THE EFFECT OF GOVERNMENT SECTORAL EXPENDITURE ON POVERTY REDUCTION IN KENYA

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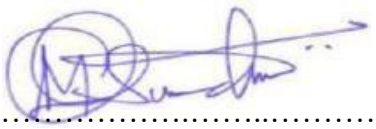
SEPTEMBER 2023

DECLARATION

I make a declaration that this is my own thesis. It has never been presented anywhere for the purpose of awarding a degree in another University.

Signature  …….Dated……**8th..September 2023**……

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I hereby approve this project as the university supervisor for this student and present it for examination.

Signature……  …… Dated……..**8th ..September 2023**……...

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DEDICATION

To my beloved and caring wife Evaburrows Khamasi Tuvei, my Dad Charles Osundwa and my Mum Tifina Osundwa for your financial and spiritual support. My dear brother Josphat Osundwa and the rest of my siblings for being there for me throughout my academic life.

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ABBREVIATIONS AND ACRONYMS

ADF	-	Augmented Dickey-Fuller
AIC	-	Akaike Information Criteria
BETA	-	Bottom-Up Economic Transformation Agenda
CBK	-	Central Bank of Kenya
CES	-	Constant Elasticity of Substitution
DFRD	-	District Focus for Rural Development
ERSWEC	-	Economic Recovery Strategy for Wealth and Employment Creation
FPE	-	Final Prediction Error
GDP	-	Gross Domestic Product
HQIC	-	Hannan and Quinn information Criterion
IMF	-	International Monetary Fund
JRF	-	Junior Research Fellowship
KIHBS	-	Kenya Integrated Household Budget Survey
KIPPRA	-	Kenya Institute for Public Policy Research and Analysis
KNBS	-	Kenya National Bureau of Statistics
LM	-	Lagrange Multiplier
LR	-	Likelihood Ratio
MDGs	-	Millennium Development Goals
MTEF	-	Medium-Term Expenditure Framework
MTPs	-	Medium-Term Plans
NPEP	-	National Poverty Eradication Plan
PEV	-	Post-Election Violence
PP	-	Phillips-Perron

PRSP	-	Poverty Reduction Strategy Paper
SBIC	-	Schwarz's Bayesian Information Criterion
SDD	-	Social Dimensions of Development
SDGs	-	Sustainable Development Goals
TFP	-	Total Factor Productivity
UN	-	United Nations
UNDP	-	United Nations Development Programme
UNESCO	-	United Nations Educational, Scientific and Cultural Organization
USD	-	United States Dollar
VAR	-	Vector Autoregressive
VECM	-	Vector Error Correction Model
WB	-	World Bank
WMS	-	Welfare Monitoring Survey

ABSTRACT

The study aimed to examine the correlation between public sectoral spending and its effect on poverty reduction in the Kenyan set up. Poverty remains to be a global phenomenon and no country is insusceptible to the menace it is likely to cause if no proper fiscal policies are put in place to address it. Economic theory opines that increased government spending leads to reduced levels of poverty in the society. However, different studies on this topic have yielded conflicting empirical results. That formed the basis of this study for further interrogation as to whether an observable nexus exists between public expenditure on the agriculture and education sectors and poverty reduction. Private consumption per capita was used as a proxy to measure poverty. Two control variables, namely; real GDP and inflation were used in the study to give fair and unbiased results. The research was anchored on the Cobb-Douglas Production model. The study employed quarterly time series data between 1990 to 2022. The data was mined mainly from KNBS, the National Treasury, CBK, KIPPRA and the World Bank. The study adopted the VECM model for establishing the long-run relationships between the variables of interest. Unit root tests were conducted using both ADF and PP techniques to transform data into stationary time series for robustness. In addition, the study conducted autocorrelation analysis using LM to confirm the validity and reliability of the study results. The null hypothesis with no autocorrelation was rejected in the study. The findings indicated that Government expenditure on agriculture was significant in lowering poverty (β_1=0.4833; p=0.0000) while expenditure on education, was not (β_2 = -0.0884; p=0.0000). Thus, the need for enhanced allocation of resources and government expenditure to agriculture and education to alleviate the poverty scourge. The findings will benefit policy makers, fiscal analysts, and advocacy groups.

Key words: Government Expenditure, Poverty, Agriculture, Education, Kenya real GDP, Inflation rate, VECM , ADF and PP

CHAPTER ONE

INTRODUCTION

1.1 Background

On the global scale, theoretical, and empirical literature indicate a positive relationship between sectoral expenditures and GDP growth and hence, poverty alleviation by extension (Mudaki et al 2012; Loto, 2011). Nevertheless, this kind of evidence remains unclear especially in developing countries with Kenya included. While some authors find a positive relationship (Omari et al, 2016), others argue that increase in government expenditure increases the likelihood of excessive borrowing which in turn causes inflation with the potential of exacerbating poverty (Chani et al., 2011).

Poverty can be defined as deprivation of resources to meet the basic level of material well-being (Kulundu et al, 2000). According to Sen (1987), poverty is diverse and can be defined in three different ways: (1) a situation of inability to obtain adequate food, shelter, clothing, and education due to inadequate income; (2) material deprivation because of lack purchasing power and (3) lack of prospects and security. According to Davis and Sanchez-Martinez (2014) poverty is a state where an individual's material and economic resources are inadequate to meet their minimum needs. According to World Bank (2004), poverty is defined as the deficiency in material welfare composed of low incomes, lack of ability to acquire basic needs for living with dignity, lower qualities of healthcare and education, inadequate capacity, and reduced accessibility to clean and safe water and personal hygiene.

Ravallion (2001) posits that poverty is multi-dimensional and comprises of economic, political, social, cultural, psychological material wellbeing of an individual. Poverty is characterized by being powerless, marginalized, low self-esteem and lack of freedom of speech. Meth (2006) considers poverty as a political issue in relation to allocation and distribution of resources. Sida

(2017) summarizes the definition of poverty in a multidimensional poverty framework. According to this framework, the poverty problem is categorized into four dimensions: deprivation of resources, inadequate access to opportunities and choice, lack of power and voice and lack of human security. This framework presupposes that a person living in poverty is both poor in terms of resources and poor in at least one of the other dimensions of poverty (Sida, 2017).

The spectrum of poverty ranges from purely relative to purely absolute conceptions of poverty. Relative poverty measures poverty based on the society where an individual lives. This varies per country and over a given period (JRF, 2013). Conversely, absolute poverty can be defined as the severe dearth of primary and fundamental human needs like food, shelter, clothing, education, healthcare, and safe and clean drinking water and sanitation (United Nations, 1995).

Poverty remains to be a global problem facing many economies. According to the World Bank report on global poverty trends (2021), it was estimated that globally, 9 percent or 698 million societies, live in destitution (i.e. less than $ 1.90 a day). That number increased further by an estimated 50 million people in the year 2021.

It is important to note that between the years 2010 and 2021, China and India witnessed the greatest diminishments in poverty to an estimated 407 million people in the world (Kharas and Dooley, 2022). On the contrary, sub-Saharan Africa underwent a surge in abject poverty within the period of 2010 and 2020 which translated to 433 million people (World Bank, 2020). As a matter of fact, the greatest happened in Angola, 9.4 million, the Democratic Republic of Congo, 8.8 million, and the South Sudan, 7 million, respectively. The World Bank (2021) estimated that 66 percent of the global population who lived in extreme poverty were from sub-Saharan Africa.

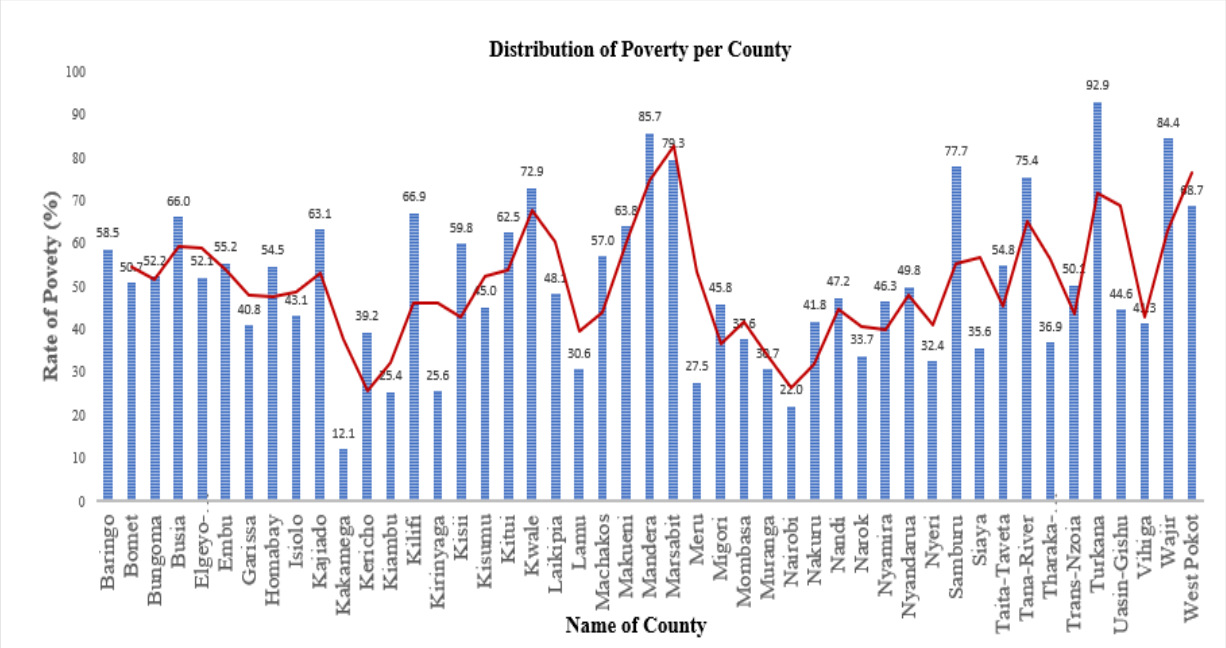
The level of poverty has also been on the upward trend in fragile and conflict-affected countries, with Yemen being the highest with an estimated 16 million people who lived in extreme poverty between 2010 and 2021 (Kharas and Dooley, 2022). The other countries in that category included Venezuela (10 million) and Syria (6.7 million).

Since poverty is a complex and multifaceted global problem, its alleviation needs concerted efforts. The World Bank (2013) suggested key intervention measures against poverty: address climate change problem to promote agricultural production, enhance community-driven development programs, disaster preparedness, quality education for all, access to sustainable energy, access to microfinance, enhance safety nets and cash transfers and promote accessibility to water and sanitation.

1.1.1 Poverty in Kenya and Intervening Strategies

Kenya conducted an Integrated Household Budget Survey (KIHBS) in 2015/2016 on 21,773 households. The survey aimed at providing data with key socio-economic facets of the Kenyan population. It included data on education, housing, health, water and sanitation and energy. During that process, an updated poverty and inequality indicators database at both national and county levels was developed. Furthermore, the survey gave a representation of the head count poverty which was proportionate to the people with incomes falling below the poverty line. Figure 1.1.1 presents head count poverty per county in Kenya.

Figure 1.1: Distribution of Poverty Level across the 47 Counties in Kenya



Source: Author's Compilation from KIHBS 2015/16 Dataset, 2023

From the above analysis, Turkana County was ranked with the highest poverty rate at 92.9% while Kakamega County had the lowest poverty rate at 12.1%. Empirical evidence points to higher levels of poverty incidence in rural areas at 67% against a lower level of 23% in urban centres (KNBS, 2020). Among the four cities, Kisumu had the uppermost poverty rate at 45% which was followed closely by Nakuru at 41.8%. Nairobi city had the lowest poverty rate at 22% while Mombasa city had poverty rate of 37.6%. The KNBS (2020) estimated that 18.3 million people (34 percent) were living in deprivation of basic needs.

The Kenyan Government implemented various strategies from independence in 1963. They geared towards GDP growth and poverty alleviation. The *Sessional Paper No. 10 of 1965 on African Socialism and its Application to Planning in Kenya* which cited poverty, diseases, illiteracy, as key limitations to human expansion and economic growth (Republic of Kenya, 1965), was a classic example. The paper advocated for expanding accessibility to basic education and subsidized provision of healthcare services which improved peoples' social wellbeing. The

Government issued *4th Sessional Paper on National Food Policy* that targeted the agricultural sector for self-sufficiency in food production and alleviation of poverty (Republic of Kenya, 1981).

In her continued efforts to minimize the levels of poverty, the Government of Kenya launched the District Focus for Rural Development (DFRD) in the year 1983 which decentralized the planning for development at the district levels with the aim of stimulating economic growth and development at the grassroots. DFRD also guided the allocation of national resources to support local development initiatives, raise income levels and consequently reduce poverty (Omiti, et al, 2002).

Further, the Government launched the famous Social Dimensions for Development (SDD) Programme (Government of Kenya, 1994). That programme opined that the structural transformations that happened in the year 1980s negatively affected the provision of essential services to the underprivileged leading to loss of jobs and incomes which eroded the purchasing power leading to exacerbation of poverty. Therefore, the SDD programme identified measures that were aimed at salvaging the underprivileged in the society from adverse effects that were occasioned by the institutional reforms of the 1980s (Omiti, et al, 2002). Despite these efforts, the poverty levels were still high until the government launched the National Poverty Eradication Plan (NPEP) in 1999. The NPEP provided a clear roadmap toward poverty alleviation. It outlined pro-poor policies for delivering of critical services such as basic education, health, clean and safe drinking water.

In addition, the Poverty Reduction Strategy Paper (PRSP), 2000-2003 was launched to complement the NPEP in a bid to alleviate poverty (Republic of Kenya, 2000). This was the most structured and comprehensive strategy that played a pivotal role in fighting poverty menace (Omiti et. al., 2002). This policy provided a framework for sustainable, rapid economic growth, promote

good governance and social protection, empower the marginalized as well as increase access to gainful employment opportunities and hence the ability to raise their incomes.

The government's efforts in the fight against poverty was further articulated in the Economic Recovery Strategy for Wealth and Employment Creation (ERSWEC) that was unveiled in the year 2003. This was a blueprint that aimed to resuscitate the economy on the new path of sustainable GDP growth that aimed at reducing the level of poverty (Government of Kenya, 2004). Through the implementation of this strategy, the economic activities expanded from 2.3 percent in 2003 to 7.1 percent in 2006 (Government of Kenya, 2007). Consequently, the level of poverty significantly reduced to 46 percent in 2006 from 56.8 percent in 2003 during the same period (IMF, 2010).

After that period, the government put in place a lot of structural measures that aimed at cushioning the majority poor out of poverty. Notably, the Kenya Vision 2030 was the launchpad that the government articulated its economic, social, and political transformation and as a new development blueprint in the long-term. It envisions a Kenya transformed into a middle-income country with a global competitive advantage that is able to provide high standards of living to all its citizens by 2030' (Government of Kenya, 2008). The implementation of the Kenya Vision 2030 is hinged on three key pillars: economic, political, and social. The economic pillar opines an average growth rate in the economy by 10 percent per annum. The Kenya Vision 2030 identified key flagship projects upon which each of the three pillars is implemented. Those flagship projects are contained in strategic and periodic five-year successive plans called Medium-Term Plans (MTPs) which also guide the budgeting process through the Medium-Term Expenditure Framework (MTEF). The first MTP covered the period from 2008-2012, the second one covered the period from 2013-2017, the third one covered the period 2018-2022. The government is planning to launch the fourth MTP that will cover the period 2023-2027. The social pillar stipulates that the country should reduce its poverty level by between 3 and 9 percent down from the 46 percent level as at 2006 (Government of Kenya, 2008).

The aspirations of the African Union Commission Agenda 2063 as well as the first and second SDGs are well a in the Constitution of Kenya 2010 which recognizes that well-being is multidimensional. For instance, article 43 guarantees the following rights: accessibility to adequate shelter and housing; sensible personal hygiene; highest attainable standard of healthcare; absence of hunger and enough food of tolerable quality; safe and clean drinking water in appropriate quantities; access to social security and high-quality schooling for all. The first aspiration of the African Agenda 2063 espouses an Africa hinged on inclusive growth, job creation and sustainable development by eradicating generational poverty through social and economic transformation. It envisions an Africa where her people enjoy decent living with sound health and well-being. It also desires for a well-educated and skilled African populace through improved science, technology, research, and innovation. Modernization of agriculture for increased production, productivity, and value addition are also key ingredients for a food secure Africa. The GDP of the African continent is projected to grow proportionately with the world's population and her natural resource endowments by 2063. It opines a fully developed human capital through sustained investments in universal early childhood education, and expanded access to higher education. Equitable and sustainable use and management of water resources are also measures that will propel Africa to socio-economic prosperity and regional cooperation and arrest poverty by 2063.

The Government also formulated the "Big 4 Agenda" strategy as a mechanism for accelerating poverty reduction. One of the four agenda aimed at "ensuring 100 percent food and nutrition security by the year 2022" (Government of Kenya, 2023). That agenda was well aligned to the first two SGDs. The government's aim was to achieve 100 percent food security through expansion of the production of food and supply, value-addition in the food processing value chain, subsidization of food prices to ensure affordability (Government of Kenya, 2018). Further, the Government unveiled other strategies such as increased budgetary allocation to agriculture, to

expand and equip learning institutions to improve access to quality education (Government of Kenya, 2021). The multiplier effects will be to spur economic growth and reduce the poverty level. The Maputo Declaration at the African Union General Assembly convened by the Leaders of States and Government in July of the year 2003 proposed the implementation a minimum of 10 percent of the allocation from the national budget towards the agriculture sector. That policy aimed at bolstering agricultural production and making Africa, including Kenya, a food secure continent and assuage the poverty menace.

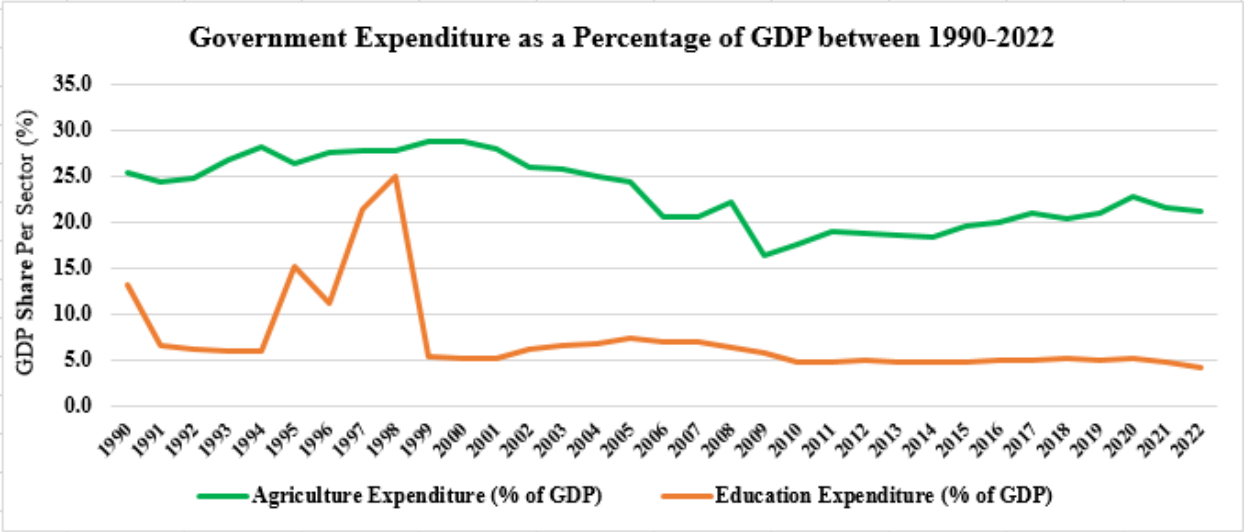
Several studies posit that agriculture and education are the pillars of developing economies such as Kenya and advocate for increased expenditure to these sectors in an endeavor to combat poverty (Chidoko et al, 2012). However, in a study by Mwasagua et al (2018), the correlation between public outlays on agriculture and education is still unclear and needs further interrogation.

1.1.2 Government Sectoral Expenditure

Government expenditure refers to the outlays incurred by the government, through a National Budget, to provide public goods and services. The budget guides resource allocation to several sectors within the economy (including agriculture and education) and promotes fiscal transparency in accordance with the aspirations of the Kenyan Constitution of 2010.

Government expenditure ordinarily promotes economic growth by creating jobs, building human capacity, subsidizing production, and improving social welfare (Omodero, 2019). These are the direct and indirect measures towards alleviating poverty in a country (Dahmardeh et al, 2013). Over the years, the government has been allocating the national budget to various sectors of the economy with the aim of enhancing growth in the economy as well as development. Key among these sectors are agriculture and education. The trends in government expenditure in agriculture and education sectors spanning from 1990 to 2022 are well elaborated in figure 1.1.2.

Figure 1.1.2 Trends in Government Sectoral Expenditure (Agriculture and Education) as a percentage of GDP 1990-2022



Source: Author's Compilation from KNBS Economic Surveys, 1990-2022 (2023)

The allocations of the budget to the education sector were inconsistent between the year 1990 to 1999 and became consistent after the year 2000. However, the allocation to the agriculture sector was increasing but declined between the year 2008 and 2009 before increasing again. The inconsistencies in the budgetary allocations have affected the performance of agriculture and education sectors in relation to their contributions towards the GDP and poverty reduction in the Kenyan case study.

1.2 The Research Problem

The socio-economic expansion of any country is anchored on robust investment in agricultural and educational sectors which are key to poverty reduction for the sub-Saharan African countries including Kenya. Increased government spending in agricultural and education sectors will contribute to a large extent in transforming lives and livelihoods. For instance, they will enhance food security, promote access to affordable education, increase incomes and purchasing power and promote knowledge and innovation.

Poverty has remained to be the most fundamental problem in Kenya, both theoretically and empirically. The government has over the years implemented various interventions to fight against poverty. Notably, the government's new blueprint of Bottom-Up Economic Transformation

Agenda (BETA) is making deliberate exertions towards enhancing availability of food and nutrition in a bid to alleviate poverty through subsidized agricultural production among other measures. Further, the government has also enhanced allocation for funding tertiary and university education with an aim of increasing accessibility to higher education that is geared towards enhancing knowledge capacity and employment creation. These interventions are also aligned to the UN MDGs of 2000s and the current 17 Sustainable Development Goals. Agriculture is the pillar of the economy because it employs the majority rural poor in the country. Policy makers have underscored the importance of increased government expenditure to agriculture and education in a bid to arrest the poverty problem owing to the critical roles the two sectors play in the economy.

However, there has been unending debate as to whether increased allocation of the national budget to agriculture and education translates to poverty reduction in Kenya. For example, Global Education Monitoring Report indicate that education plays a key role in poverty reduction by not only enhancing knowledge and skills for improved livelihoods but also enhanced innovativeness and creativity for socio-economic stability. Similarly, agriculture contributes approximates 35 percent to the Gross Domestic Product and 70 percent to the rural employment in Kenya respectively. However, the proportion of the budget allocated to these sectors is a question of debate and whether it will be of any significance in reducing the level of poverty.

While theoretical evidence indicate that agriculture and education sectors are a prerequisite for economic growth and hence, poverty alleviation, globally, there is limited empirical evidence with respect to how government expenditure on the two sectors reduce poverty in Kenya. In addition, most studies have focused on government spending and its effect on poverty alleviation in general. Furthermore, available literature has failed to establish a common ground as to the nature of the relationship. That means that although some studies find a positive correlation between public expenditure on agriculture and education on poverty, others find a negative relationship. The

variations in the study findings could be attributed to the differences in methodologies used, variable descriptions, and the scope of their studies leading to unclear policies of arresting poverty. Therefore, it goes without saying that the disconnect between poverty reduction against government spending in Kenya as highlighted by the previous studies was a subject for further debate.

1.3 Research Questions

i) How does government spending on education and agriculture affect the level of poverty in Kenya?
ii) Is there any nexus between short-run and long-run sectoral expenditure and poverty reduction?

1.4 The Study Objectives

The general objective of the study was to determine whether government/public sectoral expenditure had any significant impact on the reduction of poverty levels in Kenya. Specifically, the study aimed to:

i) Estimate the effect of government expenditure on agriculture and education sectors on poverty reduction in Kenya
ii) Test for existence of the nexus between short-run and long-run sectoral expenditure and poverty reduction and
iii) Draw conclusions and make key policy recommendations from the findings of the study.

1.5 Significance of the Study

The study is very significant since reduction in poverty is one of the top Government agenda since Kenya's independence in 1963. To achieve poverty alleviation, the government must address a basic requirement, that is, enhance economic growth and development.

Therefore, the study delved more into establishing whether the public expenditure on agriculture and education have had any substantial impact on the reduction of poverty. That is the knowledge gap addressed by the current study.

Furthermore, the study findings would contribute significantly to the expenditure policy framework for the National Treasury. The results of the study would guide on better ways of resource allocation with far-reaching and long-run positive impact on poverty alleviation and improved economic growth. Finally, the study formed the basis for future similar studies that would be carried out around this topic.

1.6 Organization of the Study

The research project was prepared in five chapters. Chapter one detailed the background information on poverty level in Kenya. Chapter two reviewed and analyzed existing literature and theories underpinning the study, chapter three discussed the research methodology, chapter four presented the research findings while the chapter five concluded the study with key policy guidance.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter analyses the theories and empirical literature underpinning the study. It is structured into four subsections. Sub-section one reviews theories supporting the study, the second subsection provides the empirical literature while the third one critically summarizes both theoretical and empirical model. The chapter concludes by summarizing the literature and research gaps which forms the motivation of this study.

2.2 Theoretical Literature

Government expenditure is an essential component of stabilizing the economy through reallocation of resources to priority sectors such as agriculture and education which are fundamental in poverty reduction. Romer's (1990) endogenous growth is the main model underpinning the study. The growth in the economy was depended on investment in the human capital, knowledge, and innovation. Romer posits that technology is non-rival and non-excludable. That means, the use of technology in one country does not preclude another country from using it. Romer's thinking was consistent with that of Barro (2009) who postulated that savings in human capital and knowledge were the greatest contributors to economic growth with a direct impact on poverty reduction. The following theories have been put forward in support of Romer's endogenous growth model:

2.2.1 Wagner's Theory of Increasing Expansion of Fiscal Requirements

This theory was propounded by a German economist Adolph Wagner in 1876. He argued that the share of government expenditure increases as existing economic activities intensify and new ones extended. Wagner (1876) predicted that increase in social progress resulted to increased ratio of government expenditure to national income to keep up with the pace of per capita income which

was on the upward trajectory. Further, he asserted that increase in government expenditure was meant to improve the peoples' social welfare and lift them out of poverty. Even though Wagner's study was done in German, it applied to other countries, both developing and developed (Gaurav, 2011). However, the only limitation of this theory is that the more developed an economy is, the more its government expenditure is affected (Irandoust, 2019).

2.2.2 Wiseman-Peacock Displacement Hypothesis

Jack Wiseman and Alan T. Peacock (1961) investigated into the growth in government expenditure in the United Kingdom that was anchored on Adolph Wagner's. They emphasized on the concentration of government expenditure at the central level of government. They examined that government expenditure was a function of revenue. That, is, as the revenue grows, public expenditure also grows marginally up to certain tolerable levels of taxation beyond which the households could not accept. That means that governments should take into consideration public demand regarding provision of certain services particularly when the revenues are increasing at the same levels of taxation. However, some exogenous factors like civil unrests and influx of refugees stretches the governments' revenue collection capacities beyond their limits, thus enlarging the tax structure in a bid to meet the high public expenditure on defense. That is called "Displacement Effect" which causes a shift of government expenditure and revenues to higher levels. As this occurs, individuals get used to those social disturbances, and even when they are over, they have adjusted to those conditions and feel capable of absorbing the heavier tax burdens. That means the level of public spending does not go back to the initial lower levels.

2.2.3 The Solow-Swan Theory

According to the neoclassical economists, Robert Solow and Trevor Swan (1956), economic growth depends on three factors, namely; labour, capital accumulation and technology. Eventually, the economic expansion is contributed by a combination of labour and capital stock. According to Firth & Mellor (2000), labour and technological growth are perceived to be constant

exogenous factors. That implies that capital accumulation is a cause-and-effect of the increasing rate of economic growth. Thus, there will be zero capital accumulation when the growth rate in labour and technology is zero. Solow (1999) further opined that a country does not maintain the incentive to invest if there was no expansion in labour and technology. Thus, the growth rate in the economy is based on the country's capacity of labour and investment savings which also grows over time.

2.2.4 The Keynesian Philosophy

This theory was hypothesized by John Maynard Keynes (1936) who renamed it as the General Theory of Employment, Interest and Money. According to this theory, unemployment and inflation are inversely related and therefore the government's fiscal policy should ensure a balance between the two. The General Theory is anchored on five factors; firstly, Keynes' rejection of the loanable interest rates which are a fiction as they do not exist in the market according to Keynes. Secondly, uncertainties in investments which could affect money demand and supply. Thirdly, theory of liquidity preference. The interest rates which are highly dependent on demand for money are affected by future shocks like inflation, which could easily worsen and cause a surge in the interest rates. Fourthly, since the level of production determine the real wages, the marginal product of labour is also affected up to a certain level beyond which it diminishes. It is important to note that the government may need to spend a little more to pay for the real wages to maintain the same level of production. Fifthly, Keynes argued that since the price levels are not sticky, it would be rather difficult to maintain equilibrium level of employment. That means the government would spend more revenues to maintain employment at equilibrium level, hence pumping a lot of money in the economy. Solikin (2018), therefore concludes that government expenditure affects economic growth.

2.3 Empirical Literature

Various researches that have been conducted on the correlation between poverty reduction against public expenditure have given varied results. This section, therefore, examines relevant empirical literature to the study.

In Thailand, Fan et al. (2008) interrogated the linkage between agricultural expansion and poverty reduction using double log functional form and established that increase in government expenditure increases agricultural productivity, makes a country food secure and alleviates poverty.

According to Gasiorek et al. (2016) study on the effect of government/public expenditure on economic and poverty level on East African Community, however, conflicting results were observed. They found that poverty level in Kenya rose by 2 percent between 1997 and 2005 despite Kenya's growth in public expenditure by 10 percent more than Uganda. It was interesting to note that the latter managed to alleviate poverty by a wider margin against the priori expectation (Mwasagua, Odondo & Nyongesa, 2021). This irregularity forms the basis for further interrogation into the subject with specific attention to Kenya.

In another research conducted by Tenai (2020) on the effect of public expenditure on selected sectoral output performance in Kenya covering the period between 1980 to 2016 using non-experimental research design on time series data, varied results were obtained. The findings showed a positive impact of the government's expansionary fiscal policy on agriculture and service sectors (including education). Further, the study was consistent with Keynesian macroeconomic analysis that an increase in government expenditure and decrease in taxes increase aggregate output and promote economic growth which in turn reduces poverty (Keynes, 1936). Economic expansion is a key policy instrument in reducing absolute poverty through improved provision of public goods, increased access to high quality of education and other social services such as safe drinking water and good health and sanitation (Wilhelm et al, 2005, Birowo 2011).

Fan and Rao (2003) researched on government sectoral expenditure in Third World economies by analyzing the trends, determination, and impact on economic growth across 43 countries (including Kenya) between the years 1980 and 1998. The study concentrated on agriculture and education among other sectors and used endogenous growth model borrowed from Barro (1990). Fan and Rao (2003), in their research further analyzed sector level of government spending on total output (GDP) using GDP as the response variable, while labour, capital, government spending and other structural adjustment programs as independent variables. A regression analysis on the variables revealed that government spending positively affected economic growth and reduced poverty. However, structural adjustment programs had different effects on selected sectors of the economy. For instance, reduction in government expenditure on agriculture and education slowed economic growth implying that those sectors had positive economic growth-promoting effect. Efficiency of government spending could be improved through reallocation of resources among sectors.

Danladi et al (2015) analyzed government expenditure and its implication for the growth in the economy in Nigeria between the year 1980 and 2013 using the autoregressive distributed lag (ARDL) method. The study observed that an increase in government expenditure translated to growth in output over the years and reduced poverty by a significant margin. The study disaggregated expenditure into two groups: total development and total recurrent. The findings for the total capital expenditure, although insignificant, was positive while the results of the total recurrent expenditure were both positive and significant. Therefore, the current study delved more into similar studies to gain a more understanding on the correlation between government outlays and economic expansion and hence poverty reduction both in the short-run and long-run.

Birundu (2011) examined the connection between public expenditure composition and economic growth particularly on agriculture and education, among other sectors using annual longitudinal data from the year 1970 to 2012. The coefficients of the variables were estimated using the OLS

technique. The results were varied but revealed that government sectoral spending affected the growth in the economy which significantly played a role in poverty reduction. For example, results for agriculture sector had a negative relationship while the education sector was significant and positive implying that the rise in public expenditure on education promoted economic growth over time and reduced the level of poverty.

A further investigation into the subject by Omodero (2019) in Nigeria was done using secondary data spanning from the year 2000 to 2017. The study was based on Romer's endogenous growth model. A regression analysis using Ordinary Least Squares technique revealed an inconsistent relationship between the response variable and the independent variables. In an endeavor to meet the SDG target on poverty reduction, the study recommended for an increased budgetary allocation on agriculture and education among other sectors of the economy with more investment in human capital and technology in line with the aspirations of Romer (1990) and Barro (1988).

Gomanee et al. (2003) and Mosley et al. (2004) further studied the impact of public spending on poverty reduction using panel data from Asia, Sub-Saharan Africa, and Latin America. They used different sectors including agriculture and education and measured headcount poverty on $1 by holding GDP per capita constant. They found out that contractionary fiscal policy on agriculture and education had a negative but statistically substantial impact in relation to poverty reduction. They assumed a shift of distribution of income in a pro-poor direction since aggregate output was held constant. A similar study in China found that public spending on rural education and agricultural research and development had the largest impact on economic growth and poverty reduction (Fan et al. 2002). The findings were consistent with those of Datt and Ravallion (2002) in India, who estimated the determinants of differences of poverty headcount using time series data spanning from 1960-1994. According to their study, government development spending was statistically significant with a positive impact on poverty reduction.

In Kenya, Mudaki and Masaviru (2012), estimated the composition of public expenditure to economic growth and poverty reduction using Ordinary Least Squares on time series data spanning from 1972 and 2008. The study was consistent with a similar one conducted in Nigeria by Loto (2011). Both cases adopted Constant Elasticity of Substitution (CES) production function with public spending, tax rate and technology as factors affecting economic growth and poverty reduction. The results observed that public expenditure on education was statistically significant with positive effect on economic growth and poverty reduction. Conversely, public spending on agriculture was statistically significant but with negative impact on economic growth and did not fulfill the priori expectation of positive relationship with economic growth and poverty alleviation. Kosura et al (1999) investigated the significance of the agricultural sector to growth rate of the economy and its effect in the reduction of poverty using Welfare Monitoring Survey (1994) data. The research found out that close to 80 percent of the rural dwellers were poor and engaged in agriculture. This was characterized using poor farm skills and technology, small parcels of land without land title deeds and inadequate and poor-quality farm inputs which led to low agricultural output. They established that investment in mechanization would promote value addition and increased agricultural production which in turn accelerated economic growth and reduced poverty levels. Therefore, increased government spending in agriculture cannot be gainsaid.

Battle and John (2012) used general equilibrium model to examine the nexus between government spending and economic expansion and poverty reduction. The results affirmed a positive relationship among the variables of interest. The results further revealed that reallocation of more public funds to productive sectors including agriculture and education accelerated economic growth and poverty reduction. A key finding of the study was that increased government investment, particularly in agriculture promoted value addition and accelerated GDP growth which in turn reduced poverty. The findings of that study were like those of Omondi (2014) who sought to establish the nature of the relationship between public expenditure on education and

economic growth using Romer Endogenous growth model. He found that education was a positive enabler of economic growth in terms of increasing real GDP which consequently accelerated poverty reduction.

Further, Mehmood et al (2010), conducted research of the Pakistan government to establish whether increased government expenditure to agriculture and other sectors had any significant effect on the GDP and the alleviation of poverty. The study used longitudinal data spanning from the year 1976 to 2010. The results indicated the existence of a positive relationship between government expenditure and economic growth and an inverse relationship with poverty.

2.4 Summary of Literature Review

According to the global perspective, the examined theories and studies revealed the connection between government sectoral expenditure and poverty reduction, although that was still unclear. The reviewed literature indicate that government expenditure generally affected the GDP growth rate which had a direct influence on poverty reduction. Furthermore, the studies succinctly demonstrated that poverty reduction depended on the fiscal policies pursued by a country. On the contrary, increase in government expenditure increased the likelihood of excessive borrowing which in turn caused inflation (Chani et al, 2011).

However, most of the studies did not incorporate the factors causing poverty, such as real GDP and inflation, which is critical in addressing the poverty problem holistically. Based on that background, the current study investigated a lot more into the subject to determine if the government investment on agriculture and education sectors had any significant impact on economic growth and poverty reduction.

Finally, time series data analysis requires a longer study period to give sufficient degrees of freedom for statistical inferences, which was a shortfall by some studies reviewed. The current study filled the gap by collecting quarterly data from 1990 to 2022.

Based on that background, the current study interrogated the subject to determine the correlation between public expenditure on agriculture and education sectors and their impact on economic growth and reduction in the poverty level in the context of Kenya.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This Chapter details the techniques employed to evaluate the effect of government sectoral expenditure on poverty reduction in Kenya. The Chapter discussed the conceptual framework, theoretical approach which in turn informed the empirical model and variable description. Further, the estimation of the model and relevant diagnostic tests were discussed. Finally, the chapter presented both pre-estimation and post-estimation tests employed in the study.

3.2 Conceptual Framework

The nexus between public sectoral expenditure on agriculture, education and poverty alleviation can be summarized in a flow chart diagram as shown below.

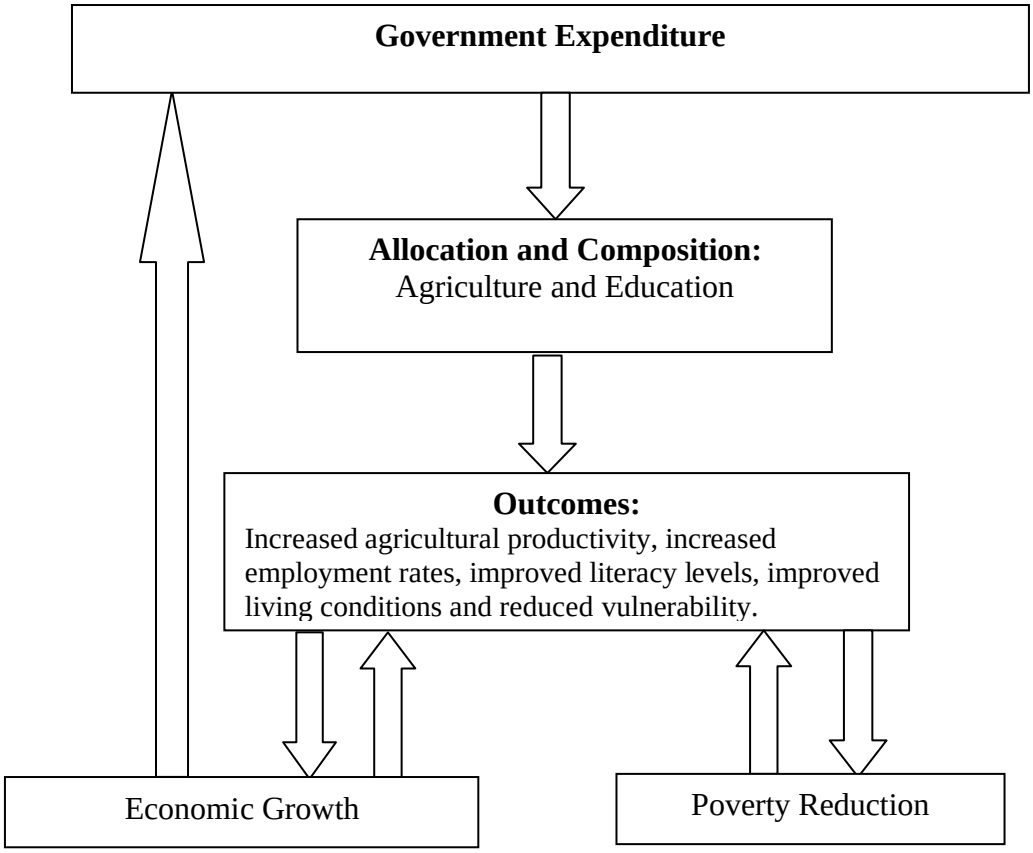


Figure 2.2: Conceptual Framework for Public Expenditure and Poverty Reduction

The conceptual framework showed that the composition of budgetary allocation on agriculture and education were factors of the growth in the economy and the reduction in poverty. Increased public spending to those sectors led to increased economic growth and improved outcomes in terms of agricultural productivity, employment rates, literacy levels and living standards. Essentially, increased GDP growth led to an expansionary fiscal policy on the economy hence increased government expenditure as depicted by the framework.

3.3 Theoretical Framework

The various theories reviewed in chapter two have pointed toward the existence of the nexus between government sectoral spending and reduction in poverty in Kenya. Most researchers used the Cobb-Douglas Production model because it is widely used for analyzing economic growth which has an inverse relationship with the level of poverty in a country (Romer, 1990). For that reason, the current study adopted Romer's endogenous growth theory anchored on the Cobb-Douglas Production model which takes the following form:

$Y = AK^{\alpha} L^{1-\alpha}$

Where Y = total output of a country

A = total factor productivity (TFP)

K = physical capital stock

L = human capital stock

α = capital share in output

1- α = share of labour in output

According to Romer (1986), the economic growth or total output of a country depends on three factors, namely; physical capital stock (K), human capital stock or labour force (L) and the level of technology (A). A higher value of A produces more total output for any given level of inputs.

However, the model assumes that the inputs have positive marginal products. Hence, positive marginal products imply that the bigger the quantity of each input, the bigger the level of output. This model has been broadly used in previous studies (Obalade et al, 2019; A. Saboor et al, 2006; Sims, 1980 & Chowdhury, 1986). The model predicts the growing returns to scale in the technology and long-standing knowledge-based progression (Cortright, 2001). This model is consistent with Barrow (1997) who argued that capital accumulation and human capital promote economic growth and reduce poverty levels in a country.

3.4 Empirical Model

The overarching principle behind model specification is to effectively explain the role of public expenditure on the level of poverty (Mwasagua, 2018). Keynes (1936) postulated that a rise in government spending resulted to an increase in GDP growth which translated to a decrease in poverty levels in a country. Ferroin et al (2005) reaffirmed that the composition and the level of government expenditure directly influenced poverty and total output. Thus, poverty is a function of sectoral expenditure and output. Given that consideration, the variable relationship that the current study adopted can be expressed as below:

Poverty Level = f (Government Sectoral Spending, real GDP, inflation rate)…… (1)

Sectoral expenditure sharing in this model refers to allocation in agriculture and education sectors and is derived from the MTEF (Government of Kenya, 2014) which is a tool for resource allocation on priority basis. Various studies have indicated that agriculture and education are the main sectors that the poor majority interact with hence adopted for this study. However, the same studies have ignored the other factors that affect poverty. This study has, therefore, considered the real GDP and inflation rate as control variables which significantly affect poverty levels in a country.

The specific functional relationship is given by,

PC = f (Agr, Edu, π, α) ……...……...……. (2)

Where,

PC = Private Consumption, which is a proxy measure for poverty

Agr = Expenditure on Agriculture Sector

Edu = Expenditure on Education Sector

π = real GDP

α = inflation rate

β_i are the parameters, ε_t is the error term

Following the theories examined by this study, the empirical model generated in equation (3) will be estimated.

$PC = \beta_0 + \beta_1^{agr} + \beta_2^{edu} + \pi + \alpha + \varepsilon_t$……..……...……...…… (3)

Equation 3 can be transformed into a natural log to form a log linear regression model below;

$lnPC = \beta_0 + \beta_1 ln^{agr} + \beta_2 ln^{edu} + \pi + \alpha + \varepsilon_t$……..……...……..……...…(4)

3.5 Variable Description

The table below presents a description of the variables and how they will be measured;

Table 3.5: Variable Description

Variable	Specific Variable	Description	Measurement	Expected sign
Dependent Variable	Poverty	Private Consumption is a proxy measure for poverty. It relates to the household expenditure on the basic commodities	Percent (%)	-
Independent Variable	Spending on agriculture sector	Represents the total budgetary allocation to agriculture sector	Kenya Shillings (KShs)	Positive
	Spending on the education sector	Represents the total budgetary allocation to education sector	Kenya Shillings (KShs)	Positive
	Real GDP (π) per capita	Refers to inflation-adjusted value of total output	Percent (%)	Positive
	Inflation Rate (α)	Refers to increase in the price level of commodities. Used to measure purchasing power per household	Measured as Consumer Price Index (CPI) per household	Positive

The study used income per capita (Y) to measure the level of economic growth and its impact in poverty reduction (Dahlquist, 2013). Two control variables of real GDP and inflation rate were

used to avoid giving unbiased estimation results and to establish correlational analysis between the variables.

3.6 Type and Sources of Data

This study employed secondary data to examine the correlation between response and explanatory variables of the model. Secondary time series data spanning for a 33-year period from 1990 to 2022 on the Kenyan population was the basis of the study. That gave sufficient degree of freedom for making statistical inferences which is associated with time series data.

The data was largely obtained from the World Bank (WB), International Monetary Fund (IMF), the National Treasury and Economic Planning, the Central Bank of Kenya (CBK), Kenya National Bureau of Statistics (KNBS) and the Kenya Institute of Public Policy Research and Analysis (KIPPRA).

3.7 The Unit Root Tests

The unit root tests were conducted to determine whether the stationarity of the variables (absence of a unit root) or non-stationarity (presence of unit roots) was achieved at level or not. The rationale behind testing for stationarity was to eliminate or rule out spurious regressions which could have led to misleading conclusions or violation of independence assumption of OLS (Wooldridge, 2009). Stationarity test was the basis for cointegration analysis which is largely associated with time series data (Gow, et al 2016). Cointegration test was used to determine the long-run relationship or convergence of the variables of interest in the series. A variable with unit roots can become stationary at level or after differencing it ones, twice and so on. A variable that becomes stationary after the first differencing is supposedly integrated at order one, or simply represented as $I(1)$, with no differencing as $I(0)$. In some cases, a series may exhibit stationarity properties after differencing more than ones. Therefore, if a series is differenced d times to become stationary, then it is supposedly integrated of order d or simply denoted as I (d).

The study employed both ADF and PP tests for robustness. Since PP test is non-parametric, it did not require the specification of the model and lagged parameter in the regression model for running the test. It is said to be a perfect substitute for ADF although it is based on the asymptotic theory which assumes infinity in sample size. In this study, the null hypothesis was rejected with the presence of unit roots since the test statistic was greater than the critical values at 1%, 5% and 10% levels of significance.

The ADF and PP tests were done from the Ordinary Least Squares (OLS) estimates of the model as depicted in equations (5) and (6) respectively.

$$\Delta Y_t = \beta_\theta + \alpha T + \delta Y_{t-1} + \sum_{i=1}^{k} \beta_i \, \Delta Y_{t-1} + \mu_t \quad \text{.......(5)}$$

$$\Delta Y_t = \beta_\theta + \alpha T + \delta Y_{t-1} + + \mu_t \quad \text{....(6)}$$

Where Y_t is the response variable subjected to the unit root tests, β_0 is the intercept, T is a linear time series trend, μ_t and is the error term that is identical and independently distributed with a mean of zero and a constant variance.

3.8 Johansen Tests for Cointegration and the VECM

Cointegration was done to establish whether there existed long-term relationships among the variables of interest. Cointegrated variables exhibit similar stochastic trends over a given period. According to Digkang and Osei-Assibey (2020), if the variables are cointegrated, then the equilibrium will not be destabilized by the long-run shocks. Fundamentally, testing for stationarity, using ADF and PP test, informed the decision to conduct cointegration. The study employed Johansen Cointegration technique as opposed to Engel Granger test. This is because the former allows for multivariate regressions without prior assumption of either endogeneity or exogeneity of the variables as opposed to the latter (Ender, 2003).

Watson and Stock (1993) assert the sensitivity of cointegration to the lag length choice made. Essentially, the lags help to rid off serial correlation. However, the lag length choice was the key

problem. Choosing many lags might affect the sample power of the test, while having only a few lags could make the test incorrect and asymptotic. Therefore, the frequency of the time series was used to guide the choice of the lag length. Assuming it was quarterly, then only four lags would be chosen and if monthly, then twelve lags would be ideal. This study took into consideration five lag selection criteria. They included; FPE, LR, AIC, SBIC and HQIC. Asteriou & Hall, (2007) argue that the rule of thumb was to select a lag that has been suggested by at least three of the five selection criteria above.

The study used the VECM as a suitable model to estimate the correlation between poverty reduction and government expenditure on agriculture and education in Kenya. This is because of cointegration. Secondly, the VECM gives an opportunity to differentiate between short-run and long-run correlation among the variables.

3.9 Autocorrelation Test

Autocorrelation is a post-estimation test conducted to confirm the validity and reliability of the estimated results. Secondly, a good model should yield normally distributed residuals that are free from serial correlation which might affect the results. Thus, autocorrelation test ensured that the test results were not biased and that the estimated coefficients were stable.

The study employed the Lagrange Multiplier (LM) with null hypothesis of no autocorrelation at lag order. The acceptance of the null hypothesis was fulfilled when p-value was greater than 0.05. To confirm the stability of the VECM regression model, the study employed the eigenvalues of the companion matrix which were required to be less than 1. The stability test was also passed if the trace statistic was greater than the critical values at order zero to order three, which was proved to be the case as per the model results.

CHAPTER FOUR

EMPIRICAL FINDINGS

4.1 Introduction

The chapter presented the empirical findings of the study. The chapter composed of two main sections. Section one analyzed descriptive statistics while section two presented econometric results.

4.2 Descriptive Statistics

The section presented an analysis of descriptive statistics of all the variables under study. This will help in better understanding the distribution and trends in the variables. Further, descriptive statistics were used to ascertain the statistical behaviors of the data in the model. Essentially, a quarterly time series data spanning between 1990 and 2022 was used. The table below summarizes the mean, standard deviation, minimum and maximum values as well as skewness and kurtosis of all the variables of interest.

Table 4.2 Descriptive Statistics

Descriptive statistics	**Poverty Rate**	**Agriculture Expenditure**	**Education Expenditure**	**Real GDP**	**Inflation Rate**
Mean	-.070303	1.72271	16.0516	3.654242	11.31121
Std. Deviation	3.658866	15.95192	53.23819	2.308432	9.237055
Min	-11	-68.55341	-236.1338	-.8	1.55
Max	14.38	40.66367	98.75171	8.06	45.98
Skewness	1.031886	-2.240659	-3.242864	-.244328	2.069331
Kurtosis	10.66566	13.87111	17.10636	2.299291	7.489265

Source: Author's computation, 2023

According to the results of the period under study, the poverty rate averaged -0.0703, with a standard deviation of 3.659. Further, the study observed that the minimum and maximum poverty rate was -11 and 14.38 respectively. The mean real GDP was found to be 3.654% with a standard deviation of 2.308. On the contrary, the average inflation rate was 11.311% giving a standard deviation of 9.237. That implied that inflation rate reduced poverty level with a bigger margin than real GDP (Finn et al, 2014).

Since the study employed time series data, the probability values for skewness and kurtosis were used to depict a trend analysis for individual variables in the model. Skewness showed the symmetry of distribution around the mean of each variable. The study revealed that all the variables under study were normally distributed. Kurtosis measured the flatness of the distribution. The study found that all the variables were leptokurtic with more positive values and heavier tails than a normal distribution.

4.3 Unit Root Tests

The trends and lags which are critical in time series were employed in this study. The study revealed that both control variables of real GDP and inflation rate were stationary at levels in both the Augmented Dickey-Fuller and the Phillip-Perron tests. This is because, the overall test statistics were greater than the critical values in both cases as indicated in Table 4.4. Hence there was no need for differencing and re-testing.

However, the study observed that the dependent variable (poverty rate) was non-stationary at level using the ADF test but stationary at level using the PP test. The presence of unit roots at level using the ADF test on this variable necessitated the first differencing, I(1) and re-testing to determine whether the unit roots still existed. The results, however, revealed non-stationarity (presence of unit roots) of the variable. The results were differenced a second, I(2) time to acquire

stationarity. The two key independent variables, agriculture, and education, both acquired stationarity at the first differencing using both ADF and PP tests.

Table 4.4 Stationarity Tests using ADF and PP Techniques

Series	**Order**	**Exogenous**	**ADF Test t-statistic (p value)**	**PP Test t-statistic (p value)**
Poverty Rate	Level	Test Statistic	-1.411	-26.391
		P-value	0.8577	0.0000
	First Difference	Test Statistic	-3.634	-
		P-value	0.0271	
	Second Difference	Test Statistic	-5.541	-
		P-value	0.0000	
Agriculture Expenditure	Level	Test Statistic	-2.399	-11.281
		P-value	0.3802	0.3494
	First Difference	Test Statistic	6.933	-39.164
		P-value	0.000	0.000
Education Expenditure	Level	Test Statistic	-1.213	-4.716
		P-value	0.9077	0.8757
	First Difference	Test Statistic	-4.873	-26.079
		P-value	0.0003	0.0004
Real GDP	Level	Test Statistic	-5.495	-29.648
		P-value	0.0000	0.0000
Inflation Rate	Level	Test Statistic	-3.468	-18.048
		P-value	0.0430	0.0495

Source: Author's computation using Stata 15

From Table 4.4 above, since the variables acquired stationarity at different intervals, it was justified to adopt VAR or VECM models. However, the choice of the right model used was arrived at by conducting Johansen Cointegration test. Since both Johansen Cointegration test and the VAR/VECM model require the researcher to specify the lag length, the 4-lag order selection test was adopted in the study.

4.4 Lag Selection Criteria

As discussed in Chapter Three, the study adopted five selection criteria as tabulated below:

Table 4.5 Lag Selection Criteria

Selection-order criteria
Sample: 2458q3 - 2465q3 Number of obs = 29

lag	LL	LR	df	p	FPE	AIC	HQIC	SBIC
0	-508.856				1.7e+09*	35.4383	35.5121*	35.6741*
1	-485.201	47.31	25	0.005	1.9e+09	35.5311	35.9741	36.9455
2	-473.026	24.349	25	0.499	5.5e+09	36.4156	37.2277	39.0087
3	-448.363	49.327	25	0.003	9.2e+09	36.4388	37.6201	40.2107
4	-399.11	98.506*	25	0.000	5.9e+09	34.7662*	36.3166	39.7167

Endogenous: PovertyD2 AgriExpeD1 EduExpenD1 Real_GDP InflationRate
Exogenous: _cons

The natural rule of thumb is the selection of that lag identified by the criterion which gives the lowest value. From the above table, the model indicates that lag 4 is the optimal lag and that AIC is the best criterion for the model since it has the lowest value, 34.7662.

4.5 Johansen Tests for Cointegration

The presence of cointegration was tested using trace statistic and critical values at rank zero.

H0: no cointegration in the time series data

Ha: presence of cointegration in the time series data

Table 4.6 Johansen Test for Cointegration

Johansen tests for cointegration

Trend: constant — Number of obs = 31
Sample: 2458q1 - 2465q3 — Lags = 2

maximum rank	parms	LL	eigenvalue	trace statistic	5% critical value
0	30	-573.89588	.	96.5832	68.52
1	39	-557.51934	0.65235	63.8301	47.21
2	46	-542.8897	0.61087	34.5708	29.68
3	51	-534.99739	0.39901	18.7862	15.41
4	54	-529.69209	0.28985	8.1756	3.76
5	55	-525.6043	0.23182		

From Table 4.6 above, it is evident that there is cointegtration among all the variables at all the ranks of order 0 all through to order 3. This is because all the critical values are less than the trace statistic values at 5% level of significance. Hence the null hypothesis was rejected.

The presence of cointegration (or longrun relationship between at least two time series variables of interest) imply that the ideal model used was the VECM and hence the VAR was dropped.

Table 4.7 The Vector Error Correction Model

Sample: 2458q1 - 2465q3 — Number of obs = 31
AIC = 38.48512
Log likelihood = -557.5193 — HQIC = 39.07319
Det(Sigma_ml) = 2.88e+09 — SBIC = 40.28917

Equation	Parms	RMSE	R-sq	chi2	P>chi2
D_PovertyD2	7	5.34402	0.2479	7.911322	0.3405
D_AgriExpeD1	7	21.1564	0.4601	20.44972	0.0047
D_EduExpenD1	7	51.9412	0.5879	34.23386	0.0000
D_Real_GDP	7	2.87639	0.2359	7.409807	0.3875
D_InflationRate	7	9.6198	0.0823	2.151973	0.9510

From the VECM model above, the value of the R^2 measured the goodness-of-fit. In other words, it explained how well the data fitted the regression model. Since the focus was on the response

variable, that is, poverty, the R^2 value considered from the model was 0.2479 which was a bit lower. However, given that it was a differenced variable, the lower R^2 was expected. Thus satisfying the expected condition that the model fitted well.

4.6 Regression results for the VECM model

The results observed that there was cointegration in the model given that the coefficients of agriculture expenditure, education expenditure, real GDP and inflation were negative and statistically significant. That depicted the existence of both short-run and long-run relationships in the model. The results are presented in Table 4.8 below:

Table 4.8 VECM Regression Results

beta	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
_ce1						
PovertyD2	1	.	.	.	.	.
AgriExpeD1	.4832538	.0831055	5.81	0.000	.3203701	.6461375
EduExpenD1	-.0884183	.0178809	-4.94	0.000	-.1234643	-.0533724
Real_GDP	-.407372	.3741964	-1.09	0.276	-1.140783	.3260394
InflationRate	-.2003322	.0872139	-2.30	0.022	-.3712683	-.0293961
_cons	4.291297	.	.	.	.	.

From the above table, the regression equation explaining the poverty, AgriExp, EduExp, Real_GDP and InflationRate can be expressed as follows;

$$PC = 4.291297 + 0.4832538AgriExp - 0.0884183EduExp - 0.407372\pi - 0.2003322\alpha + \varepsilon_t \quad \ldots\ldots(7)$$

From the above regression equation, the coefficient of the agriculture expenditure (0.4832538) was statistically significant at 5% level of significance implying that the contribution of agriculture expenditure on poverty was positive. Government expenditure on education was also statistically significant at 5% level of significance with a coefficient of -.0884183. The control variables of

real GDP and inflation had negative coefficients of -.407372 and -.2003322 respectively as expected. Thus an increase in government expenditure to either agriculture or education will be affected by changes in real GDP and inflation. The coefficients of these variables (real GDP and inflation rate) imply that poverty reduction and real GDP and inflation were directly proportional. This is to say that one unit reduction in poverty was contributed by a decrease in real GDP by -.407372 units and inflation rate by -.2003322 units respectively.

The study found consistent results from the previous studies. However, the coefficient of the education sector was conflicting. While it was expected that an increase in education expenditure would increase the growth rate of the economy and reduce the level of poverty, the study results showed that even though economic growth had increased, the level of poverty had also increased against the priori expectation. That could have been attributed to the shift in government fiscal policy to education infrastructure as opposed to increased enrollment in schools, tertiary colleges and universities. That means the government was allocating more funds to build schools, tertiary colleges and universities whilst access to these institutions remained unaffordable by the poor majority.

4.7 Results for autocorrelation test

The table below indicates the results of autocorrelation.

Table 4.9: Autocorrelation test resuts

Lagrange-Multiplier Test

Lag	Chi	Df	Prob>chi2
1	26.0031	25	0.40743
2	29.1012	25	0.25971

H0: no autocorrelation at lag order

The study findings in the Table 4.9 above confirmed that there was autocorrelation at lag order using the Lagrange Multiplier. That was because the p-values were statistically significant and greater than 0.05 at 95% significance level. In this case the null hypothesis was rejected. That is to say that the null hypothesis of no serial correlation was accepted and so the estimated results were valid. Therefore, the VECM model was stable and the estimated regression equation was unbiased.

CHAPTER FIVE

CONCLUSION AND POLICY RECOMMENDATION

5.1 Introduction

The findings of the study were analyzed and presented in the previous chapter. The chapter focused on the conclusion and policy recommendations of the study. It begins by giving a summary of the preceding chapters, then the conclusion which then guides the policy recommendations.

5.2 Summary

The study sought to investigate the nexus between the government sectoral expenditure on poverty reduction in Kenya with a focus on two sectors of the economy, namely, agriculture and education. In view of this, the study formulated three objectives to be addressed. They were as follows; to estimate the effect of government spending on agriculture and education sectors on poverty alleviation in Kenya; to test for existence of the nexus between short-run and long-run sectoral expenditure and poverty reduction and to draw conclusions and make key policy recommendations from the results of the study.

A Kenyan economy case study was the focus, with data collected quarterly between 1990 to 2022. The VECM model was used to estimate the results which comprised of the regression coefficients and then the autocorrelation test using the Lagrange Multiplier to confirm the validity of the estimates. Prior to the VECM estimation, the study conducted stationarity tests using both ADF and PP techniques. The main aim was to avoid spurious regressions which could have caused non-stationary variables. Further, the study computed eigenvalues to determine the stability of the model. The results found all the eigenvalues to be less than 1 indicating stability of the model.

From the first objective, the study found that public expenditure on both agriculture and education gave mixed findings. Government expansionary fiscal policy on agriculture sector had a positive

impact on poverty alleviation while the same was not the case with education sector. This can be attributed to more spending on education infrastructure rather than subsidizing education to make it more affordable by the poor majority households. Nonetheless, the study established that real GDP and inflation are control variables which could affect the level of allocation to the two sectors. Low inflation rates bestow more purchasing power to households which increases the amount of private consumption and hence reduces poverty. Similarly, increase in real GDP increases household incomes which in turn reduces poverty.

Secondly, the findings of the Vector Error Correction Model showed that there existed both short-run and long-run relationships among the variables. That means that the variables were interrelated in both the short-run and long-run.

5.3 Conclusion

The government's expansionary fiscal policy to agriculture and education is aimed at spurring economic growth and reducing poverty levels in Kenya. That is achieved through subsidizing agricultural production to increase food and nutrition security and subsidizing higher education to make it affordable and accessible to the poor majority. Increased food production is a key intervention measure towards reducing poverty which also addresses the first and second goals of the seventeen Sustainable Development Goals. Similarly, enhanced accessibility to affordable and quality education is a key ingredient of improved knowledge capacity and employment creation as espoused by the fourth SDG.

The country has witnessed inconsistencies in the budgetary allocations to agriculture and education sectors creating the need for further analyses on the influence of government expenditure on poverty reduction. It is on that background that the study sought to exhaustively examine this subject. More specifically, it sought to determine if expansionary fiscal policies on agriculture and education had impacts on reducing poverty levels in Kenya and whether there

exists short-run and long-run relationships between sectoral expenditure and poverty reduction. The study employed time series data spanning from 1990 to 2022. The econometric analysis was based on the VECM model.

The analysis generated varied results. Firstly, the expansionary fiscal policy on agriculture positively reduced the level of poverty during the period of study. On the contrary, the study observed a negative relationship with regards to the allocation to the education sector. Secondly, to clearly examine, that relationship, the study employed two control variables: real GDP and inflation rate. A regression analysis on these variables revealed that they both had a positive impact on poverty as was expected. Therefore, their inclusion in the model as control variables was effective. Thirdly, the study concludes that even though the allocation on education reduced the level of poverty in Kenya over the study period, this reduction was less significant as opposed to the agriculture sector. Finally, the study observed that there was a long-term inter-relationship among all the four variables used.

5.4 Policy Recommendations

From the empirical analysis of the study, key policy recommendations can be drawn from the findings. Firstly, the study discovered that the government allocations to key poverty reduction sectors of agriculture and education had not been consistent over the study period and so more attention should be paid to those sectors. In the same spirit, the government should focus on price stability mechanisms that get rid of skyrocketing inflation to increase purchasing power and arrest the poverty problem.

Further, the government should implement progressive taxation which aims at taxing individuals based on their incomes. The more they earn, the higher their taxes and vice versa. That will ensure that there will be additional revenues to be injected back in the economy for providing affordable and quality education and subsidizing agricultural production among other services. This will

create more employment opportunities by the two sectors, improve the standards of living and hence reduce the poverty level. Additional revenues are also an incentive for increasing nominal wages which further bestows more purchasing power to the Kenyan households and lift them out of poverty.

Moreover, the government should focus on subsidizing education in addition to allocating more resources towards construction and equipping of education infrastructure. This paradigm shift will make education more affordable and accessible at all levels leading to increased job opportunities and improved standards of living. Therefore, the study proposes for increased and consistent budgetary allocation to the two sectors, agriculture, and education, for enhanced production and knowledge capacity which will reduce the level of poverty in the long-run. The government should also fully implement the poverty-specific-reduction strategies discussed in the study through additional budgetary allocations. Among them were the implementation of Goals 1, 2 and 4 of the SDGs and the government's new blueprint of Bottom-Up Economic Transformation Agenda (BETA) on addressing climate change and enhancing food and nutrition security. These efforts will go a long way in reducing the levels of poverty in the country.

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