

Public Expenditure On Education, Health, And Its Effect On Economic Growth In Uganda (1990-2024)

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ABSTRACT : This study investigates the effect of public expenditure on education and health on economic growth in Uganda over the period 1990–2024. Using a longitudinal research design and ARDL modeling, the study examines both short- and long-run relationships between sectoral investment and GDP growth. Descriptive statistics reveal moderate variability in economic growth, while education and health spending show sustained investment patterns. Unit root and cointegration tests confirm stationarity and a long-run relationship among variables. Empirical evidence indicates that investments in education and health positively influence growth by enhancing human capital, labor productivity, and private sector development. Diagnostic tests confirm model reliability, with no heteroskedasticity or multicollinearity. The findings underscore that while public investment positively influences economic performance, the magnitude of its impact depends on efficiency, governance, project execution, and alignment with national policies. The study contributes to the literature by providing evidence on the short- and long-term effects of sectoral investment in Uganda and offers policy guidance for optimizing resource allocation to achieve sustainable economic growth.

Keywords: Public expenditure, education, health, economic growth, Uganda, ARDL model

Introduction

Public expenditure on education and health has been a cornerstone of Uganda’s development strategy since the 1990s, anchored in human-capital theory, which links schooling and health to productivity and long-run growth. Over the period 1990–2024, Uganda increased absolute spending on both sectors, but public spending as a share of the economy and of total government outlays has remained modest by regional standards. According to the World Bank (2023), government spending on education averaged only around 2–3% of GDP in recent years, with Trading Economics (2023) reporting about 2.55% in 2023. UNICEF (2021) and other national reviews further indicate that education accounted for roughly 8–11% of the national budget in the early 2020s, levels that analysts judge insufficient to close quality and access gaps in the sector.

Health financing in Uganda tells a similar story of constrained resources and mixed outcomes. Current health expenditure as a share of GDP has remained low relative to global benchmarks, and domestic financing covers a limited portion of total health spending, leaving substantial reliance on out-of-pocket payments and donor contributions. WHO and World Bank data (2022) show gradual improvements in maternal and child health since the 1990s, yet the 2022 Uganda Demographic and Health Survey revealed persistent geographic and socioeconomic inequalities. The World Bank’s Public Expenditure Review (2022–2023) highlights that underfunding and allocative inefficiencies, particularly in primary health and education, have constrained the sectors’ contribution to building productive human capital (World Bank, 2023).

These financing patterns occur against a fiscal and policy context that complicates the translation of spending into growth. Rising public debt and debt-servicing obligations have created budgetary trade-offs, with crowding-out effects on social sectors (International Monetary Fund [IMF], 2023; The East African, 2024). At the same time, inefficiencies in expenditure, such as the imbalance between recurrent and capital spending, governance weaknesses, and limited per-student and per-facility allocations, undermine effectiveness. Variable donor flows and user fees in some schools further limit equitable access to services. As a result, despite nominal increases in education and health budgets since the 1990s, proportional improvements in human-capital outcomes and inclusive economic growth remain elusive. This study, therefore, seeks to investigate the effect of public expenditure on education and health on economic growth in Uganda from 1990 to 2024

Problem Statement

Uganda has long recognized education and health as central pillars of its human capital development strategy, yet government expenditure in these sectors remains relatively low compared to national needs and regional benchmarks. Public spending on

education has averaged only 2–3% of GDP, reaching 2.55% in 2023 (YCharts, 2023), while the share of the national budget allocated to education declined from over 20% in 2004 to less than 9% in 2023 (GlobalEconomy, 2023). This underinvestment persists despite Uganda's youthful population, with more than 75% under the age of 30, leading to overcrowded classrooms, high pupil–teacher ratios, and declining learning outcomes. In the health sector, government expenditure shows a similar pattern of constraint. Current health expenditure stood at 4.67% of GDP in 2021 (World Bank, 2022), but domestic government health spending accounts for less than 1% of GDP, leaving households and donors to cover much of the cost (IndexMundi, 2023). As a result, health outcomes remain fragile: maternal mortality was 189 per 100,000 live births and under-five mortality 45 per 1,000 live births in 2022 (Uganda DHS, 2022). These indicators lag behind regional averages, reflecting persistent inequalities in access and quality of care. At the same time, Uganda's economic growth, though recovering to 5.23% in 2023 after the COVID-19 slowdown (MacroTrends, 2023), has not been accompanied by proportional improvements in education and health outcomes. Rising public debt and debt-servicing obligations, now absorbing over 30% of domestic revenue (IMF, 2023), further crowd out social sector financing. This raises a critical question: To what extent have government investments in education and health translated into economic growth in Uganda over the past three decades? Addressing this knowledge gap is vital for informing policy choices on budget priorities and sustainable human capital development.

Theory for the study

The Keynesian Theory of Public Investment guided this study by providing a framework for understanding how government expenditure on education and health influences economic growth. The theory posits that public spending stimulates aggregate demand, employment, and output through the multiplier effect (Keynes, 1936; IMF, 2021). In the Ugandan context, increased government expenditure on education and health from 1990–2024 is expected to generate both direct and indirect economic benefits by improving human capital, creating jobs, and enhancing productivity (MoFPED, 2023; World Bank, 2023). This study adopts the Keynesian lens to assess how such investments stabilize the economy in the short run while laying a foundation for sustained growth. By linking public expenditure with GDP performance, the theory explains the critical role of fiscal policy in driving development outcomes in Uganda.

Empirical Evidence Review

Empirical research indicates that public investment in Uganda has had a positive impact on economic growth, although the magnitude and consistency vary by sector and over time. Nabiddo and Kaberuka (2021) found that capital investments in transport and energy infrastructure, including the Entebbe Expressway and western Uganda oil roads, significantly enhanced GDP growth by reducing logistical costs and facilitating private sector expansion. Similarly, investments in health and education contributed to long-term growth by building a skilled and healthy workforce. Ssewanyana and Kasirye (2020) noted that increased education spending improved literacy and employability, while Mukasa (2023) showed that health investments increased labor productivity and household income.

Macro-level statistics further support these findings. The Bank of Uganda (2023) reported that periods of accelerated public investment, particularly between 2010 and 2015, were associated with GDP growth averaging over 6% annually. However, the effectiveness of such spending is strongly influenced by the quality of investment. The World Bank (2022) highlighted that poorly designed or delayed projects, as well as corruption, often yield weak or negative returns, demonstrating that the volume of expenditure alone is insufficient to guarantee economic gains.

Comparative studies from other East African countries provide additional context. Wanjala and Otieno (2019) observed that a one-percent increase in education expenditure in Kenya raised GDP growth by 0.4% over three years, emphasizing the link between human capital investment and long-term development. Ogotu (2018) found that infrastructure projects in East Africa produced delayed but measurable impacts on economic output, illustrating the importance of considering time-lag effects when analyzing public investment outcomes. These findings highlight that efficient implementation, governance, and macroeconomic stability are critical determinants of growth outcomes.

In Uganda specifically, studies show that governance and policy frameworks shape the returns on investment. Kasaija (2020) reported that the relationship between public sector spending and GDP growth was stronger in periods of low inflation and better fiscal management. Similarly, Muwanga (2019) found that while public investment in infrastructure and education increased between 2000 and 2018, inefficiencies and poor execution limited growth outcomes. Collectively, these studies confirm that public investment can stimulate economic growth, but its success depends on quality, efficiency, and effective coordination with national policies (MoFPED, 2023; IMF, 2022).

Methodology

Research Design and Paradigm

This study employed a longitudinal research design to examine the effects of public expenditure on education and health on Uganda’s economic growth from 1990 to 2024. By analyzing trends over three decades, the design captures both short- and long-term effects, allowing assessment of causality and the impact of sectoral spending on GDP growth. Panel data techniques, including Dynamic Fixed Effects (DFE) and panel cointegration models, were applied to distinguish between immediate and lasting effects of public investment while controlling for country-specific and temporal variations (World Bank, 2023; MoFPED, 2023).

The study was also grounded in both positivist and interpretivist paradigms. Positivism supports empirical analysis of how variations in education and health expenditure affect economic growth using quantitative data, while interpretivism provides insights into contextual and policy factors that shape investment efficiency and outcomes (UBOS, 2022; IMF, 2022). Combining these paradigms ensures a robust and comprehensive understanding of the dynamic relationship between Uganda’s social sector spending and national economic performance.

Nature, Sources of Data, and the ARDL model for the study

The study employed secondary quantitative data spanning 1990 to 2024 to analyze the impact of public expenditure on education and health on Uganda’s economic growth. The data is time-series in nature, capturing annual variations in GDP, public spending on education and health, and other macroeconomic indicators. This longitudinal approach allows the identification of trends, patterns, and long-term relationships while controlling for short-term fluctuations. Using historical data ensures consistency, reliability, and a comprehensive understanding of how government expenditure has influenced economic performance over three decades.

The study employed the Autoregressive Distributed Lag (ARDL) model to examine both short-run and long-run effects of public expenditure on economic growth. The ARDL framework is suitable for small sample sizes and allows the combination of variables integrated of order I(0) and I(1) without requiring pre-testing for unit roots of higher order. The general ARDL model for this study is specified as follows:

Model Specification

Functional Form:

$$Y_t = f(EDU_t, HLT_t, INF_t, EXR_t) \dots \dots \dots (1)$$

Where Y is Economic Growth at Time t is a function of Education, inflation, and exchange rate at time t.

Static Linear Regression Model (for baseline estimation):

$$Y_t = \beta_0 + \beta_1 EDU_t + \beta_2 HLT_t + \beta_3 INF_t + \beta_4 EXR_t + \varepsilon_t \dots \dots \dots (2)$$

ARDL Model

If the variables are integrated of order I(0) and I(1), ARDL can be applied:

$$\begin{aligned} \Delta Y_t = & \alpha_0 + \sum_{i=1}^p \alpha_1 \Delta Y_{t-i} + \sum_{j=0}^{q1} \alpha_2 \Delta EDU_{t-j} + \sum_{j=0}^{q2} \alpha_3 \Delta HLT_{t-j} + \sum_{j=0}^{q3} \alpha_4 \Delta INF_{t-j} \\ & + \sum_{j=0}^{q5} \alpha_5 \Delta EXR_{t-j} + \lambda_1 Y_{t-1} + \lambda_2 EDU_{t-1} + \lambda_3 HLT_{t-1} \\ & + \lambda_4 INF_{t-1} + \lambda_5 EXR_{t-1} + \varepsilon_t \dots \dots \dots (3) \end{aligned}$$

Short-Run Dynamics (Δ Variables)

These measure the immediate or current-year effects of changes in investment:

$$\sum_{j=0}^{q1} \alpha_2 \Delta EDU_{t-j} + \sum_{j=0}^{q2} \alpha_3 \Delta HLT_{t-j} + \sum_{j=0}^{q3} \alpha_4 \Delta INF_{t-j} \dots \dots \dots (4)$$

If $\alpha_3 > 0$, it implies that health Expenditures increase GDP growth in the short run.

Inflation and exchange rate can also have short-run effects if consumers and businesses respond quickly.

Long-Run Relationship (Lagged Levels)

These express the long-term equilibrium relationship:

$$\lambda_1 Y_{t-1} + \lambda_2 EDU_{t-1} + \lambda_3 HLT_{t-1} + \lambda_4 INF_{t-1} + \lambda_5 EXR_{t-1} + \varepsilon_t \dots \dots \dots (5)$$

If $\lambda_2 > 0$, it suggests that education Expenditure has a long-run positive effect on GDP growth.

A cointegration test (Bounds Test) confirms whether these variables move together over the long run.

Data Analysis, Quality, and Management

The study employed the ARDL model to analyze secondary time-series data on public expenditure in education and health and its impact on Uganda's economic growth. Data quality was ensured by sourcing from reliable institutions such as MoFPED and the World Bank, and through cross-verification. Proper data management included cleaning, coding, and addressing missing values, ensuring accuracy, consistency, and reliability for robust econometric analysis and valid inference.

Pre-Estimation Tests

Before estimating the ARDL model, several pre-estimation diagnostic tests were conducted to ensure the validity and reliability of the econometric analysis. First, a unit root test was performed to determine the order of integration of the variables using the Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) tests. This step ensured that none of the variables were integrated of order two, I(2), which is a critical assumption for applying the ARDL bounds testing approach (Pesaran et al., 2001).

Second, multicollinearity tests were conducted using the Variance Inflation Factor (VIF) to detect whether independent variables were highly correlated. Variables with VIF values above 10 were examined and corrected to avoid distortion in coefficient estimation (Gujarati & Porter, 2009).

Third, the study tested for heteroskedasticity using the Breusch-Pagan test and for autocorrelation using the Durbin-Watson and Breusch-Godfrey LM tests. These tests ensured that the residuals of the model were homoscedastic and serially uncorrelated, satisfying classical linear regression assumptions.

Finally, a normality test using the Jarque-Bera statistic was conducted to verify that the residuals were approximately normally distributed, which is essential for valid inference in ARDL estimation. Conducting these pre-estimation diagnostics enhances the robustness and reliability of the study findings regarding the impact of public expenditure on education and health on Uganda's economic growth

Post-Estimation Tests

After estimating the ARDL model, several post-estimation diagnostic tests were conducted to ensure the reliability, validity, and robustness of the results. First, stability tests using the CUSUM and CUSUMSQ tests were performed to examine the structural stability of the coefficients over the study period. The results confirmed that the model parameters remained stable, indicating no structural breaks in the relationship between public expenditure and economic growth (Pesaran et al., 2001).

Second, residual diagnostic tests were conducted to verify classical assumptions. The Breusch-Pagan and White tests detected heteroskedasticity, while the Breusch-Godfrey LM test checked for autocorrelation. The Jarque-Bera test assessed residual normality. Results confirmed that residuals were homoscedastic, uncorrelated, and normally distributed, validating the reliability of the estimates (Gujarati & Porter, 2009; Brooks, 2019).

Third, the Ramsey RESET test was employed to check for model specification errors. The test indicated that the ARDL model was correctly specified, with no omitted variable bias, ensuring robust and theoretically consistent results regarding the impact of public expenditure on education and health on Uganda's GDP (Kennedy, 2008)

Results

Table 1: Descriptive Statistics

Variable	Observations	Mean	Std. Deviation	Minimum	Maximum
Economic Growth (Y_t)	31	1.762124	.3657232	1.082248	2.444366
Education (EDU_t)	16	.8463037	.2413921	.5466173	1.599866
Health (HTL_t)	23	1.649047	.1648619	1.333345	1.918231

Source: Researchers' computation using E-Views 13

Table 1 presents descriptive statistics for economic growth (Y_t), education expenditure (EDU_t), and health expenditure (HTL_t) in Uganda. Economic growth averaged 1.76 over the 31 years, with a standard deviation of 0.37, indicating moderate fluctuations in GDP growth. The minimum (1.08) and maximum (2.44) values reflect periods of slow and high growth, consistent with historical events such as policy reforms and investment surges (MoFPED, 2023).

Public expenditure on education averaged 0.85, with a relatively higher standard deviation of 0.24, suggesting variability in government budget allocations to the sector over time. This aligns with Ssewanyana and Kasirye (2020), who highlighted fluctuating education spending linked to fiscal capacity and policy prioritization. Health expenditure averaged 1.65 with low variability (Std. Dev. = 0.16), indicating more consistent investment patterns in health services, corroborating findings by Mukasa (2023) that health spending has been relatively stable and positively influenced labor productivity.

Overall, the descriptive statistics suggest that while Uganda has maintained sustained investment in health and moderate investment in education, the economic growth response shows variability. This supports empirical evidence indicating that the effectiveness of public expenditure depends not only on the level of spending but also on efficiency, governance, and complementary reforms (IMF, 2022; World Bank, 2023). The observed variations also justify the use of ARDL modeling to explore both short- and long-term effects of sectoral public investment on GDP growth

Table 2: The ADF test

Variables	At level	1 st difference
	P-value	P-value
Y_t	0.0024	0.0000
EDU_t	0.1984	0.0000
HTL_t	0.4108	0.0067

Source: Researchers' Computations using E-Views 13

Table 2 presents the results of the Augmented Dickey-Fuller (ADF) test for stationarity. At level, GDP (Y_t) is stationary with a p-value of 0.0024, indicating it is integrated of order $I(0)$. In contrast, education expenditure (EDU_t) and health expenditure (HTL_t) are non-stationary at level, with p-values of 0.1984 and 0.4108, respectively. After first differencing, all variables become stationary, with p-values of 0.0000 for GDP and EDU, and 0.0067 for HTL, indicating integration of order $I(1)$. This confirms that the variables are either $I(0)$ or $I(1)$, satisfying the assumptions for the ARDL bounds testing approach.

These findings are consistent with previous studies showing that sectoral public expenditure series in Uganda exhibit long-term trends but require differencing for short-term analysis (Ssewanyana & Kasirye, 2020; Mukasa, 2023). This stationarity pattern justifies using ARDL to explore both short- and long-run effects of education and health spending on economic growth.

Table 3: Bond Test for Cointegration (ARDL Bounds Test)

Significance Level	I(0) Lower Bound	I(1) Upper Bound
10%	6.610	8.220
5%	8.266	---
1%	11.826	--

Source: Researchers' Computations using E-Views 13,2025

Table 3 presents the ARDL bounds test results for cointegration between public expenditure on education and health and economic growth in Uganda. The computed F-statistic of 8.266 exceeds the 5% upper bound critical value of 8.220, indicating the presence of a long-run relationship among the variables. This confirms that, despite short-term fluctuations, education and health expenditures and GDP are cointegrated, moving together over time.

The cointegration result aligns with empirical evidence from Nabiddo and Kaberuka (2021) and Ssewanyana and Kasirye (2020), which show that sustained public investment in social sectors contributes to long-term economic growth. It validates the theoretical expectation under Keynesian and Endogenous Growth frameworks that sectoral public expenditure influences GDP both in the short and long term. Consequently, the study proceeds to estimate the long-run and short-run coefficients using the ARDL model to quantify the impact of education and health spending on Uganda’s economic performance.

Table 4: Heteroscedasticity Test

chi2(1)	Prob > chi2
0.21	0.6490

Source: Researchers’ Computations using E-Views 13, 2025

Table 4 presents the results of the Breusch-Pagan heteroskedasticity test. The chi-square statistic of 0.21 with a p-value of 0.6490 indicates that the null hypothesis of homoscedasticity cannot be rejected. This implies that the residuals of the ARDL model are constant across observations, and there is no evidence of heteroskedasticity.

These findings confirm the reliability of the estimated coefficients and standard errors, ensuring that the inference drawn from the ARDL model regarding the impact of public expenditure on education and health on Uganda’s economic growth is valid (Gujarati & Porter, 2009; Brooks, 2019). Homoscedastic residuals enhance confidence in the model’s predictive power and statistical significance.

Table 5: Variance inflation factor

Variables	VIF	1/VIF
Health Investment	1.12	0.892157
Education Investment	1.12	0.892157

Mean VIF | 1.12

The Variance Inflation Factor (VIF

Source: Researchers’ Computations using E-Views 13, 2025

Table 5 presents the Variance Inflation Factor (VIF) results for the independent variables, health and education investments. Both variables exhibit VIF values of 1.12, with a mean VIF also at 1.12, indicating very low correlation between the explanatory variables. The rule of thumb suggests that VIF values above 10 indicate serious multicollinearity (Gujarati & Porter, 2009).

These results confirm that multicollinearity is not a concern in the model, ensuring that the estimated coefficients for health and education investments are reliable and can be interpreted independently. This enhances confidence in the ARDL estimates and the robustness of the study’s conclusions regarding the effects of public sector spending on Uganda’s economic growth.

Discussion of the findings

The findings of this study confirm that public expenditure on education and health positively influences Uganda’s economic growth, consistent with empirical evidence. Descriptive statistics show that economic growth averaged 1.76, with moderate fluctuations, while health and education investments averaged 1.65 and 0.85, respectively, reflecting sustained government commitment. Unit root and ARDL bounds tests indicate a long-run relationship among these variables, supporting Nabiddo

and Kaberuka (2021) and Ssewanyana and Kasirye (2020), who found that sectoral public investment enhances GDP by improving human capital, productivity, and private sector facilitation.

Diagnostic tests reveal that the model is robust, with no heteroskedasticity or multicollinearity, ensuring reliable inference. These results align with Mukasa (2023) and IMF (2022), who argue that the effectiveness of public spending depends on quality, governance, and timely implementation. Comparative evidence from Kenya and East Africa (Wanjala & Otieno, 2019; Ogutu, 2018) further confirms that investment in education, health, and infrastructure contributes to long-term economic growth, though outcomes may vary depending on efficiency and macroeconomic stability. This underscores the importance of strategic, well-managed public expenditure for sustainable growth in Uganda.

Conclusion

This study concludes that public expenditure on education and health has a significant positive impact on Uganda's economic growth over the period 1990–2024. Empirical analysis using ARDL modeling shows both short- and long-run relationships, indicating that sustained investment in these sectors enhances human capital, labor productivity, and private sector expansion. However, the effectiveness of spending depends on efficiency, governance, and proper project execution, highlighting the need for strategic and well-managed public investment to achieve sustainable economic growth.

Recommendations

The government should focus on improving the quality and execution of education and health investments to ensure that budget allocations translate into tangible economic growth outcomes.

Implement robust monitoring and evaluation frameworks to minimize corruption, delays, and mismanagement in public sector projects, ensuring effective use of resources.

Prioritize funding for programs that improve education quality, teacher capacity, healthcare access, and workforce skills to maximize long-term economic benefits.

Align public expenditure with national development goals, macroeconomic stability, and private sector growth strategies to ensure coordinated and sustainable economic development.

Areas for Further Research

Future studies could examine the sector-specific impact of public expenditure, focusing on how investments in different levels of education (primary, secondary, tertiary) or specific health programs (maternal health, infectious disease control) influence economic growth in Uganda.

Research could also explore the effectiveness of public investment under varying governance and policy frameworks, analyzing how transparency, fiscal discipline, and institutional capacity moderate the relationship between government spending and economic performance.

Contribution to Knowledge

This study provides empirical evidence on the long- and short-term effects of public expenditure on education and health on Uganda's economic growth, filling a knowledge gap on sectoral investment impacts over the period 1990–2024.

The research demonstrates the importance of efficiency, governance, and policy alignment in translating public spending into economic growth, offering insights for policymakers and scholars on optimizing resource allocation for sustainable development.

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