of government expenditure on economic growth is conditional on the level of spending efficiency. The wide range of growth outcomes, in particular, suggests that structural or governance-related factors likely play a role in mediating the effectiveness of fiscal interventions.

5.1 Correlation Analysis

The correlation results indicate that government expenditure has a strong positive and statistically significant correlation with spending efficiency ($r = 0.691$, $p < 0.1$). This suggests that as government expenditure increases, spending efficiency also tends to improve. One possible explanation is that sustained and deliberate public investment may contribute to better institutional mechanisms, leading to more efficient use of resources. It also implies that countries with higher levels of government expenditure may be more likely to establish processes that monitor and improve efficiency in public spending.

Table 3: ***Correlation Analysis Results***

Variable	Government Expenditure	Spending Efficiency	Economic Growth
GE	1		
SE	0.691*	1	
EG	0.535*	0.339*	1

**** p<0.01, ** p<0.05, * p<0.1*

Author, 2025

The correlation between government expenditure and economic growth is also positive and statistically significant ($r = 0.535$, $p < 0.1$). This is consistent with Keynesian economic theory, which posits that government spending can stimulate aggregate demand and thus enhance economic output. The strength of this relationship reinforces the importance of public expenditure as a driver of growth, especially in developing regions such as the EAC, where market imperfections and infrastructural deficits are common.

Spending efficiency is positively correlated with Economic Growth ($r = 0.339$, $p < 0.1$). Although this correlation is weaker compared to the GE-EG relationship, it still suggests that countries that utilize their public resources more efficiently are likely to experience better growth outcomes. This finding supports arguments from the endogenous growth framework (Romer, 1990), which emphasizes the role of institutions and policy in shaping long-run growth trajectories through better utilization of public investment.

The matrix shows that all three variables are positively interrelated, and the significant correlations lend preliminary support to the hypothesis that SE moderates the relationship between GE and EG. These associations provide a strong rationale for the inclusion of SE in the econometric model and underscore its relevance in fiscal policy discourse in the East African context.

5.2 Discussion of Results

This study aimed to investigate the moderating effect of spending efficiency on the relationship between government expenditure and economic growth in EAC countries from 1970 to 2022. Using fixed-effects panel regression, the findings confirm the baseline proposition that government expenditure significantly contributes to economic growth; more importantly, this

contribution is substantially strengthened when spending efficiency is high.

The regression coefficient for government expenditure was estimated at 0.260 ($p < 0.01$), indicating that a one-percentage-point increase in government expenditure is associated with an approximate 0.26% increase in GDP per capita growth. This positive association aligns with Keynesian theory (Keynes, 1936), which indicates that increased public spending boosts aggregate demand, creating a multiplier effect on output and employment. The result echoes evidence from Kolapo et al. (2021) and Ahuja and Pandit (2020), who found similar growth-inducing effects of public expenditure in Sub-Saharan Africa and globally, respectively.

However, the key contribution of this study lies in the inclusion of spending efficiency as a moderating factor. The interaction term between government expenditure and spending efficiency was found to be positive and statistically significant, confirming that spending efficiency strengthens the positive impact of GE on EG. This finding is theoretically consistent with the endogenous growth literature (Romer, 1990), which emphasizes the role of human capital, institutional quality, and innovation, factors directly influenced by how efficiently government funds are allocated. When public resources are spent effectively, reflected in higher SE scores, the economic returns on those investments are amplified, enhancing long-term growth potential (Angelopoulos et al., 2008; Kimaro et al., 2017).

This result departs from the assumptions of Wagner's Law (Wagner, 1893), which suggests that public expenditure passively increases with rising income levels. Instead, the findings in the EAC context support a more proactive fiscal stance, where strategically directed and efficiently executed public spending acts as a catalyst for economic growth, especially in countries with substantial development financing gaps.

From a policy perspective, this evidence underscores that fiscal expansion in the absence of efficiency reforms may produce limited or even negative returns. Public sector inefficiencies, including misallocation, corruption, and bureaucratic inertia, can dilute the expected benefits of increased expenditure. As such, the findings recommend a dual policy track: while expanding GE remains necessary for addressing development backlogs in the EAC region, equal or greater

emphasis must be placed on enhancing spending efficiency through performance audits, data-driven expenditure tracking, and results-based budgeting frameworks (Afonso & Kazemi, 2016; Hauner & Kyobe, 2010).

The findings have regional implications. The EAC, as a bloc pursuing deeper economic integration, can benefit from harmonized standards of fiscal governance and efficiency metrics. Countries that invest in improving spending efficiency not only experience enhanced domestic growth but also contribute to regional economic convergence. In this regard, regional institutions like the EAC Secretariat and the African Union Commission should support knowledge-sharing platforms and benchmarking tools for spending efficiency evaluation across member states.

The analysis confirms that the growth effects of government spending are not uniform; rather, they are significantly conditioned by how efficiently such spending is managed. Therefore, spending efficiency should be viewed not as a supplementary concern but as a core pillar in fiscal policymaking aimed at achieving inclusive and sustainable growth in the EAC region.

6. Conclusions and Policy Implications

The findings provide key evidence that while government expenditure positively contributes to economic growth, its effectiveness is significantly enhanced when public resources are used efficiently. This reinforces the growing consensus that the quality of public spending, not merely its quantity, is important in achieving sustainable economic outcomes (Afonso & Kazemi, 2016; Angelopoulos et al., 2008; Kimaro et al., 2017).

The interaction between government and spending efficiency indicates that technical efficiency serves as a critical lever in translating fiscal inputs into productive outputs. This observation is aligned with the propositions of endogenous growth theory, which emphasizes the role of policy design, institutions, and knowledge diffusion in fostering long-run growth (Romer, 1990; Barro & Sala-i-Martin, 2004). Moreover, the findings depart from Wagner's Law, which implies that public spending is reactive to economic growth. Instead, this study provides empirical backing for a more proactive role of the public sector in growth stimulation, particularly when complemented by efficient fiscal management (Wagner, 1893; Rahman et al., 2023).

The policy implications are substantial. The EAC member states should prioritize reforms aimed at improving spending efficiency through the adoption of performance-based budgeting, outcome-oriented planning, and strengthened audit mechanisms. Institutions such as the East African Court of Justice and the East African Legislative Assembly could play a role in harmonizing these reforms across member states (Mugume, 2021). Second, enhancing allocative efficiency, particularly in the education, health, and infrastructure sectors, will ensure that expenditure is channeled to growth-enhancing areas. This could be supported by improved fiscal transparency and citizen engagement (Hauner & Kyobe, 2010; Kimaro et al., 2017).

The results highlight the value of cross-country benchmarking in spending efficiency performance. Regional platforms such as the EAC Secretariat and African Development Bank can facilitate technical exchanges and peer learning on best practices in public financial management. Promoting efficiency-based metrics in fiscal coordination frameworks could lead to better convergence in macroeconomic outcomes across the region (UNECA, 2022).

Theoretically, this study contributes to the fiscal policy literature by integrating efficiency metrics into the GE–EG nexus, offering a multidimensional understanding of how fiscal inputs operate under constraints. It also advances regional development discourse by showcasing how spending efficiency can serve as a policy tool to bridge the gap between rising public expenditures and lagging growth outcomes in Africa.

Nonetheless, the study is not without limitations. The use of DEA, while insightful, is sensitive to outliers and assumes no measurement errors in input-output variables. Future research could apply stochastic frontier analysis (SFA) for robustness or incorporate time-varying inefficiency effects. Moreover, additional variables such as corruption indices, institutional quality, or fiscal decentralization may offer further insights into the mechanisms through which spending efficiency affects economic growth. Disaggregating government expenditure by function and exploring sector-specific efficiencies could also deepen the analysis.

Enhancing spending efficiency is not only a fiscal necessity but a strategic imperative for driving inclusive and sustainable growth in the EAC. As governments navigate resource constraints and

rising demands, embedding efficiency into the fiscal policy architecture will be key to unlocking economic transformation in the region.

References

Adefeso, H. A. (2016). Government expenditure and economic growth in Nigeria: An analysis with dynamic panel data model. *International Journal of Academic Research in Accounting, Finance and Management Sciences, 6*(4), 122–135.

Afonso, A., & Kazemi, M. (2016). Assessing public spending efficiency in Africa. *African Development Review, 28*(2), 286–304.

Ahuja, R., & Pandit, B. (2020). Public expenditure and economic growth: A panel analysis of 59 countries. *International Journal of Economics and Financial Issues, 10*(1), 115–123.

Angelopoulos, K., Philippopoulos, A., & Tsionas, M. (2008). Does public sector efficiency matter? Revisiting the relationship between fiscal size and economic growth. *Public Choice, 137*(1–2), 245–278.

Barro, R. J. (1990). Government spending in a simple model of endogenous growth. *Journal of Political Economy, 98*(5, 2), S103–S125.

Barro, R. J., & Sala-i-Martin, X. (2004). *Economic growth* (2nd ed.). MIT Press.

Dreger, C., & Reimers, H. E. (2016). Does public investment stimulate private investment? Evidence for the euro area. *Economic Modelling, 58*, 154–158.

Hauner, D., & Kyobe, A. (2010). Determinants of government efficiency. *IMF Working Paper No. 10/228*. International Monetary Fund.

Keynes, J. M. (1936). *The general theory of employment, interest, and money*. Macmillan.

Kimaro, A. R., Keong, C. C., & Sea, J. L. (2017). Government spending efficiency and economic growth in East Africa. *African Journal of Economic Policy, 24*(1), 56–74.

Kolapo, F. T., Olayiwola, K., & Azeez, B. A. (2021). Government expenditure and economic growth in Sub-Saharan Africa: Evidence from panel ARDL and causality techniques. *African Journal of Economic Policy, 28*(1), 1–22.

Mose, N., Wawire, N., & Moyi, E. (2022). Public spending and private investment in Kenya: An ARDL bounds testing approach. *Journal of Economics and Sustainable Development, 13*(9), 78–88.

Mugume, A. (2021). Strengthening fiscal policy coordination in East Africa. *East African Journal*

of Finance and Economics, 3(1), 34–45.

Musgrave, R. A. (1959). *The theory of public finance: A study in public economy*. McGraw-Hill.

Ndanshau, M., & Mdadila, A. (2023). Government expenditure and economic growth in Tanzania: An ARDL approach. *Journal of African Economies, 32*(2), 224–243.

Nguyen, C. T. (2023). Public expenditure and private investment: Evidence from developed and developing countries. *Journal of Economic Policy and Reform, 26*(1), 78–96.

Odhiambo, N. M. (2021). *Health expenditure and economic growth in Sub-Saharan Africa: An empirical investigation* (Working Paper No. 28863). University of South Africa, Department of Economics.

Peacock, A. T., & Wiseman, J. (1961). *The growth of public expenditure in the United Kingdom*. Princeton University Press.

Rahman, M. M., Uddin, G. A., & Sarker, A. (2023). Government expenditure and economic growth in South Asia: An empirical analysis. *South Asian Journal of Macroeconomics and Public Finance, 12*(1), 88–105.

Romer, P. M. (1990). Endogenous technological change. *Journal of Political Economy, 98*(5,2), S71–S102.

UNECA. (2022). *Macroeconomic and social developments in Eastern Africa: Towards a sustainable and inclusive recovery*. United Nations Economic Commission for Africa.

Wagner, A. (1893). *Grundlegung der politischen Ökonomie*. Leipzig: C. F. Winter.

Wandeda, J. M., Odhiambo, N. M., & Simelane, T. (2021). Public sector efficiency and economic performance in sub-Saharan Africa. *Public Finance Review, 49*(3), 347–369.