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

MAKENA PURITY

A RESEARCH PROJECT SUBMITTED TO THE DEPARTMENT OF ECONOMIC THEORY IN THE SCHOOL OF BUSINESS, ECONOMICS AND TOURISM IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OF THE DEGREE OF MASTER OF ECONOMICS (POLICY AND MANAGEMENT) OF KENYATTA UNIVERSITY

JUNE, 2025

DECLARATION

This project is my original work and has not been presented for a degree in any other university or any other award.

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DEDICATION

This work is dedicated to my husband and our children as an inspiration to greater heights in future.

ACKNOWLEDGEMENTS

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ABBREVIATIONS AND ACRONYMS

ASALs	Arid and Semi-Arid Areas Lands
CIDPs	County Integrated Development Plans
CRS	Constant Returns to Scale
CUE	Commission for University Education
DEA	Data Envelopment Analysis
DMUs	Decision Making Units
EFA	Efficiency Frontier Analysis
FDSE	Free Day Secondary Education
FY	Financial year
GER	Gross Enrolment Rate
GDP	Gross Domestic Product
GNP	Gross National Product
IMF	International Monitoring Fund
KIPPRA	Kenya Institute for Public Policy Research and Analysis
MOE	Ministry of Education
MTPs	Medium-Term Plan
OECD	Organization for Economic Cooperation and Development
SDGs	Sustainable Development Goals
SFA	Stochastic Frontier Approach
SPSS	Statistical Package for Social Science
UNESCO	United Nations Educational, Scientific, and Cultural Organization
VRS	Variable Returns to Scale

DEFINITION OF TERMS

Dropout rates: The ratio of enrolment and completion represented by the number of students discontinuing secondary education before the completion of the cycle.

Efficiency: The performance level of secondary schools that utilize the least inputs to obtain the greatest level of output.

Government Expenditure: The amount that the Kenyan government allocates, distributes, and uses for secondary schools. For every student registered in a public-funded secondary school, the funds cover the costs of ongoing, administrative, and development expenses.

Repetition rates: This is the number of students repeating the same grade more than once.

School Possession Index: According to conventional government regulations, the School Possession Index compares the relative utilities within a particular school with the enrollment levels.

Technical efficiency: The measure of performance of educational inputs in achieving educational output.

Transition rates: Student numbers joining secondary school after elementary schooling and the number of secondary education students joining tertiary education.

ABSTRACT

The objective of this study was to evaluate the degree to which education inputs are being utilized to achieve technical efficiency in education in Narok County. The specific objectives were to determine the technical efficiency level of government funded secondary schools, and identify factors determining technical efficiency in government funded secondary schools. A mixed-methods research design was adopted. Quantitative cross-sectional secondary data covering a period of five years was analyzed using Stochastic Frontier Analysis (SFA) to estimate the technical efficiency (TE) scores and their determinants. Qualitative insights were gathered through interviews with school administrators and education stakeholders to complement the quantitative findings. The study established that the overall mean technical efficiency of the sampled schools was 59.60%, implying a significant inefficiency of 40.40%, largely attributed to inadequate government funding and infrastructural deficiencies. Regression analysis revealed that government capitation, expenditure on infrastructure, investment in teaching and learning materials, and favorable teacher-student ratios had a significant positive effect on technical efficiency at the 5% significance level, while school size did not exhibit a significant influence. Qualitative findings reinforced that delayed remittance of government funds, insufficient infrastructure, and inadequate teaching resources hindered efficient school operations. The study recommends that policymakers prioritize increased, timely, and equitable government capitation, invest in infrastructure development, and improve the supply of teaching resources to enhance technical efficiency and optimize educational outcomes in public secondary schools.

CHAPTER ONE: INTRODUCTION

1.1 Background

Education is widely regarded as one of the most fundamental human rights and a critical driver of national development. According to Glewwe et al. (2014), education equips individuals with essential skills and capacities that contribute to sustainable economic growth and development. Development of any country in both societal and economic spheres depends majorly on the excellence of its education structure which also depends on the utilization of its educational resources such as teachers (Paschal & Mkulu, 2020). According to Paschal and Mkulu (2020), the main intention of education is to bring grow both professional and academic advancement of learners to be able to enhance social-economic improvement. 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.

1.1.1 Global Context

Growth and development of any economy hinges on the advancement of human capital, which is fostered through substantial investment in education and training. Recognizing this, governments worldwide are channeling a significant portion of public funds into education, with expenditures often ranging from 14%-20% of government spending and 5.1%-5.5% of gross domestic product (World Economic Forum, 2016). Education yields extensive social benefits. Consequently, it's deemed a merit good, warranting state provision either in full or part. 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.

Globally, governments are responsible for providing merit goods such as education to their citizens. Kenya is a part of the global community and a participant to various international treaties like EFA, UNESCO, MDGs and the SDGs that propagate provision and access to high standards of education for all. “This comprehensive Vision of education as well as an all-inclusive approach to sector progress was wholly incorporated by Kenya as an important vehicle for achieving Vision 2030, the road map for development” (Odhiambo, 2010; Gikondi et al., 2010; Republic of Keya/UNESCO, 2012). Additionally, Kenyan Constitution 2010 and the Basic Education Act 2013 affirm that education is a fundamental right to every human being and should be made available to all without any form of discrimination. This therefore, underscores the need for proper utilization of funds and other education resources (World Bank, 2013).

Any education structure is defined as efficient when maximum education output is obtained from a given set of education inputs or if a given education output can be obtained from minimum education inputs (UNESCO, 2017). Ngware (2000) noted that, “Technical efficiency is whether education systems meet their internally established aims measured through retention rates, standardized test scores, promotion rates, cohort wastage rates, operation factor, optimal 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” (Ngware, 2000).

“The number of schooling years used by a cohort of students to graduate constitutes an input indicator suitable for the measure of efficiency in education” (Achoka, 2007). However, this will not be addressed in this study. According to Ombongi (2008) the idea of TE can be obtained by comparing outputs to inputs from the time pupils join a

grade level to the last level in a cycle of educational. A perfectly efficient system has its value of coefficient as 1 or 100 otherwise, it is inefficient. “If the input-output rate is applied, the perfect state is equal to one (1), otherwise it is inefficient. Since it is expensive and problematic to generalize, school’s records system based on pupil information, educational TE is estimated using the reconstructed cohort method” (Ngware, 2000) because it includes promotions to the next grade, retention as well as the graduation rates.

1.1.2 Kenyan Context

Government expenditure can be defined as any spending expensed by the national, regional, or local governments that involves a significant percentage of Gross National Product (GNP). In Kenya, primary school education obtains the largest share of spending at about 42%. Secondary takes the second largest portion at about 31%. High institutions of learning, university, take around 15% of the public spending on education. ECDE, on the contrary, received a mere 0.2% in 2010/11, and the share has since increased to 2% in 2014/15. Patterns in recurrent government spending are similar to those for overall expenditure (MOEST, 2020). Spending on merit goods like education, health, defense and security, accounts for a substantial amount of public expenditure as well as a country’s GDP. This explains the need for efficient utilization of such resources. A report by OECD (2022), noted that Norway and Chile had devoted a high proportion of their GDP (both 6.6 percent) to education. Israel and New Zealand followed at 6.2 percent while the United Kingdom spent 6.1 percent and the United States 6.0 percent of their GDP in education.

In Zanzibar, the government increased public expenditure on education from 13.2% to 19.5% in 1990 in an attempt to realize Education for All by year 2000 as well as the Zanzibar Vision 2020 of ensuring 100 percent transition to secondary education

(Mohammed, Yusuf, & Omar, 2021). In education, technical efficiency deals the schools' capacity to abate educational wastage while maximizing resource utilization so as to deliver quality test scores and high transition (Kalluru & Bhat, 2009), Agasisti (2014). In Kenya, transition rate is set at 100% but it is yet to be achieved. This is another indicator of an inefficient education system. Technical efficiency involves the identification of and controlling wastefulness of resources as well as the processes that affect efficiency and progress of educational outcomes. TE is concerned with redesigning new processes that enhance efficiency and excellence in educational outcomes as put forward by (Darrab & Khan, 2010). Charnes, Rhodes and Coopers (1978) described TE as the proportion of aggregated outputs to that of aggregated inputs.

Inadequate and or late release of education funds leads to innumerable of difficulties such as staff shortage, 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.

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 subsidy for free compulsory education and subsidized secondary day school learning (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 Kenyan Constitution (2010), as well as the County Integrated Development Plans (CIDPs) increases education spending to realize the 100 percent transition policy for secondary education.

1.1.3 Narok County Context

In Narok County, persistent inefficiencies in resource utilization, especially in public secondary schools, threaten to undermine the intended benefits of increased education funding. Despite government policies aimed at universal secondary education and significant financial allocations, many schools in the county continue to face resource shortages, suboptimal transition rates, and poor educational outcomes. This situation raises critical questions regarding the technical efficiency of public secondary schools in Narok County and whether increased government expenditure aligns with improvements in educational performance.

In 2017, the government through the FDSE initiative increased public secondary schools' enrolment from 5% to 20% by increasing per student allocation from Ksh. 10,265 to Ksh. 22,244 to ensure 100% transition from primary to secondary schools. These spending efforts were not followed by close track on the technical efficiency of schools to ensure that the level of government expenditure matches the educational requirements in public-funded secondary schools. The Kenyan government continues to make significant allocations towards education expenditure in every financial year. Figure 1.1 below illustrates the trend in government spending on education over the last ten years, highlighting the consistent growth in financial commitments toward the education sector.

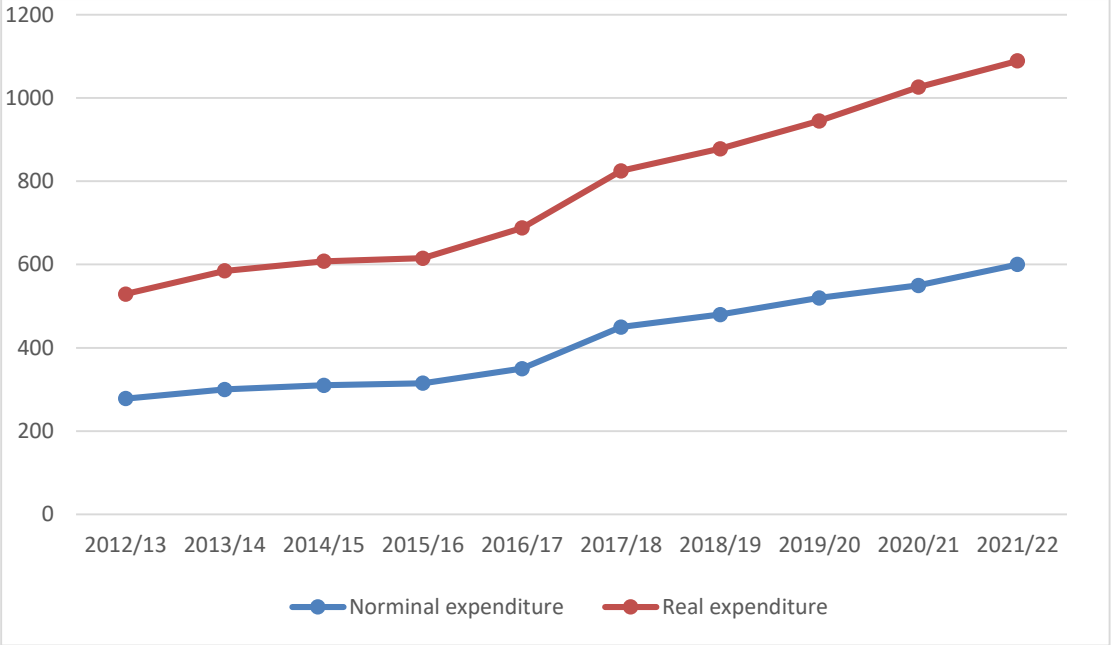

Figure 1.1 Government Spending on Education for the Last Ten Years

Source: KIPPRA 2022

From Figure 1.1, it is evident that government expenditure on education has been steadily increasing over the last decade. This growth is expected to continue as the government implements policies geared towards enhancing access to education, particularly in marginalized communities. This pattern is expected to remain unchanged in the foreseeable 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.

To contextualize government spending at the county level, Table 1.1 presents the education expenditure budget for Narok County for the 2019/2020 financial years,

providing insight into how education is prioritized within the overall county budget.

Table 1.1 Narok County Education Expenditure Budget 2019-2020

Vote Code Title	Gross Current Estimates	Gross Capital Estimates	Gross Total Estimates	Gross Current Estimates	Gross Capital Estimates	Gross Total Estimates
Ministry of Education, Youth, Sports, Culture & Social Services	1,136,156,216	859,602,043	1,995,758,259	1,117,141,469	685,738,471	1,802,879,940
Total Voted Expenditure	7,913,989,300	4,826,808,961	12,740,798,261	8,046,487,379	3,951,638,153	11,998,125,532

Source: Narok County Treasury, 2020

As shown in Table 1.1, the Ministry of Education, Youth, Sports, Culture, and Social Services in Narok County received approximately 15.03% of the gross total estimated county budget, reflecting a significant investment in the education sector. This substantial allocation signals the government's commitment to improving technical efficiency (TE) in public secondary schools, particularly in marginalized areas like Narok County. Nevertheless, the actual efficiency of resource utilization remains questionable given persistent challenges in education outcomes and infrastructure in the county. Building on these figures, Table 1.2 provides tentative budget ceilings for the education sector compared to the health sector for the 2021/2022 financial year, offering further insight into sectoral prioritization within Narok County’s development agenda.

Table 1.2 Tentative Ceilings for FY 2021/22 on Education and Health

Department	Recurrent	Development	Total	% share of allocation
Education Youth Affairs, Sports Culture and Social services	1,280,115,190.61	513,531,294.23	1,793,646,484.83	14.0%
County Health and Sanitation	2,877,881,898.99	984,788,389.83	3,862,670,288.83	30.1%
Totals	8,696,526,966.16	4,122,417,676.84	12,818,944,643.00	100.0%

Source: Narok County Treasury, 2022

The data in Table 1.2 demonstrates that education remains the second-highest priority in county expenditure, receiving 14% of the total budget allocation, following health and sanitation, which receives the largest share at 30.1%. While these figures reflect the government's ongoing commitment to improving educational access, particularly through policies such as the 100% transition policy in public-funded secondary schools, they also emphasize the need for prudent and efficient utilization of these resources. Without improving technical efficiency in resource use, the intended outcomes of increased investment, such as improved learning conditions, higher transition rates, and enhanced educational quality may not be realized in Narok County.

1.1.4 Educational outputs

Improvement in standardized score results has been underwhelming, with gains of less than 25%. This slow progression in academic performance highlights a concerning inefficiency within the education system (Basic education statistical booklet, 2020). Additionally, a report by the KNBS in 2022 shows that 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) warrants an investigation.

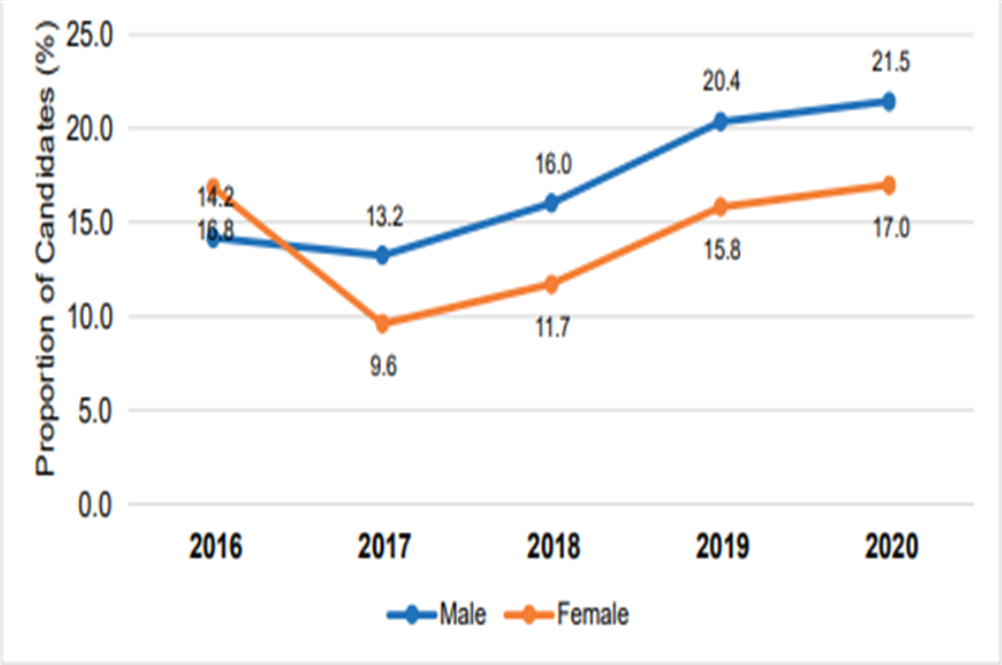

Figure 1.2 Trend in KCSE performance, 2016-2020

Source: Basic education statistical booklet 2020

1.2 Statement of the Problem.

Kenyan government has continuously invested high sums of money to education through budgetary allocation and capitation funds has been on upward trend in an attempt to realize universal education for all and align by the Social Pillar as stated in Vision 2030. In 2008, FDSE was introduced with capitation of Ksh 10,626 per schoolchild. This rose to Ksh 12,870 in 2012 and to Ksh 22, 244 in 2018 in in an attempt to attain EFA together with the global SDG 4 (Quality Education). "The budget allocation increased from 5.3 percent of Gross Domestic Product in 2012/13 to 19.5 percent in 2019/20", 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 try 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 level standing at 56.3%. This coupled with low national completion rates at 24.5% and in Narok County at 39.6% 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 outcome of this spending on efficiency is not clear. This study addresses this gap by investigating the determinants of technical efficiency in public-funded secondary schools within Narok County, with a particular focus on how government expenditure influences efficiency levels. It also explores other contextual factors that may moderate this relationship, providing evidence to inform education policy and resource allocation in marginalized counties.

1.3 Research Questions

i. What is the technical efficiency of government-funded secondary schools in Narok County?
ii. What are the factors determining technical efficiency of government-funded secondary schools in Narok County?

1.4 Objectives

1.4.1 General objective

The overall aim of this research work was to assess the relationship, if any, between government expenditure on education and the technical efficiency in public-funded secondary schools in Narok County, Kenya.

1.4.2 Specific Objectives

The specific objectives of the study sought;

i. To determine the technical efficiency of government-funded secondary schools in Narok County.
ii. To evaluate the factors determining technical efficiency of government-funded secondary schools in Narok County, Kenya.

1.5 Significance of the Study

The findings and conclusions of this study will contribute to the growing body of knowledge on technical efficiency in public secondary schools, particularly within marginalized regions such as Narok County. Future education scholars may utilize this research as a reference point to inform further studies and identify areas that require additional empirical investigation. Additionally, findings of this research work may offer invaluable insights for both policymakers and education administrators as well as other stakeholders to make informed decisions and implement measures that enhance the overall functioning and efficiency of any education systems. The findings of this study may also be useful to public secondary schools' systems of management as they may appreciate some of the influences of technical efficiency. Knowledge of the factors that determine their institution's TE may allow them to initiate necessary procedures to minimize wastage, control costs and move towards optimization of all the resources available. This study may benefit researchers and scholars equally by helping them identify of research fields through citations of topics that are related and need additional studies and empirical studies to identify any scholarly gaps.

1.6 Scope of the Study

This study primarily examined the relationship between public spending and technical efficiency (TE) in the public secondary education sector, focusing specifically on public-funded secondary schools in Narok County, Kenya. Narok County was selected as the study area because it represents a marginalized region where education outcomes are significantly affected by various socio-economic and infrastructural challenges.

The research concentrated solely on public secondary schools, excluding privately owned schools. This exclusion was deliberate, as private schools operate under different funding structures, governance models, and resource allocation mechanisms compared to government-funded institutions. Including private schools would have introduced inconsistencies in technical efficiency comparability due to these structural differences, making it difficult to draw meaningful conclusions about the influence of public expenditure. Although economic lifestyle of communities in Narok County may contribute to inefficiency in education, this aspect was not considered because of the complexity of data collection. Privately-owned secondary schools were left out of this study because their operating system and operations are run differently from government-funded secondary schools.

1.7 Limitation of the Study

There were challenges s in accessing the entire study area because of its vastness and the spread of the target public schools in meant to be studied within Narok County. Additionally, variations in school sizes, infrastructure and location influenced the generalization and reliability. Thus, one needed to be aware of this while interpreting the results. To mitigate some of these limitations, the researcher sampled 30% of the study population to ensure the study was carried out within stipulated time and the result findings were representative and adequate for generalization.

Secondly, the study relied on existing data and was constrained by the availability and accuracy of such information. Incomplete or outdated data could compromise the robustness of the analysis and lead to an incomplete understanding of the connection between government expenditure and technical efficiency in public-funded secondary schools in Narok County, Kenya. To mitigate this limitation, the researcher sought for credible and up-to-date information from the office of education at the county level and other secondary sources to guarantee accuracy and recency of the information collected.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This chapter reviews theoretical literature on the theories forming the foundation on the study. Further empirical review on past studies related to the study variables is presented, as well as the critique present literature to identify study gaps and establish the connection between the study variables.

2.2 Theoretical Literature

The section identifies, presents ad discusses relevant theories that explains the concept of public expenditure in education and the TE in public-funded secondary schools. The theoretical literature covers two (2) theories including the Production theory and the efficiency theory linking them to public expenditure in education and TE of government secondary schools.

2.2.1 The Theory of Production

Production theory posits that outputs are a function of inputs, often modeled through linear, Leontief, or Cobb-Douglas production functions. In the education context, schools act as production units where inputs such as teachers, infrastructure, and learning materials are converted into outputs like student performance and completion rates (Becker, 1962; Psacharopoulos & Patrinos, 2004). According to production theory, output is a function of inputs that firms may employ in production process. The function is either linear, Leontief or Cobb-Douglas. A linear production function is of the form;

$$Q=f(X_1,X_{2\ldots}X_n)\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots..2.1$$

Where Q is the firm's output, $X_{1,}$ $X_{2\ldots}X_n$ are the resources used in the production of output Q. A Cobb-Douglas production function presents output, Q as a function of two

inputs only; the Capital (K) and Labour (L). Leontief production function suggests that factors of production which will be used in fixed, technologically pre-determined amounts because there is no perfect substitutability amongst factor inputs.

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 advocates of the theory of Human Capital, used inputs like parental characteristics as well as 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 capacity of decision-making units (DMUs) to yield highest output by utilizing the least possible combination of inputs" (Farrell 1957). In education context, efficiency refers to a situation where outputs of education, for example standardized test outcomes are obtained from the least amount of educational resources. Farrell further proposed that the efficiency of any firm comprises of two parts; the technical efficiency and the allocative efficiency which culminates to economic efficiency. According to Farrell, TE is the capacity of a firm to generate the highest possible level of output from the available set of inputs while allocative efficiency occurs when a firm to use the resources available in their optimal proportions in consideration of their prices.

A school is said to be efficient if it delivers a specific learning outcome from a cohort of learners 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 range between zero and one with value one indicating 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).

Government expenditure represents an essential input, alongside factors like teacher qualifications, student motivation, and school infrastructure. Increased government funding can be used to improve the quality and quantity of these inputs, potentially leading to increased student enrollment, improved student completion rates and enhanced student standardized test scores thus improving the overall efficiency of an education system (Glassman & Biniaminov, 1981). The education production function was useful in analyzing how fixed educational resources are utilized in order to maximize education outcomes. This was done through input-output analysis. Policymakers can use the results for improvement and decision-making in schooling outputs can use the results.

2.2.2 Technical efficiency

It was put forward by Farrell (1957). He argued that TE of a firm is the proportion of its output against its proportion of its inputs. Thus, it is the point where all production factors might be proportionately minimized without reducing outputs. 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;

$$TE = \frac{YI}{Yi} = \frac{\exp(Xi\beta + Vi - Ui)}{\exp(Xi\beta + Vi)} = \exp(-Ui) \quad \text{.....2.2}$$

Where, Yi =scalar output associated with *ith* farm, Xi =vector of input amounts while β= vector of parameters to be identified, *exp* =exponential function, Vi = disturbance term that is independent and normally distributed N (0,σV2) which incorporates the effects of random factors outside control of the schools e.g. learner's or teacher's absenteeism. Ui = non-negative random variable connected to technical inefficiency in the school production process which is independent and normally distributed.

This theory relates to current study because 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 TE and allocative efficiency is also critical for this study. Technical efficiency measures how effectively schools use their inputs to generate outputs, but allocative efficiency focuses on whether schools are using the right blend of production factors to minimize costs for a set 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. Application of (SFA) was helpful in calculating efficiency of schools through a comparison of 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.

In education, TE reflects how well resources such as government funding, teacher qualifications, and infrastructure translate into improved learning outcomes (Glassman & Biniaminov, 1981). SFA allows for quantifying inefficiencies while considering both resource utilization and external factors like student absenteeism.

This study applies both Production and Efficiency theories to assess whether increased government spending in Narok County has translated into efficient resource use and improved education outcomes in public-funded secondary schools.

2.3 Empirical Literature

This section presents present literature for the study variables including the funding allocation and utilization of public funds in the education system and its influence on a school's technical efficiency.

2.3.1 Utilization of Government's Expenditure on Education

A study by the World Bank in 2019 on quality of education and the efficiency of government spending through a comparative analysis in a cross-country fashion reported that there existed a connection amongst public education spending and outcomes of educational process 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 underscored the necessity for enhanced governance systems 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. While insightful, the study focused on cross-country comparisons without addressing county-level dynamics within specific countries like Kenya. The current study focused on just on county in Kenya and put into consideration the effects of other non-financial aspects such as teacher-to-student ratio, teaching & learning materials on the overall TE of a public-funded secondary school in Narok county, Kenya.

Mutuku (2019) conducted a study aimed at exploring how government spending on education influences educational outcomes. His research focused on understanding how public funding affects education access and enrolment, the overall education standards, and levels of TE in schools. Specifically, it examined the relationship between government spending as well as the school enrolment figures and educational standards across Kenya's 47 devolved counties. It also aimed to measure how effectively government spending contributes to the operational efficiency of publicly funded primary schools. To assess this, the study used school admission numbers and performance scores of learners in class six as key indicators. Additionally, technical efficiency (TE) values were employed to evaluate how well schools utilize available resources, including government capitation funds.

The study drew on data from grade six national assessment results, collected through surveys conducted in 2000, 2004, and 2012 by the South and Eastern African Consortium for Monitoring Educational Quality. Additional data was sourced from the Kenya National Examinations Council (KNEC) and Statistical Abstracts spanning the years 1997 to 2018. The findings revealed a positive relationship between government spending and various school-related factors, such as student enrolment and the overall quality of education. The research also observed that technical efficiency across schools had improved notably in 2012. This progress was influenced by several elements, including access to instructional materials, the schools' geographical setting, and the level of public financial support. A key takeaway from the study was the recommendation for increased government investment in education to further enhance performance across schools. While this earlier research focused on primary education, the present study shifts attention to evaluating efficiency within secondary schools.

Munge, Kimani, and Ngugi (2016) investigated financial management practices in public secondary schools in Nakuru County, revealing that strong internal controls and effective resource management enhance school performance. Nevertheless, the study concentrated on management practices rather than directly linking government expenditure to technical efficiency using quantitative models. A study by UNESCO (2021) stressed the need for efficient education financing to meet SDG 4 targets, emphasizing that increased funding must be accompanied by mechanisms that ensure accountability and efficient resource utilization. This aligns with the current study's focus on examining efficiency within marginalized regions like Narok County.

2.3.2 Measurement of efficiency

Measuring efficiency is a vital aspect that each decision-making unit ought to undertake at least annually or as appropriate. This is because it measures how well resources are being utilized in producing outputs. This is important because it informs the DMU's decisions and courses of action in the event that it is not producing along its PPC. According to Farrell (1957), a firm's efficiency can be divided into; Technical Efficiency Score (TES) which measures how well a school utilizes its resources to achieve its current level of outputs. A score of 1 indicates the school is operating on the production frontier, meaning it cannot improve its efficiency without reducing outputs. The other category of efficiency is the Scale Efficiency Score (SES). This measures whether a school operates at the optimal scale. A score of less than 1 suggests the school might be too large or too small for efficient production. To get a measure of overall efficiency, these two metrics are then merged. Farrell's DEA employs ratio form of DMUs outputs against inputs to measure efficiency and productivity of the firm as;

$$Productivity = Outputs/Inputs$$

The Kenyan government, through FDSE, provides funding to all public-funded

secondary schools in Kenya including the capitation expenditure, teacher employment, teaching & 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 & learning.

TE in publicly funded secondary schools refers to how well these institutions utilize available resources, systems, and processes to achieve educational goals. It involves turning educational inputs like funding, staff, and materials into meaningful outcomes for students, teachers, administrators, and the wider community. In essence, it's about getting the best possible results from the resources at hand.

Research by Munge, Kimani, and Ngugi (2016) emphasized that financial management in public secondary schools is shaped by various factors, including how well budgets are handled and the strength of internal financial controls. Their study, which focused on Nakuru County in Kenya, gathered insights from school heads and bursars across all 172 government-funded secondary schools in the region. It concluded that efficient management of school finances and resources played a key role in enhancing school performance and operational efficiency. Building on this, the current study shifts its focus to Narok County. It aims to explore whether the way public education funds are allocated and used has a significant impact on the technical efficiency of secondary schools in that area

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, 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 publicly funded secondary schools and this will be the study gap that the current study sought to fill using SFA and Tobit regression as the model of estimating efficiency.

2.4 Critique of Existing Literature and Research Gaps

A significant body of research has explored the relationship between government spending and educational outcomes; however, notable gaps and limitations remain within the literature. One major shortcoming is the focus on primary education or aggregated national-level data. For instance, studies by Mutuku (2019) and Kanina (2012) concentrated primarily on primary schools or relied on generalized national statistics, providing limited insights into secondary education, particularly in marginalized counties like Narok. This narrow focus leaves an information gap regarding how government expenditure influences technical efficiency (TE) in secondary schools within underserved regions.

Moreover, there has been limited application of advanced efficiency measurement models within education research in Kenya. While Data Envelopment Analysis (DEA) has been widely utilized to assess efficiency, few studies have applied Stochastic Frontier Analysis (SFA), a more robust method that accounts for random external shocks affecting school performance. The absence of such comprehensive models restricts understanding of how much inefficiency in public-funded secondary schools is due to internal resource mismanagement versus uncontrollable external factors.

Another critical oversight in the literature is the neglect of contextual challenges unique to marginalized and Arid and Semi-Arid Lands (ASAL) regions like Narok County.

Socio-economic factors such as nomadic lifestyles, limited infrastructure, and economic instability significantly affect resource utilization and educational outcomes. Despite these realities, many existing studies fail to incorporate such contextual variables, reducing the applicability of their findings to regions facing systemic development constraints (UNESCO, 2022).

Additionally, much of the research informing educational policy and efficiency assessments in Kenya is based on data collected before 2019. Given recent changes in government funding policies, economic conditions, and education sector priorities—including renewed emphasis on the 100% transition policy for secondary education—there is a pressing need for updated empirical studies to provide policymakers with current, evidence-based insights.

This study addresses these gaps by focusing specifically on public-funded secondary schools in Narok County, a marginalized ASAL region significantly affected by educational inefficiencies. It employs the SFA model alongside Tobit regression to provide a comprehensive assessment of TE, explicitly accounting for both internal resource utilization and external influencing factors. Furthermore, the study integrates recent education funding and performance data (post-2019), ensuring that findings are relevant to current policy debates and challenges.

In addition to financial inputs, this research also explores non-financial determinants of TE, such as teacher-student ratios, learning materials, and infrastructure quality, providing a more holistic understanding of the factors influencing efficiency. By filling these critical gaps, the study offers valuable evidence to guide policymakers, education administrators, and stakeholders in designing interventions that enhance technical efficiency and educational outcomes in marginalized counties. Ultimately, this supports broader national efforts to achieve Sustainable Development Goal 4

(Quality Education) and Kenya's Vision 2030 development blueprint.

CHAPTER THREE: METHODOLOGY

3.1 Introduction

This part of the study explains how the research was carried out. It covers the overall approach and design, the guiding theories and how the research model was developed. It also outlines how key variables were defined and measured, where the study took place, who was included in the target population, and how participants were selected. Additionally, it defines the tools and instruments used for data collection, the preliminary pilot study, the stages taken to gather and analyze the data, and the practical and ethical aspects considered throughout the research process.

3.2 Research Design

The current study adopted mixed - method approach incorporating aspects of quantitative and those of qualitative data collection techniques. The research design involved utilization of existing data on government expenditure and technical efficiency metrics from Narok county's government-funded secondary schools. The quantitative research design was adopted because it offered a structured and rigorous framework for generating empirical evidence, enabling the researcher to draw conclusions from the findings. Data from Decision-Making Units, DMUs, that is the selected public learning institutions in Narok were collected using questionnaires and from secondary sources spanning over 5 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 the efficiency of institutions of higher learning (Public Universities) in Kenya, this research study used SFA in estimating the TE scores of the sampled 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.

3.3 Theoretical Framework

This study is anchored in the Theory of Production and Efficiency, as proposed by Farrell (1957) and expanded by Coelli et al. (2005) and Meeusen & van den Broeck (1977). The theory postulates that a firm (or school, in this case) converts inputs into outputs, with efficiency determined by how well these inputs are utilized to maximize output at given technological and environmental conditions. According to Beattie et al. (1985), production is defined as the conversion of inputs into outputs. Factors of production are the resources or inputs employed in production. Consider a firm that generates a single output, q, from x inputs.

q = f(x)…….3.1

An efficient Production function f(x) is achieved when maximum possible output is obtained from minimum input at a given level of technology. The theory informs the relationship between government expenditure and TE by conceptualizing financial inputs (e.g., government capitation, infrastructure development, learning materials) as critical resources in the education production process. Efficient utilization of these resources should lead to improved outputs, such as higher university entry rates or better student performance.

3.3.1 Stochastic Frontier Analysis

The Stochastic Frontier Analysis (SFA) model, as introduced by researchers Meeusen and van den Broeck (1977), offers a way to analyze production efficiency. It is typically represented using the following equation:

$$\boldsymbol{lnq_i = x_i^{/}\beta + v_i - u_i}\text{……..……..3.3}$$

Where; $\boldsymbol{q_i}$ = the output of ith DMU, x_i = K*1 vector which contains logarithms of

inputs, $\boldsymbol{\beta}$ = a vector of parameters, $\boldsymbol{u_i}$ = a random variable which is non- negative associated with the technical inefficiency and $\boldsymbol{v_i}$ = the statistical noise. Equation 3.3 represents the This model describes a production function where output levels are limited by a stochastic (random) boundary. In simple terms, it helps in estimating how efficiently inputs are turned into outputs while accounting for both random errors and inefficiency. A visual representation of this model is provided in Figure 3.1.

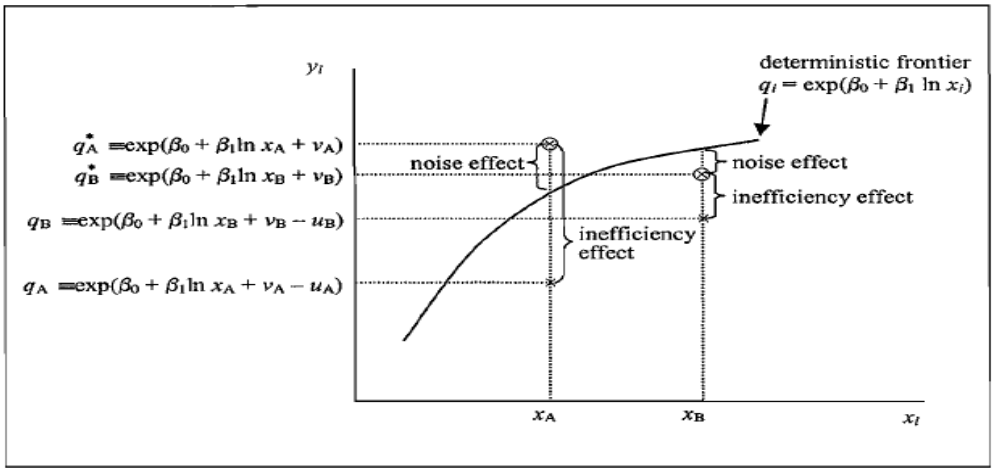

Figure 3.1: Stochastic Production Frontier

Source: Coelli et al. (2005)

In Figure 3.1, the production frontier values for Decision Making Units (DMUs) A and B are shown in relation to the deterministic production frontier. For DMU A, the noise effect is positive, placing its frontier value above the deterministic line, while for DMU B, a negative noise effect places its frontier value below that line. Despite these positions, the actual output for firm A (qA) is observed to fall below the deterministic frontier, whereas firm B's output lies above it. This difference arises due to the combined impact of inefficiency and random variation. In general, observed outputs tend to fall below the deterministic frontier, while the potential (or unobserved) outputs lie under the same frontier but are more evenly distributed. Within this framework, technical efficiency (TE) is assessed by comparing the actual observed output of a firm

to its corresponding estimated output under the stochastic frontier. In simple terms, TE is calculated as the ratio of what a firm actually produces to what it could potentially produce if it were operating efficiently. The TE scores are derived using the following formula.

$$TE_i = \frac{q_i}{exp\left(x_i^{/}\beta + v_i\right)} \quad \text{.....3.4.1}$$

$$TE_i = \frac{exp\left(x_i^{/}\beta + v_i - \mu_i\right)}{exp\left(x_i^{/}\beta + v_i\right)} \quad \text{.....3.4.2}$$

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 which measures the ith firm's output in relation to the outputs which can be obtained by DMUs which are wholly efficient while applying the same inputs vector.

3.4 Model Specification

3.4.1 Tobit Regression Model

The research work employed Tobit regression model in assessing the consequence of explanatory variables on technical efficiency. Tobit regression model has been used extensively in previous research studies such as a study by Ogechi and Gachanja (2024), Garza-Garcia (2012) among others in assessing the effect of independent variables on technical efficiency in various sectors including learning institutions. Tobit regression model is a model that is truncated and hence highly applicable when the values of the dependent variable lie between 0 & 1. After computing the TE scores using SFA approach, regression of the TE scores on independent variables was done to assess their impact on technical efficiencies of various DMUs. The Tobit regression model assumed the following form:

$$\boldsymbol{TE_i = x_i^{/}\beta + v_i - u_i} \quad \textbf{.....3.5}$$

The model used was specified as follows;

$$TE = \beta_0 + \beta_1 GC + \beta_2 SI + \beta_3 TLM + \beta_4 TS + \beta_5 UE + \beta_6 SS + \varepsilon$$

Where;

TE is the technical efficiency score.

GC is the government capitation.

SI is expenditure on school infrastructure.

TLM is the expenditure on teaching and learning materials.

TS is the teacher-student ratio.

UE is the number of students with university entry grade.

SS is the school size.

ε is the error term.

β_1, β_2 , β_3, β_4, β_5, and β_6 are the coefficients to be estimated.

3.5 Definition and Measurement of Variable

3.5.1 Government Capitation

Government capitation is the total sum of money expensed by the Kenyan government as allocation to public-funded secondary schools through Ministry of Education (MOE). This variable was aggregated as the sum of money assigned to every public secondary school in Narok County by the government. This amount is pegged on the school enrollment and captured in National Education Management Information System (NEMIS). It serves as an important variable because it is the key determinant on the level of government expenditure directed public schools as the total amount released for each school.

3.5.2 Expenditure on the school infrastructure

Spending on school infrastructure refers to the funds directed toward constructing and improving essential facilities such as classrooms, offices, laboratories, and other school buildings. It also includes the cost of maintaining these structures to ensure they remain functional and safe. In this study, this aspect was assessed by looking at the total amount of money allocated specifically for infrastructure development in each public secondary school within Narok County.

3.5.3 Teaching and learning materials

Instructional materials encompass resources that support the teaching process and enhance student learning experience such as; textbooks, science and computer labs, libraries, projectors, educational software among others. This variable was measured by the amount of money allocated for incurring teaching and learning materials. Data on these resources were obtained from school records and financial reports.

3.5.4 Teacher-student ratio

This was measured by the sum of students under direct care of one teacher per school. This was obtained as a quotient of entire sum of learners to the total available teachers in each school that was sampled and studied. Teacher-student ratio affects efficiency of schools in a number of ways such as ability to have individualized attention and differentiated instruction that is tailored to the learners' needs which impacts on the exam scores.

3.5.5 University Entry

University entry was obtained from the sum of students who attaining the minimum university entry grade, (C+) as represented by individual schools' performance in KCSE. It showed the percentage of final examination performance ensuring university transition.

3.5.6 School size

School size is the number of schools measured by total enrollment as at the time of data collection. School size is a vital aspect of technical efficiency in schools because in most cases, resources (teachers, materials) are allocated within schools of different sizes differently. Where such resources are not adequate, efficient running of schools may be hampered. The data was collected from the NEMIS records.

Table 3.1: Definition and Measurement of Variables

Variable	Definition	Measured By
Input Variables		
Government Capitation	Total amount of public expenditure allocated to public secondary schools in Kenya through MOE	Funds allocated by government to each public secondary school
Expenditure on school infrastructure	Funds allocated for school infrastructure	Funds allocated to each public secondary school in Narok County for school infrastructure
Instructional materials	Amount of money allocated for instructional materials vote head by the government	amount of money allocated for incurring teaching and learning materials
Teacher-student ratio	Quotient of number of teachers to the total students in a school.	Measured as the average sum of students under direct care of one teacher per school
Output Variables		
University Entry	sum of students who attaining the minimum university entry grade, (C+) as represented by individual schools' performance in KCSE.	Measured by the total students who scored C+ or more in each year during the period under study
	Control Variable	
School size	Total students in each school in each year for the period during the study	Measured by total enrollment

Source: Author

3.6 Study Area

This research was conducted in Narok due to its vastness, climatic conditions and economic activities that are a representation of ASALs in Kenya. Findings from this study can be applied in all counties and especially the in ASALs Counties. There are 163 public schools. Narok is comprised of six (6) sub-counties namely Narok North,

Narok East, Narok West, Transmara West, and Transmara East.

It borders the Republic of Tanzania to the South, Kisii, Migori, Nyamira and Bomet Counties to the West, Nakuru County to the North and Kajiado County to the East.

3.7 Target Population

This study targeted all key stakeholders drawn from public schools to discuss the effects of public expenditure on technical efficiency of their schools. Therefore, these included 190 schools in Narok where principals, Board of Governance chairpersons, the Sub County Education Board representatives, and school PTA representative were targeted to give relevant information to the study. The schools involved in the study represented various categories: 2 national schools, 2 extra-county schools, 50 county-level schools, and 116 sub-county schools.

3.8 Sampling Frame

This study utilized stratified arbitrary sampling by dividing the government-funded secondary schools within County of Narok into strata on the basis of their school category, and regional distribution to ensure that the schools were drawn from every sub-county in Narok County for effective representation and uniform distribution. In this sense, schools at the national level, the extra county level, the county, and the sub-county level schools were selected through random sampling from the population to ensure representativeness. This method ensured that sample used reflected the diversity of the entire population and reduced sampling bias.

Table 3.2: The Sampling Matrix

School Category	Target Population	Sample Size, %	Sample Size
National level Schools	2	100	2
Extra County level Schools	2	100	2
County level Schools	50	30	15
Sub level County Schools	116	31	36
Total	190		55

Source: Author

3.9 Research Instruments

This research work employed data from primary as well as secondary sources. Close-ended questionnaires were used for primary data while the secondary data on government expenditure on education in Narok County was obtained from official government records. The information gathered covered areas such as budget allocations, spending trends, and policy guidelines related to education funding. To capture participants' views, a rating scale was used: a response of 2 indicated disagreement, 3 showed neutrality, 4 meant agreement, and 5 represented strong agreement

3.10 Pilot Study

A pilot study was carried out using questionnaires in four public secondary schools—each representing a different category: one national school, one extra-county school, one county school, and one sub-county school. These schools used for the pilot study were not used in the main study, and were tested using test-retest technique to check on the consistency and accuracy of the results. This initial phase helped the researcher identify and correct any unclear or confusing parts of the questionnaire. The study used the pilot results to check on content validity and ascertain results reliability. It also provided a chance to spot any unexpected difficulties faced by respondents, allowing for adjustments that improved the overall quality and clarity of the research tools.

3.11 Data Collection Procedure

As outlined by Orodho (2003), data processing and analysis involve organizing and categorizing raw data to extract meaningful insights. In this study, the data collected went through several steps, beginning with editing to eliminate any incomplete questionnaire responses. To measure technical efficiency, the researcher used a computer program called FRONTIER Version 4.1, which was specifically designed to compute TE scores. In addition, Tobit regression analysis was conducted using STATA version 17.0 to assess the influence of the study's variables on technical efficiency.

Descriptive statistics were used to summarize the data, offering a clear overview of key patterns and trends. For qualitative data, the findings were presented based on emerging themes. Inferential statistics, including correlation analysis and multiple linear regression, were also applied. Correlation analysis, in particular, helped explore the relationships between the key explanatory variables and the main issue under investigation.

3.12 Data Processing and Analysis

According to (Orodho, 2003)., data processing and analysis involes organizing and classifying raw data aimed at obtaining useful information for the purpose of analysis. The raw data that was gathered went through a number of procedures, one of which was editing, in order to remove any incomplete questionnaire responses. Technical efficiency was calculated using FRONTIER Version 4.1, a computer Program was used in calculating TE scores. Tobit regression analysis using STATA version 17.0 statistical program was run to test the impact of the study variables on technical efficiency. The summary the data was done through descriptive statistics. The results of the analysis as

well as a theme-based presentation of findings were used in the analysis of qualitative data. Correlations and multiple linear regression was also included in the inferential statistics that may need to be performed. Correlation analysis was a useful tool for examining the relationship between explanatory and the problem variables.

3.13 Ethical Considerations

The researcher took time to explain the purpose of the study to participants and made sure they understood their rights before giving consent to take part. Their privacy and confidentiality were fully respected throughout the process. Every effort was made to maintain honesty, fairness, and transparency in conducting the research, while also minimizing any possible risks to those involved.

Approvals were carefully obtained from the appropriate authorities before the study began. For instance, Ethical approval for this study was obtained from the Narok County Education Research Review Committee. Strict data confidentiality protocols were implemented, ensuring that all participant information was anonymized and securely stored. Only aggregated, non-identifiable data are reported. The study adhered to ethical guidelines outlined by Kenya's National Commission for Science, Technology and Innovation (NACOSTI) and respected principles of honesty, fairness, and transparency. Participants were clearly informed about what the study involved, how data would be collected, and that they had the freedom to withdraw at any point without any consequences. No financial rewards were offered, as the aim was to encourage genuine participation based on interest and willingness alone.

3.14 Diagnostic Tests

3.14.1 Normality Test

The purpose of this test was to confirm whether the data used in the study came from a normally distributed population. Ensuring that the data follows a normal distribution is important for the reliability of many statistical analyses. To check this, normality tests were carried out. Given that the Kolmogorov–Smirnov test is well-suited for larger sample sizes—typically 50 or more—it was chosen for this study.

If the data did not meet the assumptions of normality, appropriate steps were taken to address the issue. These included using non-parametric regression methods, which do not rely on the assumption of normal distribution, and identifying and removing any outliers that may have distorted the dataset.

3.14.2 Multicollinearity Test

Multicollinearity arises when the explanatory variables in a regression model are strongly correlated with one another. This can interfere with the reliability of the results by making it harder to determine the true effect of each independent variable on the dependent variable. It also reduces the precision of the coefficient estimates, which may lead to misleading conclusions.

To address this issue, the study employed the Variance Inflation Factor (VIF) to check for multicollinearity. By identifying and removing variables that showed high correlation, the model's accuracy and interpretability were improved, ensuring more reliable results.

3.14.3 Heteroscedasticity Test

Error terms must have constant variance and a normal distribution in order for a regression model to be considered valid. To ascertain this, Breusch-Pagan test was employed. Heteroscedasticity, which occurs when this assumption is broken, means that the estimator is no longer the Best Linear Unbiased Estimator (BLUE). Regression forecasts consequently become skewed, ineffective, and inconsistent. Log transformation was used to stabilize variance and increase the model's dependability if heteroscedasticity was found.

CHAPTER FOUR: RESULTS DISCUSSION

4.1 Introduction

In this section the results of qualitative and quantitative data collected is examined with a focus on how government spending affects the TE of the sampled public learning institutions (secondary schools) in Narok County. The SFA analysis of the TE scores for the study period are also discussed.

4.2 Descriptive Statistics

4.2.1 Qualitative Findings

This study sought to determine other factors which affects the technical efficiency as its second objective. Using questionnaires, the researcher gathered data from the respondents (sampled secondary schools in the study area)- Narok County in order to accomplish this goal. The study's quantitative results offered empirical support for the TE of government secondary schools and the contribution of public spending in raising educational outcomes.

4.2.1.1 Government Capitation and Efficiency

Government capitation was recognized as a crucial factor impacting TE. 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, the respondents were asked whether they agreed that government capitation was disbursed on time. The results are presented in Figure 4.1.

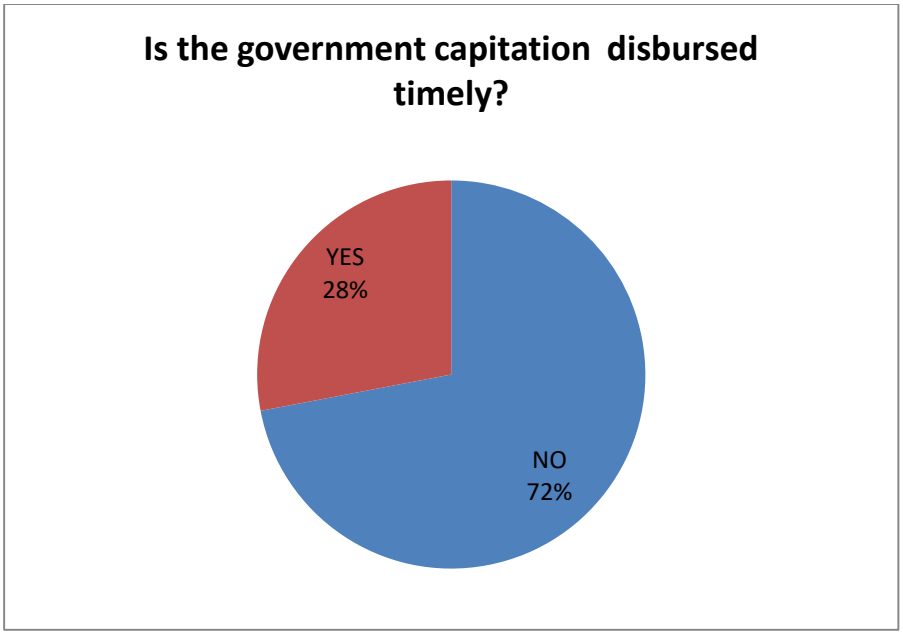

Figure 4.1 Government capitation disbursement

Source: Author

As shown in Figure 4.1, 72% of respondents strongly disagreed that government capitation was disbursed on time. Delays in capitation disbursement negatively affect school operations and efficiency. This finding agrees with Mutuku (2019) who noted that public expenditure has a substantial implication on the efficacy of learning institutions, especially when delays are experienced in the discharge of capitation funds. Respondents also provided their views on the impact of inadequate capitation on school performance, summarized in Figure 4.2.

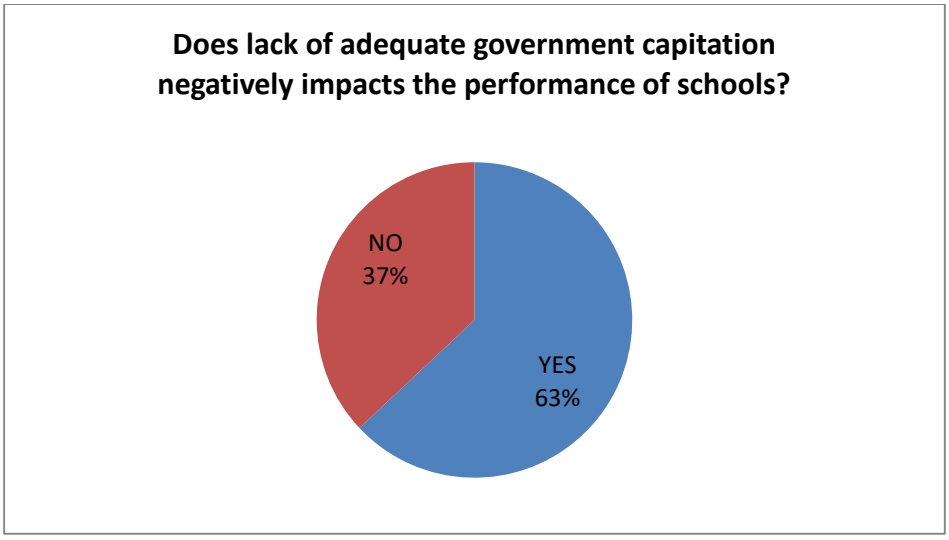

Figure 4.2 Lack of adequate government capitation negatively impacts school performance

Source: Author

The results show that 63% agreed that inadequate capitation adversely affects school performance and efficiency, aligning with Mutuku (2019), who established a significant link between public expenditure and institutional efficacy.

Additionally, respondents expressed their views on whether government capitation meets operational costs, as shown in Figure 4.3.

As shown in Figurre 4.3, 69% disagreed that government capitation is sufficient in meeting the operational costs of running schools as shown below.

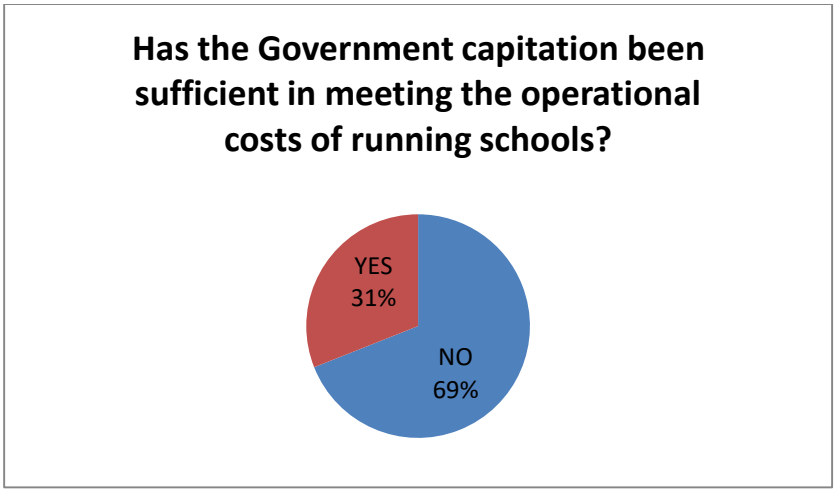

Figure 4.3 Government capitation is enough in meeting the operational costs of running schools.

Source: Author

Respondents were also asked if they believed government capitation improved educational standards. The responses are illustrated in Figure 4.4.

Results in Figure 4.4 below, 76% in the interviewed population agrees that government capitation improved standards of education in public learning institutions (secondary schools).

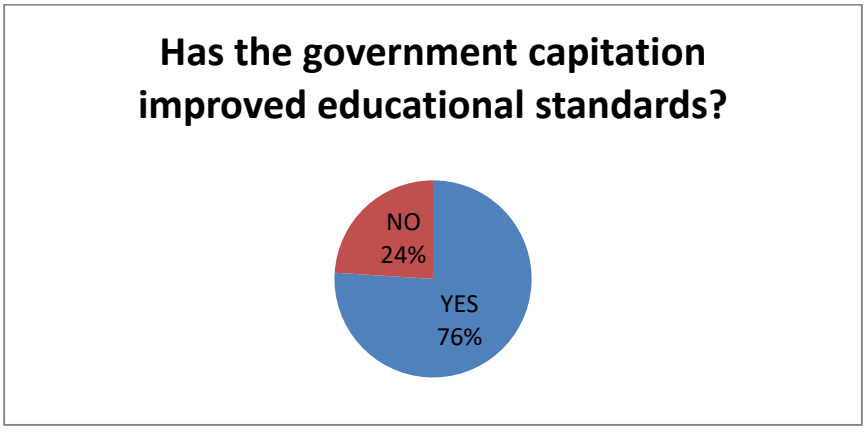

Figure 4.4 Government capitation and educational standards

Source: Author

4.2.1.2 School Infrastructure and efficiency

Investment in school infrastructure from the analysis of the responses by the sampled public schools, Narok County, had a substantial effect on their efficiency. Schools with adequate classrooms, laboratories, and libraries exhibited higher efficiency levels compared to those with poor infrastructure. Respondents' views on the adequacy of government funds for infrastructure are summarized in Figure 4.5.

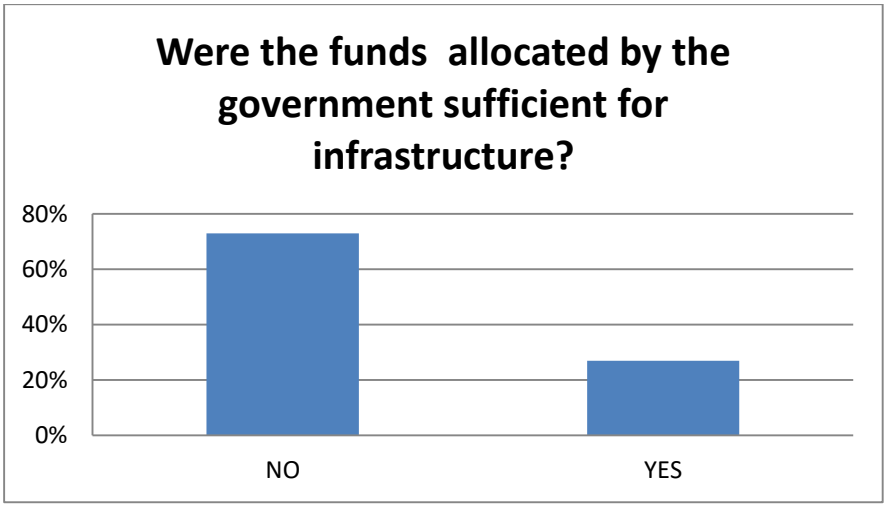

Figure 4.5 Government funds and the School Infrastructure

Source: Author

Notably, as shown in Figure 4.5, 73% of the sampled population objected that government funds allocated to secondary schools during the period under this study were not sufficient for the acquisition of school infrastructure. Further, respondents attributed the poor state of school infrastructure to insufficient government capitation, as shown in Figure 4.6.

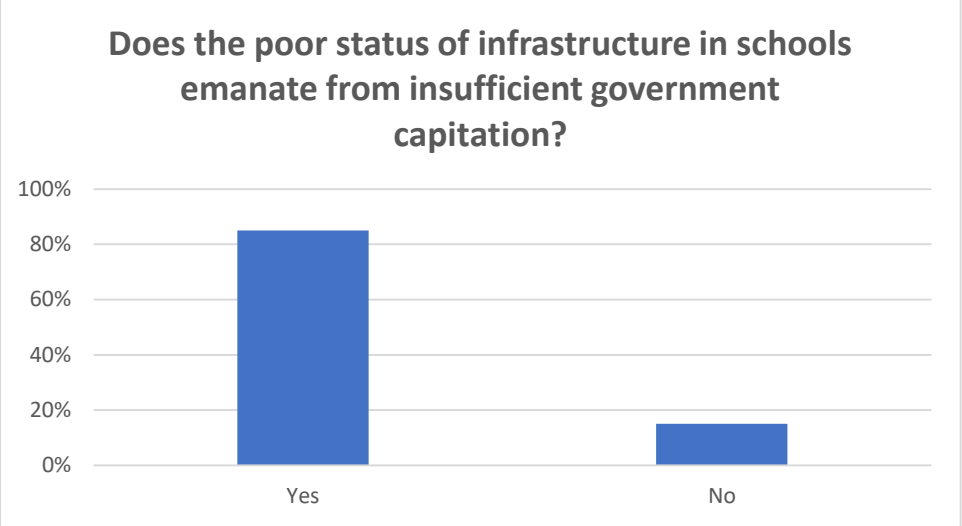

Figure 4.6 Poor status of infrastructure in schools emanated from insufficient government capitation

Source: Author

Results in Figure 4.6 shows that 85% of the sampled population agreed that the poor status of infrastructures in schools emanated from insufficient government capitation.

4.2.1.3 Teaching & Learning Materials and the TE

From the analysis of the feedback provided by the sampled population, it was established that many schools had inadequate instructional materials. Respondents were asked about the adequacy of instructional resources, with the results presented in Figure4.7 below.

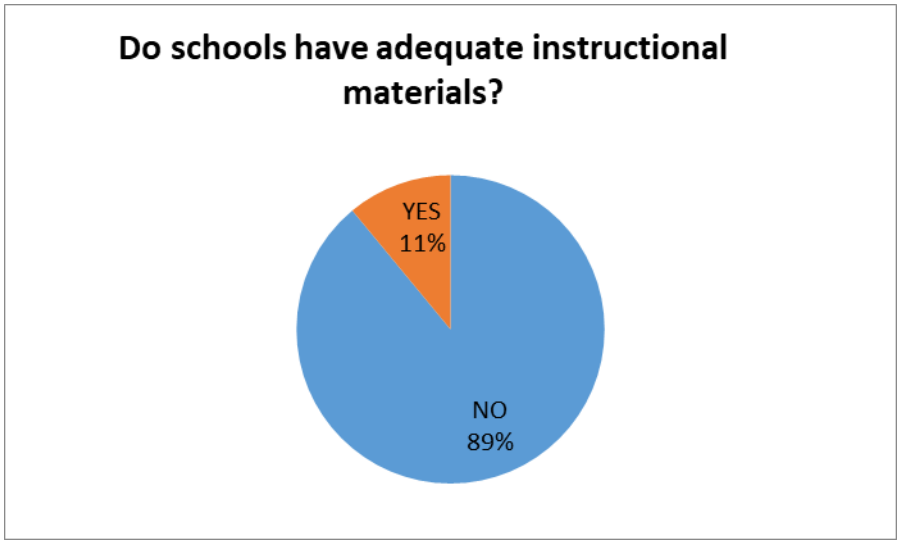

Figure 4.7 Schools and instructional materials

Source: Author

Figure 4.7 shows, 89% of the responses obtained disagreed that schools had adequate instructional resources. This calls for massive investment in teaching & learning materials to enhance the overall standards of schools. Similarly, the allocation of textbooks as well as other learning resources was insufficient in many sampled schools. The main challenges facing the learning institutions in Narok County were inadequate funding, poor infrastructure, and high student-teacher ratio as well as long delays in remittance of school funds by the government.

4.2.2 Descriptive Statistics of the Study Variables

Table 4.1: Descriptive Statistics of the Study Variables

Variable	Obs	Mean	Std. dev	Min	Max
University Entry	275	182.96	80.33431	79	451
Government Capitation	275	1.02e+67	4468597	4404312	2.51e+07
Instructional Materials	275	1933321	849033.5	836819.3	4767334
Infrastructure Expenditure	275	2035075	893719.5	880862.4	5018247
Teacher-Student Ratio	275	43.29091	1.500276	41	46
School size	275	457.4436	200.89	198	1128

Source: Author

The descriptive statistics shown in Table 4.1 summarizes the explanatory and the problem variables of this research work. The main output that was considered in this research study was the number of university entries per the sampled schools. From the table above, it's worth noting that the average population of students with grade C+ (the minimum grade for university admission) was 182 with a range of Significant disparities in school capitation allocations are found and for some schools, they receive more funding than others agreeing to a study carried out by Mutuku (2019) who found out that significant disparities in government capitation and expenditure. According to the study, government funding and school performance had a direct relationship. From the sampled schools the minimum amount of government capitation was 4,404,312 and the maximum was 25,104,507. The average expenditure on teaching and learning materials was 849,033.5. However, there was a lot of variation among the sampled schools as shown in Table 4.1. This is the same for expenditure on infrastructure. Therefore, the findings show trends hat schools with higher government capitation allocations tend to report better performance can indicate a trend or association; however, concluding that government funding directly influences performance

The findings as shown in Table presented different teacher student ratio as some schools had an optimal ratio while others were backpack with high student enrollment per teacher. The average teacher to student ratio from the sampled schools was 43. However, the range between 41 and 46 deviated from the mean by 1.500276. Notably, the favourable teacher-student ratios helped schools provide individualized attention to their students and since teachers were able to give more attention, learning outcomes improved. However, schools with crowded classrooms had troubles maintaining instructional quality and hence delivery of education was not at its best. As shown in Table 4.1, the mean school size was 457 students with a range of 198 to 1128. However, there was a high variation (200.89) of the student size among the sampled schools. This implied overpopulation in some schools and fewer numbers of students in others.

4.3 Diagnostic Test Results

Before any study findings can be ascertained to be valid and reliable, various diagnostic tests are done. These include normality, multicollinearity and heteroscedasticity tests which were performed in this study to ensure the appropriateness of the regression results. These tests aimed at checking if the data had biases which would result in spurious regression findings which otherwise would affect statistical interpretation.

4.3.1 Normality Test

To verify whether the dataset met the assumption of normality required for parametric analyses such as regression modeling, the Kolmogorov-Smirnov (K-S) test was conducted. The results are summarized in Table 4.2.

Table 4.2: Normality Test Results of the Study Variables

Variable	Obs	W	V	z	Prob>z
Log of Technical Efficiency, lnte	55	0.79393	6.038	3.843	0.00009
Log of University Entry, lnue	55	0.87071	0.854	-0.097	0.43873
Log of Government Capitation	55	0.65319	2.524	0.764	0.18302
Log of Expenditure on Teaching and Learning Materials, lntlm	55	0.77536	0.843	-0.609	0.78876
Log of Expenditure on Infrastructure, lninf	55	0.83334	2.871	1.606	0.08415
Log of teacher student ratio, lntsr	55	0.63808	0.818	-0.698	0.85724
Log of Student Size, lnss	55	0.53231	2.701	1.606	0.06079

Source: Author

To ascertain whether the data set was normally distributed, the Kolmogorov-Smirnov test was employed. It was determined as presented in Table 4.2 that the dataset demonstrated normal distribution. For most variables, p-values exceeded 0.05, indicating normal distribution suitability for parametric analysis. The non-normal distribution of technical efficiency data justified the use of Tobit regression. Hence, it was suitable for parametric statistical analyses like the regression modeling. Variables such as University Entry (p = 0.43873)**,** Government Capitation (p = 0.18302)**,** Instructional Materials (p = 0.78876)**,** Infrastructure Expenditure (p = 0.08415)**,** Teacher-Student Ratio (p = 0.85724**)**, and School Size (p = 0.06079) exhibit p-values above the 0.05 threshold, indicating that they are normally distributed. However, Technical Efficiency (p = 0.00009) shows a p-value below 0.05, suggesting deviation from strict normality. Nevertheless, log transformation was applied to normalize the variable. Moreover, with a reasonably large sample and other variables satisfying normality assumptions, parametric methods such as regression modeling remain applicable (Gujarati & Porter, 2009).

4.3.2 Multicollinearity Test

Table 4.3: Multicollinearity Test Results

Variable	VIF	1/VIF
Log of Technical Efficiency, lnte	13.48	0.074184
Log of University Entry, lnue	10.12	0.098814
Log of Government Capitation	7.69	0.130039
Log of Expenditure on Teaching and Learning Materials, lntlm	6.34	0.157729
Log of Expenditure on Infrastructure, lninf	6.07	0.164745
Log of teacher student ratio, lntsr	5.09	0.196464
Log of Student Size, lnss	4.77	0.209644
Mean VIF	**7.6514**	

Source: Author

The VIF test was applied to determine the multicollinearity of the variables. It was found from the results that the mean VIF was below 10 as shown in Table 4.3. Only Technical Efficiency (VIF = 13.48) **and** University Entry (VIF = 10.12) slightly exceed the conventional threshold. Thus, no significant multicollinearity was detected. This implies that independent variables do not excessively correlate, enhancing model reliability. While mild multicollinearity exists, it does not severely undermine model reliability given that the overall mean VIF is 7.65. Moreover, slight collinearity is expected in educational datasets where resource variables often interrelate. Nonetheless, the results should be interpreted with caution, particularly regarding variables with higher VIFs.

4.3.3 Test for Heteroscedasticity

This was done by applying Breusch Pagan test in order to investigate constance of variance of the residuals. The results were tabulated below.

Table 4.4 Heteroscedasticity Test Results

Hettest
Breusch–Pagan/Cook–Weisberg test for heteroscedasticity
Assumption: Normal error terms
Variable: Fitted values of technical efficiency
H0: Constant variance
chi2(1) = 0.00
Prob > chi2 = 0.9900

Source: Author

The implication from the results is that there was no evidence of heteroscedasticity since the p-value was above 0.05. This is presented in Table 4.4. This validation ensures the validity of regression results. A p-value greater than 0.05 leads to failure to reject the null hypothesis of constant variance. In this case, the p-value of 0.9900 confirms that residuals exhibit homoscedasticity, validating the model's reliability for inference.

4.5 Technical Efficiency

This study's first objective was to assess the TE of secondary schools in Narok. To estimate TE scores of the sampled DMUs, the SFA technique was applied. The estimated TE scores are shown below.

From Table 4.5, (see Appendix 1) the average TE scores across sampled schools was 0.5960. This implies that the sampled DMUs were 59.60% efficient and 40.40% inefficient. It is worth noting that that the inefficiency of the representative DMUs was due to inadequate government funding. This is in tandem with a research study by Ogechi and Gachanja (2024) which established that adequate government funding and the TE of public learning institutions are positively correlated.

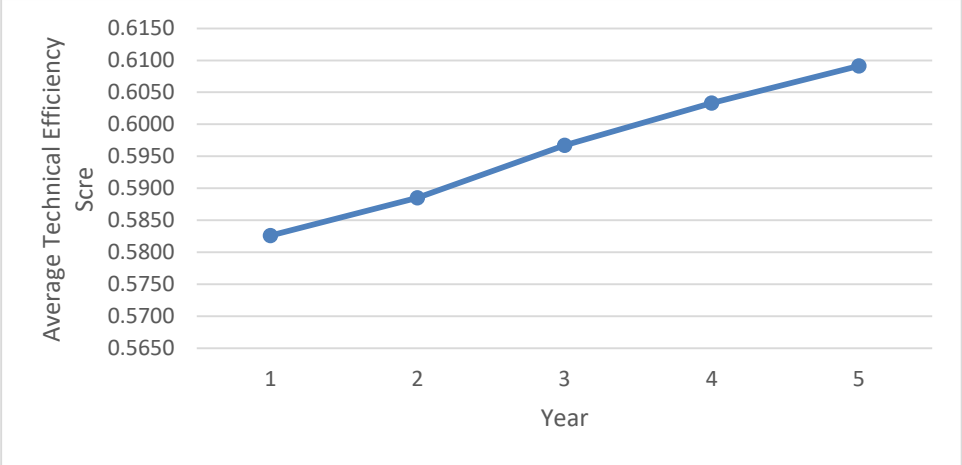

Figure 4.8: Average Technical Efficiency Scores Per Year

Source: Author

Trends and changes were looked at by assessing the TE scores during the period of this study as shown in Figure 4.8. The trend clearly demonstrated gradual improvement of technical efficiency and gradual decline of technical inefficiency with increase in government funding. Nevertheless, a number of sampled schools failed to be efficient due to delay in remittance of government funding and infrastructural deficiencies.

4.5.1 Regression Results

As its second objective, this study sought to find out other factors that influences the TE of public schools (secondary) in Narok, Kenya. In order to determine factors influencing the TE of these institutions in Narok, Kenya, the study employed Tobit regression analysis and tabulated the results below.

Table 4.6: 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
***Instructional 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

Source: Author

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 a study by Mutuku (2019), which noted that government expenditure positively influenced the TE of public schools especially secondary schools in Narok County. Schools that got more in capitation could improve on their facilities, employ many more BOM teachers and make the learning environment better. In addition, expenditure on infrastructural & instructional materials had a positive correlation with TE at a 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 results of this study as it agrees that government expenditure had a significant influence 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 explanatory variables explained the problem variable. This implies that at 5% significance level, school size was significant. Thus the model was robust and it effectively answered the research objectives. It is worth to note government capitation in public learning institutions is pegged on the student enrollment. The enrolment in a school. 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 discoveries were in tandem with those of a study by Kirwoya (2022) who established that indeed delays in remittance of government capitations significantly affect the operations of learning institutions.

CHAPTER FIVE: SUMMARY, CONCLUSIONS AND POLICY IMPLICATIONS

5.1 Introduction

This chapter provides a summary of the key findings from the study, followed by conclusions drawn directly from those findings. It further presents policy implications informed by the conclusions and highlights areas for future research to build upon this study.

5.2 The study summary

The purpose of this study was to examine the relationship between government spending and the technical efficiency (TE) of public secondary schools in Narok County, Kenya. Specifically, the study aimed to identify factors contributing to inefficiencies in the utilization of government resources and establish the connection between public expenditure and school efficiency.

The study employed both qualitative and quantitative research approaches. Data were collected from 55 government-funded secondary schools using structured questionnaires and analyzed using Stochastic Frontier Analysis (SFA) to compute technical efficiency scores, alongside Tobit regression to identify determinants influencing efficiency.

The study revealed significant disparities in capitation allocations among schools. Schools receiving higher funding exhibited greater efficiency, reinforcing the importance of adequate financial support in enhancing school performance. The study also found that well-maintained infrastructure including classrooms,

laboratories, and libraries, correlates with higher efficiency levels, suggesting infrastructure development as a key factor influencing educational outcomes.

Teacher-to-student ratios varied widely, with optimal ratios associated with improved learning outcomes, while overcrowded classrooms negatively affected instructional quality. Additionally, access to teaching and learning materials, including textbooks and laboratory equipment, emerged as a significant determinant of efficiency. Schools with adequate resources consistently recorded higher TE scores, while resource-constrained institutions lagged behind. Diagnostic tests, including normality, multicollinearity, and heteroscedasticity assessments, confirmed the robustness and reliability of the dataset, validating the application of regression modeling. The study's trend analysis of TE scores revealed gradual improvements in efficiency over time, attributed to increased government funding, although persistent inefficiencies were noted due to delays in fund disbursement and infrastructural deficiencies.

5.4 Policy Implications Based on the findings.

A number of policy recommendations can be adopted to improve the TE of public secondary schools in Narok County. For instance, increasing capitation funding is essential to bridging efficiency gaps and ensuring equitable resource distribution across all levels of schools. Infrastructural development should be prioritized, with investments in libraries, classrooms, and laboratories to create conducive learning environments, seamless and equal education opportunities for all notwithstanding the level of school which they attend. Additionally, the recruitment and training of teachers should be enhanced to reduce student-to-teacher ratios and improve individualized

learning experiences as well as enhancing the quality of the teacher through continuous trainings. Moreover, timely release of government funds is crucial in ensuring smooth and uninterrupted school operations, preventing financial constraints from hindering efficiency. Furthermore, schools should be well-equipped with learning materials, including textbooks, digital tools, and laboratory equipment, to foster a more effective learning process. By implementing these policy measures, the government can significantly enhance the TE of government-funded secondary schools in Narok County, ultimately leading to improved educational outcomes.

5.5 Areas for Further Research

In as much as this study provides valuable insights, several areas warrant further exploration. Future research could extend the analysis to other counties to examine whether the findings are consistent across different counties in Kenya and offer explanation for any inconstancies that may arise. Further studies may focus on the impact of non-monetary aspects, like school leadership, student motivation attendance levels, community and parental involvement, in influencing students' performance and efficiency levels in government-funded secondary schools. Moreover, further studies and research work may focus on TE of primary level education too. This research work focused specifically on government-funded secondary schools, future scholars and researchers may want to carry out comparative studies of TE in private and public secondary schools. Moreover, assessment of the long-run results of increased public funding on student performance could provide further insights into sustainable policy interventions within the education sector. This research work adds to the increasing research works on educational financing and provides evidence-based recommendations for policymakers to boost TE in public-funded secondary schools.

5.6 Conclusion

This research scrutinized the consequence of government expenditure on the TE of public-funded secondary schools in Narok County. Using Stochastic Frontier Analysis and Tobit regression, this research work established that government funding contributes significantly 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-funded secondary schools in the county of Narok in 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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APPENDICES

Appendix I: Technical Efficiency Scores

Table 4.5: Technical Efficiency Scores

DMU	Year 1	Year 2	Year 3	Year 4	Year 5	Average TE
1	0.5674	0.5786	0.6754	0.6987	0.6998	0.6440
2	0.5001	0.5341	0.5685	0.6028	0.6372	0.5685
3	0.5273	0.5616	0.596	0.6303	0.6646	0.5960
4	0.5307	0.5651	0.5994	0.6337	0.6681	0.5994
5	0.6716	0.6752	0.6784	0.6819	0.6853	0.6785
6	0.5005	0.5039	0.5072	0.5106	0.5141	0.5073
7	0.5688	0.5722	0.5756	0.5791	0.5825	0.5756
8	0.6373	0.6407	0.6441	0.6476	0.6511	0.6442
9	0.5345	0.5381	0.5414	0.5448	0.5482	0.5414
10	0.6032	0.6065	0.6099	0.6133	0.6167	0.6099
11	0.5174	0.5208	0.5242	0.5277	0.5311	0.5242
12	0.6202	0.6236	0.6272	0.6304	0.6339	0.6271
13	0.5859	0.5894	0.5928	0.5962	0.5996	0.5928
14	0.5517	0.5551	0.5585	0.5622	0.5654	0.5586
15	0.5178	0.5212	0.5246	0.5281	0.5315	0.5246
16	0.5861	0.5895	0.5929	0.5964	0.5998	0.5929
17	0.6203	0.6237	0.6271	0.6305	0.6339	0.6271
18	0.6545	0.6579	0.6614	0.6648	0.6682	0.6614
19	0.5522	0.5554	0.5588	0.5622	0.5656	0.5588
20	0.5009	0.5043	0.5076	0.5111	0.5144	0.5077
21	0.6032	0.6066	0.6111	0.6134	0.6168	0.6102
22	0.6374	0.6408	0.6442	0.6477	0.6511	0.6442
23	0.5691	0.5724	0.5759	0.5793	0.5827	0.5759
24	0.5349	0.5383	0.5417	0.5451	0.5485	0.5417
25	0.6717	0.6751	0.6785	0.6819	0.6854	0.6785
26	0.5013	0.5047	0.508	0.5114	0.5148	0.5080
27	0.5692	0.5726	0.5761	0.5794	0.5828	0.5760
28	0.5352	0.5386	0.5423	0.5454	0.5488	0.5421
29	0.6033	0.6067	0.6101	0.6135	0.6169	0.6101
30	0.6716	0.6751	0.6784	0.6818	0.6852	0.6784
31	0.6374	0.6408	0.6442	0.6476	0.6511	0.6442
32	0.5862	0.5896	0.5932	0.5964	0.5999	0.5931
33	0.6203	0.6237	0.6271	0.6306	0.6341	0.6272

34	0.5182	0.5216	0.5251	0.5284	0.5318	0.5250
35	0.6545	0.6579	0.6613	0.6647	0.6682	0.6613
36	0.5182	0.5216	0.5251	0.5624	0.5658	0.5386
37	0.5526	0.5561	0.5594	0.5628	0.5662	0.5594
38	0.6206	0.624	0.6274	0.6308	0.6342	0.6274
39	0.6546	0.6582	0.6614	0.6648	0.6682	0.6614
40	0.5186	0.5221	0.5254	0.5288	0.5322	0.5254
41	0.5866	0.5912	0.5934	0.5968	0.6002	0.5936
42	0.6716	0.6751	0.6784	0.6818	0.6852	0.6784
43	0.5017	0.5051	0.5084	0.5118	0.5152	0.5084
44	0.5696	0.5731	0.5764	0.5798	0.5832	0.5764
45	0.5356	0.5392	0.5424	0.5458	0.5492	0.5424
46	0.6036	0.6071	0.6104	0.6138	0.6512	0.6172
47	0.6376	0.6412	0.6444	0.6478	0.6512	0.6444
48	0.5171	0.5204	0.5238	0.5273	0.5307	0.5239
49	0.6201	0.6234	0.6269	0.6303	0.6337	0.6269
50	0.5513	0.5548	0.5582	0.5616	0.5651	0.5582
51	0.6543	0.6578	0.6612	0.6646	0.6681	0.6612
52	0.5857	0.5891	0.5925	0.5961	0.5994	0.5926
53	0.6715	0.6747	0.6784	0.6818	0.6852	0.6783
54	0.6372	0.6406	0.6781	0.6842	0.6901	0.6660
55	0.5732	0.6121	0.6584	0.6903	0.6978	0.6464
Average TE	0.5826	0.5885	0.5967	0.6033	0.6091	0.5960

Source: Author

Appendix II: Research Instrument

Greetings, thank you for accepting to take part in this questionnaire. I am doing a Master's program in Kenyatta University and I am conducting a survey to assess the relationship between government expenditure and technical efficiency of the public-funded secondary schools in the county of Narok. Please take a few moments to complete the following questions and fill the data collection sheet provided at the end of this research instrument. All of the answers you give will be confidential and only be used for this survey.

Part A: Demographics

1. School category:

    ☐ National level

    ☐ County level

    ☐ Extra County level

    ☐ Sub-County level

Part B: School Inputs through Government Capitation and Technical Efficiency

2. How often do you experience delays in the disbursement of government funds?

    ☐ Never

    ☐ Rarely

    ☐ Occasionally

    ☐ Frequently

3. For this question use a scale between 1 to 5, 1 means Strongly Agree (SA), 2 means Agree (A), 3 Neutral (N), 4 Disagree (D), and 5 Strongly Disagree (SD). Please tick the degree to which you agree or disagree with the following aspects on capitation and technical efficiency in your school.

Aspect	SA	A	N	D	SD
Capitation funds are disbursed on time to schools by Kenyan government.					
Government capitation is sufficient to cover technical costs.					
Inadequate government capitation negatively impacts school performance					
Government capitation has increased quality of education in secondary schools.					
Current level of capitation has improved performance in schools					

4. Kindly indicate how you think government capitation could be improved to better support the technical efficiency of public secondary schools? Please provide specific examples based on your experience. _____

_____

_____

Section C: School Infrastructure and Technical Efficiency

5. Use a scale between 1 to 5, with 1 = SA, 2 = A, 3 = N, 4 = D, and 5 = SD. Show the degree to which you agree or disagree with the listed aspects on School infrastructure and technical efficiency in your school.

Aspect	SA	A	N	D	SD
Funds allocated for infrastructure development are sufficient.					
Poor infrastructure is a result of inadequate government funding.					
Investment in school infrastructure directly improves student performance.					
Government funds for infrastructure are effectively utilized in my school.					

6. In your opinion, kindly indicate whether the size of your school impact the allocation and effectiveness of government resources, and what changes could be made to ensure more equitable distribution?? _____

_____

_____

Section D: Teaching/Learning Resources and Technical Efficiency

7. Use a scale between 1 to 5, with 1 = SA, 2 = A, 3 = N, 4 = D, and 5 = SD. Indicate the degree to which you agree or disagree with the enumerated aspects of the teaching &learning material and technical efficiency within the school.

Aspects	SA	2	3	4	5
My school has enough teaching & learning materials funded by the government.					
Government vote head allocation for textbooks and learning materials is sufficient.					

8. In your opinion, kindly indicate what specific resources are lacking in school, and how can government funding be better utilized to ensure students have access to adequate resources?

_____

_____

9. What are the biggest obstacles to your school's effective use of resources supplied by the government? (Select all that apply.)

☐ Inadequate funding

☐ Poor infrastructure

☐ Lack of adequate teaching staff

☐ Bureaucratic delays of government capitation

☐ High student population

Other (Specify): _____

I appreciate your and participation. Thank you.

Appendix IV: Data Collection Sheet

Variable	2020	2021	2022	2023	2024
Government Capitation, KES					
Expenditure on Teaching and Learning Materials, KES					
Expenditure on School infrastructure					
Teacher Student Ratio					
No. of students with C+ and above					
School size, Total No. of Students					

Appendix V: Research Permit

REPUBLIC OF KENYA

NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Ref No: **908233**

Date of Issue: **16/December/2024**

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This is to Certify that Ms.. Makena Purity Purity of Kenyatta University, has been licensed to conduct research as per the provision of the Science, Technology and Innovation Act, 2013 (Rev.2014) in Narok on the topic: GOVERNMENT EXPENDITURE AND THE TECHNICAL EFFICIENCY IN PUBLIC SECONDARY SCHOOLS; A CASE OF NAROK COUNTY, KENYA. for the period ending : 16/December/2025.

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