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EFFICIENCY

GOVERNMENT EXPENDITURE AND TECHNICAL EFFICIENCY IN PUBLIC SECONDARY SCHOOLS: A CASE OF NAROK COUNTY, KENYA

[*1]Purity Makena & [2]Dr. Charles Mugendi

[1]Student, School of Business, Economics and Tourism, Kenyatta University, Kenya

[2]Lecturer, School of Business, Economics and Tourism, Kenyatta University, Kenya

***Email Address of the Corresponding Author: puritymaks2000@gmail.com**

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ABSTRACT

Purpose of the Study: To analyze the effect of government expenditure on technical efficiency of public secondary schools in Narok County, Kenya.

Problem Statement: Public secondary schools in ASALs such as Narok County, Kenya, face challenges in achieving optimal technical efficiency, potentially hindering student learning outcomes. While the Kenyan government allocates funds to these schools, the impact of this expenditure on efficiency remains unclear.

Research Methodology: The research study adopted a mixed research approach combining quantitative and qualitative data collection methods. The research design involved the use of existing data on government expenditure and technical efficiency metrics from public secondary schools in Narok County, Kenya.

Results of the Study: Government funding delays significantly impact public secondary schools in Narok County, with an average technical efficiency of just 59.60% and 40.10% inefficiency. Government capitation, infrastructure expenditure, teaching materials, and teacher-student ratio positively affect efficiency, while school size was found insignificant.

Conclusion and Policy Recommendation: By implementing strategic policy interventions, such as increased funding, improved infrastructure, and better teacher-student ratios, the government can bridge efficiency gaps and improve overall school performance and build on the human capital that is needed to propel economies forward.

Keywords: *Technical Efficiency, Stochastic Frontier Analysis, Narok County, Kenya*

INTRODUCTION

Education is not only a vital human right but also a means by which economies develop their human capital for sustainable economic growth and development (Glewwe et al 2014). Development of any society in both social and economic spheres depends majorly on the quality of its education system which also depends on the utilization of its educational resources such as teachers ((Paschal & Mkulu, 2020). One of the main intentions of teaching and learning is to bring both professional growth and academic progress in learners that could be able to enhance social and economic progress. This therefore, underscores the need for proper utilization of all the education resources available not only because they are scarce but as well as due to the growing population whose educational needs must be met with these scarce resources (Gupta, Verhoeven and Tiongson, 2019). Education is a key instrument for economic development of the people and the nation because the skills and knowledge gained from education contribute to the overall well-being of an individual, the society, the nation and the world at large (World Economic Forum, 2016). Any inefficient utilization of education resources and all resources actually, should be avoided if any country is to make progress towards becoming a developed nation since education is stem from which all skills and competences need for all careers to grow (Brown and Lauder, 2013).

An education system is said to be efficient if maximum education output is obtained from a given set of education inputs or if a given education output is obtained with minimum possible education inputs (UNESCO, 2017). Ngware (2000) observed that technical efficiency refers to whether education systems achieve their internally set objectives as measured by retention rates, standardized test scores, promotion rates, cohort wastage rates, utilization factor, optimum institutional size, unit costs and graduation rates. Educational inputs comprise the buildings, teachers, and books, teaching materials and learning equipment (Levine, Green & Caren, 2008). These are aggregated financially in terms of expenditures per pupil years

In Kenya, primary education receives the largest share of spending at about 42%. Secondary receives the second largest share at about 31%, followed by university at around 15%. ECDE received only 0.2% in 2010/11, and the share has increased to 2% in 2014/15. Trends in recurrent expenditure are similar to those for overall expenditure (MOEST, 2020). It is spending on merit goods such as education, health, defense and police, among others that accounts for a significant proportion of government expenditure as well as a country's GDP. This explains the need for efficient utilization of such resources. According to a report by Organization for Economic Cooperation and Development, OECD 2022, Norway and Chile

reported the highest total expenditures on education as a percentage of GDP (both 6.6 percent), followed by Israel and New Zealand (both 6.2 percent), the United Kingdom (6.1 percent), and the United States (6.0 percent). Inadequate and or late release of education funds leads to myriad of problems including inadequate staff, shortage of teaching and learning resources, infrastructure (classrooms, tutorial spaces and office spaces). These are indicators of inefficiency in utilization of the available resources or an indication of inadequate funding or a total lack of funding by the state (Ogechi and Gachanja, 2024).

In Kenya, education and training remain a priority investment by the government. The government recognizes the role of education on poverty reduction and economic growth, thus providing constitutional commitment in providing funding for free compulsory basic education and subsidized secondary education (Republic of Kenya, 2010). In the KIPPRA report (2019) the education sector account for about 5.2% of the government's 2017/18 GDP which was about 21% of the total budget outlay to strengthen the education resource input for improved outcomes and output. In 2023/24 financial year, education the sector was allocated Ksh 628.6B which represented 27.4% of the total planned expenditure. The government's commitment in fulfilling educational policies like the Sustainable Development Goals (SDGs), especially SGD4, Kenya Vision 2030, Free Day Secondary Education (FDSE), Medium-Term Plan (MTPs), the Constitution of Kenya (2010), and the County Integrated Development Plans (CIDPs) increases education spending to realize the 100 percent transition policy for secondary education.

The government expenditure in education has been increasing for the last ten years and this trend is likely to continue into the future as government is geared towards implementing secondary education policies to ensure equity especially in marginalized communities. As a marginalized region, Narok County faces distinct challenges that influence the effectiveness of government expenditure. These include limited agricultural activity due to the arid conditions, which in turn affects the economic stability of households and their ability to contribute to the education sector. The reliance on pastoralism as a primary livelihood also presents irregular income flows, further complicating the financial landscape of education funding.

STATEMENT OF THE PROBLEM

The Kenyan government's investment in public education through budgetary allocation and capitation funds has been on upward trend in an effort to achieve universal education and align with the Social Pillar of Vision 2030. In 2008, FDSE was introduced with capitation of Ksh

10,626 per student which was increased to Ksh 12,870 in 2012 and to Ksh 22, 244 in 2018 in in an effort to achieve EFA and the global Sustainable Development Goal number four, Quality Education. The budget allocation increased from 5.3 percent of Gross Domestic Product in 2012/13 to 19.5 percent in 2019/20 (GOK, 2020), an evidence of continued government investment in education. However, despite the government's effort and continued funding of public education, less is being achieved in secondary schools across the county and especially in marginalized areas such as Narok County. For instance, according to a report by the KNBS in 2022, Kenya's adult literacy level stood at merely 82.88% with Narok County's literacy level standing at 56.3%. This coupled with low national completion rates at 24.5% and in Narok County at 39.6% (KNBS 2019) is a clear indication of wastage and inefficiency in the education system despite increased funding over the years. Public secondary schools in ASALs such as Narok County, Kenya, face challenges in achieving optimal technical efficiency, potentially hindering student learning outcomes. While the Kenyan government allocates funds to these schools, the impact of this expenditure on efficiency remains unclear. This study aimed to investigate the determinants of technical efficiency in public secondary schools within Narok County. Specifically, it examined how government expenditure on these schools influences their technical efficiency and identify other factors that moderated this relationship.

RESEARCH OBJECTIVES

The overall objective was to investigate the relationship between government expenditure on education and the technical efficiency of public secondary schools in Narok County, Kenya.

The specific objectives of the study sought;

i. To determine the technical efficiency of public secondary schools in Narok County.

ii. To estimate the determinants of technical efficiency of public secondary schools in Narok County, Kenya.

RESEARCH HYPOTHEIS/QUESTIONS

The study answered the following research questions;

i. What is the technical efficiency of public secondary schools in Narok County?

ii. What are the factors determine technical efficiency of schools in Narok County?

THEORITICAL REVIEW/ FRAMEWORK

The section identifies, presents ad discusses relevant theories that explains the concept of government expenditure on education and technical efficiency in public secondary schools. The theoretical literature covers two theories including the Production theory and the efficiency theory linking them to government expenditure on education and technical efficiency in public secondary schools.

The Theory of Production

According to production theory, output is a function of inputs that a firm employ in its production process. The function can either be linear, Leontief or Cobb-Douglas. A linear production function is of the form;

$Q=f(X_1,X_{2....}X_n)$……..……1

Where Q is the firm's output, X1, X2….Xn are the resources used in the production of output Q. A Cobb-Douglas production function expresses output, Q as a function of two inputs only; the Capital (K) and Labour (L). Leontief production function is a production function that implies the factors of production which will be used in fixed (technologically pre-determined) proportions, as there is no substitutability between factors. It was named after Wassily Leontief and represents a limiting case of the constant elasticity of substitution production function.

Researchers such as Coleman (1966), Mincer (1970) and Psacharopoulos and Patrinos (2004) used different sets of inputs to produce different outputs by applying this production theory. They argued that school attainment is an output measure of a skill acquired in school. Schulz (1961) and Becker (1962), the proponents of the Human Capital theory, used inputs such as parental characteristics, socio-economic factors, teacher characteristics and pupil characteristics in the education production process and concluded that education production process was desirable in achieving maximum utility of schooling.

Efficient utilization of education resources requires knowledge of the costs involved in the education production process. Efficiency is the ability of decision-making units (DMUs) to produce maximum output by utilizing the least possible combination of inputs (Farrell 1957). In education context, efficiency refers to when outputs from education such as standardized test results are produced at the lowest level of educational resource employment. Farrell further proposed that the efficiency of any firm consists of two parts; the technical efficiency and the allocative efficiency which culminates to economic efficiency. According to Farrell, technical efficiency is the ability of a firm to generate maximum output from a given set of inputs while

allocative efficiency is the ability of a firm to use the resources available in optimal proportions given their respective prices.

A school is efficient if it delivers a specific level of student learning outcomes e.g., standardized test scores, graduation rates while utilizing the minimum amount of resources e.g., teachers, instructional materials, funding. Schools operating below the production frontier are inefficient, implying they could potentially achieve the same learning outcomes with fewer resources or produce higher learning outcomes with the same resources. Allocative efficiency in schools largely focus on the optimal allocation of resources across different educational activities. It ensures that a school gets the most value out of its resource mix in relation to its educational goals. A school is allocatively efficient if it has chosen the most cost-effective combination of resources to achieve its desired learning outcomes.

Schools operating below allocative efficiency might be spending too much on certain resources e.g., unnecessary administrative costs or not investing enough in crucial areas e.g. teaching and learning materials. Efficiency scores take values between zero and one where value one indicates that a DMU, a school in this case, is efficient while values below one indicates that the firm is inefficient (Farrell 1957). This study will borrow heavily from the theory of productivity and efficiency in schools to measure the utilization of school resources as inputs of the school production process that converts such teaching and learning inputs into educational outputs (Coelli et al, 2005).

Technical efficiency

It was put forward by Farrell (1957). According to Farrell, technical efficiency of a firm is measured by the ratio of its output against its inputs. Thus, it is the point where all inputs could be proportionally reduced without reducing outputs. A firm is technically efficient if this ratio is equal to one; otherwise it is inefficient. Accordingly, price or allocative efficiency measures the extent to which a firm uses the various factors of production in the best proportions, in view of their prices. Other scholars such as Agner and Chu (1968) have modified Farrell's work and came up with an improved stochastic frontier which deals with stochastic noise and permits hypothesis test for production processes and extent of inefficiencies. Technical efficiency is therefore defined by the following equation;

$$TE = \frac{YI}{Yi} = \frac{\exp(Xi\beta + Vi - Ui)}{\exp(Xi\beta + Vi)} = \exp(-Ui) \quad \ldots\ldots 2$$

Where, Yi is scalar output of the *ith* farm, Xi is a vector of input quantities and β is a vector of parameters to be estimated, *exp* is the exponential function, Vi is the disturbance term assumed to be independent and normally distributed N (0,σ) and it captures the effects of random factors outside control of the schools e.g. learner's or teacher's absenteeism. Ui is a non-negative random variable associated with technical inefficiency in the school production process and is assumed to be independently distributed.

This theory was relevant to the current study as it was used to assess how well schools convert resources, such as government funding, teaching staff, and infrastructure, into desired outputs like student performance, graduation rates, and overall academic success. By applying this theory, the study evaluated whether schools are making the most efficient use of the resources allocated to them, providing insights into areas where improvements could be made.

Farrell's distinction between technical efficiency and allocative efficiency is also critical for this study. Technical efficiency measures how effectively schools use their inputs to produce outputs, but allocative efficiency focuses on whether schools are using the right combination of inputs to minimize costs for a given output level. In public secondary schools, it's possible that even if technical efficiency is high, resources might not be allocated in a cost-effective manner. For example, a school might have enough teachers and textbooks but may lack critical infrastructure like laboratories or libraries. Thus, Farrell's framework helps differentiate whether inefficiencies stem from improper use of resources (technical inefficiency) or misallocation of resources (allocative inefficiency).

Moreover, Farrell's stochastic frontier model provides a robust tool for measuring efficiency, which aligns with the methodology of this study. The application of Stochastic Frontier Analysis (SFA) was helpful in estimating the efficiency of schools by comparing their performance to an efficient frontier—essentially the highest level of output achievable given the inputs. Schools operating below this frontier are considered inefficient, either due to external factors (random shocks) or internal factors (managerial inefficiencies). By using Farrell's theory, the study measured how much technical inefficiency in Narok County's public secondary schools is due to poor resource utilization and how much is due to uncontrollable external factors, guiding both policymakers and school administrators on where to focus their efforts for improvement.

EMPIRICAL REVIEW

Utilization of Government's Expenditure on Education

The World Bank (2019) carried out a study on quality of education and the efficiency of Public Expenditure through a cross-country comparative Analysis and reported that there existed a connection between public education spending and educational outcomes across various countries in which the study was carried out. The data analysis highlighted notable inefficiencies in education financing, with approximately 16% of public funds in developing countries being wasted due to ineffective use. These inefficiencies were attributed to poor governance, weak institutional structures, and a misalignment between education policies and labor market demands. The study emphasized on the need for enhanced governance mechanisms to ensure financial resources lead to tangible improvements in learning outcomes. Additionally, the study stressed on the importance of aligning curricula with workforce needs to increase the productivity of education investments. The effectiveness of education aid was also highlighted as crucial for optimizing expenditure efficiency, with a recommendation for targeted aid programs focusing on capacity building and institutional reforms instead of mere financial injections. The current study focused on just on county in Kenya and put into consideration the effects of other non-financial factors such as teacher-student ratio, teaching and learning materials on the overall TE of a public secondary school in Narok county, Kenya.

A study by Mutuku (2019) examined the level of enrolment, quality of education and technical efficiency indicators to explain school performance, this study analyzed the relationship between government expenditure on education and educational outcomes. The objectives were to establish the effect of government expenditure on enrolment, the quality of education; and measurement of the contribution of government expenditure to levels of technical efficiency in public primary schools within 47 counties in Kenya. School enrolments and class six scores were used as outcome variables. Technical Efficiency scores in the study were used to test and determine optimal utilization of school resources including government expenditures.

The study used data collected from the class six scores undertaken by the South and Eastern African Consortium for Monitoring Education Quality nation-wide surveys of 2000, 2004, and 2012. More data was collected from the Kenya National Examination Council and Statistical Abstracts between 1997-2018. Results from the study showed that government expenditure and school attributes were positive for enrolment and quality of education. Further, technical efficiency had improved in all the regions by 2012. The efficiency levels were influenced by

school facilities, school location, and level of government funding. The study noted the need for the government to increase its overall expenditure allocated on education to serve as a catalyst for enhancing and improving overall school performance in Kenya's public primary schools. The current study focused on secondary schools' efficiency and not primary school. The government of Kenya through FDSE, provides funding to all public secondary schools in Kenya including the capitation expenditure, teacher employment, teaching and learning resources, and physical infrastructure, among other things. The DMUs will be secondary schools in Kenya. To achieve the intended educational outcomes, they use inputs and convert them to educational outputs through the teaching and learning process.

Technical efficiency in public secondary schools refers to the effective and optimal use of resources, processes, and systems to achieve desired educational outcomes while maximizing value for students, educators, administrators, and stakeholders. It is the process by which schools convert educational inputs into outputs (Coelli et al, 2005). A study by Munge, Kimani and Ngugi (2016) evaluated the factors influencing financial management in public Secondary Schools in Nakuru County. The study adopted a cross-sectional survey research design. It targeted heads and bursars of public secondary schools in Kenya. The accessible population constituted all the 172 school heads and 172 bursars of public secondary schools in Nakuru County. The study established that budget management and financial controls positively and significantly influenced financial management. Thus, the current study will seek to establish whether the funding allocation and utilization of government expenditure on education influence technical efficiency of secondary schools in Narok County.

Kanina (2012) used DEA and DEA-based Malmquist productivity index to measure technical efficiency in public primary schools in Kenya. He grouped schools into 72 districts and used exam mean scores as output whereas gross enrollment, student-to-class ratio, and student-teacher ratio were the inputs. The average efficiency score, according to the study was 90.8 percent. The study revealed that with the amount of inputs now available, schools can raise their performance by 9.2 percent. Tobit regression analysis showed that districts in urban regions outperformed those in rural areas, and a high student-teacher ratio was linked to poor levels of efficiency in rural schools. This study did not explore efficiency in secondary schools and this will be the gap that the current study sought to fill using SFA and Tobit regression as the model of estimating efficiency.

CONCEPTUAL FRAMEWORK

Production is the economic process of converting inputs into outputs. The inputs or resources used in production are called factors of production. Consider a firm that uses x inputs to produce a single output q.

q = f(x)……3

An efficient transformation of the inputs into output is characterized by production function f(x) which shows the maximum possible output obtainable with a given technology from a given set of inputs.

Stochastic Frontier Analysis

The Stochastic Frontier Analysis (SFA) was independently proposed by Meeusen and van den Broeck (1977) and Aigner, Lovel and Schmidt (1977). The stochastic frontier production model they proposed was as follows:

$$\boldsymbol{lnq_i = x_i^{/}\beta + v_i - u_i}\text{……..4}$$

Where $\boldsymbol{q_i}$ represents the output of ith firm, x_i is a K*1 vector which contains logarithms of inputs, $\boldsymbol{\beta}$ represents a vector of parameters, $\boldsymbol{u_i}$ is a random variable which is non- negative associated with the technical inefficiency and $\boldsymbol{v_i}$ accounts for the statistical noise. Equation 3.3 represents the stochastic frontier production function since the values of outputs are bounded from above by the random (stochastic) variable.

The stochastic frontier model can be demonstrated graphically as shown in Figure 3.1 below.

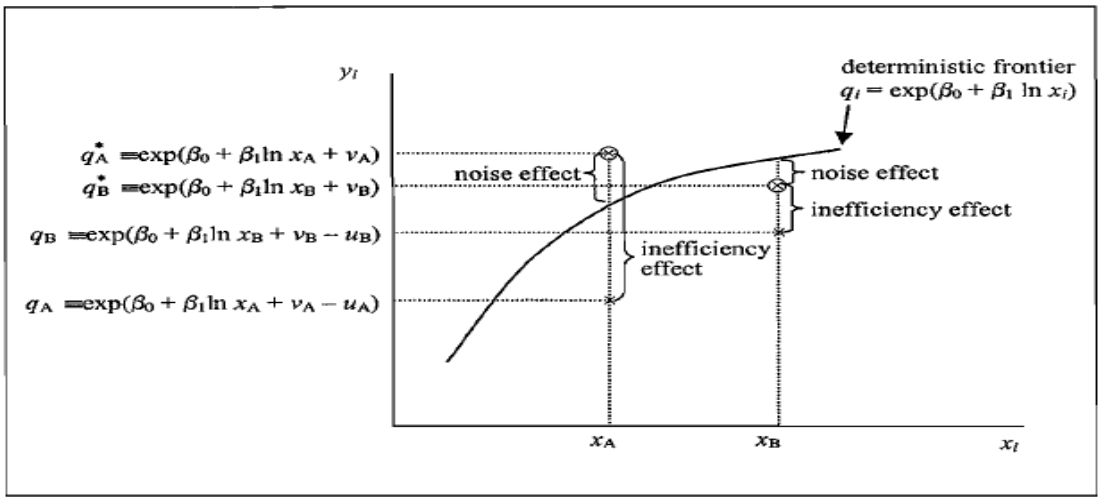

Figure 1: Stochastic Production Frontier

Source: Coelli et al. (2005)

From Figure 1, the frontier values for firm A and B lies above the deterministic production frontier since the noise effect is positive and below the deterministic frontier since the noise effect is negative respectively. However, the observed output, q_A for firm A lies below the deterministic frontier while that of firm B lies above the deterministic frontier. This can be explained by the negative sum of the inefficiency and noise effects. Generally, the observed outputs lie below the deterministic frontier while the unobserved (frontier) outputs lie below the deterministic part but distributed evenly.

Using the SFA, technical efficiency is the ratio of the observed outputs to the corresponding stochastic (unobserved) outputs. The TE scores will be computed as given below:

$$TE_i = \frac{exp\left(x_i^{/}\beta + v_i - \mu_i\right)}{exp\left(x_i^{/}\beta + v_i\right)} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 5$$

The TE scores assume the values between zero and one. This means that the TE scores are truncated and take the values only within the given range and they are non-negative. TE_i measures output of the ith firms relative to the outputs which could be produced by DMUs which are fully-efficient using the same vector of inputs.

RESEARCH METHODOLOGY

The research study adopted a mixed research approach combining quantitative and qualitative data collection methods. Quantitative research reallows for the collection of numerical data, facilitating statistical analysis to answer the research questions and draw conclusions. The research design involved the use of existing data on government expenditure and technical efficiency metrics from public secondary schools in Narok County, Kenya. The quantitate research design was appropriate because it offered a structured and a rigorous framework for generating empirical evidence, enabling the researcher to draw meaningful conclusions from the findings. Data from the Decision-Making Units, DMUs that is the selected secondary schools in Narok County were collected using questionnaires and from secondary sources covering a period of five years from 2020 to 2024. Unlike other research studies previously carried out such as a study by Ogechi and Gachanja (2024) which used DEA in estimating efficiency of public universities in Kenya, this research study used Stochastic Frontier Analysis (SFA) approach in estimating the technical efficiency scores of the DMUs. SFA was preferred mainly because it makes a clear distinction between technical efficiency and random errors thereby significantly improving the precision of the efficiency estimates arrived at.

RESULTS AND DISCUSSIONS

Qualitative Findings

The second objective of this study was to determine other factors which affected technical efficiency of public secondary schools in Narok County. To answer this objective, the researcher collected data from the respondents (sampled public secondary schools in Narok County) using questionnaires. The quantitative findings of this study provided empirical evidence on the technical efficiency of public secondary schools and the role of government expenditure in improving educational outcomes.

Government Capitation and Efficiency

Government capitation was identified as a crucial factor influencing technical efficiency. Schools that received higher government funding were found to be more efficient in resource utilization, improving student performance and overall institutional outcomes. This indicates that sustained financial support is essential for enhancing school efficiency. From the questionnaires administered to the sampled DMUs, it was established that 72% of the public secondary schools strongly disagreed that government capitation were disbursed on time whereas 63% of the DMUs agreed that lack of adequate government capitation negatively impacts the performance of schools and their overall efficiency. This finding agrees with Mutuku (2019) who noted that government expenditure has a significant implication on efficiency of learning institutions. On the other hand, 69% disagreed that government capitation is sufficient in covering the costs incurred in running of the schools. As demonstrated in Figure 4.4 76% of the respondents strongly agreed that government capitation increased access to quality education.

School Infrastructure and efficiency

Investment in school infrastructure from the analysis of the responses by the sampled public secondary schools in Narok County had a significant effect on their efficiency. Schools with adequate classrooms, laboratories, and libraries exhibited higher efficiency levels compared to those with poor infrastructure. 73% of the respondents disagreed with the notion that government funds which were allocated to the secondary schools during the period under study and voted for school infrastructure were sufficient. 85% of the respondents strongly agreed that poor status of infrastructures in schools was as a result of inadequate government capitation. 93% of the respondents strongly agreed that massive investment in school infrastructure had a

direct positive effect on the performance of students. Diverse opinions were given regarding the utilization of the funds allocated to them by the government.

Teaching and Learning Materials and Efficiency

From the analysis of the responses provided by the respondents from the questionnaires administered to them, it was established that many schools did not have adequate teaching and learning materials. 89% of the respondents strongly disagreed with the question that their schools had adequate teaching and learning materials. This calls for massive investment in teaching and learning materials to help in improving the overall efficiency of schools. Similarly, it was established that allocation for textbooks and other learning materials was insufficient in many sampled schools. The main challenges which faced the sampled public secondary schools in Narok County were inadequate funding, poor school infrastructure, and lack of enough teachers to reduce the teacher-student ratio and long delays of remittance of school funds by the government.

Regression Results

The regression analysis was conducted to determine the factors influencing school performance, with results presented in Table 7. The model demonstrates a strong explanatory power with an R-squared value of 0.9013, indicating that approximately 90.13% of the variation in the dependent variable is explained by the independent variables.

Table 1: Regression Results

Variable	Coefficient	Std. err	T	p >|t|	[95% conf.	interval]
**University Entry	2.96E-11	1.01E-09	0.14	0.871	-0.94491	0.062924
*Government Capitation	3.16E-11	1.81E-09	0.02	0.986	-3.66E-09	3.08E-77
***Teaching & Learning Materials	3.65E+00	1.31E-09	0.18	0.762	-3.93E-16	3.41E-73
***Infrastructure	2.438978	1.853621	1.32	0.81	-0.04697	0.030715
Teacher student ratio	-0.0130881	0.016886	-0.78	0.442	-0.03617	0.020795
*School Size	4.434567	2.765342	2.34	0.715	-0.04697	0.029197
Cons	1.162966	0.324577	1.61	0.115	-0.29139	2.616935

Source	SS	Df	MS	Number of obs	55
Model	0.002073675	2	0.001036838	F(2, 52)	0.35
Residual	0.153432604	52	0.002950627	Prob > F	0.7054
Total	0.15550628	54	0.002879746	R-squared	0.9013
				Adj R-squared	0.8602
				Root MSE	0.15432

The findings showed that government capitation was significant at 5% significance level and had a positive effect on efficiency, indicating that more funding leads to increased performance and efficiency in learning institutions. These findings are complemented by the study carried

out by Mutuku (2019) which established that government expenditure had a positive impact on technical efficiency. Schools that got more in capitation could improve on their facilities, employ many more BOM teachers and make the learning environment better. In addition, technical efficiency is positively related to expenditure on infrastructure and teaching and learning materials and significant at 5% significance level. As established by Gałecka, Kuropka and Szabela-Pasierbińska (2022), better were schools that had well maintained classrooms, equipped laboratories and adequate learning materials, which reinforced importance of investment in physical and instructional resources. A study by Grigoli (2012) complements the findings of this study as it established that public expenditure had a significant impact on efficiency in learning institutions especially when more resources are channeled towards teaching and learning materials.

Unsurprisingly, however, the teacher-student ratio was insignificant at 5% significance level since the overcrowded classrooms did not promote the efficiency of effective teaching and individualized instruction. The findings are against what Santín and Sicilia (2018) established in their study where they concluded that investment in employing more teachers to reduce teacher to student ratio had a positive effect on efficiency in the learning institutions. These findings overall emphasize the importance of strategic resource allocation by the government for efficient management of public secondary schools as established by Awuor (2015). Adjusted R-squared was estimated to be 0.8602. This indicated that 86.02% of the independent variables explained the dependent variable. This implies that the model was robust and it effectively answered the research objectives. School size was significant at 5% significance level and had a positive effect on technical efficiency. It is worth to note government capitation in public secondary schools is pegged on the number of students. Thus, the higher the student population the more money in form of government capitation a school receives albeit the consistency and timeliness of the release of the funds. As established from the study, many schools experienced delays in remittances of government capitation. This significantly affected their level of effectiveness and timeliness of running school operations. These findings are in line with the findings of a study carried out by Kirwoya (2022) who established that indeed delays in remittance of government capitations significantly affects the operations of learning institutions.

CONCLUSIONS

The study investigated government expenditure and technical efficiency in Narok County's public secondary schools, focusing on how public expenditure affects efficiency and

identifying key factors contributing to resource utilization inefficiencies. Among the 55 sampled schools, funding disparities were evident, with better-funded schools demonstrating higher efficiency and improved academic outcomes. Schools with well-maintained infrastructure (libraries, laboratories, classrooms) achieved higher technical efficiency than those with inadequate facilities, indicating infrastructure's direct impact on learning outcomes. Teacher-student ratios varied widely, with optimal ratios enabling personalized attention and improved learning, while overcrowded classrooms compromised instructional quality. Access to teaching materials significantly influenced efficiency, with well-equipped schools outperforming those facing shortages. Using Stochastic Frontier Analysis, the study found an average technical efficiency score of 0.5960, meaning schools operated at approximately 59.60% efficiency with 40.40% inefficiency, primarily due to inadequate government funding affecting resource availability and infrastructure development. Trend analysis revealed gradual efficiency improvements correlating with increased funding, though some schools remained inefficient due to disbursement delays. Tobit regression analysis confirmed a positive, significant relationship between government funding and efficiency levels, while teaching materials availability, infrastructure quality, and teacher-student ratios significantly influenced efficiency scores.

RECOMMENDATIONS

This study examined the effect of government expenditure on the technical efficiency of public secondary schools in Narok County, Kenya. Using Stochastic Frontier Analysis and Tobit regression, the study established that government funding plays a significant role in determining school efficiency. The findings highlighted the impact of infrastructure quality, teacher-to-student ratios, and access to learning materials on efficiency scores. The study also identified inefficiencies in resource allocation, with some schools experiencing delays in disbursement of public funds and inadequate infrastructure development as the main impediments to achieving high TE ratios in public secondary schools in Narok County, Kenya. These findings underscore the importance of timely and sufficient government expenditure in enhancing educational outcomes. By implementing strategic policy interventions, such as increased funding, improved infrastructure, and better teacher-student ratios, the government can bridge efficiency gaps and improve overall school performance and build on the human capital that is needed to propel economies forward. With the many expenditure choices and the financial constraints that most countries are facing today, efficient utilization of education resources is key. Reduction of wastage of educational resources will enable any government to

be able to meet other macroeconomic objectives with much ease-studies have shown that good macroeconomic performance stems from good education system and proper skill acquisition. This can only be achieved with proper and efficient utilization of educational resources.

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