ADDIS ABABA UNIVERSITY

COLLEGE OF BUSINESS AND ECONOMICS

DEPARTMENT OF ECONOMICS

THE IMPACT OF PRIMARY AND SECONDARY SCHOOL VOCATIONAL EDUCATION ON ECONOMIC GROWTH IN ETHIOPIA

BY

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THESIS SUBMITTED TO DEPARTMENT OF ECONOMICS IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF SCIENCE IN ECONOMICS (DEVELOPMENT ECONOMICS)

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DECLARATION

I, Aberach Abiyu declare that, this study, "impact of education on economic growth in Ethiopia" is my own work. I have undertaken the research work independently with the guidance and support of the research advisor. This study has not been submitted for any degree or diploma program in this or any other institution. It is in partial fulfillment for the requirement of the program for the degree of Master of Science in Development Economics. All sources of material used for the research have been acknowledged.

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ENDORSEMENT

This thesis has been submitted to Addis Ababa University, Collage of Business and Economics for examination with my approval as a university advisor.

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Date: 01 June 2020

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Board of Examiners Approval Sheet

As members of board of examining of the final MSc thesis , we declare that we have read and gauged the Thesis prepared by Aberach Abiyu Asmachew entitled “The Impact of Education on Economic Growth” and recommend that the Thesis is accepted as fulfilling the thesis requirement for the degree of Master of Science in Development Economics.

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Table of Contents

List of Tables

List of Figures

LIST OF ACRONYMS

AAU	Addis Ababa University
EEA	Ethiopian Economic Association
EU	European Union
GDP	Gross Domestic product
GNP	Gross National Product
HEI	Higher Education Institution
HERQA	Higher Education Relevance and Quality Agency
IIASA	International Institute for Applied System Analysis
LDC	Least Development Countries
MDGs	Millennium Development Goals
MOE	Ministry Of Education
OCDE	Organization of Cooperation &Development Economics
OECD	Organization for Economic Cooperation and Development
NEB	National Bank of Ethiopia
NER	Net Enrolment Rate
UNESCO	United Nations Educational, Scientific& Cultural Organization
US	United States
VAR	Vector Auto Regression
R&D	Research & Development
TVET	Technical and Vocational Education Training
UIS	University Information Service

ABSTRACT

This study focuses on the relationship between primary and secondary school vocational education and economic growth in Ethiopia. It is an effort to show the effect to which education affects economic growth that is its productivity level. In this study the Auto Regressive Distributed Lag (ARDL) model is used. The results show that education plays an essential role in economic growth mainly as a device for improvement of the output level. There is persuasive evidence that increases output, suggesting that education really is productivity-enhancing rather than just a device that individuals use to signal their level of ability to the employer.

Keywords: Ethiopia, Education, and Economic Growth

CHAPTER ONE: INTRODUCTION

1.1 Background of the Study

Economic growth involves a combination of different types of capitals to produce goods and services, such as human, natural and produced capital. Certainly, economic growth depends also on political institutions and social conditions quality.

In the early 1960s, economists have given a big importance to the concept of human capital principally with the writing of Becker (1962), Schultz (1961, 1962), Mincer (1958, 1962), Kiker (1966) and Blaug (1976). All these authors confirmed that human capital is different from other types of capitals. Without human capital, the country cannot grow. This capital affects and controls other factors that explain economic growth and development of a country.

Education in every sense is one of the fundamental factors of development. No country can achieve sustainable economic development without sustainable investment in human capital. Education enriches people's understanding of themselves and world. It improves the quality of their lives and leads to broad social benefits to individuals and society. Education raises people's productivity and creativity and promotes entrepreneurship and technological advances. In addition it plays a very crucial role in securing economic and social progress and improving income distribution (Ozturk, 2001).

With the aim of accelerating development through skilled manpower, education has been given high priority in Ethiopia because access to high quality education and training is one of the footholds upon which long term development rests (MOE, 2005).Byrd (2013) asserted that "human capital, expressed in terms of the level of knowledge, skills and capacity of the human resource has been considered as a crucial factor for nations' economic growth and development".

Beyond economic growth health and survival rates, fertility levels and even the quality of country's governance and institutions can plausibly be assumed to be linked to a country's levels of educational attainment (IIASA 2008). While completion of a basic education is associated with higher quality health indicators, progress on other MDGs were influenced even more by the completion of secondary education, and especially by women, for example in Sub –Saharan

Africa, an estimated 1.8 million children's lives could have been saved in 2008 if their mothers had at least secondary education- a 41 per cent reduction (UNESCO 2011).

The skills that are needed to best complement technology in the workplace are particularly relevant for the economy today and into the future. While advances in technology would predict increases in productivity, allowing workers and firms to produce more with less time and resources, productivity growth in fact has been declining recently. The skills that can be automated by technology versus skills history provides a useful example of the adaptation needed in skills development due to changes in technology and the labor market. Goldin and Katz reviewed the U.S.'s 20th century response to changes in the labor market in "*The Race Between Education and Technology"* and found that shifts in labor market needs due to industrialization led to a massive increase in secondary school education all over the changes in technology today are predicted to make the labor market and the jobs of the future fundamentally different from the world of work today (World Economic Forum 2016). In order to improve productivity, young people will need the right mix of skills to take advantage of the new technologies. Strong essential skills like literacy, numeracy and academic knowledge are crucial, but workers will also need to be flexible and adaptive, able to think critically to filter and analyze large amounts of information, and will need strong interpersonal skills to collaborate and effectively communicate with diverse groups of people.

Around the world, gaps in schooling have been narrowing for generations, with more and more young people and adults attending and completing formal education than ever. Examining their extensive dataset on educational attainment of adults from the 19th century to today, Barro and Lee (2015) find that faster rates of human capital accumulation in developing countries relative to advanced countries helped to reduce the worldwide per-capita income gap. They note that while for some time the world was divided into those with and without education, by 2040 most countries will achieve similar levels of schooling. Other research finds that global gaps will persist much longer (Winthrop and McGivney 2014), but undoubtedly schooling levels are rising in all regions.

However, despite increased access to schooling, deficiencies and lags in the quality and relevance of education and skills needed to be successful in the future world of work are limiting

the impact of the new technologies on productivity and economic growth. They are also contributing to a rise in income inequality. Technology and automation have polarized the labor market by types of skills demanded. Not only is the demand for an interpersonal and analytical skill on the rise, but there has also been growth in low-skill services jobs. For example, many middle-skill workers who previously were employed in routine work have been forced into low-skill, low-wage employment, while employment and wages for high-skill professional and managerial positions have grown for those at the top of the skill distribution (Autor and Dorn 2013). Labor market polarization and unemployment due to skills mismatch can lead to high levels of inequality, and according to the 2016 *Global Risks Report*, unemployment and underemployment are the top risk for 31 countries (World Economic Forum 2016).

Economic growth and education are intertwined. Greater access to education has certainly contributed to higher rates of economic growth. The extent of the contribution of education to economic growth depends not only on building skills, but also on their application. There is evidence that state led development models and rigid labour markets do not favor rapid economic growth, even when the state offers broad access to schooling and high education quality (for example, in Eastern European countries under socialist rule). In the words of Hannum and Buchmann (2006) education is organized as a basic human right, and better education improves people's welfare. As an instrument of development, education fosters and enhances work skills and life skills such as confidence and sociability. These skills in individuals promote economic growth on a societal level via increased productivity and potentially better governance.

Generally, education is a serious element of a country's human capital which increases the productivity of each individual worker and helps economies to move up the value chain outside labor-intensive tasks or simple production process. It is an important factor of economic growth, employment and individual earnings.

While for decades' economists have looked to education as a source of growth and increasing productivity, further research is needed on how to make the sector more productive in terms of the relevant skills acquired. Technology and jobs are changing rapidly, and the skills needed to be successful may be fundamentally different from those of the 20th century or the industrial

revolution. Further research is needed on how an individual's skills interact with technology to make them more productive. Further research is also needed into how education systems can foster these skills at scale. While the spread of access to schooling has been one of the most successful "going-to-scale" stories, quality has varied widely and many children and youth are not learning even basic skills.

According to numerous studies, education and economic growth have a positive and long-run relationship. It is continued to be a master-key of growth and development of a country, as well as an important factor to decrease poverty and migration, and to improve the quality of institutions and social conditions of citizens. Studying and measuring the impact of education on economic growth is always important, especially, in developing countries like Ethiopia where the school enrolment remains weak, mainly for girls and in rural area.

1.2 Statement of the Problem

Human capital is an important input into the economy. Increases in education levels since the 19th century have been estimated to account for between one-fifth and one-third of economic growth in the U.S. (Dean 1984, Barro and Lee 2015). On an individual level, the high returns to education reflect its impact on labor productivity, with an additional year of schooling providing an average 10 per cent increase in wages (Psacharopoulos and Patrinos 2004). Education has also been identified as a driver of improved demographic and health outcomes, contributing to decreases in infant mortality and fertility over the second half of the 20th and early 21stcenturies (Gakidou et al., 2010, Barro and Lee 2015).

Human capital is a measure of talents, education, ability and qualities labour that effects their productive capacity and earning potential. It is obtainable to produce material wealth for an economy or a private firm. It affects economic growth and can help to improve an economy by increasing the knowledge and abilities of individuals.

The economic success and effective of a country depends on its physical and human capital stock. Physical capital is the emphasis of economic research determinants which affects the improvements of human skills and abilities which are progressively figured in the research of

social and behavioral sciences. In general terms, human capital is an investment that people make in them which improves their economic productivity.

Yet despite massive increases in schooling around the world, where now more than 9 in 10 children are enrolled in primary school, productivity and growth have been slowing. Many argue that the 20th century model of schooling is no longer effective at fostering the skills young people need to thrive in a rapidly changing labor market and to make the most of the new digital technology in the workplace. Skill gaps have emerged as an important constraint to economies' capacity to absorb and benefit from fast-changing new technologies. Additionally, polarization of high- and low-skill jobs may be contributing to increasing income inequality. The success with which education and skills catch up with technological progress will be a key determinant of the impact of technological change on productivity and distributional outcomes (Eileen McGivney and Rebecca Winthrop 2016).

These forces and the needs of the future economy demand that the education sector focus on improving the quality and relevance of education and better fostering skills. Most regions in the world will reach a saturation point in terms of the number of years of schooling that workers complete, but there is still much improvement to be gained in the skills acquired within those years. Moreover, as technology continues to change, on-the-job training to update and adapt skills and lifelong learning will become increasingly important (Eileen McGivney and Rebecca Winthrop 2016).

Barro and Lee (2015) have developed measures of human capital that account for both the quantity and the quality of schooling, combining average years of schooling and performance on international student and adult skills assessments. Their results also find that high-quality schooling has a significant impact on growth across countries.

Including skills when measuring human capital has important implications for the impact of education on productivity. Rather than school progression and attainment alone, learning outcomes and skills are increasingly used to measure the success of education systems, and disparities in skills across countries have called attention to low-quality schooling in many countries. Figures from developed and developing countries alike paint a worrisome picture. As many as 130 million primary school students lack basic reading and writing skills, largely

concentrated in developing countries (UNESCO 2012). A survey of 24 OECD countries found that more than 20 per cent of all adults have low proficiency in literacy or numeracy despite the fact that nearly three-quarters of them have completed secondary school or higher (Grotlüschen et al., 2016).

To achieve sustainable growth and development in Ethiopia, it is imperative to continue assistance in poverty reduction and develop social and economic infrastructure more importantly education. Since many years the unsustainable economic growth is worrisome in Ethiopia. The factors responsible for this situation were unfavorable economic growth, political instability, negligence in education sector, worse law and order situation and poor attraction for the foreign investors. The unsustainable economic growth can be related with high inflation rate, a mounting fiscal deficit, increasing foreign debt and debt servicing, weak foreign demand for Ethiopian products, low level of physical and human capital, unfavorable weather, and political instability and among other factors, a deteriorating law and order situation in the country.

Primarily, the links between education and economic growth, income distribution and poverty reduction were well established. Education equipped people with the knowledge and skills they needed to increase their income and expanded opportunities for employment. This is true for households and for national economies. Levels for productivity, economic growth and patterns of income distribution are intimately linked to the state of education and the distribution of educational opportunity. Increasing global economic interdependence and the growing importance of knowledge-based process in economic growth have raised both the premium on education and the cost associated with education deficits.

Education enriches human capital in the labour force, which improves labour productivity hence it leads to a higher equilibrium of output. It can also enhance innovation, knowledge of new technologies, products and increase economic development.

According to Seyoum Tefere(2005) education can play a key role in bringing about development only if and when certain conditions have been met; not merely because education alone is provided as a matter of course every time new regimes are ushered in and out.

Several modern economists have argued that expenditure on education is undertaken on primarily for return and should be viewed as investment in human capital which increases human capital formation. Similarly, most of empirical studies focused on education as proxy of human capital by conceived to include all expenditures on health, on job training, formal education at the elementary, secondary and higher levels, and study programs for adults including extension programs, migration of individuals and families to adjust to changing job opportunities (**Lingaiah**, 2001) and got contradicting results. But there are no papers that include the main problems of education system such as; low access and quality, inequality, inequitable distribution of educational opportunities, inefficient administration and management, and the lack of adequate financing. As a result, the purpose of this paper is to fill these gaps in terms of making theoretical analysis rather than just measuring the impact of education on economic growth.

Education systems that do well prepare children early on, reform continuously, and use information for improvement and accountability. Information for accountability works, as do high stakes assessments; but so do low stakes assessment. Either way, test- based accountability is cost- effective. “Even if accountability costs were 10 times as large as they are, they would still not amount to 1 per cent of the cost of public education” (Hoxby).

Therefore, to address these problems remarkable progress should be implemented to surface many persisting challenges to the education system in the areas of equity, quality, organizational capacity, implementation capacities, community and private participation and financing.

1.3. Objectives of the Study

The study has the following general and specific objectives.

1.3.1. General objectives of the study

The general objective of this paper is to examine the relationship between primary and secondary school vocational education and economic growth for the period of 1980 to 2018.

1.3. 2.Specific objectives of the study

- To investigate the impact of primary and secondary school vocational education on economic growth in Ethiopia.

- To investigate the short run and long run impact of primary and secondary school vocational education on economic growth in Ethiopia.

1.4. Research Questions

i. Does primary and secondary school vocational education have a substantial long-run and short-run impact on economic growth in Ethiopia?

ii. Is there any relationship between primary and secondary school vocational education and economic growth?

1.5. Hypothesis of the study

Modern theory of economic growth maintains that human capital, especially education has the principal role on attaining economic growth and development. Proponents of endogenous growth theory lay importance on human capital formation and regard it a factor which explains difference in growth performance of under developed and developed nations (Romer, 1992). Becker (1962), who believes that human capital is just like physical capital and one, can invest in it by means of education, health and training which, in turn, will raise output and contribute to economic growth. Then the study tests the hypothesis:

Ho: $\beta s=0$ (i.e. primary and secondary school vocational education has no short run and long run significance impact on economic growth).

H1: $\beta s\neq 0$ (i.e. primary and secondary school vocational education has short run and long run significance impact on economic growth).

Ho: $\beta s=0$ (i.e. primary and secondary school vocational education has no impact on economic growth).
H1: $\beta s\neq 0$ (i.e. primary and secondary school vocational education has impact on economic growth).

In the empirical findings of this study the researcher will expect that there will be an impact and has short run and long run significant relationship between primary and secondary school vocational education and economic growth.

1.6. Significance of the study

Since education have an effect on the growth of one's country (through its direct and indirect effect on a sector of the economy). This research paper will help researchers and policy makers to give a due consideration to it. Additionally through this research paper they may be able to understand the need of education and play a major role in the process of educational development. By reading this research paper any individual can understand how much education affects a country's economy and how it affects development. So, the readers may understand the significance of education for economic growth. Additionally, this research paper may help economics students either in defining their title (problem) or during the main research process as reference material.

1.7. Scope and Limitation of the Study

This study focuses on the effect of primary and secondary school vocational education on economic growth in Ethiopia from 1980 to 2018. Doing this study internationally is a difficult task because it needs huge finance, sufficient knowledge and time. Due to these limitations the study is undertaken at national level and examines the relationship between primary and secondary school vocational education and economic growth in 1980 to 2018.Accessibility of data is a challenge at the time of doing this study due to COVID-19.

1.8. Organization of the study

This study organized into five chapters. Chapter one is introduction which contains: background of the study, statement of the problem, research objectives and questions, significance of the study, hypothesis of the study, scope and limitation of the study and the organization of the paper itself. Chapter two provided a review of theoretical and empirical literature related to human capital and economic growth. The data types and sources, model specification and estimation techniques discussed in chapter three. Chapter four includes discussion and interpretation of the results. Finally, chapter five presents conclusion and policy implication of the study.

CHAPTER TWO: LITERATURE REVIEW

2.1. Theoretical Literature Review

2.1.1. Education's Impact on Economic Growth and Productivity

The significance of education is highly recognized since long periods. Here it is good to remember Plato's Golden words "The direction in which education starts a man will determine his future life." Education is a vital device for economic development, especially primary and secondary education is serious for growth and reduction of poverty. Investment in education has a direct impact on the accumulation of human capital, which is a key to sustained economic growth and increasing incomes. The economic meaning of education is basic; it enables the poor to increase his productivity by reducing fertility and improving health. As an instrument, accelerates the strength to fully participation in the economic affairs of the society. Besides this, institutional basis of civil society, national capacity building and good governance is some of the gains from educational activities (World Bank, 1995, P.19).

Education and health are basic objectives of development; they are important ends in themselves. Health is central to well-being, and education is essential for a satisfying and rewarding life; both are fundamental to the broader notion of expanded human capabilities that lie at the heart of the meaning of development. At the same time, education plays a key role in the ability of a developing country to absorb modern technology and to develop the capacity for self-sustaining growth and development. Moreover, health is a prerequisite for increases in productivity, and successful education relies on adequate health as well. Thus both health and education can also be seen as vital components of growth and development as inputs to the aggregate production function. Their dual role as both inputs and outputs gives health and education their central importance in economic development (Todaro, 2012).

Education plays a major role in the economic development of any country, for both developed and developing. Many resources play a part in the growth of a country's economy one of which and perhaps the most important is human capital, which means the workforce become a very important of the country. A good and productive workforce by making use of other resources can lead an economy in to growth and prosperity.

One of the major factors in developing this resource i.e. human capital is education. Therefore education is one of the most important factors that lead a country to sustained economic growth. Education has therefore become a very important part of every government policy. Much effort has been done with respect to education in many developing countries including Ethiopia.

2.1.2. The Perspective of the Growth Theory

One of the most significant and important contributions is that of Lucas (1988), which is in order to related the previous work by Uzawa (1965). From these models, the level of output is a function of the stock of human capital. In the long run sustained growth is only possible if human capital can grow without bound. This makes it challenging to interpret the Uzawa-Lucas notion of human capital in terms of the variables traditionally used to measure educational attainment, for example year of schooling. They use the word 'human capital' more closely related to knowledge, rather than to skills acquired through education.

Bils and Klenow (2000) argued that one way to relate the Uzawa-Lucas model is that the quality of education could be increasing over time. In this view, the knowledge reported to school children in the year 2000 is greater to the knowledge that would have been reported in 1950 or 1990 and will make a greater difference to their productivity in later employment. Even though average educational attainment is constant over time, the stock of human capital could be increasing in a way that pushes rising levels of output. However, this argument goes into difficulties, even at the level of university education. There may be some degree courses in which the knowledge reported currently has a better effect on productivity than before (medicine and computer science) but there is other, less vocational qualifications for which this argument is less substantial.

An alternative class of models places more importance on modeling the incentives that firms have to generate new ideas. Endogenous growth models based on the analysis of research and development, notably the landmark contribution of Romer (1990), yield the result that the growth rate partly depends on the level of human capital. The fundamental assumption is that human capital is a key input in the production of new ideas. In contrast with the Uzawa-Lucas

framework, this opens up the possibility that even a one-off increase in the stock of human capital will raise the growth rate indefinitely.

In practice, the generality of these results, and the contrast with the Uzawa-Lucas model, should not be overdrawn. The Uzawa-Lucas framework can be seen as a model of knowledge accumulation in a similar spirit to that of Romer, but easier to analyze and restrictive assumptions are needed to yield the Romer result that the long-run growth rate depends on the level of human capital Jones (1995). But even under more general assumptions, a rise in the level of human capital is likely to be associated with a potentially substantial rise in the level of output, brought about through a transitional increase in growth rates.

Another interesting aspect of growth models as argued by Rustichini and Schrnitz (1991) is that individuals may under-invest in education. They presented a model in which individuals divide their time between production, original research, and the acquisition of knowledge. Each individual knows that acquiring knowledge through education will raise their productivity in subsequent research, but since they do not fully capture the benefits of research, they will tend to spend less time in acquiring knowledge relative to the socially optimal outcome. They found that although policy intervention has only small effects on the allocation of time to education, it can have a substantial effect on the growth rate. Romer (2000) maintained that models of growth driven by Research and Development (R&D) are determined by the quantity of inputs and not simply the expenditure upon it. Incentives like tax credits to encourage R&D may be ineffective unless they encourage a greater number of scientists and engineers to work towards developing new ideas.

In most endogenous growth models based on research and development, the stock of human capital is taken to be exogenously determined. Acemoglu (1997) and Redding (1996), have relaxed this assumption, and considered what happens when individuals can choose to make investments in education or training, while firms make investments in R&D. For some parameter values multiple equilibrium are possible, since the incentives of workers to invest in human capital, and those of firms to invest in R&D are interdependent.

2.1.3. Returns to investment in education

With roots in the writing of classical economists (Adam Smith 1776, Marshall 1890) the link between education and earnings only recently emerged. Formal modeling did not take place until much more recently (Schultz 1960, 1961; Becker 1964; Mincer 1974; Chiwick 2003). The study earnings by schooling has led several empirical works testing hypothesis on a great variety of social issues. These include, for example, racial and ethnic discrimination, gender discrimination, income distribution, and the determinants of demand for education. But the dominant application that has used earnings by level of education is the estimation of the rate of returns to investment in schooling.

The concept of the rate of return on investment in education is very similar to that for any other investment. It is a summary of costs and benefits of the investment incurred at different points in time, and it is expressed in an annual (percentage) yield, like that quoted for saving accounts or government bonds. Returns on investment in education based on human capital theory have been estimated since the late 1950_s. Human capital theory puts forward the concept that investments in education increase future productivity.

Estimation of the returns to education has been a popular subject in the literature (Ashenfelter and Krueger 1994; Becker 1964; Becker and Chswick 1966; Card and Krueger 1992; Card 2001; Duflo 2001; Heckman, Lochner, and Todd 2006; Rosenzweig 1995; Schultz 1961). The popularity of estimating returns to education stems from the resulting efficiency, equity and financing implications. The rank order returns to a level or type of education and a comparison with the returns of alternatives investments can assist education policy makers to make informed investment decisions.

Previous compilations have shown that private returns to primary education decline over time, but slightly (Psacharopoulos 1981,) previous work also shows that returns are highest for primary education, the general curricula, the education of women and countries with the lowest per capita income (Psacharopoulos 1985). Also primary education continues to exhibit the highest social profit ability in all world regions. Social and private returns at all levels generally decline by the level of a country's per capita income. Overall, the returns to female education are

higher than those to male education. The returns to the academic secondary school track are higher than vocational track since the unit cost of vocational education is much higher and the returns for those who work in the private (competitive) sector of the economy are higher than in the public (noncompetitive) sector (Psacharopouls 1994).

Many countries have retained more prominence on improving an education system that can produce workers capable to function in new industries, for example science and technology. This is somewhat older industries in developed economies were becoming less competitive, and consequently less likely to continue dominating the industrial countryside.

A country's economy develops more fruitful as the proportion of educated workers rises as educated workers can more competently carry out tasks that need literacy and critical thinking. But attaining a higher level education also brings a cost. A country does not have to offer an extensive network of colleges or universities to benefit from education. It can offer basic literacy programs and still see economic developments.

Countries that have a large number of population attending and graduating from schools develop faster economic growth. So many countries deliver funding for primary and secondary education to improve economic performance. Due to this education is an investment in human capital similar to an investment in better tools.

2.1.4. The central roles of Education and Health

Education and health are basic objectives of development; they are important ends in themselves. Health is central to well-being and education is essential for a satisfying and rewarding life; both are fundamental to the boarder notion of expanded human capabilities that lie at the meaning of development. At the same time, education plays a key role in the ability of developing country to absorb modern technology and to develop the capacity for self-sustaining growth and development. Moreover, health is a prerequisite for increase in productivity and successful education relies on adequate health as well. Thus both health and education can also be seen as vital components of growth and development as inputs to the aggregate production function. Their dual role as both inputs and outputs gives health and education their central importance in economic development (Smith,).

Health and education are closely related in economic development. On one hand, greater health capital may improve the return to investments in education, in part because health is an important factor in school attendance and in the formal learning process of a child. A longer life raises the return to investments in education; better health at any point during working life may in effect lower the rate of depreciation of education capital. On the other hand, greater education capital may improve the return to investments in health, because many health programs rely on basic skills often learned at school, including personal hygiene and sanitation, not mention basic literacy and numeracy; education is also needed for the formation and training of health personnel. Finally, an improvement in productive efficiency from investments in education raises the return on a lifesaving investment in health (Smith,).

Health and education levels are much higher in high income countries. There are good reasons to believe that the causality runs in both directions with higher income, people and governments can afford to spend more on education and health, and with greater health and education, higher productivity and incomes are possible. Because of these relationships, development policy needs to focus on income, health and education simultaneously.

People will spend more on human capital when income is higher. But the evidence shows clearly that even if we were able to raise incomes without a large improvement in health and education, we couldn't count on that income increase being used adequately invest in children's education and health. The market will not solve this problem automatically, and in many cases, household consumption choices themselves may lead to a surprisingly small link between income and nutrition, especially for children. The income elasticity of the demand for calories that is the percentage change in calories consumed for a percentage change in family incomes among low income people range from near zero to about 0.5, depending on the region and statistical strategy used by researchers. This less than proportional response is due to two factors: income is spent on other goods besides food and parts of the increased food expenditure are used to increase food variety without necessarily increasing the consumption calories. If the relationship between income and nutrition is indeed quite low, as some studies suggest, then development policies that emphasize increasing incomes of the poor without attention to the way these additional resources are expanded within the family may not lead to improved health and successful development more generally, at least not very quickly.

The investigation of investments in education and health is combined in the human capital approach. Human capital is the word economists often use for education, health, and other human capacities that can promote productivity when increased. After an initial investment is made, a stream of higher future income can be generated from both expansion of education and improvements in health. Therefore, amount of return can be gathered and compared with returns to other investments. This is done by estimating the present discounted value of the increased income stream made possible by these investments and then comparing it with their direct and indirect costs.

2.1.5. The Gender Gap: Discrimination in Education and Health

Young females receive less education than young males in most low income developing countries. While youth literacy is now much higher than it was recently as 1990, but in most regions girls still lag behind boys. Large majorities of illiterate people and those who have been unable to attend school around the developing world are female. The educational gender gap is especially great in the least developed countries in Africa, where female literacy rates can be less than half that of men in countries such as Niger, Mali, Guinea and Benin.

School completion is also subject to gender inequalities, and the gap is often particularly large in rural areas. Empirical evidences shows that educational discrimination against women hinders economic development in addition to reinforcing social inequality. Closing the educational gender gap by expanding educational opportunities for women, a key plank of the Millennium Development Goals is economically desirable for at least three reasons.

1. The rate of return on women's education is higher than that on men's in most developing countries.
2. Increasing women's education not only increases their productivity in the workplace but also results in greater labour force participation, later marriage, lower fertility and greatly improved child health and nutrition thus benefiting the next generation as well.
3. Because women carry a disproportionate burden of poverty, any significant improvements in their role and status via education can have an important impact on breaking the vicious circle of poverty and inadequate schooling.

Health and Gender: girls also face discrimination in health care in many developing countries like Ethiopia. Women are often denied reproductive rights, whether legally or illegally. Broadly, health spending on men is often substantially higher than that on women. In many countries such as Nigeria, health care decisions affecting wives are often made by their husbands.

Female genital mutilation / cutting (FGM/C) is a health and gender tragedy, explained in the 2005 UNICEF report changing a harmful social convention: Female genital mutilation / cutting is the most widely practiced in sub Saharan Africa and the Middle East and is believed to have affected about 130 million women. This practice, which is dangerous and a violation of the most basic rights, does not result from decisions made men; many mothers who have undergone FGM/C also require their daughters to do so. If most other families practice FGM/C, it becomes difficult for any one family to refuse to take part, to avoid the perceived resulting "dishonor" to the daughter and her family and lost "marriage ability".

2.1.6. A Brief History of Education in Ethiopia

Traditionally, education in Ethiopia was religiously based and provided in church schools and monasteries to the elite few, mostly males. Modern western education did not arrive in Ethiopia until the 20th century and developed only slowly. Merely 3.3 per cent of the elementary school-age population attended school in 1961 back then one of the lowest enrollment ratios in African countries, where European colonial rulers imposed modern education systems patterned after their own, Ethiopia's education system evolved technically speaking indigenously. Discounting a short period of military occupation by Italy from 1936 to 1941, Ethiopia is the only country in Africa that was never colonized.

However, Ethiopia's education system was nevertheless intrinsically shaped by external influences. To compensate for the lack of qualified personnel in Ethiopia's imperial government imported teachers, administrators, and education advisors from countries like France and Egypt. It also invited foreign private schools into the country when it attempted to build a more modern education system in the early 20thcentury. French was the language of instruction at many Ethiopian schools until 1935.

After World War II, efforts to create a modern mass education system intensified, but this time under the influence of education advisors from Britain and the United States. During this period,

school curricula were British, and English was promoted as the language of instruction in secondary system, likewise, was initially developed with extensive foreign involvement. Following the 1950 establishment of Addis Ababa University as Ethiopia's first HEI a handful of colleges were established throughout the decade, most of them administered and primarily staffed by Western expatriates. It was not until the early 1970_s that the higher education system became more "Ethiopianized". Under the Marxist- Leninist Derg, education policies became influenced by education advisors from Communist countries like the Soviet Union and East Germany. While the Derg politicized education and used it for ideological indoctrination, it did make progress in increasing elementary enrollment rates. It also launched a large- scale program to increase literacy the campaign won international praise and decreased the national illiteracy rate despite the civil war.

In higher education, by contrast entry rates declined sharply notwithstanding the opening of more HEIs. Education spending per tertiary student decreased in favor of military spending and many academics fled the country.

2.1.7. Growth of the Education System in Ethiopia

Ethiopia's education system expanded rapidly in the decades after the overthrow of the Derg in 1991. The net enrolment rate (NER) in elementary education, for instance, jumped from only 29 per cent in 1989 to 86 per cent in 2015.According to the UIS, Ethiopian government statistics report that the number of elementary schools tripled from 11,000 in 1996 to 32,048 in 2014, while the number of students enrolled in these schools surged from less than 3 million to more than 18 million. In secondary education, overall enrollment is much smaller, but growing modestly nevertheless: The NER in upper secondary education grew from 16 per cent in 1999 to 26 per cent 2015(UIS).

The higher education sector, likewise, has become a long way since its humble beginnings. There were just three public universities, 16 colleges, and six research institutions in 1986 enrolling fewer than 18,000 students. Today there are more than 30 public universities as well as a growing private sector. Ethiopia did not have a single privately owned tertiary institution before the early1990_s. But there are now 61 accredited private HEIs. The overall number of

tertiary students in both public and private institutions exploded by more than 2,000 per cent, from 34,000 in 1991 to 757,000 in 2014, per UIS data.

However, despite this expansion Ethiopia still trails other LDCs in key education indicators. In fact the rapid growth the past decades has overburdened the system and created a slew of new problems, such as funding shortages and a deterioration of quality. Enormous progress in increasing access to education system to be in a state of crisis and those quantitative achievements in areas like elementary enrollments mask stagnation in terms of quality and learning outcomes.

Ethiopia's adult literacy rate of 39 per cent (2012), for example is still one of the lowest in the world and far below the LDCs average of 77 per cent (in 2016, per UIS). Marked disparities in participation in education also persist between rural areas and urban centers, most notably Addis Ababa, as well as between low income households and more affluent demographic groups, and between boys and girls. School dropout rates are among the highest in the world. Just slightly more than 50 per cent of enrolled children complete elementary education. Participation rates also fall off markedly at higher levels of schooling Ethiopia's upper secondary NER remains fully 17 percentage points below the current LDCs average (UIS).

In the tertiary sector, educational quality is strained by scarce funding, poor qualities and infrastructure, overcrowded classrooms, insufficient, levels of academic preparedness among students, and a shortage of qualified teaching staff. Only 15 per cent of university instructors had doctoral degrees in 2015. Many students were taught by young, inexperienced instructors holding just a bachelor's degree. Research funding and outputs are consequently very low, so that Ethiopia ranks below other African countries like Rwanda, Senegal, Tanzania, or Uganda in comparative studies that measure research and innovation, such as the Global Innovation Index.

High and growing unemployment among Ethiopian university graduates, meanwhile, raises questions about the quality and relevance of academic curricula, which are considered ill-suited for current labour market demands. There are also great disparities between public universities and a growing number of smaller private for –profit providers, many of the said to be of dubious quality. Former Prime Minister Meles Zenawi in 2010 went as far as accusing private HEIs of

“not only providing substandard education but practically just printing diplomas and certificates and just handing them out”.

Crucially, access to tertiary education in Ethiopia remains severely constrained. While participation rates in higher education exceed those of other east African countries like Tanzania or Uganda, Ethiopia’s tertiary gross enrollment ratio of 8.1 per cent (2014) is below the LDC average and less than half of neighboring Sudan (UIS). Also tertiary education in Ethiopia remains elitist. Participation rates are highly skewed toward men from financially well-off households; women made up only 30 per cent of all tertiary students in 2014 (UIS).

2.1.8. Investment in human capital in Ethiopia

The most important among the productive resources in any country is its workforce and the level of its human capital. In this regard, Ethiopia has a long way to go, even by the standards of other low-income countries. According to the 2014 Human Development Report, the adult population in Ethiopia has only 2.4 years of schooling, which is 50 per cent lower than the average for Sub-Saharan Africa (SSA), and nearly 2 years less than the average for low-income countries.

However, the expected years of schooling for children of school-entry age, the second measure of access to knowledge in the HDI, shows significant improvements from 2000 to 2013. According to this index, children of school-entry age in 2013 are expected to attain 8.5 years of schooling as adults, showing a 100 per cent increase since 2000. The expected attainment is based on the assumption that the prevailing age-specific enrolment rates would remain unchanged throughout a child’s life.

Improvement in expected years of schooling reflects the rapid increase in primary school enrollment in recent years. This trend may allow Ethiopia to nearly eliminate the gap in the educational attainment of its younger generation with respect to other SSA and low-income countries. The expected years of schooling for children of school-entry age in SSA and low-income countries in 2013 were 9.7 and 9.0 years, respectively. Using data from several issues of the Education Statistics Annual Abstract prepared by the Federal Ministry of Education, Figure 8 shows rapid expansion of access to primary education over the last decade. In fact, gross primary enrolment rate increased from about 33 per cent in 1995 to 100 per cent in 2014.

2.1.9. Administration of Education System in Ethiopia

Ethiopia is a federation of nine regional states delineated by ethnicity, as well as two cities designated as separate administrative units or "chartered cities" (Addis Ababa and Dire Dawa). After the fall of the Derg regime, Ethiopia's government pursued a deliberate policy of decentralization, including the devolution of education administration to the regions. School education is now mostly administered by local authorities in sub districts or woredas within the individual regions, a move designed to better accommodate local needs.

Funding is share between the regions and federal government, which provides about 50 to 60 per cent of the funding through non-itemized block grants to regional governments, as well as grants given directly to schools. To ensure consistency, the federal government manages the education system with multi-year development programs that set performance targets and reform agendas for the entire system. School curricula are standardized nationwide. Schools use a national curriculum framework development department of the federal ministry of the education (MOE).

The federal MOE in Addis Ababa oversees and funds Ethiopia's higher education exercising far-reaching control over public institutions. The autonomy of public HEIs is limited, since the MOE sets admission standards, enrollment quotas, and curricula; systematically curtails academic freedoms; and frequently appoints and university administrators based on political allegiance. Private HEIs are regulated less tightly, but must be accredited by the Higher Education Relevance and Quality Agency (HERQA), a nominally autonomous body under the purview of the MOE. Quality control in technical and vocational education training (TVET) is provided by a federal TVET agency, which the MOE also oversees.

2.2 Empirical literature

Different researchers have used different representations for education and their inferences are debated about the relationship between education and economic growth in the world. Many researchers and modern economists maintained that investment in human capital improves human capital formation.

Anbelaetal (2014) recognized human capital as one of the essential factor for economic growth and shows a vital role in the technological development of countries. According to panel data

estimations including a set of OCDE countries over 1960-2011, they found that the countries productive specialization dynamics is a vital factor for economic growth.

Mankiw et al., (1992) and Barro (1991) explored the relationship between education and economic growth in both industrialized and less industrialized countries. They studied differences in secondary school enrolment rates, using a single cross-section of both the industrialized and the less- developed countries. Both studies examined that schooling has a vital positive impact on the rate of growth of real GDP.

Prichett (2001) has explained that poor policies and institutions have slow down growth in many developing countries, leading the skilled labour relatively unproductive activities. Thus disordering the statistical relationship between education and economic growth in samples that include less developed countries. Krueger and Lindahl (2001) suggest that the problem of unnoticed disparity in educational quality is aggravated in panel data. Taking data quality into account, they explain that increases in the stock of schooling do advance short-run economic growth. Hanushek and Kimko (2000) approve that direct measures of labour-force quality, from international mathematics and science test scores, are strongly related to growth. Temple (2001) discovers that growth effects are positive. However, they are non-linear. These non-linear effects may be missed by studies that impose linearity.

A series of subsequent studies made use of panel data, examining changes over time in both education and growth. Several of these panel studies failed to detect any significant relationship between the rate of increase of educational capital and the rate of economic growth. They suggested that the positive findings of the earlier cross-section studies were due to omitted variable bias, failing to control for country specific effects. Benhabib and Spiegel (1994) compared models that treat human capital as a direct input into production with models treating human capital as an intermediate input into the acquisition of skills and/or knowledge. The former implies a relationship between output growth and educational growth, whereas the latter implies a relationship between output growth and the average stock of human capital per worker. Their econometric evidence favours the latter model. A more educated workforce can more

readily identify, adapt and implement new ideas whether the ideas are generated domestically or overseas.

Teixeira and Fortuna (2003) studied human capital effects on economic growth of Portugal from 1960 to 2001. By using VAR and co integration analyses, they confirm that human capital and indigenous innovation efforts are enormously important to the process of Portuguese economic growth during the period 1960-2001.However, the relevance of the former overpasses that involving the creation of an internal basis of R&D. In addition, the indirect effect of human capital, through innovation, emerges as critical, showing that a reasonably higher stock of human capital is important to allow a country to gain the benefits of its innovation indigenous efforts.

Elena (2014) studied the EU's 2020 Strategy focused on three area of growth: smart, sustainable and inclusive that couldn't be attained without major influence of skills, knowledge or value of people, commonly known as human capital. It is challenging to believe that these goals could be recognized without a good education and training system, a large diffusion of knowledge in manufacturing services, a creative industries and a great effort to create a research-intensive economy. Using a panel methodology, the study tried to expose the role of human capital as a factor of the growth and to argue that the slow investment in human capital should influence the sustainable development of the country.

Kanayo(2013) analyzed the importance of human capital formation concept on economic growth and cannot be over emphasized and have been the fulcrum of aid and assistance by international agencies and developed countries. Furthermore, evidence from developed countries suggests that human capital has been the major driver of their development process. Using the Error Correction Model as an analytical tool, this paper examined empirically the relationship between economic growth and human capital development.

Wilson (2004) investigates the link between education and training in a country and its macroeconomic growth. An initial examination of broad statistics for all EU Member States advocates a loose connection between investment in human resources and growth in gross national product (GNP), but clear fundamental relationships are difficult to establish. According to the result increased investment in education is shown to lead higher productivity and earnings

for the individuals and also, such investment results in significant social rates of return. The returns on investment in vocational training are more difficult to demonstrate.

Appiah and McMahon (2002) assessed the net education effects outside growth and health effects on other vital factors of development in Africa, and similarly a new view of indirect reactions on economic growth and of externalities. The effects are shown to progress infant mortality, increase longevity, and strengthen civic institutions and democratization, increase political stability, and increase investment in physical capital, which in turn have positive overdue feedback effects on the economic growth process. The effects also lower fertility rates and population growth rates. They also establish the important net education effects reducing poverty, inequality and crime.

In Ethiopia, Abdu (2014) examined the relationship between real gross domestic product and various compositions of government expenditures such as: agriculture, education, health, transport and communication, urban development and housing, total capital expenditure and total recurrent expenditure in Ethiopia by using Co-integration and error correction model. The result of the study revealed that expenditure on health and total capital expenditure are both positive and statistically significant in explaining the economic growth in Ethiopia. But, Expenditure on agriculture, education, health, transport and communication, urban development and housing, and total recurrent expenditure are statically insignificant.

Kidanemariam (2013) revealed the long run and short run effect of human capital on economic growth in Ethiopia (using real GDP per capita as a proxy for economic growth) through the period 1974/75-2010/2011. He used the ARDL Approach to Co-integration and Error Correction Model in order to explore the long-run and short run impact of Human capital on Economic growth. The results of the Bounds test displays the stable long run relationship between real GDP per capita, education human capital, health human capital, labor force, gross capital formation, government expenditure and official development assistance.

Tewodros (2015) investigated the factors of economic growth in Ethiopia through the period 1974-2013. The Autoregressive Distributed Lag (ARDL) Approach to Co-integration and Error Correction Model are used in order to examine the long-run and short run relationship between

the dependent variable (real GDP) and its factors. The studies of the Bounds test explored that a stable long run relationship between real GDP, Physical capital, human capital, export, aid, external debt and inflation. The empirical outcomes expose that both physical capital and human capital are found to have positive effect on economic growth whereas debt affects economic growth negatively and statically significant at 1 per cent.

Tofik (2012) studied and explored a positive and significant relationship between capital expenditure on human capital and economic growth from year 1975 to year 2010.Likewise, public spending on education and health sector as a proxy for investment in human capital development, Teshome (2006) revealed that a positive effect of human capital development on economic growth in Ethiopia through 1960/61- 2003/04.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1. Source of Data

This section presents a simple growth model that attempts to capture the impact of some of the key macroeconomic variables including education at different levels on output growth in Ethiopia. The data and information for the study was collected from secondary source which are publication of MOE, National Bank of Ethiopia (NBE), Central Statistical Agency (CSA), Ministry of Finance and Economic Development (MOFED), World Bank and Ethiopian Economic Association (EEA).The data includes time series data on GDP, enrolment ratios on education, official exchange rate, exports, gross capital formation and imports.

3.2. Research Design

To realize the objective of this study, Explanatory or contributing research design was implemented. Besides, this the study has used quantitative research approach to examine the impact of education on economic growth in Ethiopia from the period 1980 to 2018.

3.3. Methods of Data Analysis and Interpretation

3.3.1. Descriptive Analysis

The collected data was analyzed by using descriptive method, which includes the use of percentages and tables. The data on education and economic growth include primary school enrolment, secondary school enrolment; secondary school enrolment vocational, official exchange rate, import and export were expressed and analyzed by using percentages and tables.

3.3.2. Model Specification

The main focus of this paper is to investigate the effect of primary and secondary school vocational education on Ethiopian economic growth. In this study a structured Cobb-Douglas production function is used with constant returns to scale where human capital is treated as an independent factor of production in the human capital augmented growth model to show the effect of education on economic growth (the model has been adapted from Leoning (2002)) which is as follows:

$$Y = AK^{\alpha}H^{\beta}L^{(1-\alpha-\beta)} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots eq(1)$$

Where Y- represents out put

A- is the level of technology

K, H and L are physical capital, human capital and labour at time t respectively.

Where α and β are elasticity of physical capital and human capital with respect to out- put, respectively. The model expressed as log linear model can be written as

$$LnYt = A + \alpha LnKt + \beta LnHt + \omega LnLt \ldots\ldots\ldots\ldots\ldots\ldots eq(2)$$

Where $\omega = 1 - \alpha - \beta$

According to theoretical framework advanced by Mankiw, Romerand Weil (1992) the following model is specified.

$$LnGDPt = (LnGCFt,, LnSCHENRt, LnMt, LnXt, LnOERt)$$

Where: $LnGDPt$ =natural logarithm of real GDP at time t

$LnGCFt =$ natural logarithm of gross capital formation at time t.

$LnSCHENROLt$ =natural logarithm of school enrolment (primary, secondary and others) at time t.

$LnMt =$ natural logarithm of import at time t.

$LnXt =$ natural logarithm of export at time t.

$LnOERt =$ natural logarithm of official exchange rate at time t.

3.4. Definition of Variables

Gross Domestic Product (GDP): is final value of goods and services newly produced with in a nation during fixed period of time.

Gross capital formation (GCF): is the proxy for physical capital stock of the economy. Therefore in this study, gross capital formation is used as proxy of this variable and is expected to have a positive impact on economic growth, because the accumulation of the capital is supposed to favour the growth of the real GDP by fostering further production of new goods and services.

School enrolment (SCHENROL): Implies the number of student who registered in primary, secondary and tertiary school. Various theoretical and empirical literatures shows school enrolment increase productivity, further leads economic growth. In this study school enrolment is expected to have a positive and significant impact on economic growth.

Exports(X): Exports of goods are taken as a percentage of gross domestic product at current market price. In this study it is expected to have positive effect on economic growth.

Imports (M): imports are foreign goods and services bought by citizens, businesses and government of another country. In this study it is expected to have negative effect on economic growth.

Official exchange rate (OER): at which the currency of one country can be exchanged for the currency of another country. It increases international competitiveness and promote export. Hence in this study it is expected to have positive impact on economic growth.

All of the above variables are given in the logarithm form. The log-linear form of specification allows the researcher to interpret the coefficient directly as elasticity with respect to the independent variables.

3.5. Method of Data Analysis and Estimation Technique

The method of data analysis and estimation technique of this paper has the following steps: first the presence of a unit root in all variables in levels should be checked. Second, for confirming the validity of the fitted model diagnostic tests are employed, i.e,Breush and Godfray LM test to check for serial correlation problem and Breusch- Pagan Godfrey heteroskedasticity test for reliability of the residuals of the residuals. Thirdly, the existence of co integration among the variables and selection of the approach that should be used to analysis the effect of education on

economic growth should be tested. In addition to the econometrics analysis and estimation technique, the study used descriptive statistics in order to analyse the data.

3.5.1. Unit Root Tests

Unit root test is used to test stationarity or non-stationarity of variables. It has been prevalent over the past several years. The DF and the ADF tests are the most popular tests used for unit root. Most of the economic time series variables are non-stationary and the use of non-stationary time series leads to spurious regression, if not co integrated. A variable is said to be weakly stationary if it's mean, variance and auto-covariance remains the same no matter at what point we measure them. The null hypothesis of non-stationarity is tested against alternative hypothesis of stationarity. In this study the unit root test is used to test the stationarity of variables. It is an exploration of the characteristics of the individual time series variables involved (Gujarati, 2004).

Hence, using critical values usual t-test can lead to over-rejection of the null hypotheses when it is true (Ibid). Therefore, Dickey and Fuller have established a test known as the Augmented Dickey-Fuller (ADF) test to resolve this kind of difficulty (Green, 2004). In the ADF test, the lags of the first difference dependent variable is added in the regression equation until the autocorrelation problem will be decided. The ADF test procedure for unit roots is related to statistical tests for hypothesis however, the critical values of the tau test to test the hypothesis (Gujrati, 2004) is taken from the DF tables. In addition, the lag-length of the ARDL model is resolute by Akaike Information Criterion (AIC).

3.5.2. Co integration Test

Co-integration is a statistical property that defines long run relationship of economic time series. To examine the relationship between economic growth and education, the study used autoregressive distributed lag (ARDL) model which performs in recent empirical investigation. The econometrics advantage of ARDL model is appropriate regardless of the degree of integration of the variable (i.e. whether the variable I (0), I (1) or mixture of the both), achieves better for small sample size, long run and short run parameters of the model are estimated simultaneously. If all variables are found to be I (1) the study will use the error correction model (ECM).

The ARDL method offers unbiased and effective estimates of the long run model. A stated advantage, the researcher has used the ARDL method of co-integration to explore the effect of education on economic growth. The ARDL approach comprises two steps for estimating the long-run relationship (Pesaran, Shin, and Smith, 2001). These are to examine the existence of long-run relationship among all variables in an equation and to estimate the long-run and short-run coefficients of the model. We run to the second step only if we find a Co-integration relationship in the first step.

The advantage of ARDL: First, it is more statistically significant model to determine the co integration relation in small samples as the case in this study (Pesaran et al., 2001; Narayan, 2004). A second advantage of the ARDL model is that while other co integration techniques require all of the regressors to be integrated of the same order one; the ARDL model can be functional whether the regressors are purely order zero [I(0)], purely order one [I(1)], or mixture of both. This means that it avoids the pre-testing problems related with standard Co integration, which requires that the variables be I (1) (Pessaran et al., 2001). Third, with the ARDL model it is possible that different variables have different optimal numbers of lags. Forth, the other advantage of bound testing approach is that long run and short run parameters of the model in questions are determined simultaneously.

CHAPTER FOUR: RESULT AND DISCUSSIONS

The general objective of this study is to analyze the impact of primary and secondary school vocational education on economic growth in Ethiopia using latest econometric technique of ARDL model. For this study, GDP, gross capital formation, official exchange rate, school enrolment (primary, secondary and secondary vocational), import and export collected from various institutions from 1980 up to 2018.

4.1. Descriptive analysis

Table 1: Summary Statistical results for the data 1980-2018

Summary Statistical results for the data series 1980-2018							
Variables	LNRGDP B' B	LNEXPRT B'B	LNGCF B'B	LNIMPORT B' B	LNOER %	LNPSCE1 Millions	LNSSCOV Millions
Mean	11.528	9.705	10.829	10.243	0.807	6.749	4.460
Median	11.576	9.592	10.678	10.079	0.907	6.739	3.980
Maximum	12.272	10.866	11.821	11.616	1.4220	7.260	5.584
Minimum	11.007	8.46	11.205	9.141	0.254	6.257	3.549
Std.Dev	0.431	0.746	0.465	0.845	0.372	0.352	0.782
Skewness	0.294	0.265	8.820	0.290	-0.1023	0.100	0.406
Kurtosis	1.56	1.74	2.645	1.682	1.762	1.382	1.445
Jarque-Bera	3.814	2.931	4.460	3.284	2.492	4.209	4.869
Probabilities	0.148	0.231	0.107	0.193	0.287	0.121	0.087

According to the results from above table the average value of Log of Real GDP was 11.528 Billion Birr, the average value of Log of export was 9.705 Billion Birr and the average value of Log of gross capital formation was 10.829 Billion Birr. Likewise the average value of Log official exchange rate was 0.807 per cent, the average value of Log primary school enrolment was 6.749 Million and the average value of secondary school vocational enrolment was 4.460 Million during the study time. The maximum and minimum values are important to identify the outliers of the observations of the study.

4.1.1. Trend of GDP in Ethiopia

The Ethiopian economic growth has shown various changes in different political regimes. The changes in government structure created a problem of inconsistency in implementing the policies by previous regimes including external and internal wars as well as natural disaster like famine and drought had a depressing effect on the history of economic growth of the country.

Gross domestic product of Ethiopia grew 7.7 per cent in 2018 compared to the preceding years. This rate is 2.5 per cent less than the figure of 10.2 per cent registered in 2017. The GDP figure in 2018 was $80,289 million.

The annual GDP of Ethiopia was $7,385 million in 1980 and it reaches $80,289 million in 2018. However, the annual growth rate of real GDP between the two periods was experiencing both negative and positive growths. In current regime the figure of real GDP is higher than that of Derge regime.

4.1.2. National Education Spending

Public intervention in the area of education, particularly elementary education is universally accepted. From the lens of education as a fundamental right, such intervention directly follows from the basic feature of the paradigm. Even if an alternative paradigm of a modern welfare state is preferred, its well accepted tenets lead to a substantive role of the government in the area of education. What is required is that the government should be interested in the long term increase in the expected income of its citizens, higher growth of the economy and lower poverty levels. All three are non-controversial as government objectives. Public pursuance of a policy of better educated citizens can pay dividends for all the three stated goals as revealed by the empirical literature on various aspects of education.

The role education in economic development has been recognized for quite some time in mainstream economic literature. It has both intrinsic and instrumental value. It is desirable not only for the individual but also for the society as a whole (**Sen, 1999**). Cross country studies have tried to quantify the impact of government expenditure in raising educational and health indicators. The effectiveness and efficiency of government expenditure in the social sector varies between different geographical regions and also depends on the stage of development.

Innovation institutional arrangements and alternative financing mechanisms are being explored in order to supplement public funds, and to improve the effectiveness of the public resources thus invested.

The trends in national education expenditure, tracked through the federal and regional governments' budgetary system, has increased more than two-fold from ETB 36.1 billion in 2012/13 to about ETB 88.6 billion in 2016/17, showing an annual average growth rate of 25.5 per cent and 14.4 per cent in nominal and real terms, respectively. This increasing trend is mainly due to growing recurrent costs as the system expands – in particular expansion in higher and secondary education. Moreover, the education sector accounts for the largest proportion of the government's spending at 27 per cent of total expenditure in 2016/17 reflecting Ethiopia meets the internationally agreed targets set out by the Education for All (EFA) coalition of 20 per cent of total government expenditure heading to finance education expenditure.

4.2. Econometric Analysis

4.2.1. Augmented Dickey-Fuller Unit Root Test

Numerous studies have revealed that many macro-economic time series variables are non-stationary and integrated of order 1 (i.e.; their first difference is stationary). In this study the time series variables deliberated are official exchange rate, gross capital formation, school enrolment, real GDP, export and import. To apply the ARDL methodology, we first implement unit root test on these time series variables to found whether they are stationary or not. Although the ARDL procedure does not require pre-testing the variable for stationarity tests, the tests deliver direction as to whether ARDL approach to the data analysis is appropriate or not, subsequently the approach is only appropriate for the analysis of variables that are integrated of order not more than one [I(1)]. The variables are, therefore, first tested for stationarity, before any analysis is done, using Augmented Dickey-Fuller test. The results of the unit root tests for all the variables are presented in table below.

Table 2: ADF unit root test results

Variable	at level with intercept		With trend and intercept		Non (without trend and intercept		Frist df at intercept		Frist df at trend and intercept		Frist df at at non	
	ADF	P	ADF	P	ADF	P	ADF	P	ADF	P	ADF	P
lnRGDP	-2.49	0.989	-2.29	0.435	3.67	0.978	-5.57	0.0015	-5.05	0.0012	-4.32	0.001
Lnimport	0.867	0.993	-2.03	0.567	5.63	0.998	-2.96	0.043	-5.78	0.0001	-2.01	0.03
Lnexport	0.262	0.975	-2.73	0.235	5.62	0.999	-5.33	0.0001	-5.33	0.0005	-2.84	0.0006
Loner	0.204	0.964	-2.65	0.260	2.93	0.998	-5.19	0.0001	-5.17	0.0009	-2.63	0.010
lnGCF	1.349	0.998	-1.983	0.590	2.857	0.998	-7.3	0.00001	-7.57	0.0000	-3.26	0.0036
Lnpsche	-0.18	0.931	-1.99	0.583	2.067	0.9821	-4.31	0.0014	-4.33	0.007	-3.67	0.0005
Lnsshev	-1.09	0.807	-4.626	0.000	0.873	0.892	-6.13	0.000	-6.04	0.0001	-9.4	0.0001

Where,

ln_ Log in base ten

RGDP_Real Gross Domestic Product

oer_official exchange rate

GCF_gross capital formation

psche_primary school enrolment

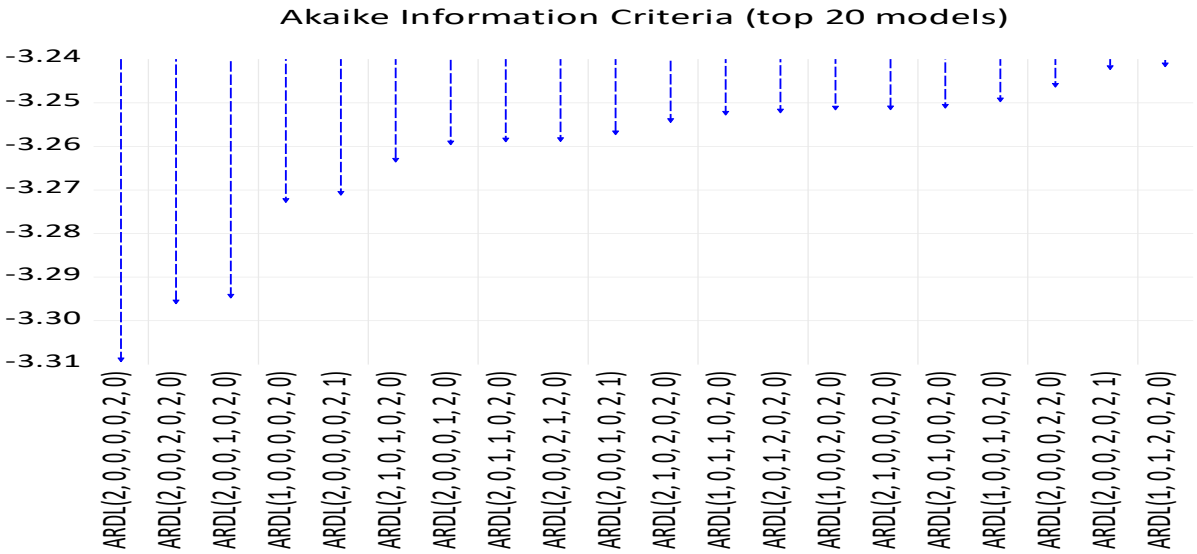
ssev_secondary school enrolment vocational

The results reported in above table show that all the variables are stationary at level with intercept and without trend and intercept. Log of Real GDP, import, export, official exchange rate, gross capital formation and primary school enrolment are non-stationary with trend and intercept. While secondary school enrolment vocational is stationary. On the other hand all variables are stationary in their first difference with intercept, first difference with intercept and trend and first difference without trend and intercept. These results indicate that all of the variables are integrated of order one [(1)]. But secondary school enrolment vocational is integrated of order zero [(0)] at first difference with intercept. This is one of the main reasons for using the ARDL model. From this we conclude that all of the variables entered in the regression are orders not more than one. So ARDL Co integration technique proposed by Pesaran et al., (2001) is the most suitable method for estimation or to check the long run relationship among the variables.

4.2.2. Model Stability and Diagnostic Test

In this study Akaike information criterion (AIC) is used to decide the optimal lag length of each variable automatically because it is a better choice for small sample size data. Moreover, according to (Narayan, 2004b)length is recommended to choose the optimal lag for each variable. Therefore, in this paper a maximum lag length of 2 was chosen for the conditional ARDL model. Finally, in this model AIC selects the optimal lag length of each variable ARDL (2, 0, 0, 0, 2,0).

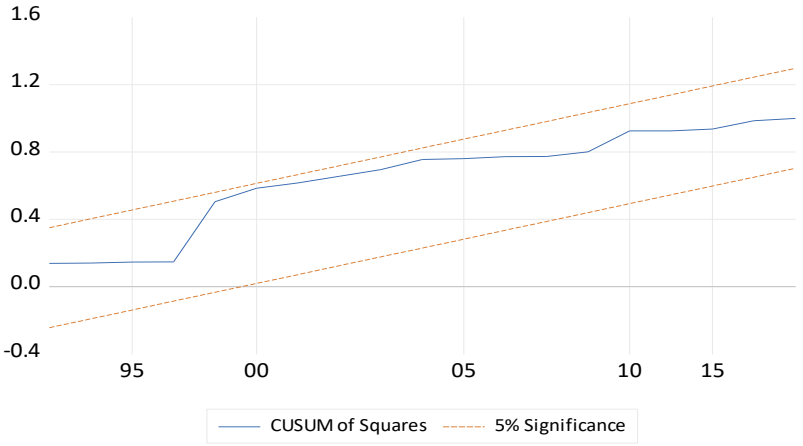
Figure 1: Model selection: by graphical method



Furthermore, the stability of the model for long run and short run relationship is identified by using the cumulative sum of recursive residuals (CUSUM) and the cumulative sum of squares of recursive residuals (CUSUMSQ) tests. The test discovers serious parameter instability if the cumulative sum goes outside the area (never returns back) between the two critical lines.

As shown from the first figure, the plot of CUSUM test did not cross the critical limits. Similarly, the CUSUMSQ test displays that the graphs do not cross the lower and upper critical limits. So, we can conclude that long run estimates are stable and there is no any structural break, hence the results of the estimated model are reliable and efficient.

Figure 2: model stability Test



From this figure the plots of CUSUM Squares are in 95 per cent confidence interval. This shows that residuals are stable.

Table 3: Breusch Godfrey Serial Correlation LM Test

F- Statistic	1.974682	Prob.F (1, 23)	0.1733
Obs*R-squared	2.846424	Prob.Chi-Square (1)	0.0916

Source: Eviews10.0 results

From this table the p-value 0.1733 is greater than 0.05 indicates the absence of autocorrelation. Therefore, residuals are not auto correlated by using Breusch Godfrey test.

Table 4: Jarque- Bera test

Residual diagnosis test	Test statistic	p-value
Auto correlation test	2.93	0.23
Breusch Godfrey Serial Correlation LM Test	Chi-Square (1)	0.091
ARCHtestofhetroskedasticity	Chi-Square (1)	0.810
Normality of residual	Jarque-Bera test 0.275	0.871

According to table 4 the P-value of Jarque-Bera test is gereater than 0.05 (0.871> 0.05) shows that the residuals are normally distributed.

4.2.3. Results of Long run Relationship

After defining the order of integration and demonstrating the presence of Co-integration among the variables, then the model can be predicted. Consequently, the long run parameters were determined by applying long run model. The result is given in the following table below.

Table 5: Long Run ARDL Model Estimation

Included observations:36

Conditional Error Correction Regression

Variables	Coefficient	Std.Error	t-Statsitic	Prob.
C	2.628176	0.894895	2.936855	0.0072
@Trend	0.0012	0.007597	0.158354	0.8755
LNRGDP(-1)*	-0.766200	0.175548	-4.364613	0.0002
LNEPRT**	-0.080125	0.107991	-0.741961	0.4653
LNGCF**	0.160408	0.072347	2.217206	0.0363
LNIMPORT**	0.076009	0.150632	0.504599	0.6184
LNOER**	0.099623	0.168594	0.590909	0.5601
LNPSCE(-1)	0.674121	0.177740	3.792729	0.0009
LNSSCOV**	-0.038703	0.022344	-1.732152	0.0961
D(LNRGDP(-1))	0.259271	0.162164	1.598821	0.1229
D(LNPSCE)	0.649427	0.222735	2.915691	0.0076
D(LNPSCE(-1))	-0.611501	0.217474	-2.811836	0.0097

*p_ value incompatible with t- Bounds distribution

** Variable interpreted as Z=Z(-1)+D(Z)

Levels Equation

Unrestricted Constant and Unrestricted Constant

Variable	Coefficient	Std.Error	t-Statistic	Prob.
LNEXPRT	-0.104575	0.136165	-0.768003	0.4500
LNGCF	0.209356	0.078172	2.678157	0.0131
LNIMPORT	0.099202	0.192365	0.515696	0.6108
LNOER	0.130023	0.217031	0.515696	0.5547
LNPSCE	0.879824	0.150540	5.844439	0.0000
LNSSCOV	-0.050513	0.030581	-1.651791	0.1116

$$EC = LNRGDP - (-0.1046 * LNEXPRT + 0.2094 * LNGCF + 0.0992 * LNIMPORT + 0.1300 * LNOER + 0.8798 * LNPSCE - 0.0505 * LNSSCOV)$$

F-Bounds Test — Null Hypothesis: No Levels Relationship

Test Statistic	Value	Signif.	I(0)	I(1)
			Asymptotic: n = 1000	
F-Statistic	3.236733	10%	2.53	3.59
K	6	5%	2.87	4
		2.5%	3.19	4.38

		1%	3.6	4.6
Actual Sample Siz: 36		Finite Sample:		
			n =40	
		10%	2.831	4.004
		5%	3.327	4.7
		1%	4.527	6.263
t-Bounds Test		Null Hypothesis: No Levels Relationship		
Test Statistic	Value	Signif.	I(o)	I(1)
t-Statistic	-4.364613	10%	-3.13	-4.37
		5%	-3.41	-4.69
		2.5%	-3.65	-4.96
		1%	-3.96	-5.31

According to the results in the above table LNPSCE and LNGCF were statistically significant variables that contribute in economic growth during 1980 to 2018. The coefficients of LNPSSCE and LNGCF show the existence of positive and long run impact on economic growth. But the variable LNSSCOV shows that the existence of negative impact and it is statistically significant. Whereas LNEXPRT, LNIMPORT and LNOER were statistically insignificant and have positive long run impact except LNEPRT this has negative coefficient.

As the long run estimated result from the above table indicated, the gross capital formation and primary school have a positive impact on Ethiopian economic growth and statistically significant at 1 per cent significance level. This result suggests that as 1 per cent increase in gross capital formation the real GDP also increased by 0.21 per cent. The same as gross capital formation, 1 per cent increase in primary school enrolment increases real GDP by 0.88 per cent. Therefore, one of these independent variables increases, the dependent variable will also increase and vice versa.

4.2.3. Short Run Error Correction Model

Table 6: Short Run Error Correction Model

ARDL Error Correction Regression
Dependent Variable :D(LNRGDP)
Selected Model: ARDL(2,0,0,0,0,2,0)
Unrestricted Constant and Unrestricted Trend
Sample:1980-2018
Included Observations:36

ECM Regression
Unrestricted Constant and Unrestricted Trend

Variables	Coefficient	Std.Error	t-Statsitic	Prob.
C	2.628176	0.492222	5.339418	0.0000
@Trend	0.001203	0.000605	1.987693	0.0584
D(LNRGDP(-1))	0.259271	0.138150	1.876742	0.0728
D(LNPSCE)	0.649427	0.161559	4.019761	0.0005
D(LNPSCE(-1))	-0.611501	0.170906	-3.577990	0.0015
CointEq (-1)	-0.766200	0.143974	-5.321787	0.0000
R-Squared	0.572369	Mean Dependent Variable		0.034670
Adjusted R-Squared	0.501098	S.D. Dependent Variable		0.053106
S.E. of Regression	0.037510	Akaike Information Criterion		3.577397
Sum Squared Residual	0.042210	Schwarz Criterion		3.31377
Log Likeli Hood	70.39314	Hannan-Quinn-Criterion		3.485282
F-Statistic	8.030802	Durbin-Watson stat		2.164396
Prob (F-Statistic)	0.000067			

According to the above table it can be decided that both dependent and independent variables are stationary at first difference. This is for the reason that the coefficient of the error correction term has negative sign that is less than one (-0.766) and extremely significant at 1 per cent. An error correction model (ECM) fits to a category of multiple time series models most commonly used for data where the fundamental variables have a long run stochastic trend. ECM is theoretically determined methodology useful for assessing both short run and long run effects of one time series on another. The word error correction relates to the fact that last period's deviation from long run equilibrium, the error, influences its short run dynamics. Thus ECM directly estimates

the quickness at which a dependent variable proceeds to equilibrium after a change in other variables.

From the above table the coefficient of error correction term -0.77 is highly significant at 1 per cent and has appropriate negative sign. Hence it will rightly act to correct any shocks from the long run equilibrium up to adjust of 77 per cent. This significant value of ECM clarifies the presence of short run and long run equilibrium relationship between education and economic growth in Ethiopia. This recognized the long run equilibrium relationship in the result tells that the findings can be used for predicting and policy recommendations.

4.3. Discussions

According to this study the researcher found out that education has positive and significant impact on economic growth in Ethiopia. Especially primary school enrolment has positive and significant effect both in the short run and long run. A substantial amount of evidence on the positive economic effects of a completed primary education, especially for those working in agriculture, has been produced over the past 40 years (UNESCO, 2010). A study which demonstrated the effect of accomplishment in fifty countries between 1960 and 2000 initiated that an additional year of schooling can rise a person's incomes by 10 per cent and average GDP by 0.37 annually (Hanushek et al.,2008). Hence this paper also supports this argument that is the expansion of primary school leads to improve economic growth and development.

However, secondary school vocational enrolment has negative and statistically insignificant impact on economic growth. It may be because Ethiopia is less industrialized country. For more industrialized countries secondary school vocational enrolment play a key role in economic development. Further enrolment in secondary school vocational in Ethiopia is important but may not be sufficient to ensure that students have harvested sufficient knowledge and skills that will enable them to create productive job and employment because secondary school vocational in a country is claimed less quality education.

Gross capital formation in this study has statistically significant and positive impact on economic growth in Ethiopia. The result is consistent with the study conducted by (TeferaYitayew, 2017). This study revealed that gross capital formation has long run significant effect on economic

growth in Ethiopia. This result inferred that gross capital formation contributes to sustainable economic growth both on the demand side and the supply side, because an important part of these expenditures are devoted to the renewal of the firms' fixed capital. In macro theory, an increase in investment should improve towards higher aggregate demand (AD) and also increase productive capability. Increasing investment should lead to higher economic growth in the long run though it depends on how effective the investment is.

According to this study import has insignificant positive effect on economic growth in the long run. It has unexpected sign in this study. A high level of imports indicates robust domestic demand and a growing economy. If these imports are mainly productive assets, such as machinery and equipment, this is even more favorable for a country since productive assets will improve the economy's productivity over the long run.

Official exchange rate has insignificant positive impact on economic growth in the long run. It is insignificant because it fluctuates daily with the changing market forces of supply and demand of currencies from one country to another. This study revealed that official exchange rate has positive impact on the economy. This is because official exchange rate has its own advantage in reducing the black market. If the black market is reduced the government can use money for different purposes and the economy of the country is also stabilized.

However, export has insignificant negative impact on economic growth in the long run during the study period. This is because Ethiopia is less industrialized country in the world and the share of export from its GDP is very small. Due to this reason the result from this study revealed that export has insignificant negative effect on economic growth in Ethiopia.

Generally, the result of this study was to explore the impact of education on economic growth in Ethiopia. Hence the result was significant and positive both in the short run and long run especially primary school enrolment has positive and significant effect both in the short run and long run as we see from the result above.

CHAPTER FIVE: CONCLUSSION ANDPOLICY RECOMENDATIONS

This chapter delivers the conclusions of the study and various policy recommendations which need to be practical in order to expand education in Ethiopia.

5.1. Conclusions

The main objective of this study was to theoretically and empirically determine the impact of primary and secondary school vocational education on economic growth in Ethiopia by using the time series data for the period 1980 to 2018. Descriptive and time series techniques were used to decide the trends of real GDP and the effect of independent variables such as official exchange rate, imports and exports, gross capital formation and school enrolments on economic growth respectively. The study has used the ARDL model to co-integration and the error correction model (ECM).

The results of the long run model revealed that gross capital formation and primary school enrolment have positive and statistically significant effect on real gross domestic product in the long run, while secondary school enrolment vocational has negative and significant effect. Whereas export, import and official exchange rate were statistically insignificant and have positive long run relationship except export which has negative long run relationship.

Based on the results of short run dynamic model, the magnitude of the error correction coefficient is -0.766 implying that within one year it adjusts about 77 per cent of the disequilibria. In this study official exchange rate, primary school enrolment and gross capital formation have expected sign, while secondary school enrolment vocational, export and import have unexpected sign.

Education inhabits a crucial role in modern thinking about growth. In spite of a large literature on the matter, there is a lot to be educated: there is no consensus of its role in growth and development, apparently as this role varies across different institutional settings and national environments.

According to economic growth theory, educational accomplishment in an economy has an energetic role in enhancing and promoting output or economic development. In order to test this hypothesis, education proxied by school enrolment was considered to play an important role in

economic growth mainly as an element for improvement of the country's gross domestic product. Hence the result obtained from this study supports the argument.

In this paper doing on secondary school vocational has value addition. Many researchers have studied the relationship between education and economic growth taking primary, secondary and tertiary school enrolment as a school enrolment variable. But most of the time they don't take secondary school vocational enrolment as a factor hence this is value addition for me in this paper.

5.2. Policy Implications

Despite significant progress, Ethiopia is still one of the world's poorest countries; while it has achieved most of the millennium development goals (MDGs) and making progress towards the sustainable development goals (SDGs). Given its low starting point, considerable investment and improved policies are needed to help the country reach its development objectives. Ethiopia's main challenges are sustaining its positive economic growth and accelerating poverty reduction.
In order to achieve sustainable economic development in Ethiopia government should spend resources in education and gross capital formation. This measure has a large positive impact on increasing economic growth that leads to improve national output. In order to increase education in Ethiopia the government should facilitate infrastructures which are needed for education especially in rural parts of Ethiopia. Hence educated societies will bring technology and innovation, which is believed to be a spring board of economic growth.

There is a need for a shared responsibility in educating our population. This means that private sector should also play a major role in the education sector through public-private partnership in educational infrastructure. The private sector should also increase support in research grants which will ultimately culminate in the discovery of new production technologies and improved physical investments. Increasing financial support particularly for the more vulnerable children like the girl child and orphans should also be considered. Enlarging the participation of women in education can contribute more to economic growth through reduced fertility, late marriages which results in a more educated future generation. This will significantly contribute to increase economic growth.

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ANNEX

Test of residuals

Table 1: ARCH Heteroskedasticity Test

F-Statistic	0.058742	Prob.F(1,21)	0.810
Obs*R-squared	0.064157	Prob.Chi-Square (1)	0.8000

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob*
. |** |	. |** |	1	0.229	0.229	2.0448	0.153
. |*. |	. |*. |	2	0.148	0.101	2.9313	0.231

*Probabilities may not be valid for this equation specification.

Table 2: Breusch Godfrey Serial Correlation LM Test

F- Statistic	1.974682	Prob .F (1, 23)	0.1733
Obs*R-squared	2.846424	Prob.Chi-Square (1)	0.0916

Source: Eviews 10.0 results