

# EFFECTS OF GOVERNMENT EXPENDITURE ON HUMAN CAPITAL ON ECONOMIC GROWTH

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A13/02138/18

This research proposal submitted to department of Economics in partial fulfilment of the  
requirement of the award of Bachelor Degree in Egerton University

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## **DEDICATION**

This work is dedicated to my Parents for having been there for us and for their love and support.

## **ACKNOWLEDGEMENT**

First and foremost, I acknowledge the Almighty God for his mercies and blessing and for the greatest gift of life that he gave us. We realize that without God, this work would not even have started and because of his favor, the work has been done successfully.

We also extend my gratitude to the Egerton University for having accorded us a chance to pursue my studies in the institution. We wish to express my sincere appreciation to my supervisor Dr. Symon Kiprop for his tireless support, positive criticism and general guidance and encouragement throughout the research period. My tireless contributions brought us this far and I forever remain indebted to you.

We also acknowledge my beloved families for being understanding and for encouraging us as I undertook this research, my friends for their support and various contributions that made this work to be what it is.

## **ABSTRACT**

This research project investigated the relationship between government expenditure on human capital and economic growth in Kenya. Using multiple regression analysis, the study tested the hypothesis that increased spending on human capital, such as education and health, leads to economic growth. The study controlled for variables such as politics, government policy, and income distribution.

The research findings revealed a positive and significant long-term association between expenditure on education and health and economic growth in Kenya. Furthermore, the research established that human capital expenditure is a significant determinant of GDP growth in Kenya. These findings suggest that investing in human capital has the potential to drive economic growth in developing countries like Kenya.

The study recommends that both the national and county governments in Kenya increase their expenditure on human capital to support the development of the education and health sectors and enhance economic growth.

### **List of Abbreviations**

**GDP** – Gross Domestic Product

**DW** – Durbin Watson

**GCC** – Gulf Cooperation Council

**KIPPRA** --The Kenya Institute for Public Policy Research and Analysis

**ARDL** -- Auto-regressive distributive lagged model

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## **CHAPTER ONE**

### **INTRODUCTION**

#### **1.1 Background of the study**

Kenya government has put priorities to ensure universal, inclusive and quality health, education and training that is accessible to all. Against the backdrop of the sustainable development goals, Kenyan's key policies, plans and strategies that guide education and health sector include aspect of the Kenya vision 2030, it is 5 years rolling medium plan.

The existing view in modern economic growth theory, human capital is a crucial component of economic prosperity. On the other hand, the government's fiscal policy influences the long-term growth rate by deciding on public spending throughout the budget announcement process. Public funding for education and health has been a top goal for governments in developing nations because it is a key indicator of socioeconomic development. One of the developing nations, Kenya is working to reduce poverty, boost labor productivity, and increase social welfare to a larger extent through wiser public spending choice.

Since 1970s much of attention of macroeconomics has focus on long term issues that affect government policy. Human capital and technological advancement are the big factor promoting sustainable economic development (Schulz, 2002). Human capital theory rest on the assumption that formal education is highly instrumental and necessary to improve education productivity. The provision of formal education is seen as investment in human capital, which proponents of the theory have considered as equally or even more worthwhile that of physical capital(Woodhall, 1997). Modern economist seem to concur that education and health care are the key to improving human capital and ultimately increasing the economic output of the nation(Becker, 1993). During the time of Kenya's independence, the country faced a shortage of skilled labor that limited its growth potential. However, the Kenyan government is currently working to improve this situation by employing skilled and trained laborers. In addition

to this effort, the government has been increasing its expenditure in both education and health sectors over the past few years.

According to the World Bank, Kenya allocated the following amount for the past 8 years

Table 1.1 Trends of GDP, Expenditure on Education and Health

Year	GDP (in billions of USD)	Education Expenditure (as % of GDP)	Health Expenditure (as % of GDP)
2015	63.4	5.4	4.0
2016	69.2	5.6	4.1
2017	74.9	5.8	4.2
2018	83.5	5.9	4.3
2019	98.2	6.1	4.4
2020	95.5	6.2	4.5
2021	110.3	4.8	4.6
2022	112.2	5.1	4.8

These table 1.1 demonstrate the Kenyan government's commitment to improving access to education and healthcare for all citizens, especially those in marginalized regions, rural areas, and urban slums.

Therefore, investing in human capital is recognized as important for country's development. Improve quality of education and health are associated with many benefits such as increased productivity, reduced income inequality, poverty and improved economic growth and health (Onsendo, 2007). Keynesian (1930) regard public expenditure as an exogenous factor which can be utilized as policy instrument to promote economic growth.

## **1.2 Statement of the problem**

According to Psacharopoulos and Woodhall (1997), human capital was identified as a positive contributor to productivity, leading to socio-political development. Kenya recognized the significance of human capital in achieving its growth targets outlined in the country's development plans. This was evident in the increased annual expenditure levels for education and healthcare recorded in the annual budgetary provisions, aimed at improving the capacity and well-being of human capital for efficient and effective service delivery.

Vision 2030, the country's development plan, emphasized the application of science, technology, and innovation to raise productivity and efficiency. This highlighted the need for a highly skilled and healthy workforce to develop policies, strategies, and programs that addressed the macroeconomic and socio-economic challenges facing the country. However, the achievement of such enhanced skills and a healthy workforce, leading to improved productivity and efficiency, could only result from deliberate expenditure with demonstrable impacts on economic growth.

Despite the critical role of expenditure in human capital, there was a lack of empirical assessment on how the expenditure by the Government of Kenya in the education and healthcare sectors impacted the country's economic growth. This had led to insufficient budgetary allocations and limited fiscal attention being accorded to the two sectors that were essential for enhancing human capital capacities and well-being to achieve targeted economic growth projections, as highlighted in the (KIPPRA Policy Brief of 2018).

This research aimed to fill this gap in the literature by investigating the effect of government expenditure on the education sector on economic growth in Kenya. The study utilized comprehensive data and research methods to isolate the specific impact of government spending on education and health from other factors. The findings provided insight into the importance of government spending on education and healthcare as a means of enhancing human capital and achieving economic growth in Kenya.

### **1.3 Objectives of the study**

The general objective of the study was to determine the effect of government expenditure on human capital in the Kenyan economy. The specific objectives were:

- (I) To determine the effects of education expenditure on economic growth in Kenya.
- (II) To establish the effects of health expenditure on economic growth in Kenya.

### **1.4 Research Hypothesis**

- (i). How does education expenditure affect economic growth in Kenya?
- (ii). How does the health expenditure affect economic growth in Kenya?

### **1.5 Significance of the study**

Understanding the significance of expenditure in health and education was crucial for policymakers to create policies that promote sustainable economic growth and inclusive human development. The findings of this study informed policymaking decisions regarding both sectors.

Evidence-based information from the study guided policymakers in creating an enabling environment that promoted employment creation, skill development, and improved standards of living for Kenyans. This had the potential to lead to increased investment in the country, poverty reduction, and overall socio-economic development.

Moreover, the study's results provided investors and businesses with insights into the factors that impacted economic growth in Kenya, including expenditure in health and education. This encouraged increased investment and entrepreneurship in the country, contributing to economic development and job creation. Ultimately, the findings of this study had far-reaching implications for the socio-economic development of Kenya.

### **1.6 Scope and Limitations of the study**

The study focused on the effects of government expenditure in human capital on Kenyan economic growth. The study specifically looked at how government expenditure on the

education and health sector affected economic growth in Kenya. The study used data from the World Bank and the Kenyan government to examine the relationship between government expenditure on both education and health sector and economic growth in Kenya. The study also looked at the impact of other factors, such as government expenditure in infrastructure on economic growth in Kenya.

The study acknowledged several limitations that could impact the results and conclusions. Firstly, the study relied on secondary data and was limited by the availability and accuracy of data. Additionally, the data used in the study may not have been up-to-date or fully reflected the current state of the education and health sector in Kenya. The data may also have been subject to measurement errors and biases, which could have impacted the results.

To address the limitation of not considering other factors that may impact economic growth, the study suggested including a more comprehensive analysis that considers a range of variables, such as private investment in education and health, macroeconomic conditions, and technological advancements. This would provide a more comprehensive understanding of the factors that impact economic growth in Kenya.

To address the potential impact of measurement errors and biases, the study recommended employing robust statistical methods and sensitivity analyses to ensure the accuracy and reliability of the results. Additionally, the study suggested comparing and validating its findings with other relevant studies to ensure the validity of the conclusions.

## 1.7 Definition of terms

**Government expenditure** - Refers to the money spent by a government in a given period of time, such as a fiscal year, on various activities and programs, such as national defence, education, healthcare, infrastructure and social welfare etc. Government expenditure on education is the independent variable on this study.

**Economic growth** – An increase over time in a country's real output per capita. It is a dependent variable which measured in real GDP.

**Fiscal policy** - Refers to the use of government spending and taxation to influence the economy

**Macroeconomics** – is concern with the behaviour of economic system in totality, its concern is to explain determinant of large aggregates such as total output, rate economic growth, general price level and employment.

## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **2.1 Introduction**

This chapter presented existing literature that was relevant to the study. Initially, theoretical literature that reviewed various government expenditure in human capital performance was presented, where portrayals of the models were shown. The second section reviewed studies carried out on the subject, and the final section dealt with the critics of the literature.

#### **2.2 Theoretical literature review**

The objective of the theoretical literature review was to examine the impact of government expenditure in human capital on economic growth in Kenya. The study aimed to answer research questions related to the effect of government expenditure in human capital, the factors affecting government expenditure, and the most effective ways of allocating government expenditure to maximize its impact on economic growth.

The study was significant because the impact of government expenditure in human capital, specifically the education and health sectors, had been a widely debated topic in recent years. The study aimed to contribute to the debate by providing empirical evidence on the subject. The results of the study would have provided valuable information for policymakers in Kenya, as well as in other developing countries, who were looking to allocate resources effectively to achieve economic growth.

Additionally, the review considered the relationship between government expenditure in education and health sectors and other economic variables, such as income inequality and poverty reduction.

##### **2.2.1 Keynesian Theory**

The Keynesian theory, first introduced by Keynes in 1936, named after British economist John Maynard Keynes, suggests that government expenditure can stimulate economic growth by increasing aggregate demand. This theory places more importance on aggregate demand for goods as the driving force for economic downturn, and argues that government

policies can promote demand at the macro level and fight unemployment and deflation. The theory proposes that changing tax collection levels and government expenditures in the economy can impact aggregate demand, with the main goal of achieving full employment, price stability, and economic growth.

Keynesian theory suggests that government spending on human capital development, including education and health, can contribute to economic growth by increasing the productivity and efficiency of the workforce. According to Keynesians, government spending in these areas can lead to an increase in the supply of skilled labor, which can in turn stimulate economic activity and job creation. This is because investing in human capital can result in a more productive and healthy workforce that is better equipped to meet the demands of the economy.

This theory is relevant in the context of education and health in Kenya, as the government has invested heavily in these sectors in recent years with the aim of improving the country's economic performance. By examining the relationship between government expenditure on human capital development and economic growth in Kenya, this study can shed light on the effectiveness of Keynesian policies in promoting economic development.

However, one limitation of the Keynesian theory in the context of human capital development is that it may not fully account for the complex interplay between government spending and other factors that affect economic growth, such as technological innovation and international trade

### **2.2.2 Human Capital Theory**

The theory of human capital was developed by economist Gary Becker, Human capital is a component of production, and it is through increased expenditure that higher productivity is generated (Becker, 1964). Human capital contribution may be grouped into three categories: social capital, intellectual capital, and emotional capital, however unlike other production criteria like land and physical capital, it is interchangeable but not transferrable (Becker 1964). According to Mahroum (2007), the majority of labor surplus economies have a



shortage of physical capital, which has to be addressed by accelerating the rate at which human capital is developed in order to raise the quality of that capital through focused investment initiatives.

Mahroum noted that the capacity to develop ability, use competence, and import competence from outside the specific production system are the three main aspects that determine how effectively human resources are used at the macro-level. In conclusion, the human workforce's contribution is a component of output in a production framework that is motivated by the amount of investment it receives. This indicates that expenditures allocated to the expansion of human capital serve as the foundation for success in a production process that results in sustained economic growth.

However, one of the limitations of Human Capital theory is that it may not fully capture the complex relationship between education, health and economic growth, as other factors such as institutional quality and macroeconomic conditions also play a role.

### **2.2.3 Endogenous Growth Theory**

The theory of endogenous growth, which asserts that the growth of an economy is driven by internal factors such as expenditure in innovation, knowledge, and human capital, gained prominence in the 1980s and 1990s. Scholars such as Sergio Rebelo (1991), Paul Romer (1986, 1990), Ortigueira and Santos (1997), and Robert Lucas (1988) proposed that sustained human capital expenditure results in overlap on the general economy and reduced the diminishing return to accumulation of capital, rather than technological change driving growth in the model. Howitt and Aghion (1992), Romer (1987, 1990), and Helpman and Grossman (1991) further supported the theory, arguing that economic players optimally determine saving and consumption, thereby maximizing resource allocations to R&D that enable technological advancement and economic development.

This stands in contrast to the earlier exogenous growth theory, which focused on external factors such as natural resources, technological advancements, and population growth as the primary drivers of economic growth. However, critics of the endogenous growth theory, including Krugman (1991) and Parente (2000), have pointed out its inability to explain

variations in growth between less developed and developed economies, and its difficulty in verifying its assumptions with empirical evidence..

The limitations of this theory is that it assumes that knowledge and technology are public goods, which may not always be the case in practice.

### **2.3 Empirical literature review**

In this empirical literature review, the focus is on the relationship between government expenditure in human capital through education and healthcare and economic growth. The reviewed studies provide insights into this relationship both globally and locally. The importance of human capital, which includes knowledge, skills, and healthcare of the workforce, is widely recognized for achieving economic growth.

Bakare (2006) used a vector autoregressive error correction model to investigate the implications of human capital growth on Nigeria's annual economic performance. The study found a significant link between the expansion of human capital expenditure in the economy and a change in the growth rate of GDP. Kwabena (2010) studied the impacts of education on development outcomes in several African economies and concluded that expenditure in education has a significant positive effect on national development.

Jorgenson and Fraumeni (1992) used growth accounting methodology to demonstrate that investing in both human and physical capital accounted for a significant percentage of growth in both industrial and education sub-sectors of the US economy. Pradhan and Mallick et al (2016) examined the impact of public sector expenditure, particularly on educational programs, on the growth of economies in sampled Asian countries.

Heshmati (2001) investigated the relationship between healthcare expenditure and GDP using the Solow growth model, finding a correlation between the two variables. Adeel (2016) used the auto-regressive distributive lagged model (ARDL) to study the impact of healthcare expenditure on labor productivity in Pakistan, finding that additional expenditure on healthcare and an increasing employment rate resulted in healthier and more productive workers and increased production, eventually leading to an increase in GDP per capita.

Boussalem et al (2014) studied the relationship between healthcare spending in Algeria and the growth of the economy using co-integration and causality tests, finding that healthcare spending had a substantial influence on the growth of the Algerian economy. Majdi (2012) studied the correlation between healthcare spending and the growth of economies in a sample of 15 countries north and south of the Mediterranean, using panel data from 1990 to 2008 and an OLS multiple regression econometric model.

In Kenya, Mudaki and Masaviru (2012) explored the impact of government expenditure on various modules and the growth of the Kenyan economy using Johansen's (1988) cointegration, Granger causality tests, regression analysis, and Vector Auto regression model method. The study found that increased spending on education exhibited the characteristics of a significant booster of economic growth statistics, recommending increased expenditure in the education sector as one of the key determinants of Kenya's economic growth.

## **2.4 Theoretical Framework**

According to the theoretical review, the Keynesian theory did not consider the inflationary effects of increased government spending on the economy. On the other hand, the Endogenous Growth Theory addressed the limitations of previous growth theories by modelling the process of economic growth. The impact of government expenditure on human capital can be observed in the economy, and forecasts can be made about its effect on economic growth. This theory emphasizes the critical role of the government in shaping economic growth. Endogenous Growth Theory suggests that expenditure in human capital is a key driver of economic growth, as it increases the productivity and efficiency of the labor force. This theory also recognizes that economic growth is a self-reinforcing process, where expenditure in human capital and technological progress leads to further economic growth. As a result, the study adopted the Endogenous Growth Theory to explain the relationship between government spending in human capital and economic growth in Kenya

## **2.5 Literature Overview**

According to theoretical literature, new growth theories offer far more effective criteria for assessing human capital and its contribution to growth. Through boosting worker

productivity, knowledge production, and innovation, expenditure in healthcare and education are thought to help the economy grow.

#### **2.5.1 Government expenditure in education on economic growth**

Whether expenditure in education had a positive impact on economic growth was a controversial subject in the empirical literature. The majority of empirical research in this field used cross-country regressions, which combined developing and developed economies. This caused a significant amount of overlap between the data sets and study parameters, which may have accounted for the inconsistent findings of empirical research. The empirical literature also revealed a wide range of methodological flaws in estimating the effects of education expenditure variables on economic growth. These flaws included issues with measuring human capital expenditure, a lack of data availability that led to the prevalence of cross-country regressions, endogeneity bias, and parameter heterogeneity as a result of cross-country regressions.

#### **2.5.2 Government expenditure in health on economic growth**

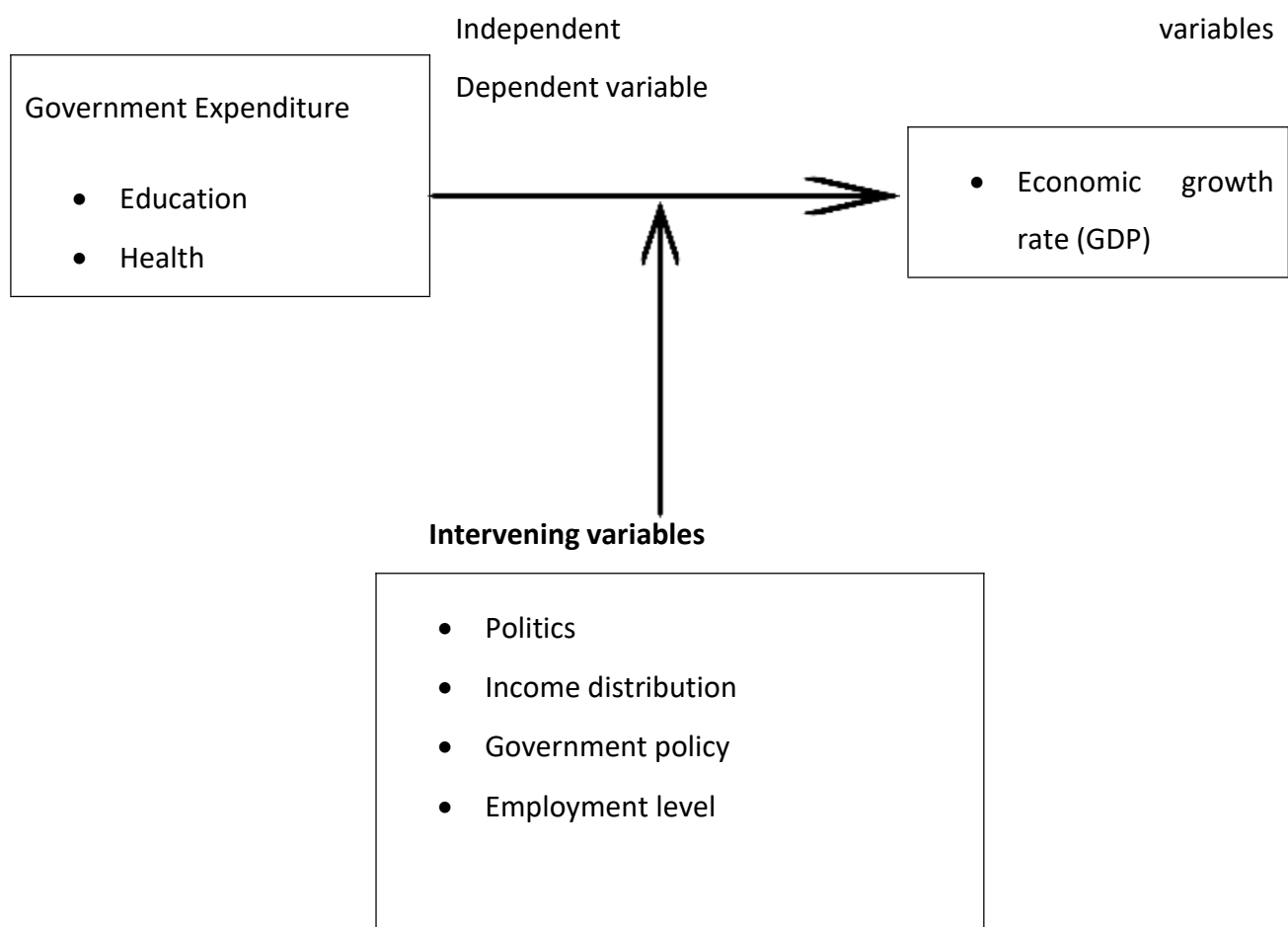
The studied theoretical literature and empirical data from many nations and historical periods provide inconsistent or conflicting conclusions on the healthcare variable. The findings on the impact that spending on the healthcare sector has on economic growth were fairly conflicting, even in circumstances when various articles were investigating a given nation within identical time frames.

### **2.6 Conceptual Framework**

The conceptual framework for the study included the variables of government expenditure in human capital, economic growth, and other factors that may affect the relationship between the two variables.

Human capital was defined as the knowledge, skills, and abilities of individuals that contribute to their economic productivity. It could be developed through education, training, and healthcare.

Economic growth was defined as the increase in a country's gross domestic product (GDP) over time. This included growth in the economy's output of goods and services, as well as growth in incomes and standards of living.



## **CHAPTER THREE**

### **RESEARCH METHODOLOGY**

#### **3.1 Introduction**

This chapter presented the methodology and analytical techniques that were utilized to estimate the impact of government expenditure on human capital towards economic growth in Kenya. The research solely relied on secondary data sources. The empirical analysis of this study focused on examining the relationship between government expenditure in the human capital and economic growth in Kenya, with the objective of determining the direction and strength of their correlation.

#### **3.2 Research design**

The study used a correlational research design, which allowed researchers to investigate the relationship between two variables without manipulating them. In this case, the independent variable was government spending on human capital, and the dependent variable was economic growth. The study collected data on both variables and analyzed the strength and direction of the relationship using statistical methods.

A correlational research design was appropriate for this study because it allowed for the examination of the relationship between government spending on human capital and economic growth without manipulating either variable. Additionally, it provided insights into the strength and direction of the relationship, which could inform policy decisions..

#### **3.3 Study Area**

The study focused on Kenya as the study area. Kenya was a developing country with a significant portion of its national budget allocated towards education and health sectors. The country had made substantial efforts towards improving human capital in education and health sectors over the years by increasing budgetary allocations towards both sectors. For example, in the 2022/2023 financial year, the government allocated KES 544.4 billion and Sh146.8 billion towards education and health sector respectively.

The study relied on secondary data sources from various government reports, publications, and databases. The study covered the period from 2000 to 2022 as it covered a period of significant changes in the education and health sector in Kenya. In Kenya, the education and health sectors underwent significant changes from 2000 to 2022. The education sector saw the introduction of free primary education, digital learning, curriculum reform, and increased expenditure. These changes resulted in increased enrolment, improved access to information, and a focus on developing competencies and values in addition to academic knowledge. In the health sector, Kenya launched a program for universal health coverage, increased the number of health facilities, improved access to medicines, and improved maternal and child health. Additionally, the government responded to the COVID-19 pandemic with measures such as establishing quarantine centers, mass testing, and vaccination campaigns. These changes significantly improved the quality of life for Kenyans by providing them with access to quality education and healthcare.

### **3.4 Data collections**

The data used in this research is secondary data collected from World Bank Open Data sources, Kenya National Bureau of Statistics, Ministry of Education, Ministry of health and the National Treasury. The main variables of the study are GDP, Education, health expenditure and total public expenditure on education. The research use time series data since the subject of the study is Kenya.

### **3.5 Data analysis**

Data analysis is a process of inspection, cleaning, transforming and modelling data with the goal highlighting useful information, suggesting conclusions and supporting decision making. It involve examining what has been collected in the survey so that we make good decisions and inferences.

A multiple regression model was used to examine the data that was gathered for this study. Data analysis was aided by the use of Microsoft Excel 2016. The independent variables of this study were GDP, education expenditure, health expenditure, and total public expenditure.

### **3.5.1 Descriptive Analysis**

The data analysis also included descriptive statistics such as mean, percentages, and tables. The researcher was able to identify the key factors that affect economic growth, which include GDP, education expenditure, health expenditure, and total public expenditure. In order to draw valid conclusions, the data was collected in accordance with the study's objectives.

### **3.5.2 Inferential analysis**

Inferential analysis is a statistical method used to draw conclusions about a population based on a sample of data. It involves making inferences and predictions about a population based on a subset of data obtained from that population. The most common methods used in inferential analysis include hypothesis testing and confidence intervals.

#### **3.5.2.1 The model**

The following was the multiple regression model used for this study.

$$Y = B_0 + B_1X_1 + B_2X_2 + B_3X_3 + B_4X_4 + \epsilon_t$$

**3.5.2.2 Variable definition, measurement and sources of data from the multivariate regression above,**

Y = Economic growth (GDP)

X<sub>1</sub> = Education expenditure

X<sub>2</sub> = Health expenditure

Control variables.

X<sub>3</sub> = Private investment

X<sub>4</sub> = export and imports



### **3.5.2.3 Pre-diagnostic Tests**

Multiple regression analysis technique will be used to establish the relationship between independent variables and the dependent variable. Statistical significance of regression coefficient will be tested using t- statistics. The unit root test will be tested using augmented Dickey-Fuller test for unit roots.

#### **Correlation**

This technique is used to measure the strength and degree of the association between the independent variables and the dependent variable. It's usually denoted by  $\rho$  such that:

$$-1 \leq \rho \leq +1$$

If  $\rho = 0$ , correlation is zero, there is no linear association between X and Y

If  $\rho = 1$ , there is an exact positive or direct linear association between X and Y

If  $\rho = -1$  there is an exact negative linear association

### **3.5.2.4 Post diagnostic Tests**

These tests will apply the assumption of the error terms to ascertain whether they conform to the requirements for linear regression.

#### **Autocorrelation**

Autocorrelation is a special case of correlation i.e. autocorrelation refers to the relationship not between two or more different variables but between the successive values of the same variable. Here we are concerned with the autocorrelation of the error term.

The most frequently used statistical test for the presence of serial correlation is the Durbin-Watson (DW) test (see Durbin and Watson, 1950). The DW test is important because the presence of autocorrelation in the residuals can lead to biased and inconsistent estimates of the regression coefficients, which can affect the reliability and validity of the model. The DW test is a simple way to check for the presence of autocorrelation in the residuals, and if it is detected, corrective measures can be taken to improve the model's accuracy.

### **Heteroscedasticity**

This occurs when the assumption of constant variance (homoscedasticity) , will be unreasonable it then to occur where there a large variation in the size of independent variable, this is because the data sets span a very long time period and the accuracy with which the economic variables are measured (in our case 2000-2022) may also vary considerably. We will use Goldfield and Quant Test for heteroscedasticity. The test is appropriate when the data has a clear pattern or structure, and it is robust to deviations from normality. Therefore, it is suitable for detecting heteroscedasticity in our study since we are analyzing data from a period of 23 years which could potentially have variations in the size of the independent variable and inaccuracies in measuring economic variables.

## CHAPTER FOUR

### ANALYSIS AND DISCUSSION OF RESULTS

#### 4.1 Introductions

In this chapter we present the analysis and discussion of the data collected for our study on the effects of government expenditure in human capital on economic growth. The chapter begins with a description of the data analysis methods used in the study. This is followed by a presentation of the descriptive statistics for the variables of interest. The results of the inferential statistical tests are then discussed in detail, including the tests for correlations and the regression analyses.

#### 4.2 Descriptive Analysis

Table 2: Descriptive analysis

Variable	Mean	Standard Deviation	Minimum	Maximum
LOG Y	10.51	0.3424	10.08	11.05
LOG X1	9.21	0.37442	8.8	9.75
LOG X2	9.12	0.37765	8.7	9.73

**Note:** The minimum and maximum values of a variable provide important information about the range of values that the variable can take. Specifically, the minimum value represents the lowest possible value that the variable can take in the data, while the maximum value represents the highest possible value

According to figure 2 above, each variable's mean and standard deviation are displayed. The data center is identified by the means. Indicated are the data sets' averages. The standard deviations inform us of how near or far the statistical data sets' values are from the mean, or how crowded the data are in relation to the mean.

The standard deviations are typically low, as seen in Fig. 2 above, indicating that the average values in our data sets are relatively close to the mean.

### 4.3 Inferential analysis.

#### 4.3.1 Correlation

The correlation coefficients between GDP and Education Expenditure, and GDP and Health Expenditure are:

Correlation coefficient between GDP and Education Expenditure: 0.938

Correlation coefficient between GDP and Health Expenditure: 0.902

#### 4.3.2 Multiple regression

$$Y = B_0 + B_1X_1 + B_2X_2 + B_3X_3 + B_4X_4 + \epsilon_t$$

where  $B_0$  is the intercept (the value of GDP when both Education Expenditure and Health Expenditure are zero),  $B_1$  is the coefficient for Education Expenditure (the increase in GDP for a one-unit increase in Education Expenditure, holding Health Expenditure constant),  $B_2$  is the coefficient for Health Expenditure (the increase in GDP for a one-unit increase in Health Expenditure, holding Education Expenditure constant),  $B_3$  is the coefficient for private investment and  $B_4$  is the coefficient for export and imports

$$\text{Log}Y = 1.7977 + 0.6349\text{Log}X_1 + 0.0098\text{Log}X_2 + 0.1266\text{Log}X_3 + 0.1542\text{Log}X_4$$

The estimated coefficients for the regression equation are:

$$B_0: 1.7977 \quad B_1: 0.6349 \quad B_2: 0.0098 \quad B_3: 0.1266 \quad B_4: 0.1542$$

This equation indicates that, holding other factors constant, a one-unit increase in Education Expenditure is associated with a \$0.6349 billion increase in GDP, and a one-unit increase in Health Expenditure is associated with a \$0.0098 billion increase in GDP.

The R-squared value for this regression model is 0.9945, which means that about 99.4% of

#### Regression Statistics

Multiple R	0.997229
R Square	0.994465
Adjusted R Square	0.993235
Standard Error	0.028796
Observations	23

#### ANOVA

	df	SS	MS	F	Significance F
Regression	4	2.681839	0.67046	808.5341	0
Residual	18	0.014926	0.000829		
Total	22	2.696765			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95%	Upper 95%
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the variance in GDP can be explained by the independent variables (Education Expenditure and Health Expenditure) and control variables (private investment and exports and imports) in the model. This suggests that the model is of good fit for the data.

#### 4.4 Regression Analysis

The regression analysis was carried out and the results were as follows

Table 3: Empirical results

Intercept	1.797688	0.548646	3.276589	0.004192	0.645025	2.95035	0.645025	2.95035
logX1	0.634931	0.097001	6.5456	3.76E-06	0.431139	0.838723	0.431139	0.838723
logX2	0.009815	0.083846	0.117056	0.908112	-0.16634	0.185968	-0.16634	0.185968
logX3	0.126567	0.089486	1.41438	0.174315	-0.06144	0.314571	-0.06144	0.314571
logX4	0.154203	0.066623	2.314581	0.032649	0.014235	0.294172	0.014235	0.294172

For the purposes of these tests, the null hypothesis was as follows:

H<sub>0</sub>; There is a significant linear relationship between expenditure in education and economic growth rate

Since the  $t_{cal}$  (6.5456) is greater than 0.8387 we reject the null hypothesis at 5% level of significance implying that expenditure in education is important in explaining economic growth.

H<sub>0</sub>; There is a significant linear relationship between expenditure in health and economic growth rate

Since the  $t_{cal}$  (0.1171) is less than 0.1860 we accept the null hypothesis at 5% level of significance implying that expenditure in health is not important in explaining the economic growth.

The joint test hypothesis of the parameters estimates at 5% level of significance.

$$H_0 : \beta_1 = \beta_2 = 0$$

$$H_a : \beta_1 \neq \beta_2 \neq 0$$

$$\alpha = 5\%$$

F calculated = 808.53

Since the (F-calculated = 808.53) is greater than (F-tabulated = 2.49) implies education and health expenditure that are statistically significantly in influencing economic growth. Therefore the model can be used for prediction.

## **CHAPTER FIVE**

### **CONCLUSION AND POLICY RECOMMENDATIONS**

#### **5.1 Introduction**

The summary, conclusions and policy recommendations arising from the findings are obtainable in this section. In addition, the inferred information that would contribute to bridging the knowledge gap and identified areas of further research are highlighted based on study findings

#### **5.2 Conclusion**

Government expenditure in human capital, particularly in education and health, has positive effects on economic growth. Education expenditure leads to a more skilled and productive workforce, which contributes to the creation of new ideas and innovation, leading to economic growth. Similarly, health expenditure leads to a healthier population, which increases productivity and reduces healthcare costs.

Expenditure in education and health has significant long-term benefits for the economy, including increased innovation, improved productivity, and higher standards of living.

This study has confirmed that expenditure in human capital is a positive contributor to economic growth and a determinant of the required economic growth, as measured by real

GDP. This study confirms the importance of expenditure in human capital for sustainable economic growth and development.

### **5.3 Policy recommendation**

Based on the findings that government expenditure in human capital, particularly in education and health, has positive effects on economic growth, the following policy recommendations are proposed:

**Increase expenditure in education and health:** Governments should prioritize spending on education and health to improve the well-being of their citizens and promote economic growth. This includes allocating sufficient funds towards improving access to quality education and healthcare services.

**Foster innovation and entrepreneurship:** Governments should encourage innovation and entrepreneurship by providing funding for research and development, promoting the development of new industries, and supporting small and medium-sized enterprises.

**Ensure inclusive economic growth:** Policymakers should strive to ensure that economic growth is inclusive and benefits all members of society, particularly those in marginalized and disadvantaged communities. This can be achieved by implementing policies that promote social equity and providing access to education and healthcare services to all.

**Strengthen partnerships:** Governments should work in partnership with the private sector, civil society, and international organizations to improve human capital development and promote economic growth. Collaboration can help leverage resources, share knowledge, and develop effective policies and programs.

**Monitor and evaluate progress:** Governments should establish mechanisms to monitor and evaluate the impact of policies and programs aimed at improving human capital development and promoting economic growth. This will help ensure that resources are being used effectively and efficiently and allow policymakers to make data-driven decisions.

### **5.4 Areas of future research**



Year	GDP (in billions of(USD) Log Y	Education Expenditure(USD) Log X <sub>1</sub>	Health Expenditure(USD) logX <sub>2</sub>	Private investment Log X <sub>3</sub>	Import and export(M+X) Log X <sub>4</sub>	Total Public Expenditure (as % of GDP)	Employment Rate (as % of population)
2000	10.08	8.84	8.75	8.87	9.70	21.6	39.3
2001	10.09	8.83	8.72	8.93	9.68	20.7	38.5
2002	10.10	8.80	8.72	8.94	9.67	20.3	37.7
2003	10.12	8.80	8.70	8.97	9.73	19.5	36.9
2004	10.16	8.80	8.71	9.01	9.84	19.1	36.1
2005	10.19	8.86	8.75	9.07	9.93	18.9	35.3
2006	10.22	8.87	8.76	9.09	10.01	18.5	34.5
2007	10.25	8.88	8.78	9.15	10.11	18.2	33.7
2008	10.28	8.89	8.77	9.16	10.19	17.8	33.0
2009	10.31	8.93	8.81	9.23	10.09	17.5	32.3
2010	10.39	9.02	8.90	9.63	10.16	18.1	31.6
2011	10.45	9.11	9.36	9.67	10.29	18.7	30.9
2012	10.52	9.18	9.07	9.70	10.34	19.2	30.2
2013	10.57	9.25	9.14	9.75	10.34	19.7	29.5

This study has focused on government expenditure in human capital in Kenya. A similar research study can be conducted to explore the effects of government expenditure in human capital on economic growth in other countries. For instance, a cross-country analysis could be carried out to compare the impact of human capital expenditure on economic growth across different countries and investigate the factors that contribute to variations in these effects.

2014	10.61	9.31	9.19	9.81	10.36	20.3	28.9
2015	10.80	9.53	9.40	10.00	10.36	20.9	28.3
2016	10.84	9.59	9.45	10.05	10.33	21.5	27.8
2017	10.87	9.64	9.50	10.08	10.39	22.1	27.2
2018	10.92	9.69	9.56	10.16	10.41	23.3	26.6
2019	10.99	9.78	9.64	10.27	10.42	23.9	25.9
2020	10.98	9.77	9.63	10.27	10.36	24.5	25.2
2021	11.04	9.72	9.70	10.30	10.41	24.8	26.1
2022	11.05	9.75	9.73	10.33	10.47	24.7	28.5

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