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NEXUS BETWEEN EDUCATION EXPENDITURE AND SCHOOL ENROLLMENT RATES IN KENYA

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Abstract: **As an important component of human resources, education has always attracted the interest of economists, researchers and policy makers. Governments around the world in general, and Kenya in particular, which spends 30 percent of its budget on education, are trying to increase human capital by investing more in education. However, whether higher education spending can increase school enrollment and transfer rates is still a matter of debate. Several policies have been brought about by the government for example the free primary education and the free day secondary education. In spite of all these efforts, the government still has not achieved its goal which is 100 percent completion and transition rates in both public primary and secondary schools in Kenya. This study sought to identify the nexus between education expenditure and school enrollment rates in Kenya for the period 1990-2020.This study is anchored on the Wagner's law of increasing state activities, Rostow-Musgrave model and Human Capital theory. The research adopted longitudinal research design and used time series data covering the period of 31 years from 1990-2020. Descriptive statistics like mean, standard deviation, minimum and maximum values were used to describe the characteristics of study variables. Using inferential statistics like correlation and regression analysis, the relationship between study variables was established. Tables and graphs were used to display the results. There were tests of time series properties, such as unit root tests, co-integration tests, vector error correction model tests, autocorrelation tests, heteroscedasticity tests, normality tests, and multicollinearity tests. The study findings indicated that education expenditure had a slightly positive effect on primary school enrollment in Kenya. Results also showed that education expenditure had a slightly positive effect on secondary school enrollment in Kenya. The study concluded that education expenditure had a positive effect on school enrollment rates in Kenya. The study recommends that the government of Kenya should review the education expenditure policies to make them more effective in terms of delivering the expected outcome.**

Keywords: **education expenditure, policy makers, school enrollment and transfer rates.**

1. INTRODUCTION

1.1 Background of the study

The most effective catalyst for success and progress on the planet is education. It is also regarded as a crucial tool that significantly affects the level of growth and development of the nation. It empowers people to eradicate poverty by promoting responsible citizenship, democracy, good governance and increased access to economic opportunities (UNESCO, 2006).

The macro and micro effects of investing in education are positive for society, including both direct and indirect systemic effects. Spending on education is regarded as being essential to a country's progress. According to studies, investing in education is a good strategy for the poor to escape poverty. This can be accomplished by targeted government investment, industry subsidies, and enhancing of the government's position in sectors that are now crucial to contemporary development

policy. Consequently, the United Nations Educational, Scientific, and Cultural Organization (UNESCO) has advised developing countries to allocate at least 26% of their total budget to the field of education (UNESCO, 1990).

In Kenya, 30% of the state budget is spent on education. This investment aims to increase free basic education, subsidized secondary education (FDSE) and student loans for higher education (Ojala, 2016). The driving force behind such progress is the conviction that educating children in underdeveloped nations is crucial for long-term economic growth and stable democracies that raise living standards and enable the attainment of the sustainable development goals.

Education sector policies in Kenya since independence

Education reform and development has been a long-term goal of the Kenyan government since independence in 1963. The Ominde Commission, which is Kenya's first post-independence commission, was created in 1964 with the intention of improving the outdated educational system. The 1976 Gachathi Report from the National Committee on Educational Policy and Goals placed a strong emphasis on redefining policies and goals, with a particular focus on national unity and economic, social, and cultural aspirations. The National Center for Early Childhood Education was established at the Kenya Institute of Education as a result, and the government supported the Harambee schools.

The 8-4-4 system was developed in 1985 with the goal of enhancing educational performance to satisfy the nation's economic demands (Republic of Kenya, 2008). Eight years of elementary education, four years of secondary education, and four years of higher education are all included in the system. This policy aims to address the ways in which students acquire the technical and practical skills to become self-employed, thus, more public education expenditure spending to support practical subjects (Mbaya, 2016).

A greater emphasis was placed on education as a means of reducing poverty through programs like the Economic Recovery Strategy for Welfare and Job Creation (ERSWEC) 2003-2007, which led to the introduction of free primary education in 2003 by the then-President of the Republic. In September 2004, Kenya approved the Sectoral Approach to Planning (SWAP) for Education. These two frameworks led to the development and launch of the realistic, comprehensive and affordable Kenya Education Sector Support Program (KESSP) in July 2005. The government embarked on these reforms which were geared towards attaining the education as an aspect of the Millennium Development Goals (MDGs). The government also abolished user fees, which came with the advent of cost-sharing in education in 1988. The goal of this action was to give around 3 million school-age children who are not enrolled in classes due to financial hardship access to education (Osando, 2007).

To achieve Education for All, the Sessional Paper No. 1 of 2005 announced the policy framework for education, training, and research to improve and increase access to education (EU). In this publication, many stakeholders involved in funding elementary and secondary education are represented. 2008 saw the implementation of free full-time education to ease the transition from primary to secondary education.

The Kenya Constitution (GOK, 2010), Session Paper No. 14 of 2012 (GOK, 2012), and Vision 2030 provide the current policy direction for the country's provision of education and training. In a number of ways, the Kenyan constitution provides direction for educational policy. Citizens have the right to reasonable quality products and services, including education, as well as the knowledge required to fully utilize those goods and services, under constitutional provisions. The social pillar of Vision 2030 names equitable and high-quality educational services as a crucial enabler of sustainable development. that regardless of socioeconomic, cultural, religious, or physical distinctions, every child has a right to free and compulsory basic education, and those parents are responsible for ensuring that all children of school age attend school (GOK, 2010).

Overview of Education expenditure in Kenya

Kenya's young population needs sustainable investment in human development. Kenya's population growth rate was 2.3 percent in 2018 for a population of 51.4 million. The proportion of young people aged between 15 and 34 years is 20.3%, while the total population of school age (3-17 years) is 19.5 million, which is equivalent to 41% of the population. The age group with higher education (colleges, polytechnics and universities) between 18 and 25 years is 6.9 million, which is equivalent to 15.3 percent of the total population.

Many education investment and financing methods have been adopted in Kenya for example out of pocket expenditure, Public Education Expenditure (PEE), donor funding and education insurance schemes. However, Kenya being a developing country, most of its population is below the poverty line (National census, 2009). Majority of Kenyans are unable to meet the high education expenses required to achieve full education. The main source of funding for this sector is the state budget, with the largest public financial flows coming from the Treasury to the Ministry of Education, the Teacher Service

Commission, 47 county governments and 290 constituencies. This resource provides information on public preschools, elementary schools, high schools, vocational schools, and universities. Therefore, the government has been trying to intervene in providing equitable distribution of learning opportunities to all Kenyans. The table below shows the most common sources of education financing in Kenya.

Table 1.1: Sources of education financing in Kenya (%)

	2013/14	2014/15	2015/16	2016/17	2017/18
Central Government	54.1	52.6	52.2	52.9	57.9
Constituency Development Fund	1.2	1.1	1.0	1.0	0.9
County Governments	0.3	3.6	3.7	3.8	4.2
Household (Parents)	40.1	38.7	39.1	38.3	33.7
NGOs and religious bodies	0.7	0.7	0.6	0.6	0.6
Private sector and companies	0.02	0.02	0.02	0.02	0.02
External loans and grants	0.3	0.3	0.3	0.5	0.4
Internally Generated Funds	3.4	3.1	3.0	2.9	2.6
Total Education Financing (Billions Ksh)	489.8	553.0	589.3	641.6	740.1

Source: Ministry of Education (2018)

Due to funding for Free Basic Education (FPE) and Free Full Day Secondary Education, public spending on education surged dramatically in 2017–18. (FDSE). Overall education spending climbed from Ksh 140.3 billion in 2008-09 to Ksh 415.3 billion in 2017-18, a 29.6% rise. Nonetheless, the percentage of government spending on education has declined from 25,60% in 2008-09 to 14,95% in 2017-18, according to the 2018 Kenya Economic Survey. Spending on enhancing the educational system increased from Ksh 13.9 billion in 2013–14 to Ksh 14.6 billion in 2015–16 and Ksh 30.0 billion in 2017–18. These costs mainly include infrastructure development (KNBS, 2018). The figure below shows the general trend in investment on education in Kenya.

Vertical axis - Government expenditure on education (%); Horizontal axis - years

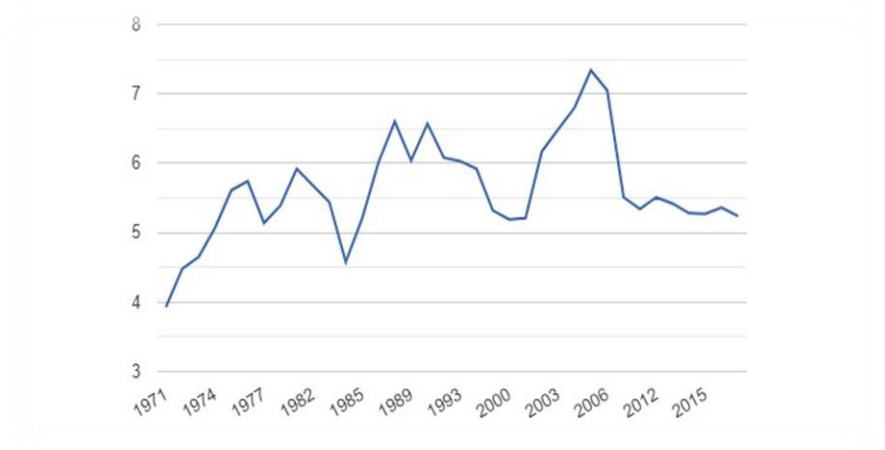

Figure 1.1 Kenya - Education spending, percent of GDP (1971-2017)

Source: UNESCO,2015

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As of 2015, Kenya's total government spending on education as a percent of GDP was 5.27. The 44-year period's highest number was 7.36 in 2005, while the lowest was 3.93 in 1971. A growing population was a contributing factor to the high investment percentage in 2005, thus the government had to step up efforts to raise the level of education in the nation (Mbaya, 2016). Government spending per sub sector is shown in the table down below.

Table 1.2: Sub sectoral spending on education 2015/2016 - 2019/2020 (Ksh million)

	2015/2016	2016/2017	2017/2018	2018/2019*	2019/2020+
Recurrent expenditure					
Ministry of education					
• State Department for Early Learning & Basic Education.	57,519.21	54,977.03	83,922.18	87,966.70	89,846.99
• Teachers Service Commission.	180,970.14	190,947.22	217,614.31	240,738.30	252,651.67
• State Department for University Education.	57,971.43	54,025.03	87,311.67	91,661.66	108,723.07
• State Department for Vocational and Technical Training.	2,308.13	2,479.53	2,511.60	7,777.79	17,100.86
Sub Total	**298,768.91**	**302,428.81**	**391,359.77**	**428,144.45**	**468,322.59**
Development expenditure					
Ministry of education					
• State Department for Early Learning & Basic Education.	5,258.23	8,188.86	9,064.74	7,462.33	8,378.88
• Teachers Service Commission	100.00	6.34	5.94	16.69	945.00
• State Department for University Education.	5,002.01	9,106.74	3,569.62	10,155.01	9,235.23
• State Department for Vocational and Technical Training.	4,248.17	5,746.18	8,454.88	9,245.20	9,787.14
Sub Total	**14,608.41**	**23,048.12**	**21,095.18**	**26,879.24**	**28,346.25**
TOTAL EXPENDITURE	**313,377.32**	**325,476.93**	**412,454.95**	**455,023.69**	**496,668.84**

Source: The National treasury

**provisional* *+revised budget estimates*

The information indicates that total spending is expected to increase by 6.5 percent to Ksh 439.2 billion in 2018–19. Total current spending is projected to increase by 4.1 percent from Ksh 391.4 billion in 2017/18 to Ksh 6.4 billion in 2018/19 as technical instructors are moved from the Teacher Services Commission (TSC) to the Department of State. TSK's operational costs are estimated at 55.6 percent of the ministry's total operational costs for the period. As a result of anticipated increases in spending for the State University Department of Education, it is anticipated that the Department's development spending will rise dramatically to Ksh 31.8 billion in 2018/19. This comes after an increase in money to support the construction of facilities at public colleges. In a manner similar to this, TSC expects an increase in development spending from Ksh 5.9 million in 2017/18 to Ksh 273.0 million in 2018/19, aiding in the funding of the construction of county and sub-county offices. An estimated 7.2% of overall expenses during the term will go toward development costs. (Kenya Economic Survey for 2019).

Primary education

The introduction of Free Basic Education (FPE), which has been ongoing since 2003, has led to remarkable progress in access to basic education. This program does not target the poor in its implementation, but provides a capital contribution of KSh 1,020 per child for all public primary schools (Munyanga, Olwande, Mueni and Wambugu, 2010). In 2017/2018 the budget allocated for free primary education increase to 14 billion with the government paying Ksh 1420 per child per year (Republic of Kenya, 2017).

Secondary education

Economic development benefits significantly from secondary school spending, even more so than can be realized through basic education alone. Beginning in January 2008, the government gave each student a subsidy of Ksh 10,265 as part of the launch of free secondary education (Oyaro, 2008). Due to this, secondary schools across the nation are now enrolling more students and have more teaching and learning materials available. When the program was first introduced in 2014–15, 2.17 million students received the Ksh 28.03 billion in benefits. Benefits of Ksh 32.95 billion are now being given to 2.6 million pupils. 2016–17 enrollment in a public secondary school. The cap per student also raised, going from Ksh 12,870 in 2014–15 to Ksh 22,240 in 2018. (Kenya Economic Report 2018).

A recent fee structure for different categories of public secondary schools shows that the government pays a grant of Sh12,870 while parents pay Sh53,554 for boarding students while parents are said to pay Sh9,370 for daily schooling (Wanzala, 2017).

Overview of primary school and secondary school enrollment rates in Kenya

Since realizing the importance of education for social mobility, sustained economic growth, and community development, the Kenyan government has implemented policies that have accelerated the sector's expansion (National Education Sector Plan, 2015). The educational attainment targets set out in Kenya's education policy are measured by: net basic education level (NER) of 100 percent, primary school completion rate of 100 percent and attainment of a primary to secondary school transition rate of more than 70 percent, gender equality in secondary and primary schools and a 50 percent increase in adult literacy (Republic of Kenya, 2012).

Below is a table showing the trend in both the primary gross enrollment rates and primary net enrollment rate in the 2014-2018 period.

Table 1.3 Primary school gross enrollment rate and net enrollment rate for 2014-2018

	2014	2015	2016	2017	2018
Gross Enrollment rate	103.5	103.6	104.1	104.0	104.0
Net Enrollment rate	88.2	88.4	89.2	91.2	92.4
Completion rate	79.3	82.7	83.5	84.0	84.2

Source: Kenya Economic Survey 2019

From Table 1.3 Gross Enrolment Rate is higher than the Net Enrolment Rate because it is the enrolment of all pupils even the over age and repeaters while NER does not include them. Completion rate is the lowest since it is affected by dropouts but has been increasing gradually over the years. School enrolment has constantly exceeded gross enrollment rates and has been rising yearly since the introduction of free primary education. Since the introduction of free primary education, school enrollment has consistently exceeded gross enrollment rates and has been increasing yearly. In 2018, the primary GER remained constant at 104.0 percent, while the NER slightly increased to 92.4 percent. From 79.3 percent in 2014 to 82.7 percent in 2015, 83.5 percent in 2016, 84.0 percent in 2017, and finally 84.2 percent in 2018, the primer completion rate (PCR) increased.

In 2008, the government introduced free full-time education to increase the rate of transition to secondary education. Transition rates since that year experienced major improvement, although not all students that completed their class eight proceeded to form one. This is due to the cost sharing policy between government and the guardians. The guardians are expected to cater for the student's uniform and their upkeep (Keriga and Bujira, 2009). Below is a table showing the trend in both the secondary gross enrollment rates and secondary net enrollment rate in the 2014-2018 period.

Table 1.4: Secondary school gross enrollment rate and net enrollment rate for 2014-2018

	2014	2015	2016	2017	2018
Gross enrollment rate	58.7	63.3	66.7	68.5	70.3
Net enrollment rate	47.4	47.8	49.5	51.1	53.2
Secondary transition rate	76.1	81.9	81.3	83.1	83.3

Source: Kenya Economic Survey 2019

The transition rate from primary to secondary education increased from 76.1% in 2014 to 83.3% in 2018, according to Table 1.4. GER grew from 58.7% in 2014 (60.9 males and 55.5% females) to 63.3 in 2015 (67.1 males and 32.9 females), then to 66.7 in 2016, 68.5 in 2017, and finally to 70.3 in 2018. NER has a trend an increase from 47.4% in 2014 to 53.2% in 2018 The FDSE program increases access to secondary education. Irrespective of the fact that secondary transition rate has been increasing over the years. Primary completion rate is slightly more than secondary transition rate implying indicating a number of dropouts after class eight.

1.2 Statement of the Problem

Goal 1 of the sustainable development goals aims to eliminate poverty by providing all girls and boys with access to free and equitable primary and secondary education. Similar to this, Kenya's 2010 constitution acknowledges that all children must get a basic education in accordance with the Bill of Rights. The law requires all Kenyan parents to enroll their children in primary and secondary schools if they have children living in the nation. To support this, the government introduced a policy of free primary and secondary education to facilitate access to primary and secondary education. Kenya spends 1609.57 Ksh on a pupil under free primary education, while spending about 2520.04 Ksh on a pupil under free day Secondary Education. However, the government still has not been able to achieve the 100% enrollment rates despite all its efforts.

Iyer (2009) looked into how well public investment affected the results of basic education in 115 districts across three Indian states. Among the variables taken into account were the cost of a basic education, per capita income, the student-teacher ratio, and the split between public and private primary schools. The results show that enrolment rates are not greatly affected by funding for elementary education. Carsamer and Ekyem (2015) also conducted an empirical analysis of government expenditure on education and enrolment in primary and secondary schools, and they found that education investment had a significant and positive impact on enrollment at the elementary and secondary levels. There exists an empirical gap since the former found no significant effect of education spending on enrollment, while the latter found a significant effect of effect of education spending on enrollment.

Adesiyan (2017) looked at the effects of government investment on primary and secondary education in Nigeria. It is impossible to apply the study's conclusions to the situation in Kenya because it was carried out in a setting different from Kenya. Owuor and Too (2018) examined the impact of FPE's contribution on education outcomes in Kenya. There is a conceptual gap since the study focused on FPE as the dependent variable and not government expenditure. Although many studies have been done worldwide on the effects of government spending on school outcomes, non-have been done in Kenya with an aim to find out why it has not been able to achieve 100% primary and secondary enrollment rates. Thus, this research intended to identify the nexus between education expenditure and school enrollment rates in Kenya.

1.3 Research Questions

i. What is the nexus between educational expenditure and primary school enrollment rates in Kenya?

ii. What is the nexus between educational expenditure and secondary school enrollment rates in Kenya?

1.4 Objectives of the Study

The main objective was to assess the nexus between educational expenditure and school enrollment rates in Kenya.

Specific objectives

i. To assess the nexus between educational expenditure and primary school enrollment rate in Kenya.

ii. To examine the nexus between educational expenditure and secondary school enrollment rates in Kenya.

1.5 Significance of the Study

The study makes an empirical contribution to knowledge about government spending on education and school enrollment rates in Kenya. This study aimed to shed light on the connection between education investment and national enrollment rates. Feedback from the survey would inform policy makers about effective measures to increase investment in education and the fact that it can promote economic growth. This research will supplement existing knowledge based on current issues and serve as a catalyst for additional study among academics and research organizations both now and in the future. With

the help of this study, it will be possible to evaluate critically whether education investment can be counted on to raise enrolment rates in Kenyan public schools.

1.6 Scope of the Study

This research used time series data specifically from Kenya for the period 1990-2020. This determined the 31-year change in the enrollments rates in public secondary and primary schools of Kenya as a result of education investment.

1.7 Organization of the Study

The study is structured in the following manner: Chapter 1 consists of an introduction to the topic, research background, statement of the problem, research questions, study objectives, significance of the study, scope and organization of the study. Chapter 2 describes literature review, both theoretical and empirical as well as literature review. Chapter 3 outlines the study methodology, which includes the theoretical framework, empirical model specification, data analysis and presentation and the time series property test. Chapter 4 presents study findings and discussions. Chapter 5 outlines summary of the study findings, conclusion and recommendations.

2. LITERATURE REVIEW

2.1 Introduction

This chapter examines theoretical foundation and empirical research on the nexus between Kenya's school enrollment rate and education spending. The chapter is divided into three parts. Part, one reviews the theoretical literature related to the study under consideration; Part two reviews the empirical literature, while part three brings together the previous two sections to provide a synthesis of the literature.

2.2 Theoretical literature

2.2.1 Wagner's law of increasing state activities

The German economist Adolf Wagner is honored by the name of this idea (1835-1917). This theory states that public spending for any country increases steadily as income grows. It is based on the notion that a state of welfare has brought forth the state of capitalism present in the free market since population always aim for better social amenities and services as their income levels grow. Wagner viewed allocation of funds into economic investment to be dependent on economic growth, thus as the economy expands, so does allocation and expenditure expand. However, this theory is flawed in that it lacks a well-defined theory of public choice. The expansion of the public sector cannot be explained by its lack of industrialization and its focus on demand for growth in government spending while ignoring supply.

2.2.2 Rostow-Musgrave model

A study on the growth of public spending by Rostow and Musgrave found that because the government provides essential infrastructure services and the majority of these projects require significant capital investment, the growth rate of public spending will be very high in the early economic development stages. Investments in roads, power, water supply, and health care are required to move the economy from a traditional stage to an early stage of development. As a result, the government will eventually be forced to spend more money on establishing an egalitarian society (Ogba Likita, 1999). Although the theory presupposes that the state plays a significant role in development, this is not always the case and ignores the costs of public sector production.

2.2.3 Human Capital theory

The human capital theory is based on the idea that expanding the population's potential for output requires formal education (Almendarez, 2013). Possessing formal education is advantageous, if not superior to having physical capital, and is regarded as an investment in human capital (Woodhall, 1997).

Human capital theory views people as economic entities operating as their own economies. Therefore, investments in individuals can be measured mathematically in terms of the economic value they can contribute to society. According to the hypothesis, individual earnings are lower when people are young and rise as they get older because younger people are more likely to engage in human capital (educate themselves) and must forgo money in order to do so (Becker, 1975).

The application of the human capital theory to the estimation of the worth of education and learning is practical. This enables both private citizens and governmental entities to estimate the projected return on investment in education. The applicability of the human capital theory enables individuals to quantify the worth of intangible assets like status and educational attainment.

2.3 Empirical Literature

Theoretically, higher enrollment rates and higher levels of school completion may be predicted to be linked to spending on education. Better learning environments and opportunities for students can be achieved by investing more on teachers, structures, textbooks, and other educational resources. However, there is debate in empirical research as to whether spending on education actually increases enrollment rates.

Carsamer and Ekyem (2015) used a sample of 20 developing African countries to undertake an empirical analysis of government spending on education and enrollment in elementary and secondary school in Africa over a 15-year period, from 1998 to 2012. The analysis follows a standard econometric analysis starting with a time series stationarity test using the Extended Dickey-Fuller for single data series and data sets (panels). by looking at the intricate relationships between three important factors: per capita income, educational reform, and political stability. The key finding is that education spending favorably affects enrolment at the primary and secondary levels, with secondary level spending having a bigger impact. The findings also demonstrate that, even while political unrest lowers school enrolment, education reform has an impact. According to the analysis, per capita income is the key to achieving universal access to a basic education.

The impact of government spending on basic and secondary education in Nigeria was evaluated by Adesiyan (2017). This model was developed to determine the association between government spending and the percentage of children attending primary and secondary schools. Interesting observations that are explained by anomalies in the allocation or government spending on education in Nigeria were made using the OLS technique to examine data for the years 1981 to 2013. Primary school enrolment has been found to be significantly positively correlated with per capita income, government spending, and employee remittances, but negatively correlated with population growth and employee remittances.

The effect of FPE's contribution on educational results in Kenya was investigated by Owuor and Too (2018). The aim of this study was to evaluate the degree of primary school engagement and retention. Data at the school level were gathered using a random sample; principals, vice principals were chosen as the targeted teachers. Out of a population framework of 641 schools and 7776 instructors from 10 sub-districts in Nakuru District, 384 teachers from 128 primary schools made up the sample. Teachers were given a questionnaire, and quality assurance and standards officials and education officers were scheduled for interviews. This study uses both descriptive and inferential statistics for its analysis. The findings support rising enrollment and retention rates.

Ihugba, Ukwunna, and Obukwu (2019) used the ARDL technique to cointegration to conduct an effect analysis on government spending on education and enrollment in primary schools in Nigeria. The model sought out to establish a relationship between two variables by taking into account interactions with the control variables of per capita income, remittances, investment, and population growth. The low governmental investment in education can be used to explain an intriguing finding. Government spending on education and primary school enrolment were found to be unrelated, whereas referrals and primary school enrollment were shown to be positively correlated. Population growth and economic expansion have a good short-term association but a negative long-term one.

Using secondary data from the years 2000 to 2017, Idrees, Khan, and Fauzee (2021) investigated the effect of government spending on school enrollment in Pakistan. This study used the least squares method and descriptive statistical analysis to arrive at empirical data. The results show that government spending and national income have a positive effect on student enrolment, showing that as government and government spending increase, so does enrollment in schools across the country.

2.4 Overview of the Literature Review

The study examines theoretical works, including the human capital theory, the Rostow-Musgrave model, and Wagner's law of growing state activity. The study uses the Rostow-Musgrave model and Wagner's rule of growing state activities to ascertain whether government education spending has an effect on enrolment rates. The human capital theory is used to establish how the role of human capital investment through education expenditure will impact the society resulting to enrollment in schools.

In terms of empirical research, Carsamer and Ekyem (2015), Owuor and Too (2018), Adesiyan (2017), Ihugba, Ukwunna, and Obukuu (2019), and Idrees, Khan, and Fauzee (2021) all demonstrated that government spending on education had a favorable impact on enrollment in elementary and secondary schools. This unique study on a single nation focuses on the connection between Kenya's primary and secondary school enrolment rates and educational investment via FPE and FDSE. This shows whether this government education policies have had an effect on the enrollment through the years, that is before they were implemented, during the time they were implemented and years after implementation.

3. METHODOLOGY

3.1 Introduction

This section outlines the research design, theoretical and model specifications for this research. The chapter also provides the definition and measurements for the variables. Further, the chapter captures data type and sources, and data analysis and presentation.

3.2 Research Design

A research design constitutes the plan for the data collection, data measurement and analysis method (Labaree, 2013). The study adopts the longitudinal research design that involves collection of data on the same sample over time. The data are then used to describe the pattern of change over time in order to identify the degree and direction of the link between the variables under consideration. In this research, data was collected on the same sample (Kenya) over a specified period of time.

3.3 Theoretical Framework

This research employed the Cobb-Douglas production function assumption made by Barro and Lee (2010) in their theoretical framework. The endogenous growth theory guided this paradigm. Suppose the Cobb-Douglas function is:

$Y = AK^{\alpha}H^{1-\alpha}$……..3.1

Y stands for production, K for physical capital, H for human capital, and A for overall factor productivity. If we assume that H = hL, where h is the amount of human capital per worker and L is the number of workers, the production function can be recast as follows:

$Y = AK^{\alpha}(hL)^{1-\alpha}$……..3.2

Expressing the variables in per worker term and then taking log, we have:

$\log(Y/L) = \ln A + \alpha \log (K/L) + (1-\alpha) \log (H/L)$…… 3.3

Expressing the variables in per worker term and then taking log, we have:

$\log(Y/L) = \ln A + \alpha \log (K/L) + (1-\alpha) \log (H/L)$…… 3.3

Or

$\log y = ln\, A + \alpha \log k + (1-\alpha)\, \emptyset \log h$…… 3.4

where k=capital stock per worker and y=output per worker. Barro and Lee (2010) used the assumption that education (or schooling) closely correlated with human capital per worker, and as a result, we have:

$h = e^{\emptyset(s)}$……..3.5

In the equation above, (s) stands for a unit of labor's efficiency with s years of education. If we

further assume that s is linear, then:

$h = e^{\emptyset s}$……..3.6

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Substituting Equation 3.6 for Equation 3.4:

$\log y = log\ \mathrm{A} + \alpha \log \mathrm{k} + (1 - \alpha)\ Øs$…… 3.7

Barro and Lee (2010) calculated the following figures to gauge how output and human capital are related:

$\log(Yt) = \beta 0 + \beta 1 \log(\mathrm{Kt}) + \beta 2(\mathrm{St}) + \varepsilon t$…… 3.8

3.4 Empirical Model Specification

The study identified two (2) empirical models for the relationship between education spending and school enrollment rates as follows, based on the aforementioned framework and in line with Barro (2013), who has expanded it to account for various educational levels (primary and secondary).

$\log(ER) = \beta 0 + \beta 1 \log(\mathrm{EduEXP}) + \varepsilon t$…… 3.9

Where ER is used to capture school enrollment rates (primary and secondary), EduEXP is the education expenditure and ε is a stochastic error term. Equations 3.9 was used to examine whether education expenditure causes school enrollment rates. Adding extraneous variables of inflation (INF), per capita income (PCI), and population growth rate (PGR), the model becomes;

$\log(\mathrm{ER}) = \beta 0 + \beta 1 \log(\mathrm{EduEXP}) + \beta 2 \log(\mathrm{INF}) + \beta 3 \log(PCI) + \beta 4 \log(\mathrm{PGR}) + \varepsilon t$…..3.10

Further,

$\log(\mathrm{EduEXP}) = \beta 0 + \beta 1 \log(ER) + \varepsilon t$……3.11

3.5 Definition and Measurement of Variables

This section presents definition and measurement of the study variables. This includes primary school enrollment rates, secondary school enrollment rates, and educational expenditure.

Table 3.1: Definition and Measurement of Variables

Variable	Type	Description
Primary school enrolment rate	Dependent variable	The overall number of students, regardless of age, enrolled in primary school, expressed as a percentage of the eligible official population of school-age children in a given school year.
Secondary school enrollment rate	Dependent variable	In a given school year, the total number of students, regardless of age, enrolled in secondary school as a proportion of the eligible official school-age population.
Education expenditure	Independent variable	The act of committing funds geared towards funding education It was measured in terms of expenditure as a percentage of GDP
Inflation	Extraneous variable	The pace at which a price increases, or more simply, how much a dollar is worth when it comes to making a purchase. It was quantified in percentage terms.
Per Capita Income	Extraneous variable	One of the most important indicators of a population's overall social wellbeing is GDP per capita income. It was measured in terms total income per total population.
Population Growth Rate	Extraneous variable	It measures the increase in the number of people that reside in a country. It was measured as a percentage

3.6 Data Types and Sources

In order to ascertain the connection between education spending and school enrolment rates in Kenya, secondary data was used in this study. Time series data from 1990 to 2020, spanning a 31-year period was used in this study. The World Bank's World Development Indicators and Kenya's National Bureau of Statistics (KNBS) were the information's sources. The

aforementioned sources provide annual information on learning characteristics such as enrolment rates in elementary and secondary schools as well as education spending. The data was analyzed with the aid of EVIEWS version 9.0 statistical software.

3.7 Data Analysis and Presentation

To determine the nexus between education expenditure and school enrollment rates in Kenya, descriptive and inferential statistics were generated. The properties of the study variables were described using descriptive statistics like mean, standard deviation, minimum and maximum values. The link between study variables was examined using inferential statistics like correlation and regression analysis. There are tables and graphs used to display the results.

3.8 Time series property tests

Time series data often exhibit non stationarity and if used as is would yield spurious results. To guard against this, stationarity tests should be carried out. To determine the appropriate model and estimation method, several tests were carried out, including unit root test, cointegration test, vector error correction model, autocorrelation, heteroscedasticity, normality, and multicollinearity.

3.8.1 Unit root test

When a unit root is present, the time series is not stationary; when it is absent, the time series is stationary (Nkoro & Uko, 2016). Stationarity test was conducted to identify the properties of the data. The significance of this is that many econometric methods assume a stationary time series, whereas they may not (Dauda, 2010).

To test the unit root, this study used the ADF test extended by Dickey-Fuller (1981). The ADF test incorporates a lagging difference term of the dependent variable to account for potential autocorrelation in error terms. In real-world applications, non-stationarity is indicated by an ADF test value less than the critical value, and stationarity is shown by an ADF value greater than the critical value.

3.8.2 Co-integration test

The main aim of the cointegration in time series data is to keep the long-run information intact. This test demonstrates that non-stationary variables that have been designated stationary can be combined linearly. If cointegration is present, the series have a stable long-term relationship; if it is not, the linear combination is not stationary and the variable loses all further relevance. This test was carried out using an autoregressive distributed lag model (ARDL).

The ARDL approach to cointegration helps identify the cointegration vector, ie H. There is only one long-term association equation for each significant variable. The ARDL model of the cointegration vector is re-parameterized into an error correction model if a cointegration vector is found. The outputs of the re-parameterized ECM should capture both the short- and long-term dynamics of each model variable.

3.8.3 Error Correction Model

If the data is found to be cointegrated, the long-term relationship of the variables is determined and the ECM estimation of the short-term dynamics is continued. According to Engel and Granger (1987), there is an error-correcting model representation of the dynamic system that controls the combined behavior of the two series across time when they are cointegrated. EMC is applied to find the degree of adjustment that the variable follows in response to short-run deviations from the long-run equilibrium path. If Yt and Xt are cointegrated, that is t ~ i(0), which shows the residual. Thus, we can express the relationship between Yt (variable enrollment results and number of teachers) and Xt (government spending on education) using the Error Correction Model (ECM) specification as

$$\Delta InY_t = \propto 0 + b1\Delta InX_{t-1} - \pi\widehat{U_t} + e_t \quad \text{.....3.10}$$

In this model, the feedback effect is an adjustment effect, whereas the multiplier effect, or, measures the direct impact of a change in Xt on a change in Yt. It shows how regularly unbalance is dealt with.

3.8.4 Vector Error Correction Model

According to Granger's Representation Theorem (Granger, 1988), Y1t produces Granger Y2t or vice versa if two variables are cointegrated and each individual is I(1). The VECM must account for the dynamics of the causal link between short-term and long-term variables (VECM). The pattern is as follows:

$$\Delta RGDP_t = \Omega_1 + \sum_{k=1}^{n-1}\alpha_{11,k}\Delta RGDP_{1,t-k} + \sum_{k=1}^{n-1}\alpha_{12,j}\Delta PEE_{2,t-k} + \sum_{h=1}^{r} \propto_{1,h} EC_{h,t-1} + C_{1t} \quad \text{.....3.11}$$

$$\Delta PEE_{2t} = \Omega_2 + \sum_{k=1}^{n-1} \propto_{21,k} \Delta PEE_{21,t-k} + \sum_{k=1}^{n-1}\alpha_{22,j}\Delta RGDPX_{2,t-k} + \sum_{h=1}^{r}\alpha_{1,h}EC_{h,t-1} + C_{2t} \quad \text{.....3.12}$$

The residual of the h-th cointegration equation has a one-period delay, and the variable ij,k describes the effect of the j-th delay value on the present value of the j-th variable, which is equal to the GDP or PEE. The hth error correction term is represented by ECh,t-1. The VECM technique takes both immediate and long-term causality into account. Testing the null hypothesis that j,h=0 for h=1,r yields the long-term Granger causality from the RGDPi variable to the PEEj variable based on cointegration, and F-statistics is used to estimate the short-term Granger causality from the RGDPi variable to the RGDPj variable. Rejecting the null hypothesis for one or both leads to the conclusion that the Granger RGDPi variable influences the PEEj variable.

3.8.5 Test for Autocorrelation, Heteroskedasticity, Normality and Multicollinearity

Breusch-Godfrey LM test was used in the study to measure autocorrelation. The null hypothesis of autocorrelation was taken into account and assessed in the Breusch-Godfrey LM test at a 5% level of significance. Testing for heteroskedasticity was done using Breush-pagan-Godfrey Test. If the test is significant, then the data is heteroskedastic and if the test is insignificant, then the data is homoscedastic.

The normality test was used to find whether the data set was well modeled by a normal distribution or not. This test guided on the type of distribution of the residuals. The Jarque-Bera test was used in the study as a normalcy test. If the p value is negligible in this test, the null hypothesis of a normal distribution is accepted.

To identify any presence of multicollinearity among the variables, correlation analysis was used, as it identifies relationship between the independent variables and also the strength/weakness of the correlation. Correlation coefficients less than 0.8 denotes absence of multicollinearity and vice versa.

4. RESEARCH FINDINGS AND DISCUSSION

4.1 Introduction

This chapter presents data analysis research findings and discussion. The study aims at identifying the nexus between education expenditure and school enrollment rates in Kenya. The findings are presented in accordance with the research objectives.

4.2 Descriptive Statistics

This section presents descriptive statistics results for the research variables: primary enrollment, secondary enrollment, education expenditure, GDP per capita, inflation and population growth. The results are shown in Table 4.1.

Table 4.1: Descriptive Summary

	PRIMARY ENROLLMENT (%)	SECONDARY ENROLLMENT (%)	EDUCATION EXPENDITURE (%)	GDP PER CAPITA (%)	INFLATION (%)	POPULATION GROWTH (%)
Mean	98.43	48.08	5.62	0.69	11.60	2.75
Std. Dev.	6.09	13.70	0.75	2.30	9.47	0.28
Maximum	109.42	79.20	7.34	5.16	45.98	3.38
Minimum	88.24	28.83	4.70	-3.95	1.55	2.25
Observations	31	31	31	31	31	31

Source: Research data (2021)

The results reveal that Kenya's average annual primary school enrollment rate for the period from 1990-2020 was 98.43%, with a slight variation (standard deviation of 6.09%). The minimum enrollment rate was 88.24% and maximum enrollment rate was 109.42%.

Results reveal that Kenya's average annual secondary school enrollment rate for the period from 1990-2020 was 48.08%, with a slight variation (standard deviation of 13.7%). The minimum enrollment rate was 28.83% and maximum enrollment rate was 79.20%.

The findings show that Kenya's average annual education expenditure as a percentage of GDP for the period from 1990-2020 was 5.62%, with a slight variation (standard deviation of 0.75%). The minimum education expenditure was 4.7% and maximum education expenditure was 7.34%.

Results indicate that Kenya's average annual GDP per capita for the period from 1990-2020 was 0.69%, with a slight variation (standard deviation of 2.3%). The minimum GDP per capita was -3.95% and maximum GDP per capita was 5.16%.

The findings reveal that Kenya's average annual inflation for the period from 1990-2020 was 11.6%, with a slight variation (standard deviation of 9.47%). The minimum inflation was 1.55% and maximum inflation was 45.98%.

Results shows that Kenya's average annual population growth for the period from 1990-2020 was 2.75%, with a slight variation (standard deviation of 0.28%). The minimum population growth was 2.25% and maximum population growth was 3.38%.

4.3 Unit Root Tests

In most cases, time series data are usually non-stationary. The single root test was carried out using the Augmented Dickey-Fuller (ADF) test to determine whether the study was stationary or not. The aim was to avoid erroneous regression outcomes from the use of non-stationary series. Results are shown in Table 4.2.

Table 4.2: Unit Root Tests

Variable	Prob (Level)	Prob (1ST Difference)	Comment
Primary enrollment	0.4643	0.000	Stationary at first difference
Secondary enrollment	0.9936	0.0026	Stationary at first difference
Education expenditure	03734	0.000	Stationary at first difference
Inflation	0.0600	0.000	Stationary at first difference
GDP per capita	0.0219	-	Stationary at level
Population Growth	0.3275	0.0010	Stationary at first difference

Source: Research data (2021)

The findings in Table 4.2 reveal that the variables: Primary enrollment, secondary enrollment, education expenditure, inflation and population growth were non stationary at level ($p>0.05$). However, the variables were stationary at difference ($p<0.05$). GDP per capita was found to be stationary at level ($p<0.05$).

4.4 Lag length Selection Procedure

Before carrying out the Johansen cointegration test, the optimal length of analysis delay was determined. In this study, the optimal lag length was selected using the Akaike Information Criterion (AIC). The decision rule was to choose the model with the lowest information criterion value. Table 4.3 shows AIC values for lag 1 and 2 respectively.

Table 4.3: Lag Length Selection

LAG	AIC
Lag 1	18.133
Lag 2	14.241

Source: Research data (2021)

Based on results in Table 4.4, lag 2 gave the lowest AIC value; hence the analysis used lag 2 as the optimal lag length.

4.5 Johansen Co integration

This study used the Johansen cointegration test because it is known to be more accurate and better than Engel's test for greater integration. Results are captured in Table 4.4.

Table 4.4: Johansen Test Results

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.962823	215.1415	95.75366	0.000
At most 1 *	0.898116	122.9638	69.81889	0.000
At most 2 *	0.699656	59.01404	47.85613	0.0032
At most 3	0.440134	25.33485	29.79707	0.1498
At most 4	0.25302	9.093237	15.49471	0.3568
At most 5	0.032502	0.925171	3.841466	0.3361

Trace test indicates 3 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Source: Research data (2021)

The results in Table 4.4 showed that the null hypothesis of a maximum of 3 cointegration equations was not rejected at the 5% significance level. The tracking statistic for the null hypothesis was that a maximum of 3 cointegration equations was smaller than the set critical value of 5%. This shows that there were 3 equations for cointegration.

4.6 Vector Error Correction Model

The presence of 3 cointegration equations resulted to conducting Vector Error Correction Model (VECM). The findings are presented in Table 4.5.

Table 4.5: Vector Error Correctio Model

Error Correction:	D(PRIMARYENROLLMENT)	D(SECONDARY ENROLLMENT)	D(EDUCATION_EXPENDITURE)	D(INFLATION)	D(GDP PER CAPITA)	D(POPULATION GROWTH)
CointEq1	0.193121	-0.3614	-0.02514	1.038628	0.080044	0.000724
	-0.14826	-0.14291	-0.02284	-0.43584	-0.14159	-0.00026
	[1.30261]	[-2.52882]	[-1.10025]	[2.38303]	[0.56532]	[2.81440]
D(PRIMARY ENROLLMENT (-1))	-0.41133	0.264927	-0.00018	-0.11191	-0.15151	4.80E-05
	-0.21989	-0.21196	-0.03388	-0.64642	-0.21	-0.00038
	[-1.87063]	[1.24988]	[-0.00544]	[-0.17313]	[-0.72149]	[0.12580]
D(PRIMARY ENROLLMENT (-2))	-0.15496	-0.26062	0.059089	0.053146	0.06035	0.000228
	-0.1932	-0.18624	-0.02977	-0.56798	-0.18452	-0.00034
	[-0.80204]	[-1.39939]	[1.98480]	[0.09357]	[0.32707]	[0.68088]
D(SECONDARY_ENROLLMEN (-1))	-0.36099	0.280031	0.080366	-1.016	0.109054	-0.00078
	-0.22572	-0.21759	-0.03478	-0.66358	-0.21557	-0.00039
	[-1.59924]	[1.28698]	[2.31061]	[-1.53110]	[0.50588]	[-1.99593]
D(SECONDARY_ENROLLMENT__GR(-2))	-0.53818	0.543513	-0.02968	-1.21656	-0.35177	-0.00029
	-0.29051	-0.28004	-0.04476	-0.85403	-0.27744	-0.0005
	[-1.85257]	[1.94087]	[-0.66302]	[-1.42450]	[-1.26792]	[-0.56635]

D(EDUCATION_EXPENDITURE___(-1))	-1.45246	6.231544	0.504664	-14.9623	0.182486	-0.01007
	-2.94426	-2.83814	-0.45368	-8.65549	-2.81186	-0.00511
	[-0.49332]	[2.19564]	[1.11238]	[-1.72864]	[0.06490]	[-1.96908]
D(EDUCATION_EXPENDITURE___(-2))	-1.41967	7.055415	0.449849	-6.75632	-0.02541	-0.00694
	-2.15892	-2.08111	-0.33267	-6.34677	-2.06184	-0.00375
	[-0.65758]	[3.39022]	[1.35225]	[-1.06453]	[-0.01233]	[-1.85184]
D(INFLATION____(-1))	-0.03744	-0.04022	0.002423	-0.0522	0.024969	0.000161
	-0.0848	-0.08174	-0.01307	-0.24928	-0.08098	-0.00015
	[-0.44147]	[-0.49203]	[0.18543]	[-0.20941]	[0.30833]	[1.09142]
D(INFLATION____(-2))	-0.10872	0.114165	-0.0278	-0.46105	0.019909	-1.70E-05
	-0.08063	-0.07773	-0.01242	-0.23704	-0.07701	-0.00014
	[-1.34838]	[1.46882]	[-2.23731]	[-1.94503]	[0.25854]	[-0.12130]
D(GDP_PER_CAPITA_GROWTH___(-1))	-0.43303	-0.71773	-0.02514	1.262198	-0.12847	0.001568
	-0.44299	-0.42703	-0.06826	-1.3023	-0.42307	-0.00077
	[-0.97750]	[-1.68075]	[-0.36828]	[0.96920]	[-0.30367]	[2.03841]
D(GDP_PER_CAPITA_GROWTH___(-2))	0.227993	0.596249	-0.04992	0.200171	-0.47186	0.001249
	-0.37109	-0.35772	-0.05718	-1.09093	-0.3544	-0.00064
	[0.61438]	[1.66682]	[-0.87296]	[0.18349]	[-1.33141]	[1.93779]
D(POPULATION_GROWTH____(-1))	-131.013	169.1329	19.72085	-637.238	-98.6401	1.213171
	-116.885	-112.672	-18.0107	-343.616	-111.628	-0.20295
	[-1.12087]	[1.50111]	[1.09495]	[-1.85451]	[-0.88365]	[5.97782]
D(POPULATION_GROWTH____(-2))	106.5213	-67.9652	-14.1779	348.4162	69.08223	-0.55864
	-77.7331	-74.9313	-11.9778	-228.518	-74.2374	-0.13497
	[1.37035]	[-0.90703]	[-1.18368]	[1.52468]	[0.93056]	[-4.13908]
C	0.689476	4.906321	0.095651	-9.08888	-0.47237	-0.0112
	-1.98952	-1.91781	-0.30656	-5.84875	-1.90005	-0.00345
	[0.34655]	[2.55829]	[0.31201]	[-1.55399]	[-0.24861]	[-3.24324]
R-squared	0.698125	0.612376	0.59729	0.585736	0.422024	0.987203
Adj. R-squared	0.417813	0.25244	0.223345	0.201062	-0.11467	0.97532
F-statistic	2.490525	1.701346	1.597266	1.52268	0.786342	83.07548

Source: Research data (2021)

Table 4.5 shows that D(education expenditure) had a long run relationship with D(primary enrollment (-2)) as supported by t statistic of 1.98480 >1.96. Results also reveal that D(education expenditure) had a long run relationship with D(secondary enrollment (-1)) as supported by t statistic of 2.31061>1.96. Further, results indicate that D(education expenditure (-1)) had a long run relationship with D(secondary enrollment) as supported by t statistic of 2.19564>1.96. Finally, results indicated that D(education expenditure (-2)) had a long run relationship with D(secondary enrollment) as supported by t statistic of 3.39022>1.96. The results indicate that there is a long run relationship between education expenditure and school enrollment rates.

4.7 Diagnostic Tests

The study tested several diagnostic tests to ensure that spurious regression results were not reported.

4.7.1 Normality Test

The normality test was based on Jarque-Bera, a good health test whether the sample data has bias and excess according to the normal distribution.

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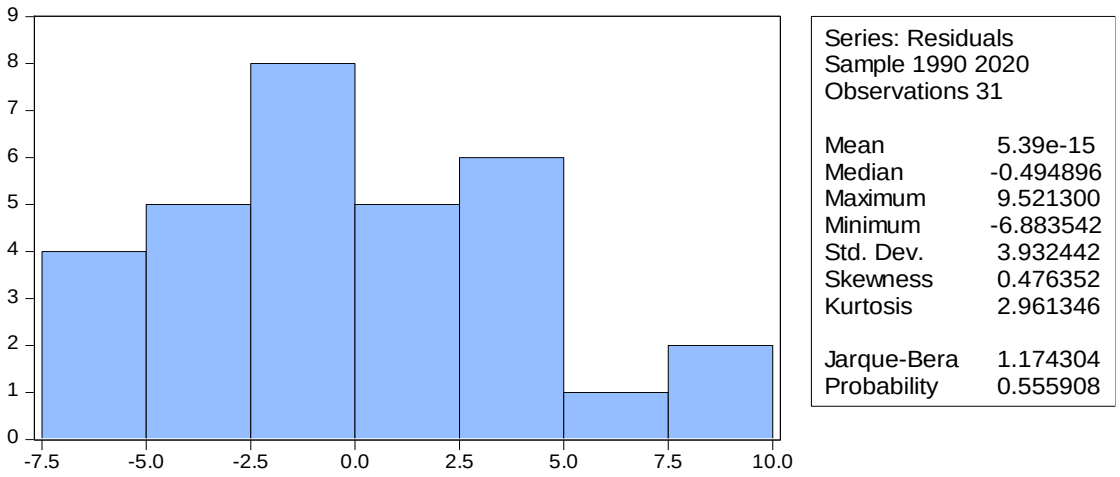

Figure 4.1: Jarque– Bera test of Normality

Source: Research data (2021)

Figure 4.1 indicates a probability value of 0.556 >0.05. This means that the study data was normally distributed.

4.7.2 Multicollinearity Test

Multicollinearity test was checked using correlation matrix to determine the relationship between the independent variables. In correlation analysis, an r correlation coefficient of 0.8 and above is indicative of serious multicollinearity that would result in biased estimates. Table 4.6 shows the results.

Table 4.6: Correlation Matrix

	PRIMARY ENROLLMENT	SECONDARY ENROLLMENT	EDUCATION EXPENDITURE	INFLATION	GDP PER CAPITA	POPULATION GROWTH
PRIMARY ENROLLMENT	1					
SECONDARY ENROLLMENT	0.609046	1				
	0.0003	-----				
SECONDARY ENROLLMENT	-0.3122	-0.46821	1			
	0.0873	0.0079	-----			
INFLATION=	-0.11665	-0.4741	0.31059	1		
	0.532	0.0071	0.089	-----		
GDP PER CAPITA	0.475297	0.379531	-0.07454	-0.488	1	
	0.0069	0.0352	0.6902	0.005	-----	
POPULATION GROWTH	-0.45921	-0.71411	0.491182	0.608	-0.39576	1
	0.0094	0.000	0.005	0.000	0.0275	-----

Source: Research data (2021)

Table 4.6 shows that there was no multicollinearity between the independent variables. This was supported by correlation coefficients less than 0.8.

4.7.3 Heteroscedasticity Test

The heteroscedasticity test was used to see if the error term in time series data was connected to the observations. The null hypothesis is that there is no heteroscedasticity in the data. The results are shown in Table 4.7.

Table 4.7: Breush-pagan-Godfrey Test

Heteroskedasticity Test: Breusch-Pagan-Godfrey			
F-statistic	0.339227	Prob. F(5,25)	0.8842
Obs*R-squared	1.969579	Prob. Chi-Square(5)	0.8533
Scaled explained SS	1.256187	Prob. Chi-Square(5)	0.9394

Source: Research data (2021)

The findings reveal a probability value, 0.8842>0.05, therefore the null hypothesis that the data does not suffer from heteroscedasticity was accepted. Hence the data did not suffer from heteroscedasticity problem.

4.7.4 Autocorrelation Test

The autocorrelation testing was based on Breusch-Godfrey Serial Correlation LM Test. Results are shown in Table 4.8.

Table 4.8: Breusch-Godfrey Serial Correlation LM Test

Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	7.149522	Prob. F(2,23)	0.0738
Obs*R-squared	11.88423	Prob. Chi-Square(2)	0.0626

Source: Research data (2021)

The findings indicate a probability value, 0.0738>0.05, therefore the null hypothesis that the data does not suffer from autocorrelation was accepted implying that there was no autocorrelation.

4.8 Relationship between Education expenditure and Primary school enrollment Rate

The first objective of the study was to assess the nexus between educational expenditure and primary school enrollment rate in Kenya. The OLS method was used to determine the relationship between educational expenditure and primary school enrollment rate. Results are shown in Table 4.9.

Table 4.9: Education expenditure and Primary school enrollment Rate

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Education Expenditure	1.63742	1.363542	1.20086	0.2406
Inflation	0.298428	0.125132	2.384906	0.0247
GDP Per Capita	1.360896	0.45089	3.018246	0.0056
Population Growth	-9.50764	4.400675	-2.1605	0.0401
C	129.364	10.68332	12.10897	0.000
R-square	0.454582			
Adjusted R-square	0.370672			
F-statistic	5.417471			
Prob(F-statistic)	0.002612			

Source: Research data (2021)

Estimated model:

Primary School Enrollment=129.364+1.63742 Education expenditure+0.298428Inflation+1.360896 GDP Per Capita-9.50764 Population Growth

Table 4.9 shows adjusted R square of 0.37 indicating that jointly education expenditure, inflation, GDP Per capita and population growth explain 37% of variations in primary school enrollment in Kenya.

The findings indicated that education expenditure had a positive though insignificant effect on primary school enrollment in Kenya (β=1.63742, p>0.05). The results revealed that increase in education expenditure results to increase in primary school enrollment in Kenya though minimally. The findings supported a study by Carsamer and Ekyem (2015) who established that education spending positively affects enrolment at the primary levels. Ihugba, Ukwunna, and Obukwu

(2019) established that Government spending on education and primary school enrolment were not significantly related. According to Idrees, Khan, and Fauzee (2021), government spending has a positive effect on student enrolment.

Results showed that inflation had a positive and significant effect on primary school enrollment in Kenya (β=0.298428, p<0.05). The results revealed that increase in inflation results to increase in primary school enrollment in Kenya.

The findings reveal that GDP Per Capita had a positive and significant effect on primary school enrollment in Kenya (β=1.360896, p<0.05). The results revealed that increase in GDP Per Capita results to increase in primary school enrollment in Kenya. The findings concurred with Carsamer and Ekyem (2015) results that per capita income is the key to achieving universal access to a basic education. Adesiyan (2017) found that primary school enrolment was significantly and positively correlated with per capita income.

Results showed that population growth had a negative and significant effect on primary school enrollment in Kenya (β= -9.50764, p<0.05). The results revealed that increase in population growth results to decline in primary school enrollment in Kenya. The findings agreed with a study Adesiyan (2017) who found that population growth was negatively related with primary school enrollment.

4.9 Relationship between Education expenditure and Secondary school enrollment Rate

The second objective of the study was to determine the nexus between educational expenditure and secondary school enrollment rate in Kenya. The OLS method was used to determine the relationship between educational expenditure and secondary school enrollment rate. Results are shown in Table 4.10.

Table 4.10: Education expenditure and Secondary school enrollment Rate

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Education Expenditure	0.71825	1.605875	0.44726	0.6584
Inflation	0.231331	0.147371	1.56972	0.1286
GDP Per Capita	0.439596	0.531023	0.827827	0.4153
Population Growth	-46.9585	5.182776	-9.06049	0.000
C	178.2014	12.58199	14.16321	0.000
R-square	0.850748			
Adjusted R-square	0.827787			
F-statistic	37.05062			
Prob(F-statistic)	0.000			

Source: Research data (2021)

Estimated model:

Secondary School Enrollment=178.2014+0.71825 Education expenditure+0.231331Inflation+0.439596GDP Per Capita-46.9585 Population Growth

Table 4.10 shows adjusted R square of 0.827 indicating that jointly education expenditure, inflation, GDP Per capita and population growth explain 82.7% of variations in secondary school enrollment in Kenya.

The findings indicated that education expenditure had a positive though insignificant effect on secondary school enrollment in Kenya (β=0.71825, p>0.05). The results revealed that increase in education expenditure results to increase in secondary school enrollment in Kenya though minimally. The findings supported a study by Carsamer and Ekyem (2015) who established that education spending favorably affects enrolment at the secondary levels. According to Idrees, Khan, and Fauzee (2021), government spending has a positive effect on student enrolment.

Results showed that inflation had a positive though insignificant effect on secondary school enrollment in Kenya (β=0.231331, p>0.05). The results revealed that increase in inflation results to increase in secondary school enrollment in Kenya though minimally.

The findings reveal that GDP Per Capita had a positive though insignificant effect on secondary school enrollment in Kenya (β=0.439596, p>0.05). The results revealed that increase in GDP Per Capita results to increase in secondary school enrollment in Kenya though minimally.

Results showed that population growth had a negative and significant effect on secondary school enrollment in Kenya (β= -46.9585, $p<0.05$). The results revealed that increase in population growth results to decline in secondary school enrollment in Kenya.

5. SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter presents a summary of the study findings, conclusion, recommendations for policy and practice, and suggestions for further research. The presentation is done in accordance with the study's objectives. The main goal was to assess the nexus between educational expenditure and school enrollment rates in Kenya.

5.2 Summary of the Findings

The first objective of the study was to assess the nexus between educational expenditure and primary school enrollment rate in Kenya. From descriptive output, Kenya's average annual primary school enrollment rate for the period from 1990-2020 was 98.43%. Based on the regression analysis, education expenditure had a positive though insignificant effect on primary school enrollment in Kenya. However, the study established a significant long run relationship between educational expenditure and primary school enrollment rate in Kenya.

The second objective of the study was to determine the nexus between educational expenditure and secondary school enrollment rate in Kenya. From descriptive output, Kenya's average annual secondary school enrollment rate for the period from 1990-2020 was 48.08%. Based on the regression analysis, education expenditure had a positive though insignificant effect on secondary school enrollment in Kenya. However, the study established a significant long run relationship between educational expenditure and secondary school enrollment rate in Kenya.

5.3 Conclusion

From the findings, the study concluded that education expenditure had a positive though insignificant effect on primary school enrollment in Kenya. The implication is that increasing the education expenditure would enhance primary school enrollment though to a small extent. The study concluded that a long run relationship exists between educational expenditure and primary school enrollment rate in Kenya.

The study also concluded that education expenditure had a positive though insignificant effect on secondary school enrollment in Kenya. The implication is that increasing the education expenditure would enhance secondary school enrollment though to a small extent. The study concluded that a long run relationship exists between educational expenditure and secondary school enrollment rate in Kenya

5.4 Recommendations

The study recommends that the government of Kenya should review the education expenditure policy to make it more effective in terms of delivering the expected outcome. Education expenditure in this study was found to have a negligible effect on school enrollment.

The study also recommends that the government of Kenya should increase the budgetary allocation to education to ensure that financial resources are adequate to support enrollments in schools. Education expenditure in this study was found to have a negligible effect on school enrollment, which could be attributed to inadequate budgetary allocation.

The study also recommends that the government of Kenya should monitor and audit the expenditure on education to make sure that financial resources allocated to education actually support education.

The study further recommends that the anti-corruption agencies in Kenya should investigate how education budget is spent by the relevant institutions mainly the ministry of education. The fact that education expenditure has a negligible effect on school enrollment could imply that financial resources meant to support education are misappropriated.

5.5 Suggestions for Further Research

The study focused on the nexus between educational expenditure and school enrollment rates in Kenya. The study focused on educational expenditure which is a macro factor. Future studies could consider investigating the effect of micro factors such as cultural factors and socio-economic factors on school enrollment.

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