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THE IMPACT OF HUMAN CAPITAL ON ECONOMIC GROWTH IN ETHIOPIA

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DECLARATION

I, TeferaYitayew declare that, this study, "impact of human capital 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 Art 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 St. Mary's University, School of Graduate Studies for examination with my approval as a university advisor.

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As members of board of examining of the final MSc thesis , we certify that we have read and evaluated the Thesis prepared by Tefera Yitayew Bayleyegn entitled "The Impact of Human capital on Economic Growth" and recommend that the Thesis is accepted as fulfilling the thesis requirement for the degree of Master of Art in Development Economics.

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List of Tables

List of figures

LIST OF ACRONYMS

ADF……………..…. Augmented Dicky Fuller

AR.…………………… Autoregressive Order

ARDL………………… Autoregressive Distributed Lag

CPI……………….…..Consumer Price Index

CSA……………………Central statistical agency

DF………………..…... Dicky Fuller

DW……………………. Durbin Watson

ECT………………….... Error Correction Term

EEA/EEPRI…….……... Ethiopian Economic association

GTP……………………Growth and Transformation Plan

HD…………………….Human Development Index

HSDP…………….…… Health Sector Development Plans

ILO…………………… International Labor Organization

MOE………………….. Ministry of Education

MOH………………….. Ministry of Health

MOFED…………………. Ministry of Finance and Economic Development

NBE……………….…… National Bank of Ethiopia

ODA………………..…... Official Development Assistance

OLS……………….…… Ordinary Least Square

R&D…………………….....Research and Development

UNESCO………….….. United Nations Educational, Scientific and Cultural Organization

VECM……………….... Vector Error Correction Model

ABSTRACT

The general objective of the study was to examine the impact of human capital on economic growth in Ethiopia using real GDP as a proxy for economic growth and education expenditure, health expenditure, official development assistance and school enrolment (primary, secondary and tertiary) as a proxy of human capital over the period 1974 -2015. Wide differences of various empirical studies are found in the model specifications, human capital approximation and the results obtained. The study answers the research question: Is human capital having long run and short run significances impact on economic growth in Ethiopia? The sources of data being used in this study are secondary data which obtained from various sources. The ARDL Approach to Co-integration and Error Correction Model are applied in order to investigate the long-run and short run impact of Human capital on Economic growth respectively. The finding of the Bounds test shows that there is a stable long run relationship between real GDP, education expenditure, health expenditure, labor force, gross capital formation, official development assistance and school enrolment. The result of this research showed that expenditure on health, expenditure on education, and growth capital formation are positive and statistically significant long run and short run effect on economic growth of Ethiopia. The economic performance can be improved significantly when the expenditure on health, expenditure on education and growth capital formation improves. However, school enrolment and official development assistance are statically significant and negative long run and short run impact on economic growth. This shows that, the increase in enrolment rate is not sufficient to sustain the growth. What is more important is how the amount is utilized and quality of education. However, there may be a mismatch between the skills taught by the educational system and the skills needed by the labor market, so educated workers may end up doing low productivity jobs. Thus, despite a country's achievements in accumulating human capital through the school enrolment, this achievement may not lead to economic growth and poverty reduction if the labor market and quality is not considered. Hence the government should strive to create institutional capacity and continue its leadership role in creating and enabling environment that encourage better investment in human capital (education and health) by strengthening the infrastructure of institutions that produce quality manpower. Moreover, future researches in this area are suggested.

Keywords: Economic Growth, Human Capital, ARDL, ECM, Ethiopia.

Table of Contents

CHAPTER ONE: INTRODUCTION

CHAPTER TWO: LITERATURE REVIEW

CHAPTER ONE: INTRODUCTION

1.1. Background of the study

Traditionally, economic theory has given emphasis on physical capital accumulation as the most important source of economic growth, at least in the short-run and exogenous technical progress being the long-run determinant of growth. The exogeneity of technological progress in the neoclassical growth model and the difficulty of explaining long-term economic growth (because of diminishing returns to physical capital) have restricted the analytical capacity of the neoclassical model and its empirical verification. The endogenous growth models developed by Romer (1986) and Lucas (1988) were giving emphasis on human capital accumulation and its roles for economic growth (Mankiu, 2009).

Economic growth is gradual and steady process which continues even in the long period and this gradual and steady process helps to raising the level of output, income and employment. The concept of investment in human being and its role on economic growth is an old concept and new theory of economic growth developed in the early 80's to emphasizing the importance of human capital in long term economic growth. One of the characteristics of modern economic growth is technological progress including of existing physical and human resources account for most of measured historical increase in the per capital growth domestic product(Lingaiah,2001).

International differences in income per person can be attributed to either (1) differences in the factors of production, such as the quantities of physical and human capital, or (2) differences in the efficiency with which economies use their factors of production. That is, a worker in a poor country may be poor because he lacks tools and skills or because the tools and skills he has are not being put to their best use. To describe this issue in terms of the Solow model, the question is whether the large gap between rich and poor is explained by differences in capital accumulation (including human capital) or differences in the production function. Although the capital variable in the Solow model is usually interpreted as including only physical capital, in many ways human capital is analogous to physical capital. Like physical capital, human capital increases our ability to produce goods and services. Raising the level of human capital requires investment in the form of teachers, libraries, and student time. Recent research on economic growth has

emphasized that human capital is at least as important as physical capital in explaining international differences in standards of living (Mankiu, 2009).

National wealth should also include the value of the skills and training of the countries residents what economists call human capital in practice. Endogenous growth theorists have provided a number of reasons to explain why in the firms and the economy as a whole, the marginal productivity of capital may not be diminishing. One explanation emphasizes the role of human capital the economist's term for the knowledge, skills, and training of individuals. As economies accumulate capital and become richer, they devote more resources to investing in people through improved nutrition, schooling, health care, and on-the-job training. This investment in people increases the country's human capital, which in turn raises productivity If the physical capital stock increases while the stock of human capital is remains fixed, there will be diminishing marginal productivity of physical capita. Recent research findings point to a strong connection between productivity growth and human capital. The government affects human capital development through educational policies, worker training, health programs, and in other ways (Andrew et al, 2001).

Health and education are both components of human capital and contributors to human welfare. One index of human welfare, which incorporates income, education and health, shows that Africa's level of human development is the lowest of any region in the world. Work can enhance human development when policies are taken to expand productive, remunerative and satisfying work opportunities; enhance workers' skills and potentials; and ensure their rights, safety, and wellbeing. Measuring aspects of work, both positive and negative, can help shape policy agendas and track progress toward human development enhancing work (UNDP, 2015).

Africa has found slow economic growth severely limits the ability of governments and households to fund further investments in health and education. Low investments in human capital may impinge on already low growth rates of income. Such interrelations might be thought to imply a vicious circle of development, but this should not be overstated. Poor countries have considerable discretion over how much to invest in health and education. Since Independence, Africa has achieved a rapid growth of some aspects of human capital particularly in the expansion of education despite starting from a low level of income. The expansion of the human capital stock has not been matched by a commensurate rise in physical capital. The result has

been low growth of incomes and low returns to the educational investment. A nation's human capital endowment the skills and capacities that reside in people and that are put to productive use can be a more important determinant of its long term economic success than virtually any other resource. This resource must be invested in and leveraged efficiently in order for it to generate returns, for the individuals involved as well as an economy as a whole.

Ethiopia is one of the second populous countries in sub Saharan Africa and one of the world poorest countries. The country's per capita income of $590 is substantially lower than the regional average. The government of Ethiopia currently implements the second phase of its growth and transformation plan (GTP II). GTP II which will run from 2015/16 to 2019/20 aims to continue improvements in physical infrastructure through public investment projects. Ethiopia is also among the countries that have made the greatest progress towards achieving the Millennium Development Goal (MDGs). Over the past two decades, there has been significant progress in key human development indicators: primary school enrollments have quadrupled, child mortality has been cut in half and now strategically planning for the Sustainable Development Goals (WB, 2015).

The general objective of the study was to examine the impact of human capital on economic growth in Ethiopia using real GDP over the period 1974 -2015. Wide differences of various empirical studies are found in the model specifications, human capital approximation and the results obtained. The ARDL Approach to Co-integration and Error Correction Model are applied in order to investigate the long-run and short run impact of Human capital on Economic growth respectively. The result of this research showed that expenditure on health, expenditure on education, and growth capital formation are positive and statistically significant long run and short run effect on economic growth of Ethiopia. The economic performance can be improved significantly when the expenditure on health, expenditure on education and growth capital formation improves. However, school enrolment and official development assistance are statically significant and negative long run and short run impact on economic growth. This shows that, the increase in enrolment rate is not sufficient to sustain the growth. However, there may be a mismatch between the skills taught by the educational system and the skills needed by the labor market, so educated workers may end up doing low productivity jobs. Without efficient and sound policy, strong institutional structure foreign assistance to governments is dangerous

because it increases the power of the elite in the recipient governments, leads to corruption and hinders economic growth. It also discourages the growth of private sector investments, encourages public sector led growth.

1.2. Statement of the problem

Human capital is acquired mental and physical ability to human being through education, skill development, training, health care and other capacities of people to enhance their productivity and efficiency. It refers to any aspects of person that produces economic values which includes personal attributes such as health, nutrition status, knowledge and skills (Todaro, 2012).

Thus, human capital is regarded as even more important than physical capital development. The quality of human being as a productive source has been consistently improving due to improvement in education and skills, availability of health services etc. Underdeveloped countries are faced by the diverse manpower problems. So, they spread the education, knowledge and knowhow and raise the level of skills and physical efficiency of the people for fast growth of their economy (Lingaiah, 2001).

According to economic theory human capital especially education and health in an economy has long been viewed as important factors in enhancing and promoting output or economic growth (Wilson etal, 2005).

Human capital has gained significant importance in growth theories. Various researchers have utilized different proxies for human capital and got different result about the relationship between human capital and economic growth in the world. Studies made by various scholars such as Schltz, Habison, Kendrik, Anramoviz, Becker, Bowman, Simon and Kuznets other economists shown that increased education of the labor force appears to explain a substantial part of the growth of output in both developed and developing countries.

Mankiw et al (1992) and Barro (1991) examined variations in secondary school enrolment rates, using a single cross-section of both the industrialized and the less- developed countries. Both studies concluded that schooling has a significantly positive impact on economic growth. Barro and Sala-i-Martin (1995) also investigated the impact of educational expenditures by governments. Their findings showed a strong positive impact. Odit(2010) also suggested that

4

human capital plays important role on economic growth in mauritius using education as a proxy of human capital. Similarly, Wilson (2004) investigated the impact of human capital on economic growth using education and training as a proxy of human capital and concluded impact of investment in education and training on national economic growth is positive and significant. But all of the above empirical studies used only education as aproxy of human capital.

On the other hand Pelinescu (2014) investigated that there is a positive and statically significant relationship between GDP per capital and secondary education, but the relationship between education expenditure in GDP and GDP per capital is negative which is contradict to Barro and Sala-i-Martin (1995). Kanayo(2013) analyzed that investment in human capital in the form of education and capacity building at the primary and secondary levels impact significantly on economic growth, while capital expenditure on education was insignificant to the growth process which is contradict result to the other studies.

In Ethiopia some researcher tried to investigate the relationship between human capital and economic growth. Woubet (2006) investigated that the average level of human capital appears to have no significant impact on the evolution of total level of output which is contradict to economic theory about importance of human capital. Using school enrollment as a proxy for human capital Seid (2000) found out that the human capital variable has an insignificant on economic growth which was similar result with woubet(2006) and only use education aspect as aproxy of human capital. Abdu Muhammed(2014) also investigated that only expenditure on health and total capital expenditure is both positive and statistically significant. However, Expenditure on education is statically insignificant.

But, Teshome (2006) found positive impact of human capital development on economic growth in Ethiopia using public spending on education and health sector as a proxy for human capital. Similarly, Kidanemariam (2014) analyzed the impact of human capital development on economic growth. The estimated long run model revels that human capital in the form of health is the main contributor to real GDP per capita rise followed by education human capital (proxy by secondary school enrolment), but health has no significant short run impact on the economy. Even its one period lag has a significant negative impact on the economy. But, according to him education human capital only proximate by secondary school enrollment and aspects of human capital such primary and higher level school enrolment, education expenditure that are stated on

economic theory are not included on this study. Tewodros (2014) also analyzed relationship between education and health that are accepted as an indicator of human capital and economic growth is tested empirically and the finding indicates that in the long run investment on education and health would affect further economic growth. Tewodros (2015) investigated that there is a stable long run relationship between real GDP and human capital. The empirical results reveal that both physical capital and human capital are found to have positive impact on economic growth which is similar result to Tewodros (2014) and Teshome (2006).

According to schultz, there are five ways developing human resources. These are health facilities and services conceived to include all expenditures, on the job training, formal organized education at the elementary, secondary and higher levels, study programmes for adult including extension programmes, migration of individuals and families to adjust to changing job opportunities (Lingaiah, 2001).

Several modern economists have argued that investment in education is undertaken primarily for return and should be regarded as investment in human capital which enhances human capital formation. Similarly, most of empirical studies focused only on education as a proxy of human capital and got contradict result. To the best of my knowledge there are no papers that included all aspect of human capital and there are various contradiction results among empirical studies. Therefore, from various economic theories and empirical literature this study analyzes the impact of human capital on economic growth in Ethiopia through the Time Series Model.

1.3. Objectives of the Study

The general objective of this study is to examine the impact of human capital on economic growth in Ethiopia. More specifically, the study aims at achieving the following objectives.

- To examine how human capital affects economic growth in Ethiopia
- To analyze the short run and the long run impact of human capital on economic growth in Ethiopia; and
- To examine the causal relationship between human capital and economic growth in Ethiopia.

1.4. Hypothesis of the study

Modern theory of economic growth argues that human capital, especially education and health has the principal role on achieving economic growth and development. Proponents of endogenous growth theory lay emphasis 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. human capital have no short run and long run significance impact on economic growth)

H1: $\beta s \neq 0$ (i.e. human capital has short run and long run significance impact on economic growth).

Similarly,

Ho: $\beta s = 0$ (i.e. there is no causality between human capital and economic growth).

H1: $\beta s \neq 0$ (i.e. there is causality between human capital and economic growth).

In the empirical findings of this study the researcher will expect that there will be short run and long run significant relationship between human capital and economic growth and there is causality between human capital and economic growth.

1.5. Significance of the study

This study deal with the impact of human capital on economic growth in Ethiopia and beneficial for different stakeholders such as for the researcher, governments, policy makers and other economic agents. The study improves the practical knowledge and skill of the researcher of this study by making familiar with factual evidence and general information on the relationship between human capital and economic growth. The study also help for the appropriate policy option regarding the subject area of human capital and economic growth in Ethiopia and serve as bench mark to conduct further research in this area.

7

1.6. Scope and limitation of the study

Undertaking research on the impact of human capital on economic growth at international level is a complex task since it requires huge finance, time, and sufficient knowledge. These constraints force the study to undertake a research at national level (in Ethiopia) and examinethe relationship between human capital and economic growth in Ethiopia between 1974 to 2015 fiscal years. Availability of data is usually a challenge for researchers in most developing countries like Ethiopia, as was the case in this study.

1.7. Organization of the thesis

This thesis organized into five chapters. Chapter one is introduction which contains: background of the study, statement of the problem, research objectives and questions, scope and limitation of the study, significance 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 the three chapters. 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. Concepts and overview of human capital and its measurements

Human capital represents the productive capacity of the people. Just like land or machinery, workers are an essential requirement for production. As such, human capital denotes the skill of the labor force, how well and efficiently workers can transform raw materials and capital into goods and services. These skills such as literacy, numeracy, cognitive, and analytical skills can be learned and honed through education; thus, any discussion of human capital has to touch upon education (Son, 2010).

Human capital plays a critical role in economic growth and poverty reduction. From a macroeconomic perspective, the accumulation of human capital improves labor productivity; facilitates technological innovations; increases returns to capital; and makes growth more sustainable, which, in turn, supports poverty reduction. Thus, human capital is regarded at the macro level as a key factor of production in the economy wide production function. From a microeconomic perspective, education increases the probability of being employed in the labor market and improves earnings capacity. Thus, at the micro level, human capital is considered the component of education that contributes to an individual's labor productivity and earnings while being an important component of firm production (Andrawetal, 2001).

Although the conceptual definition of human capital is clear, its measurement is difficult because it is practically impossible to observe individual skill, and even harder to design a metric that is comparable across individuals and countries. Thus, various proxy measures of human capital have been proposed in the empirical literature, such as literacy rates (Azariadis and Drazen 1990); school enrollment rates (Barro 1991, Mankiw et al. 1992); years of schooling (Barro and Lee 1996, 2001, and 2010; Cohen and Soto 2007); and test scores (Hanushek and Kimko 2000, Hanushek and Woessmann 2009). While the literacy rate, which measures the proportion of the population who can read and write, is an important measure of well-being, it does not measure the educational attainment or skill level of the workforce. On the other hand, school enrollment rate is a relevant metric only for school-age children and has little relevance for the workforce.

Human capital became especially popular in historical research after the rise of growth theory in the 1950s and the human capital theory advocated by Becker (1964) and Schultz (1961). Broad measures of human capital in economic historical research the notion of human capital arose out of the awareness that physical capital alone was not enough to explain long run growth. Many social indicators such as educational enrolments and life expectancy became combined in a common term: human capital. Often, human capital is implicitly referred to as formal and informal education. Yet, it can also contain factors such as the costs of raising children, health costs, ability and others aspect.

Human capital consists of the abilities, skills, and knowledge of particular workers. Thus, like conventional economic goods, human capital is rival and excludable. If, for example, an engineer's full effort is being devoted to one activity that precludes the use of his or her skills in another. In contrast, if an algorithm is being used in one activity, that in no way makes its use in another more difficult or less productive. The models of this section therefore resemble the Solow model (and the Ramsey and Diamond models) in assuming constant returns to scale. Thus they do not provide candidate explanations for worldwide economic growth. But the models differ from the Solow model in implying that moderate changes in the resources devoted to physical and human capital accumulation may lead to large changes in output per worker (Romer, 1996).

Human capital is only one factor in accounting for differences in growth rates across countries. While low starting levels of human capital may have hindered Africa's economic growth, its poor performance cannot be attributed to a lack of subsequent investment in human capital. A more important proximate cause is the low level of investment in physical capital. Low rates of investment in physical capital have implications for the rates of return on human capital, particularly education. The conventional wisdom that the rates of return to education are very high is shown not to have held in the context of many African labour markets in the 1980s and 1990s. If human and physical capitals are complements then the policy problem is enabling them both to grow rapidly. Returns to human capital investment depend on the success of policies in promoting the growth of physical capital. There is evidence from micro studies that the income returns to education reflect the effects of education in raising productivity. These effects have been observed for both industry and agriculture. For industry it is the secondary level which is

important while for agriculture it is primary education. Less research has been done on the productivity effects of health and nutrition in Africa. The limited evidence is consistent with conclusions from other developing countries that these effects may be substantial. The role of human capital in Africa's economic development is complex. Inadequate investment in education and health are clearly not the only cause of Africa's economic difficulties. However, the poor health and education of Africa's workers is one factor explaining her low income. Government investment in the social sectors is likely to be economically productive and indeed is likely to bring more direct benefits to the people than many other forms of government expenditure. Government investment in both education and health may be particularly important as there are indirect benefits of such investments which individuals may not allow for in their investment decisions. Social rates of return may substantially exceed private rates (Simon, 1998).

International differences in income per person can be attributed to either (1) differences in the factors of production, such as the quantities of physical and human capital, or (2) differences in the efficiency with which economies use their factors of production. That is, a worker in a poor country may be poor because he lacks tools and skills or because the tools and skills he has are not being put to their best use. The Solow model makes the simplifying assumption that there is only one type of capital. Recent research on economic growth has emphasized that human capital is at least as important as physical capital in explaining international differences in standards of living. One way of modeling this fact is to give the variable we call "capital" a broader definition that includes both human and physical capital (Mankiu, 2009).

One, suggested by Mankiw, Romer, and Weil (1992), is to argue that there is some minimum level of human capital the ability to talk, to read and write, and so on-that most individuals obtain more or less automatically.

2.1.2. Human capital and Growth theories

Human capital impacts economic growth only if it is utilized in the labor market: those who have attained schooling need to be employed so that their skills can be used to produce goods and services. However, there may be a mismatch between the skills taught by the educational system and the skills needed by the labor market, so highly educated workers may end up doing low productivity jobs. Thus, despite a country's achievements in accumulating human capital through

the education system, this achievement may not lead to economic growth and poverty reduction if the labor market is not considered (Son, 2012).

From the early 1990s, various studies have attempted to identify the determinants of economic growth; long-run growth is endogenous rather than exogenous (Romer, 1986; Lucas, 1988; Mankiw et al., 1992). The concept of human capital refers to the abilities and skills of human resources of a country, while human capital formation refers to the process of acquiring and increasing the number of people who have the skills, good health, education and experience that are critical for economic growth. Thus, investment in education and health are considered as human capital development. Human capital plays a special role in a number of models of endogenous economic growth. In Romer (1990) human capital is the major input to the research sector, which generates the new products or ideas that underlie technological progress. Thus, countries with greater initial stocks of human capital experience a more rapid rate of introduction of new goods and thereby tend to grow faster.

One particular source of externalities that has been emphasized in the recent growth literature is the accumulation of human capital and its effect on the productivity of the economy. Lucas (1988) provides one of the best-known attempts to incorporate the spillover effects of human capital accumulation, in a model built upon the idea that individual workers are more productive, regardless of their skill level, if other workers have more human capital(Montieletal, 2008).

Economic theory suggests that human capital would be an important determinant of growth, and empirical evidence for a broad group of countries confirms this linkage. Many economists use different measurement to proxy human capital, however, the assumptions and results are, nevertheless, basically the same. The study conducted in 735 developing countries during 1960 to 1985 by Barro (1991) was the famous one. In his study the average number of years of education attainment (School attainment) was used as measurements of human capital. The result indicates that Countries that start with a higher level of educational attainment grow faster for a given level of initial per capita GDP.

Education has been considered a key determinant of economic growth since the introduction of Solow's (1956) growth model. Although Solow did not explicitly factor in education in his growth theory, the central role of technology in his model provided the impetus for the focus on

education; after all, an educated population was necessary for technological innovation. The endogenous growth models played the central role of human capital in technological development and economic growth. According to these new growth theories such as Lucas (1988); Romer (1990); Mankiw, Romer, and Weil (1992); Barro and Sala-i-Martin (1997) the accumulation of human capital through education and on- the-job training fosters economic growth by improving labor productivity, promoting technological innovation and adaptation, and reducing fertility. Economic growth takes place due mainly to two factors: labor productivity growth and employment growth (Son, 2010).

Another issue regarding studies on the relationship between education and economic growth is the lack of consistency between human capital theory and empirical testing. While the Solow and Nelson-Phelps models defined the basis of human capital theory, testing them in practice has been a problem. Mincer (1974) tested this relationship by measuring human capital as years of schooling, and derived a log-linear specification for output and schooling, respectively.

The Solowian exogenous growth theory that was developed in the 1950s, at the height of the wave of newly independent countries, can be considered the immediate predecessor of the new growth theories that emerged in the 1980s and 1990s. Originally, it only included labour, L, physical capital, K, and technology, A, the latter exogenously explaining long-run growth. However, with the human capital revolution also human capital was augmented to this model. Yet, because also for human capital diminishing returns were assumed, no real difference took place in the structure of the theory (Mankiu, 2009).

In the neo-classical growth model from the 1950s have no special attention was given to human capital. Basically, it was argued that the growth of physical capital had an effect on the growth of GDP while the unexplained residual, labeled Total Factor Productivity (TFP), explained economic growth in the long-run. The rise of human capital theory (Schultz 1961; Becker 1964) led to the inclusion of human capital.

In contrast to neoclassical models, endogenous growth models explicitly incorporate technology and attempt to recognize that technological change depends on economic decisions in the same way as capital accumulation. In particular, technological change is most commonly related to the stock of human capital. In the endogenous models, economic growth can continue indefinitely

because the returns on investment in a broad class of both physical and human capital goods do not necessarily diminish through time. Spillovers of knowledge across producers and external benefits from improvements in human capital are part of this process because they offset tendencies to diminishing returns. Growth frameworks have also incorporated R&D concepts, as well as imperfect competition (Romer, 1986).

Endogenous growth theory argues that, as an economy's physical capital stock increases, its human capital stock tends to increase in the same proportion. Thus, when the physical capital stock increases, each unit of physical capital effectively works with the same amount of human capital, so the marginal productivity of capital need not decrease. The result that the saving late affects the long-run growth rate of output stands in sharp contrast to the results of the Solow model, in which the saving rate does not affect the long-nm growth late. Saving affects long run growth in the endogenous growth framework because, in that framework, higher rates of saving and capital formation stimulate greater investment in human capital and R&D. In comparison to the Solow model, the endogenous growth model places greater emphasis on saving, human capital formation, and R&D as sources of long-run growth (Andrawetal, 2001).

One particular source of externalities that has been emphasized in the recent growth literature is the accumulation of human capital and its effect on the productivity of the economy. Lucas (1988) provides one of the best-known attempts to incorporate the spillover effects of human capital accumulation, in a model built upon the idea that individual workers are more productive, regardless of their skill level, if other workers have more human capital(Montiel etal,2008).

The world's poor countries have average levels of income per person that are less than one-tenth the average levels in the world's rich countries. These differences in income are reflected in almost every measure of the quality of life from the number of televisions and telephones per household to the infant mortality rate and life expectancy. Much research has been devoted to the question of whether economies con- verge over time to one another. If they do, then the world's poor economies will tend to catch up with the world's rich economies. This property of catch-up is called convergence. If convergence does not occur, then countries that start off behind are likely to remain poor. The Solow model makes clear predictions about when convergence should occur. According to the model, whether two economies will converge depends on why they differ in the first place. On the one hand, suppose two economies happen by historical accident to

start off with different capital stocks, but they have the same steady state, as determined by their saving rates, population growth rates, and efficiency of labor. In this case, we should expect the two economies to converge; the poorer economy with the smaller capital stock will naturally grow more quickly to reach the steady state. On the other hand, if two economies have different steady states, perhaps because the economies have different rates of saving, then we should not expect convergence. Instead, each economy will approach its own steady state (Mankiu, 2009).

Human capital is accumulated through explicit "production": a part of individuals' working time is devoted to accumulation of skills. The growth of physical capital depends on the saving rate (I =sy), while the growth rate of human capital is determined by the amount of time devoted to its production. In the long run, the level of income is proportional to the economy's initial stock of human capital. In this particular formulation, the saving rate has no effect on the growth rate. The important implication of the external effect captured in the model presented by Lucas (1988) is that under a purely competitive equilibrium its presence leads to an underinvestment in human capital because private agents do not take into account the external benefits of human capital accumulation. The equilibrium growth rate is thus smaller than the optimal growth rate, due to the existence of externalities. Because the equilibrium growth rate depends on the rate of investment in human capital, the externality implies that growth would be higher with more investment in human capital. This leads to the conclusion that government policies (subsidies) are necessary to increase the equilibrium growth rate up to the level of the optimal growth rate. A government subsidy to human capital formation or schooling could potentially result in a substantial increase in the rate of economic growth (Montieletal, 2008).

Lucas's (1988) original formulation is cast in an optimizing framework in which private agents determine their consumption path by maximizing their utility subject to an intertemporalresource constraint. The main point of his analysis, however, can be made by assuming a constant saving rate, as in Lucas (1993). Lucas (1988) also develops a second model that assumes a different structure of techno- logical change. In this alternative framework all human capital accumulation occurs through on- the-job training, or learning by doing, rather than through the time allocated by workers to this accumulation. Thus, it is the time devoted directly to production activities that determines the rate of growth.

An alternative approach to assessing the role played by external effects in the growth process was proposed by Romer (1986). In his framework the source of the externality is the stock of knowledge rather than an aggregate stock of human capital. Knowledge is produced by individuals, but because newly produced knowledge can be, at best, only partially and temporarily kept secret, the production of goods and services depends not only on private knowledge but also on the aggregate stock of knowledge.15 Firms or individuals only partially reap the rewards to the production of knowledge, and so a market equilibrium results in an underinvestment in knowledge accumulation. To the extent that knowledge can be related to the level of technology, Romer's framework can be viewed as an attempt to determine endogenously the rate of technological progress. In subsequent work, Romer (1990) also explained endogenously the decision to invest in technological change, using a model based on a distinction between a research sector and the rest of the economy. In that framework, firms cannot appropriate all the benefits of knowledge production, implying that the social rate of return exceeds the private rate of return to certain forms of capital accumulation. A tax and subsidy scheme can thus be utilized to raise the rate of growth. Following David Romer , a simplified version of Romer's (1990) model can be described as follows. Consider an economy with two production sectors: a goods-producing sector, which uses physical capital, knowledge, and labor in the production process, and a knowledge-producing sector, where the same inputs are used to expand the stock of knowledge (Romer, 1991).

2.1.3. The role of education and health

Human capital is a broad concept which identifies human characteristics which can be acquired and which increase income. It is commonly taken to include peoples' knowledge and skills, acquired partly through education, but can also include their strength and vitality, which are dependent on their health and nutrition. Human capital theory focuses on health and education as inputs to economic production. This is in contrast to the concept of human development which views health and education as intrinsically valuable outcomes to be placed alongside economic production as measures of human welfare. In understanding the role of human capital as an input into development it is necessary to consider the possible links between human capital, other forms of capital, income and growth. While it is true for every country, for which there is data that more educated people earn more than less educated ones it does not follow that there is a

simple relationship between investing in people and countries becoming richer. Human and certain forms of physical capital may be complementary (Simon, 1998).

Education and Health as Joint Investments for Development 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 to 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 (Todaro, 2012).

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 could not count on that income increase being used to 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. Health is an important factor in school attendance. Healthier children are more successful in school and learn more efficiently. Deaths of school-age children also increase the cost of education per worker. Longer life spans raise the return to investments in education. Healthier individuals are more able to productively use education at any point in life (Todaro, 2012).

The analysis of investments in health and education is unified in the human capital approach. Human capital is the term economists often use for education, health, and other human capacities that can raise productivity when increased. An analogy is made to conventional investments in

17

physical capital: After an initial investment is made, a stream of higher future income can be generated from both expansion of education and improvements in health. As a result, a rate of return can be deduced and compared with returns to other investments. This is done by estimating the present discounted value of the in- creased income stream made possible by these investments and then comparing it with their direct and indirect costs. Of course, health and education also contribute directly to wellbeing. For example, education increases empowerment and autonomy in major matters in life, such as capacity for civic engagement, making decisions concerning one's own health care, and freedom to choose one's own spouse over arranged marriage. But the basic human capital approach focuses on their indirect ability to increase wellbeing by treated child. The net benefit of the program is greater than the cost of hiring additional teachers to keep this ratio (Todaro, 2012).

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).

Investment in education promotes growth. Schultz analyzed the contribution of education to growth in national income and the conclusion that the resources allocated to education rose about 6.5 times relative to consumer income in dollar and relative to the gross formation of physical capital in dollars. Investment in education contributed 3.5 times more to the increase in growth national income than investment in physical capital. Improvement in health of masses increases their productive capacity and leads to quantitative improvement in human capital. Therefore expenditure on health care important in building and maintaining a prod active labor force as well as in improving the levels of the people and quality of the society under the health programmes are expanding medical knowledge through increased basic research in the life of

sciences, faster dissemination of new formation and techniques to health policy makers and the public, improved financing or medical sciences ,free medical aid to the poor and down trodden and other poor sections of population ,and improving more and better organized health facilities and manpower including research laboratories and medical schools general hospitals and nursing homes, highly trained specialists and nursing aides(Lingaiah,2001).

Human capital Productive investments embodied in human persons, including skills, abilities, ideals, health, and locations, often resulting from expenditures on education, on-the-job training programs, and medical care. Investments in human capital have to be undertaken with both equity and efficiency for them to have their potential positive effects on incomes and break the vicious circles of poverty in developing countries. Health and education are closely related in economic development. Broad Findings We conclude that health and education play pivotal roles in economic development, as both inputs into production enabling higher incomes and outputs directly affecting human well-being. Many health and education problems plague developing countries, ranging from child labor to heavy disease burdens. Education and health will not always automatically improve with higher incomes. Thus government plays an essential role in health and education and in most developing countries the considerable improvements in policy is needed (Todaro, 2012).

2.1.4. Human capital and migration

Brains drain is the emigration of highly educated and skilled professionals and technicians from the developing countries to the developed world. This is particularly true in the case of scientists, engineers, academics, and physicians, many thousands of whom have been trained in home country institutions at considerable social cost only to reap the benefits from and contribute to the further economic growth of the already affluent nations. The international brain drain has in fact influenced the style and approach of educational systems in the developing world. The brain drain, broadly construed, has diverted the attention of the scientists, physicians, architects, engineers, and academics that remain in their homeland from important local problems and goals. These include the development of appropriate technology; the promotion of low cost preventive health care; the construction of low cost housing, hospitals, schools, and other service facilities; the design and building of functional yet inexpensive labor intensive roads, bridges,

and machinery; the development of relevant university teaching materials; and the promotion of problem-oriented research on vital domestic development issues (Todaro, 2012).

2.1.5. Economic growth and human capital in Ethiopia

2.1.5.1. Trends of Ethiopian economy and investment in education and health

Ethiopia is a landlocked nation with the second most populous country in Africa after Nigeria with a total population of about more than 102.1 million in 2016. It is one of the poorest countries in the world ranking 174 out of 186 countries in the Human Development Index (HDI) and its human HDI is 0.44 in 2015. Ethiopia's per capita gross national income of US$486.27 in 2015 is much lower than the corresponding average of Sub-Saharan Africa and for low-income countries as a whole. By the early l970s, Ethiopia's economy not only had started to grow but also had begun to diversify into areas such as manufacturing and services. However, these changes failed to improve the lives of most Ethiopians. Ethiopia enjoyed an annual around 7.2 percent average growth rate in per capita gross domestic product (UNDP, 2016).

2.1.5.2. Education and health policy in Ethiopia

Sustained economic growth will be achieved by high human capital such us education and health, sufficient infrastructures leading to high marginal productivity of capital, high saving rates, and a stable population. Alemayehu and Befekadu(2002) had made some key conclusions on Ethiopian economy which include the following: Over quite a long period of time and despite very different policy regimes, the structure of the economy has changed relatively little. And Growth performance is still dependent on a fragile economic sector and on exogenous conditions. Not only this but also, over a long period of time the economy has performed below expectations, given initial conditions.

2.1.5.2.1 Education policy in Ethiopia

Education is a process by which man transmits his experiences, new findings, and values accumulated over the years, in his struggle for survival and development, through generations. Education enables individuals and society to make all-rounded participation in the development process by acquiring knowledge, ability, skills and attitudes. And aims at strengthen the

individual's and society's problem-solving capacity, ability and culture starting from basic education and at all levels (Todaro, 2012).

Education policy becomes very important. While each country's needs and conditions are different, a general recommendation arising from this study is that education policy must be closely tied with labor and economic policy. The educational system must not exist in a vacuum; rather, decisions on priorities, curricula, and budget allocation need to be made in line with medium- and long-term development plans. If the country seeks to develop its information technology sector, then the quality of math and science education will need to be improved. Likewise, if a country needs to improve governance and institutions, then civics and history cannot be eliminated from the curriculum. Likewise, development institutions will need to hone education sector strategies and policy (Son, 2010).

In Ethiopia, education dates back to the Sixth Century when the Sabean alphabet was introduced along with Christianity. Beginning in the early years of the Christian era, the churches of Ethiopia developed school system which over the centuries served not only as focal points for learning but also prepared the nation's religious and governmental leaders. The indigenous system of church education had its parallel in the schools of Falashas, and the Quranic schools of the Muslims (Woubet, 2006).

According to Teshome (1979), church education has not been impartial in the provision of education to the public and didn't serve the whole nation. But no other church in Africa has had such a great impact on the development of education as the Ethiopian Orthodox Church. In the long history of church education, Ethiopia evolved a particularly Ethiopian education system. The full curriculum consisted of religious teachings, prose, poetry and poems as well as documentation in Geez and Amharic. It is emphasized that education has, meaning only when in its cultural context. But the pattern of education changed very little in contrast to the emerging socio economic transformations. And, an opportunity was lost to combine the educational effort of an ancient church with that of a government system. So, any account of education in Ethiopia must recognize the contributions made by church education.

Developments in the field of modern education can be discussed in the three phases. The first phase is during the imperial period. At the beginning of the twentieth century, the education

system's failure to meet the needs of people involved in statecraft, diplomacy, commerce, and industry led to the introduction of government-sponsored secular education. Hence the more planned and coordinated expansion of education has been done after 1941, the primary objective of education had been to produce trained manpower that could run the emergent state bureaucracy (Teshome, 2006). After 1941 the series of concrete educational policies were introduced for the promotion of education in the country. From 1942 until 1955, the Ethiopian Government was engaged in the expansion of the education system. The high expenditure on education in relation to total expenditure, as well as the rapid growth of student enrolment showed the commitment of the Ethiopian government to the expansion of education.

The second phase is during the Derg. After the overthrow of imperial rule, the provisional military government dismantled the feudal socioeconomic structure through a series of reforms that also affected educational development. The structure and organization of educational activities were changed alongside the objectives of the socialist government. The Government's goals for education are (1) education for production, (2) education for scientific consciousness, and (3) education for political consciousness (Tewodros, 2014).

The military regime worked toward a more even distribution of schools by concentrating its efforts on small towns and rural areas that had been neglected during the Imperial regime. With technical assistance from the Ministry of Education, individual communities performed all primary school construction. In large part because of such community involvement, the number of primary schools grew from 3,196 in 1974/75 to 7,900 in 1985/86, an average increase of 428 schools annually. The number of primary schools increased significantly in all regions except Eritrea and Tigray, where there was a decline (Tekeste, 1996).

The last phase is during EPRDF. The new strategy presupposes the overall lack of coordination between education, training, research and development efforts in the country. The New Education and Training Policy also addressed the issues of technical Vocational training. Thus, it is stipulated in the document that Parallel to general education, diversified technical and vocational training will be provided for those who leave school from any level of education for the development of middle level manpower. Investment is thought to be simply more schools, and places for more kids in school. These are necessary conditions but insufficient alone to bring about needed development gains. More is needed, including increasing curriculum relevancy,

training teachers to use the most effective pedagogy, improving the way schools are organized and managed, and involving parents and the larger community in supporting schools and ensuring quality education. (Woubet, 2006)

During the military regime gross enrolment in the primary school has generally increased continuously from 18.89 percent in 1974/75 to 42.55 percent in 1982/83. During 1984/85-1988/89, secondary school gross enrollment rate increased from 4.88 percent to 15.06 percent. However it has generally decreased during the transitional government periods (1991/92-1994/95). After 1994/95 it has increased continuously for the next sixteen years and reached to 37.6 percent in 2010/11. Gross enrollment rate in the tertiary level is very poor in Ethiopia as compared to the primary and secondary level .It was below one percent until the year 1998/99. Starting from 1999/00, it has showed above one percent rate and reached 7.6 percent in 2010/11. Still the majority of Ethiopia's economically active population did not attain even the primary level education. Especially the proportion of economically active population who attained Tertiary level has remained below one percent until the year 2000(Kidanemariam, 2014).

2.1.5.2.2 Health policy in Ethiopia.

In the WHO's definition, a health system is "all the activities whose primary purpose is to promote, restore, or maintain health." Health systems include the components of public health departments, hospitals and clinics, and offices of doctors and paramedics. Outside this formal system is an informal network used by many poorer citizens, which includes traditional healers, who may use somewhat effective herbal remedies, or other methods that provide some medical benefits, such as acupuncture, but who also may employ techniques for which there is no evidence of effectiveness beyond the placebo effect. It has long been understood that some developing countries' health systems were far more effective than others in achieving health goals (Todaro, 2012).

In Ethiopia following the change of government in 1991, the new Government of Ethiopia put in place many political and socio-economic transformation measures. Among these, it developed a first national health policy, which was followed by the formulation of four consecutive phases of comprehensive Health Sector Development Plans (HSDPs), starting from 1996/97. The policy and the first HSDP were based on critical reviews of prevailing national health problems and a

broader awareness of newly emerging health problems in the country. At the core of the health policy are democratization and decentralization of the health care system; developing preventive, promotive and curative components of health care; assurance of accessibility of health care for all parts of the population; and encouraging private and NGO participation in the health sector. During the past fifteen years, the Federal Ministry of Health has built an impressive framework for improving the health for all, including maternal and neonatal health. This has included a wide range of strategies such as Making Pregnancy Safer (2000), Reproductive Health Strategy (2006), Adolescent and Youth Reproductive Health Strategy (2006) and the Revised Abortion Law (2005). There are also strategies on free service for key maternal and child health services (Health Care Financing Strategy), the training and deployment of new workforce of female. The Ministry has also established the MDG Performance Package Fund and given priority to maternal health, which is expected to facilitate mobilizing additional funding opportunities (HSDP, 2014).

The main cause of many of Ethiopia's health problems is the relative isolation of large segments of the population from the modern sector. Additionally, widespread illiteracy prevents the dissemination of information on modern health practices. A shortage of trained personnel and insufficient funding also hampers the equitable distribution of health services. Moreover, most health institutions were concentrated in urban centers prior to 1974 and were concerned with curative rather than preventive medicine (HSDP, 2011).

The current Government therefore accords health a prominent place in its order of priorities and is committed to the attainment of these goals utilizing all accessible internal and external resources. In particular the Government fully appreciates the decisive role of popular participation and the development of self-reliance in these endeavors. The Government believes that health policy cannot be considered in isolation from policies addressing population dynamics, food availability, acceptable living conditions and other requisites essential for health improvement and shall therefore develop effective intersectorality for a comprehensive betterment of life. So health development shall be seen not only in humanitarian terms but as an essential component of the package of social and economic development as well as being an instrument of social justice and equity. Pursuant to the above the health policy of the Transitional Government shall incorporate the following basic components (Tewodros, 2014).

Health services in Ethiopia are primarily financed from four sources: a) the federal and regional governments; b) grants and loans from bilateral and multilateral donors; c) non- governmental organizations; and d) private contributions. Although health financing has improved significantly over the years, it remains a major challenge for the health system of Ethiopia. The objectives of the health care financing component of HSDP are aimed at achieving a sustainable health care financing system. More specifically, the objectives call for mobilization of increased resources to the health sector, promoting efficient allocation, effective expenditure management for allocative equity, and better utilization of available health resources. (HSDP, 2011)

2.2 Empirical literature review

Various researchers have utilized different proxies for human capital and their conclusions are controversial about the relationship between human capital and economic growth in the world. Several researcher and modern economists' argued that investment in education is undertaken primarily for return and should be regarded as investment in human capital which enhances human capital formation.

Anbelaetal(2014) identified as human capital is one of the main determinants of economic growth and plays an important role in the technological progress of countries. Based on econometric panel data estimations involving a set of OCDE countries over 1960-2011, we found that the countries' productive specialization dynamics is a crucial factor for economic growth. It is also shown that the interaction between human capital and structural change towards high knowledge-intensive industries impacts on the economic growth. However, the sign of this effect depends on the type of country and length of the period of analysis. Specifically, in the long term and in developed countries, where knowledge-intensive industries already account for a great share of the economy, the impact of the interaction between human capital and structural change is positive. In the case of less developed countries, and considering a shorter time period, the effect of human capital via specialization in high-tech and knowledge-intensive activities emerged as negative.

Ali et al (2012) also this examined the role of human capital formation in economic growth in Pakistan by using the secondary data for the period of 1972- 73 to 2010-11. The results implied that education enrollment (proxy for human capital), health and physical capital are important to

boost the economic growth in Pakistan. Human capital, fixed capital and employed labor force affect the GDP and result in unidirectional and non-unidirectional causality. After estimating the model, we concluded that education enrollment index, gross fixed capital formation and Gini coefficient have positive and significant impact on gross domestic product, while head count ratio and infant mortality rate, CPI inflation and investment growth rate have negative and significant impact on gross domestic product in Pakistan.

Arabi et al (2013) investigate the impact of human capital on economic growth in Sudan for the period 1982-2009 by using a simultaneous equation model that links human capital i.e. school attainment; and investment in education and health to economic growth, total productivity, foreign direct investment, and human development index. Based on three-stage least squares technique, the empirical results of the paper show that quality of the education has a determinant role in the economic growth; health quality factor has a positive impact on economic growth as expected and total factor productivity which mainly represents the state of technology has adverse effect on economic growth and human development due to the obsolete and old fashion technology.

Elena (2014) analyzed the EU's 2020 Strategy is focused on three area of growth: smart, sustainable and inclusive that couldn't be achieved without major contribution of skills, knowledge or value of people, common knew as human capital. It is difficult to believe that these goals could be realized 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 paper tried to reveal 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 countries.

Gisoryetal (2014) investigated empirically how government expenditure contributes to economic growth in East Africa. Hence this study focused on disaggregated expenditure over the period from 1980 to 2010. The findings showed that expenditures on health and defense to be positive and statistically significant effect on growth. In contrast, education and agriculture expenditure were insignificant. This study suggests that for East Africa, the policy of increasing spending on health and defense budget to promote economic growth will be appropriate, but fewer funds should be channeled towards other sectors.

Haldaretal(2007) examined the time series behavior of investment in physical capital, human capital (comprising education and health) and output in a co-integration framework, taking growth of primary gross enrolment rate and a dummy for structural adjustment programme (openness which has been initiated in 1991) as exogenous variables in India from 1960 to 2006. The results suggest that physical capital investment has no long-run nor short-run effect but the human capital investment has significant long-run effect on per capita GNP; the stock of human capital measured by primary gross enrolment rate (lagged by three years) and openness is found to have a significant effect on growth of per capita GNP. The Generalized Impulse Response Function confirms that the innovation in per capita GNP growth can only explain the movements of the growth of per capita GNP (itself) and investment in education human capital positively and significantly only for a short period of time but does not explain the movements of the investment in physical capital and health human capital. Moreover, the innovation in change in education human capital investment significantly and positively explains the movement of the changes in education human capital investment (itself), health human capital investment and growth of GNP per capita; the innovation in health human capital investment significantly explains the changes of education and health human capital investment only.

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. The study made use of secondary data and examined the time series characteristics of the variables selected, to avoid the problems of spurious correlation often associated with non-stationary time series to concurrently generate long-run equilibrium relationships. Findings also showed that investment in human capital in the form of education and capacity building at the primary and secondary levels impact significantly on economic growth, while capital expenditure on education was insignificant to the growth process.

Mankiw et al (1992) and Barro (1991) investigated the link between education and economic growth in industrialized and less industrialized countries. They examined variations in school

enrolment rates, using a single cross-section of both the industrialized and the less- developed countries. Both studies concluded that schooling has a significantly positive impact on the rate of growth of real GDP. Similarly, Barro and Sala-i-Martin (1995) also investigated the impact of educational expenditures by governments. Their findings showed a strong positive impact. Using instrumental variable techniques to control for simultaneous causation, their regressions suggest that the annual rate of return on public education is of the order of twenty percent.

Mincer (1981) analyzed the individuals differ in both inherited and acquired abilities, but only the latter differ among countries and time periods. Human capital analysis deals with acquired capabilities which are developed through formal and informal education at school and at home, and through training, experience, and mobility in the labor market. This is just as accumulation of personal human capital produces individual economic (income) growth, so do the corresponding social or national aggregates. At the national level, human capital can be viewed as a factor of production coordinate with physical capital. This implies that its contribution to growth is greater the larger the volume of physical capital and vice versa.

Odit et al (2010) focused on the impact of investment in education on economic growth in Mauritius. It is an attempt to explore the extent to which education level of the Mauritian labour force affects its economic growth that is its output level. The paper used the Cobb-Douglas production function with constant returns to scale where human capital is treated as an independent factor of production in the human capital augmented growth model by bringing evidence from a data set for the period 1990 to 2006 obtained from the central statistical office and Bank of Mauritius reports. The results reveal that human capital plays an important role in economic growth mainly as an engine for improvement of the output level.

wilson (2004) examined the links between education and training in a country and its macroeconomic growth. An initial analysis of broad statistics for all EU Member States suggests a loose correlation between investment in human resources and growth in gross national product (GNP), but clear causal relationships are difficult to establish. According to the result Increased investment in education is shown to lead to higher productivity and earnings for the individual and similarly, such investment results in significant social rates of return. The returns on investment in vocational training are more difficult to demonstrate. It is concluded that, overall,

the impact of investment in education and training on national economic growth is positive and significant.

In Ethiopia, Abdu (2014) analyzed the relationship between real gross domestic product and various composition of government expenditure like: agriculture, education, health, transport and communication, urban development and housing, total capital expenditure and total recurrent expenditure in Ethiopia through Co-integration error correction model. The output of the research showed that expenditure on health and total capital expenditure are both positive and statistically significant in explain the growth of Ethiopian economy. However, Expenditure on agriculture, education, health, transport and communication, urban development and housing, and total recurrent expenditure are statically insignificant.

Kidanemariam (2013) investigated the long run and short run impact of human capital on economic growth in Ethiopia (using real GDP per capita, as a proxy for economic growth) over the period 1974/75-2010/2011. The ARDL Approach to Co-integration and Error Correction Model are applied in order to investigate the long-run and short run impact of Human capital on Economic growth. The finding of the Bounds test shows that there is a 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. The estimated long run model revels that human capital in the form of health (proxied by the ratio of public expenditure on health to real GDP) is the main contributor to real GDP per capita rise followed by education human capital (proxied by secondary school enrolment). In the short run, the coefficient of error correction term is -0.7366 suggesting about 73.66 percent annual adjustment towards long run equilibrium. This is another proof for the existence of a stable long run relationship among the variables. The estimated coefficients of the short-run model indicate that education is the main contributor to real GDP per capita change followed by gross capital formation (one period lagged value) and government expenditure (one period lagged value). But, unlike its long run significant impact, health has no significant short run impact on the economy. Even its one period lag has a significant negative impact on the economy.

Tewodros (2014) showed that the relationship between education and health that are accepted as an indicator of human capital and economic growth is tested empirically. The study aimed at decomposing the relationship between human capital (using health index and education index as

a proxy) and economic growth using time series data from 1971- 2011 in Ethiopia using modern econometrics technique. Long-run relationship among variables is confirmed through Johnson co-integration analysis whereas the long-run and short-run dynamics are observed by VECM specification. For causality purpose VECM based causality tests are employed. The finding indicated that in the long run investment on education and health would affect further economic growth.

Tewodros (2015) analyzed the determinants of economic growth in Ethiopia during the period 1974-2013. The Autoregressive Distributed Lag (ARDL) Approach to Co-integration and Error Correction Model are applied in order to investigate the long-run and short run relationship between the dependent variable (real GDP) and its determinants. The finding of the Bounds test showed that there is a stable long run relationship between real GDP, Physical capital, human capital, export, aid, external debt and inflation. The empirical results reveal that both physical capital and human capital are found to have positive impact on economic growth while debt affects economic growth negatively and statically significant at 1 percent.

Tofik (2012) analyzed and found a positive and significant relationship between capital spending on human capital and economic growth from year 1975 to year 2010.similarily, using public spending on education and health sector as a proxy for investment in human capital development, Teshome (2006) found a positive impact of human capital development on economic growth in Ethiopia over the period 1960/61- 2003/04.

Wube (2008) tried to see the effect of human capital on productivity in two ways. First by taking human capital, as a facilitator of the adaption of new technologies rather than taking it as a separate input (Nelson-Phelps Hypothesis). Second, tested the direct effect of it by taking it as a separate by using health and education spending as a proxy of human capital of the country. According to the study human capital has a positive influence on facilitating the adaption of new technologies.

Wubet(2006) also investigated the impact of human capital on economic growth in Ethiopia over the period 1971-2005 using an error-correction methodology. Contrary to microeconomic studies, the macroeconomic evidence from this study shows that the human capital variable in the form of schooling has an insignificant impact on the level of output.

2.3 .Conceptual framework

Mankiw et al (1992) and Barro (1991) investigated the link between education and economic growth in both industrialized and less industrialized countries. They examined variations in secondary school enrolment rates, using a single cross-section of both the industrialized and the less- developed countries. Both studies concluded that schooling has a significantly positive impact on the rate of growth of real GDP. Barro and Sala-i-Martin (1995) also investigated the impact of educational expenditures by governments. Their findings showed a strong positive impact. Odit(2010) also suggested that human capital plays important role on economic growth in mauritius using education as a proxy of human capital. Similarly, Wilson (2004) investigated the impact of human capital on economic growth using education and training as a proxy of human capital and concluded impact of investment in education and training on national economic growth is positive and significant. But all of the above empirical studies used only education as aproxy of human capital. Ali etal (2012) examined the role of human capital formation in economic growth in Pakistan and the results implied that education enrollment index, gross fixed capital formation and Gini coefficient have positive and significant impact on gross domestic product, while head count ratio, infant mortality rate have negative and significant impact on gross domestic product in Pakistan.

Pelinescu (2014) highlighted the importance of human capital in ensuring economic growth in Romania and EU countries. The finding shows that a positive and statically significant relationship between GDP per capital evidenced by the number of patents and qualification of employees (secondary education), but the relationship between education expenditure in GDP and GDP per capital is negative which is contradict to Barro and Sala-i-Martin (1995). Kanayo(2013) also analyzed the importance of human capital formation on economic growth in Nigeria. The findings a showed that investment in human capital in the form of education and capacity building at the primary and secondary levels impact significantly on economic growth, while capital expenditure on education was insignificant to the growth process. But, kanayo (2013) focused only on education aspects of human capital and the result is contradict to the other studies. Gisoryetal (2014) investigated empirically how government expenditure contributes to economic growth in East Africa. The result showed that expenditures on health

and defense to be positive and statistically significant effect on growth. In contrast, education expenditure was insignificant.

In Ethiopia some researcher tried to investigate the relationship between human capital and economic growth. Woubet (2006) investigated the impact of human capital on economic growth over the period 1971-2005 through the application of an Error-correction methodology. In its variable definitions he uses total output, gross capital formation, average human capital, gross exports, labor force, and official development assistance. The finding indicates the average level of human capital appears to have no significant impact on the evolution of total level of output which is contradict to economic theory about importance of human capital. Using school enrollment as a proxy for human capital Seid (2000) found out that the human capital variable has an insignificant on economic growth which was similar result with woubet (2006) and only use education aspect as a proxy of human capital. Abdu Muhammed(2014) also investigated the relationship between Economic growth and various compositions of Public expenditures by using co-integrated error correction modeling from the period 1975-2011G.C .The result showed that only expenditure on health and total capital expenditure is both positive and statistically significant. However, Expenditure on education is statically insignificant.

But, Teshome (2006) found positive impact of human capital development on economic growth in Ethiopia using public spending on education and health sector as a proxy for human capital. Similarly, Kidanemariam (2015) analyzed the impact of human capital development on economic growth and the shows that there is a 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. The estimated long run model revels that human capital in the form of health (proxied by the ratio of public expenditure on health to real GDP) is the main contributor to real GDP per capita rise followed by education human capital (proxied by secondary school enrolment),but health has no significant short run impact on the economy. Even its one period lag has a significant negative impact on the economy. But, according to him education human capital only proximized by secondary school enrollment and aspects of human capital such as migration, education expenditure that are stated on economic theory are not included on this study. Tewodros (2014) also analyzed relationship between education and health that are accepted as an indicator of human capital and economic

growth is tested empirically and the finding indicates that in the long run investment on education and health would affect further economic growth. Tewodros (2015) investigated the determinants of economic growth in Ethiopia during the period 1974-2013. The finding shows that there is a stable long run relationship between real GDP and human capital. The empirical results reveal that both physical capital and human capital are found to have positive impact on economic growth which is similar result to Tewodros (2014) and Teshome(2006).

The literature on the effect of education on economic growth is far from achieving a definitive conclusion. He exposed the theoretical reasons of the way a higher level of average education could make a country grow faster, but the empirical results do not always go in the same direction. In the empirical part he tried to evaluate a conclusion by Belzil, Hansen and Liu (2011) in which it was suggested a new path to explain the contradictory results in the field. In their article they conclude that individuals with lower schooling ability could have low (or even negative) returns to schooling when living under a compulsory schooling policy. This fact can be extrapolated to the macro level and say that the way a country has increased its average return to schooling is important to the effect of education on growth. Using three different educational attainment databases, he inferred the educational policies taken in different countries and made separate analysis for each class of them. As a result, the returns to education in countries where a compulsory schooling policy was taken are clearly lower than in those where this policy is clearly rejected by observing the data (Alferdo, 2012).

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 data sources and type of data

The main objective of this paper is to examine the impact of human capital on economic growth in Ethiopia. This study is based on the secondary sources of data. The data used in the model is annual data for the period 1974-2015. The data for this study obtained from Ethiopian CSA (Central Statistics Agency), MOE, (Ministry of Education), MOH (Ministry of health) , NBE (National bank Ethiopia) ,Ministry of Finance and Economic Development (MOFED), Ethiopian Economic Association (EEA), National Bank of Ethiopia (NBE), UNCTAD , international labor organization, emigration bureau ,and World Bank.

3.2. Research design

To achieve the objective of this study, Explanatory or causal research design was adopted. Besides, this the study have been used quantitative research approach to examine the impact of human capital on economic growth in Ethiopia from the period 1974 to 2015.

3.3. Model Specification

Human capital plays a special role in a number of models of endogenous economic growth (Barro, 1991). Endogenous growth theory as developed by Lucas (1988) basically represents an extension of the Solow (1956) neoclassical growth model incorporating positive externalities related to the accumulation of human capital through knowledge. Different scholars have designed different conceptual frameworks that incorporate human capital as one of the determinant factor of economic growth. These researchers have employed the human capital augmented Solow growth model (Cobb- Douglas production function) as their framework, specifying output/output per worker as dependent variable while labor, physical capital and human capital are dependent variables. According to lucas (1988) human capital is an important source of long term growth because of its positive policies that enhance investment in human capital, therefore promote long run growth.

Barro (1991) has also measured human capital using education (educational attainment) and health (life expectancy). Including both the education and health indicators are relatively better

measure of human capital than using education or health indicators alone. Because it expresses the notion that both education and health are an important elements of human capital.

According to economic theory human capital especially education and health in an economy has long been viewed as important factors in enhancing and promoting output or economic growth (Wilson etal, 2005). According to schultz, there are five ways developing human resources. These are health facilities and services conceived to include all expenditures, on the job training, formal organized education at the elementary, secondary and higher levels, study programmes for adult including extension programmes, migration of individuals and families to adjust to changing job opportunities (Lingaiah, 2001).

Cobb- Douglas production function in the study, taking output growth as a dependent variable while growth in labor, growth in physical capital and growth in human capital were taken as explanatory variable. In this study the impact of human capital on economic growth in Ethiopia is analyze based on the standard growth accounting model. The augmented Solow production function specifies that output is a function of labor, human capital, capital stock and productivity (Mankiwetal 1992). Mankiw et al. (1992) explain the relationship as follow in a Cobb-Douglas production function with constant returns to scale.

The general form of the human capital augmented Cobb-Douglas production is shown below:

$$Y_t = AK_t^{\alpha} H_t^{\beta} L_t^{\,1-\alpha-\beta} \qquad \qquad \alpha+\beta <1$$

Where Yt represents output at time t, A is the level of technology which is not accounted by the growth in factors of production. Kt, Ht and Lt are physical capital, human capital and labor at time respectively. α,β and U are elasticity of physical capital with respect to output, elasticity of human capital with respect to output and an error term respectively.

$$LnY_t = A + \alpha LnK_t + \beta LnH_t + \Theta LnL_t \quad , \text{ where } \Theta = 1 - \alpha - \beta$$

Based on theoretical framework developed by mankiw,romer and weil(1992) the following model is specified.

LnRGDPt = (LnLFt, LnGCFt ,LnEDUEX t, LnSCHENROL, tLnHEALTHEX t, LnODAt)

Where:

LnRGDPt = Natural logarithm of real GDP at time t.

LnLFt = Natural logarithm of labor force growth rate at time t.

LnGCFt = Natural logarithm of gross capital formation at time t.

LnEDUEX t =Natural logarithm of education expenditure at time t.

LnSCHENROLt =Natural logarithm of school enrollment (primary, secondary and tertiary) at time t.

LnHEALTHEX t =Natural logarithm of health expenditure at time t.

LnODAt = Natural logarithm of official development assistance at time t.

In this study real GDP per capita used as a proxy for economic growth. The study also proxy human capital by total government expenditure on education, total government expenditure on health, school enrolment and official development assistant based on theoretical and empirical literature.

3.4. Definition of variables and hypothesis

Definition of variables and hypothesis of the dependent and the explanatory variables that are included in the model of this paper are explained as follows:

Real GDP (RGDP) is the market value of the goods and services produced by an economy over time. Since most economists argue that economic growth can be measured as growth in real GDP, it includes in the model as main dependent variable in order to measure economic growth.

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

Labor force (LF):- Theoretically, labor force is a major element for sustainable rate of economic expansion. It could be the engine of growth for labor intensive economies like Ethiopia. Therefore in this study, labor forces have been expected a positive and significance impact on economic growth.

Expenditure on education (EDUEX) is money spent in formal schooling, on-the job-training and off-the-job training. Giving more emphasis to education is raising the productivity of workers by providing useful knowledge and skills.

Health expenditure (HEALTHEX): Health status affect the human capital level of individuals and thereby the growth of a given country. Health capital can affect economic growth through the channels of productive efficiency, life expectancy, learning capacity, creativity, etc. Healthier workers will become strong, energetic, creative, attentive so forth that makes them more effective in the production process with any given combination of skills, physical capital and technological knowledge. Rise in expenditure on health leads rise in economic growth.

School enrolment (SCHENROL) shows the number of student who registered in primary secondary and tertiary school. Various theoretical and empirical literatures shows school enrolment increase productive, further leads economic growth. In this study expect the positive and significance impact of school enrolment on economic growth.

Official Development Assistance (ODA) is defined as inflows from external assistances. As we know Ethiopia is one of the poor countries in the world. As result Ethiopia is getting from external assistance in the form of aid. To see its effect on the economic growth this variable is chose as one explanatory variable as one part of human capital development and expected to have positive contribution to the socio economic status of the recipient country.

All of the variables discussed above are given in logarithm form. The log-linear form of specification enables the researcher to interpret the coefficient of the dependent variables 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 includes the following steps: first it needs to check for a unit root test of all variables in levels. Second, confirming the validity

of the fitted model diagnostic tests are employed, i.e.Brush and Godfray LM test to check serial correlation problem and Breusch- Pagan Godfrey heteroskedasticity test for observing the variance constancy of the residuals. Thirdly, it needs to test the co integration of variable and selection of the approach that used to analysis the impact of human capital on economic growth. Finally, causality will be test by employing the granger causality tests. In addition to the econometrics analysis and estimation technique, the study employed descriptive statistics in order to analysis the data.

3.5.1. Unit Root Tests

A test of stationary or non-stationary that has been become popular over the past several years is the unit root test. The DF and the ADF tests are the most usually used tests 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 which cannot be used for precise decision. A variable is said to be 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-stationary is tested against alternative hypothesis of stationary. In this study the stationary is tested by using unit root test. Unit root test is investigation of the characteristics of the individual time series variables involved (Gujarati, 2004).

Therefore, using such critical values can lead to over-rejection of the null hypotheses when it is true (Ibid). Hence, Dickey and Fuller have developed a test known as the Augmented Dickey-Fuller (ADF) test to solve 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 resolved. The parameter of interest in the ADF model is Φ and the null and alternative hypothesis that will be tested are as follows: Ho: $\Phi = 0$ Ha : $\Phi < 0$ The ADF test procedure for unit roots is similar to statistical tests for hypothesis But, the critical values of the tau test to test the hypothesis (Gujrati, 2004). Hence, the advantages over DF test; the researcher has used the ADF test of stationary. In addition, the lag-length of the ARDL model is determined by Akaike Information Criterion (AIC).

3.5.2. Co integration test

Co-integration is a statistical property that describes long run relationship of economic time series. To analyze the relationship between GDP and human capital, the study will use autoregressive distributed lag (ARDL) approach which appears in recent empirical investigation. The econometrics advantage of ARDL approach is applicable irrespective of the degree of integration of the variable (i.e. whether the variable I (0), I (1) or mixture of the both), performs better for small sample size, long run and short run parameters of the model are estimated simultaneously. If the all variables are I (1) this study used error correction mechanism (ECM) model.

The ARDL procedure provides unbiased and valid estimates of the long run model. A mentioned advantage, the researcher has used the ARDL method of co-integration to investigate the impact of human capital development on economic growth. The ARDL approach involves two steps for estimating the long-run relationship (Pesaran, Shin, and Smith, 2001). The first step is to examine the existence of long-run relationship among all variables in an equation and the second step is to estimate the long-run and short- run coefficients of the model. We run the second step only if we find a co-integration relationship in the first step. Therefore, following the ARDL approach proposed by Pesaran and Shin (1997, 1999) and Pesaran, Shin, and Smith (2001), the following model is specified in order to determine/test the long-run co-integration relationships between variables.

The advantage of ARDL First, the ARDL model is the more statistically significant approach 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 approach is that while other co integration3 techniques require all of the regressors to be integrated of the same order; the ARDL approach can be applied whether the regressors are purely order zero [I(0)], purely order one [I(1)], or mixture of both. This means that the ARDL approach avoids the pre-testing problems associated with standard cointegration, which requires that the variables be already classified into I(1) or I(0) or mixture of both (Pessaran et al., 2001). Third, with the ARDL approach it is possible that different variables have different optimal numbers of lags. Forth, the other advantages of bound testing approach in the long run and short run parameters of the model in questions are determined simultaneously.

3.5.3. Granger causality test

In this study the causality test will be employee. The Granger causality test is applied to investigate the direction of causality between the variables. This concept involves the effect of past values of one or more of the variables on the current value of the other.

CHAPTER FOUR: RESULT AND DISCUSSIONS

The general objective of this paper is to analyze the impact of human capital on economic growth in Ethiopia using recent econometric technique of ARDL model and causality analysis. Human capital variables represented by health expenditure , education expenditure official development assistance and school enrolment(primary ,secondary and tertiary) collected from various institution from 1974 up to 2015.

4.1. Descriptive analysis

4.1.1 Trends of real GDP in Ethiopia from 1974 - 2015

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.

RGDP
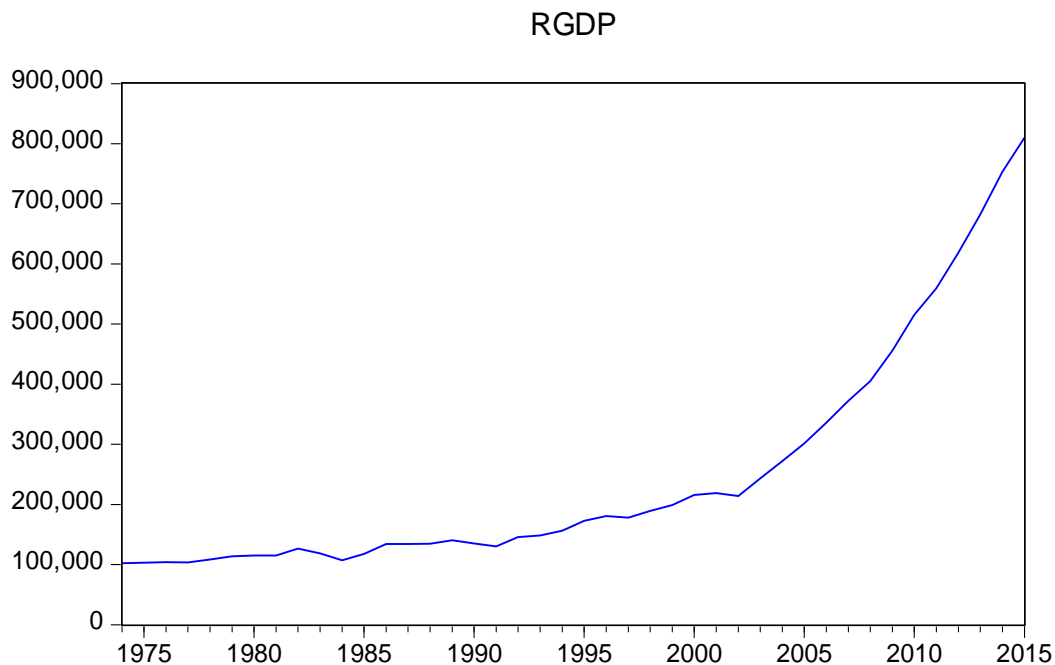
Source: own calculation based on MOFED, NBE and WB data

Figure 4.1 Trends of real GDP in Ethiopia From 1974-2015

According to the above figure 4.1, (2015/2016) the real GDP of Ethiopia was 102,407 million birr in 1974 and it reaches 810,187 million birr in 2015. 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 Trends in the share of public spending on education and/or health to GDP in Ethiopia

Human capital is the term economists often use for education, health, and other human capacities that can raise productivity when increased. An analogy is made to conventional investments in physical capital: After an initial investment is made, a stream of higher future income can be generated from both expansion of education and improvements in health.

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 could not count on that income increase being used to 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. Health is an important factor in school attendance. Healthier children are more successful in school and learn more efficiently. Deaths of school-age children also increase the cost of education per worker. Longer life spans raise the return to investments in education. Healthier individuals are more able to productively use education at any point in life (Todaro, 2012).
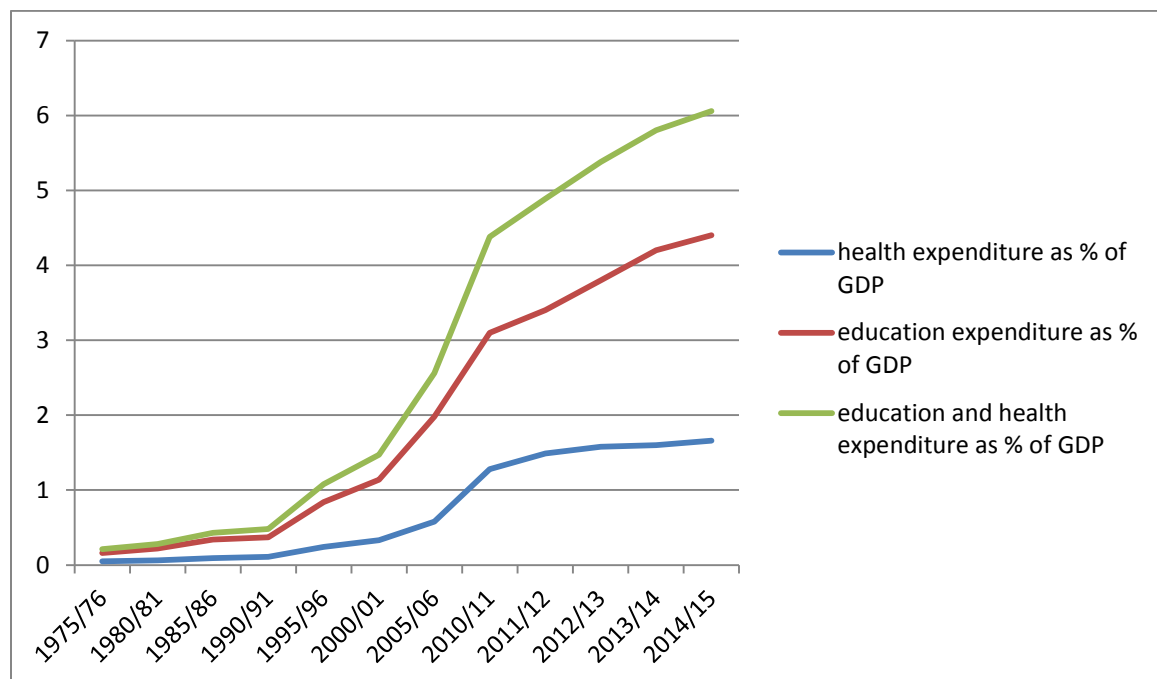
Figure 2 Trends in the share of public spending on education and/or health to GDP

Source: own calculation based on MOFED, EEC and World Bank data

As shown in Figure 1, total expenditure on education and health as a percentage of GDP has increased continuously. But total expenditure on education as a percentage of GDP was above from the total expenditure on health as a percentage of GDP in all periods. After the overthrow of the military regime, the share of health expenditure to GDP has also increased more than before. Between the year 1990/91 and 2010/11 the average share of health expenditure to GDP was around 2.1 percent. Similarly, the average share of education to GDP has an average of around 1.5 percent in similar year. After that, average of health and education has recorded 1.6 and 3.6 percent respectively from 2011/12 to 2014/15.

Most of the time expenditures (both recurrent and capital) of health, education and training were employed to measure human capital, which is the major driving force of economic growth. During the military power, the coverage and well distribution of education and health were very low comparing to current government. The trend of expenditure in health, and education at the starting period was very low and starts slightly increase until 2009.After 2009 onwards it was

43

increased by higher rate and it reached its higher level in recent years. Health and education play pivotal roles in economic development, as both inputs into production enabling higher incomes and outputs directly affecting human well-being.

4.2. Augmented Dicky-Fuller Unit Root Test

In order to determine the degree of stationary, a unit root testing is carried out through the standard Augmented Dicky-Fuller (ADF) test. A formal and widely used test for stationary and the order of integration of each variable are undertaken using different methods (mostly ADF). Here, the test for ADF is performed for the model with intercept and trend component and also for the model without intercept term and trend component.

This test was undertaken to check the order of integration of the variables. Most economic variables that exhibit strong trends which means variables that moves up ward and down ward direction persistently with time, such as GDP, consumption, or price level, are not stationary. Unit root test is a common method to accommodate non stationary of the data. If non stationary of macro variables is not corrected, it would lead to the problem of spurious regression (false relationships among the variables). When a series contains unit root, it is common to transform the variables so as to make it stationary. Such a transformation process can be carried out through differencing. The number of times in which the series is differenced to attain stationary is referred to as the order of integration. A stationary series is a series that is integrated of order zero, known as I (0). If the data requires differencing once to make it stationary then it said to be integrated of order one, I(1). In order to apply ARDL model all the variables entered in the regression should not be integrated of order two. To check these conditions, unit root test is conducted before any sort of action taken. Even though the ARDL framework does not require per testing variables to be done, the unit root test could convenience us whether or not the ARDL model should be used (Green, 2003).

Table 4.1: ADF unit root test results

Variable	ADF test statistic without trend	P value	ADF test statistic with trend	P value
LnRGDP	4.07	1.00	0.539	0.99
lnLF	0.974	0.9955	-2.122	0.51
lnGCF	1.085	0.996	-2.1288	0.51
lnHEALTHEX	3.645	1.00	-0.541	0.97
lnEDUEX	0.697	0.990	-0.2208	0.99
lnSCHENROL	-0.810	0.805	-1.986	0.59
lnODA	-0.3299	0.911	-3.7097**	0.032
$\Delta lnRGDP$	-2.0506	0.26	-6.67***	0.000
ΔlnLF	-1.745	0.40	-4.052**	0.014
ΔlnGCF	-7.999***	0.0000	-8.33***	0.000
ΔlnHEALTHEX	-4.157***	0.002	-5.30***	0.004
ΔlnEDUEX	-2.979	0.13	-3.704**	0.023
ΔlnSCHENROL	-3.5497***	0.01	3.539**	0.048
ΔlnODA	-7.48***	0.000	-7.085***	0.000

Source: Eview 9.0 results

Akaike information criterion (AIC) is used to determine the lag length while testing the stationary of all variables. <u>Note:</u> the ***, ** and * sign indicates the rejection of the null hypothesis of non-stationary at 1%, 5% and 10% significant level respectively.

The results from this test show that six of the variables are non-stationary in their levels (for both type of specifications) while the null of non-stationary is not rejected for one variable (official development assistance with intercept and trend) at 5 % level of significance .On the other hand, in their first differences, all of the variables are stationary. These results indicate that, with intercept and trend, six of the variables are I (1) and one of them is I (0). This is one of the main justifications for using the ARDL approach (bounds test approach of cointegration) developed by Pesaran, Shin, and Smith (2001). The results of unit root tests reveal that all the variables are non-stationary at level, I(0) except official development assistance , while after taking the first

difference, I(1), all the variables were confirmed to be stationary as shown in table 4.1 all the variables in this study are integrated of order one.

Form table 4.1, (lnRGDP), labor force (lnLF), growth capital formation (lnGGCF), expenditure on health (lnHEALTHEX), education expenditure (lnEDUEX) , school enrolment (lnSCHENROL) are integrated of order one (I.e. I(1)) while official development assistance is integrated of order zero(I(0)). This shows official development assistance is stationary in level where as real GDP growth capital formation, education expenditure, health expenditure labor force and school enrolment are stationary in first difference (trend and intercept). From this unit root test we can conclude that none of the variables entered in the regression are orders two, which are not desire in applying ARDL model. So ARDL co integration technique proposed by Pesaran et al. (2001) is the most appropriate method for estimation or to check the long run relationship among the variables.

4.3. Model Stability and Diagnostic Test

To check the verifiability of the estimated long run model, some diagnostic test is undertaken. Priority in doing any analysis, we required to check the standard property of the model. In this study we carried a number of model stability and diagnostic checking, which includes Serial correlation test (Brush &Godfray LM test), normality test and Hetroscedasticity test.

Table 4.2: Diagnostic test for the long run ARDL Test Statistics: Breusch-Godfrey Serial Correlation LM Test.

F-statistic	0.022868	P (2, 32)	0.8808
Obs*R-squared	0.029652	Prob. Chi-Square(1)	0.8641

Source: eviews 9.0 results

Note: the ***, ** and * sign indicates the rejection of the null hypothesis of non-stationary at 1%, 5% and 10% significant level respectively.

Table 4.3: Diagnostic test for the long run ARDL Test Statistics:Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	1.759923	Prob.F(7,33)	0.1291
Obs*R-squared	11.14528	Prob.Chi-Square(7)	0.1324
Scaled explained SS	9.0022104	Prob.Chi-Square(7)	0.2511

Source: Eviews 9.0 results

Note: the ***, ** and * sign indicates the rejection of the null hypothesis of non-stationary at 1%, 5% and 10% significant level respectively.

Table 4.4: Normality test

Std. Dev.	0.0293	Jarque Bera	1.2837
Skewness	-0.394	probability	0.526
Kurtosis	3.38		

Table 4.5: Model stability test

	Value	probability
T-statistic	1.079301	0.3595
F-statistic	1.164890	0.3595

The above table indicates that the long run ARDL model estimated in this study passes the heteroskedasticity, normality and serial correlation diagnostic tests and stability test. This is because the p-value was unable to reject the null hypothesis specified for each test. Therefore based on the result of the test: The null hypothesis of no serial correlation (Brush Cod fray LM test) is failed to reject for the reason that that the p-values associated with test statistic is greater than the standard significant level (I.e. 0.8808> 0.05). Her LM test for testing serial correlation is applied because unlike the traditional Durbin Watson test statistic which is totally inapplicable when the lagged dependent variable appear as a repressors, LM test avoid such limitation of DWtest.

The other diagnostic test is heteroscedasticity test. As we have seen from the above table, we can fail to reject at 5% significant level due to its p-value associated with the test statistics are greater than the standard significance level(I.e. $0.1291 > 0.05$). This shows that accept the null hypothesis that the model have no heteroskedasicity problem.

According to Ramsey's test, which tests whether the model stable or not was stated on table 4.5 above. The result says the model is correctly stable. As the test result confirms we cannot reject it. That is the p value is 0.3595.

The other time series model and data test is about the nature of distribution of the residual. The null hypothesis is suggested that the residual is normal distributed. From table 4.4, the p-value associated with the Jaque-Berra normality test is larger than the standard significance level (i.e. $0.526 > 0.05$), we fail to reject the null. So the residual is normally distributed.

4.4. Long Run ARDL Model Estimation

This result indicates us the existence of a long-run relationship among real GDP, labor force, gross growth capital formation, education expenditure, health expenditure, school enrolment and official development assistance. After confirming the existence of long-run co-integration relationship among the variables, the estimated long-run relationship between the variables are estimated and the estimated coefficients after normalizing on real GDP are reported in Table 4.4 below.

Table 4.6: long run estimation result using the autoregressive distributed lag approach (ARDL) selected based on Akaike Information Criteria (AIC).

Dependant variable

Independent variable	Coefficients	S.E	T ratio	p- value
LnLF	0.1135	0.165	0.690	0.4949
LnGCF	0.206	0.030	6.817	0.0000***
LnEDUEX	0.598	0.050	11.957	0.0000***
LnHEALTHEX	0.196	0.560	3.501	0.0014***
lnSCHENROL	-0.188	0.035	-5.354	0.0000***
LnODA	-0.037	0.013	-2.907	0.0065***
Constant	4.053	0.300	13.484	0.0000***

R squared	0.9988	S.D of depvar	0.6238
R bar squared	0.9985	Resual sum of seq	0.0174
F stast	2679.58	Equation lag likelihood	100.9925
P value	0.00000	Akaike info criterion	-4.38987
Dwstastics	2.0048	Schwarz Bayesian criteria	-3.9301

Source: Eviews 9.0 ARDL results

Note: The ***, ** and * sign indicates the significance of the coefficients at 1%, 5% and 10% significant level respectively.

The long run estimated model presented as follow with figures including the coefficient, t-values and p-values

LRGDP =4.053 + 0.206LGCF + 0.114LLF + 0.598LEDUEX+ 0.196LHEALTHEX- 0.188LSCHENROL - 0.037ODA

    (13.484)   (6.817)   (0.690)   (11.957)   (3.501)
(-5.354)   (-2.907)

The long-run coefficients of education expenditure, growth capital formation and health expenditure are a way of thinking with theory and are also statistically significant that contribute in economic growth during 1974 - 2015. The coefficients of education expenditure and health expenditure reveal the existence of a positive and significant long-run relationship between human capital and economic growth.

The result of Table 4.6 indicates that growth capital formation, education expenditure, health expenditure and labor force are expected sign and statically significances except labor force which is statically insignificance. Whereas, school enrolment (primary, secondary, and tertiary) and official development assistance are unexpected sign which is negative and statically significant long run impact on economic growth. As we have discussed in the theoretical and empirical literature parts, physical capital, labor force, and human capital (proxy by education expenditure, health expenditure, school enrolment and official development assistance) have positive impact on Ethiopian economic growth regardless of significant. 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. Proponents of endogenous growth theory lay emphasis on human capital formation and regard it a factor which explains difference in growth performance of under developed and developed nations (Becker, 1962).

Education expenditure and health expenditure has a long run impact on the Ethiopian economy growth and statistically significant at 1 percent significance level. The findings of this research concerning the long run positive impact of the education expenditure which is the proxied of human capital on Ethiopian economic growth, are consistent with the endogenous growth theories (mainly advocated and/or developed by Lucas 1988), Romer (1990) which argue that improvement in human capital (skilled and healthy workers) leads to productivity improvement that enhances output. As a result a one percent increase in the education expenditure has resulted in 0.598 percent change in real GDP under the study period. Similarly as one percent increase in health expenditure has result in 0.196 percent increase in real GDP and vice versa. According to theoretical literature, 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).

As the long run estimated result of the above table showed, the capital formation which is proxied by gross capital formation has a positive impact on Ethiopian economic growth and statistically significant at 1 percent significance level. According to solow's and Keynesian theory of growth capital is the major determinate of economic growth. Since we have specified the growth model in a log-linear form, the coefficients can be interpreted as elasticity with respect to real GDP. The coefficient of gross capital formation (GCF) is 0.206. This indicates that, in the long run, being other things constant, a one percent change in gross capital formation leads 0.206 percent change in real GDP during the study period.

The result of this study revealed that the impact of labor on Ethiopian economic growth during the study period, even if there is positive relationship, it is not statistically significant. This insignificant result might be associated with high population growth and low productivity of the labor force.

The development assistance, which is measured by official development assistance has a negative relationship with real GDP and statistically significant at 1 percent significance level. The economic objectives of foreign aid are poverty reduction and increasing savings, investment and rate of growth of GNP in developing countries. However, in many cases donor motives for giving aid and recipient motives for accepting it conflict with the economic objectives of foreign aid. According to Todaro (1989) there is no historical evidence that over large periods of time donor country assist others without expecting some corresponding benefits (political, economic, military) in return. This leads to the non-achievement of objectives of foreign aid in many cases.

 Friedman (1958) and Bauer (1972) called for an end in aid, arguing that it is not a necessary requirement for the economic growth of a country. Both Friedman and Bauer assert that foreign

assistance to governments is dangerous because it increases the power of the elite in the recipient governments, leads to corruption and hinders economic growth. In particular, Bauer noted that aid discourages the growth of private sector investments, encourages public sector-led growth (Haile, 2015).

Like official development assistance, school enrolment also negative relationship with real GDP and statically significance at 1 percent significance level. From theoretical literature Human capital impacts economic growth only if it is utilized in the labor market: those who have attained schooling need to be employed so that their skills can be used to produce goods and services. However, there may be a mismatch between the skills taught by the educational system and the skills needed by the labor market, so highly educated workers may end up doing low productivity jobs. Thus, despite a country's achievements in accumulating human capital through the education system, this achievement may not lead to economic growth and poverty reduction if the labor market is not considered (Son, 2012).

The literature on the effect of education on economic growth is far from achieving a definitive conclusion. The unexpected sign of the coefficient of school enrolment contradicts with economic growth theories. Hence, further detailed research should be done to identify the reason behind such result (unexpected sign of school enrolment). Belxiletal (2011) exposed the theoretical reasons of the way a higher level of average education could make a country grow faster, but the empirical results do not always go in the same direction. In the empirical part he tried to evaluate a conclusion by Belziletal (2011) in which it was suggested a new path to explain the contradictory results in the field. In their article they conclude that individuals with lower schooling ability could have low (or even negative) returns to schooling when living under a compulsory schooling policy. This fact can be extrapolated to the macro level and say that the way a country has increased its average return to schooling is important to the effect of education on growth. Using three different educational attainment databases, he inferred the educational policies taken in different countries and made separate analysis for each class of them. As a result, the returns to education in countries where a compulsory schooling policy was taken are clearly lower than in those where this policy is clearly rejected by observing the data (Alferdo, 2012).

4.5. Short Run Error Correction Model

After the acceptance of long run coefficients of the growth equation the short run Error Correction Model (ECM) is estimated. ECM indicates the speed of adjustment to restore equilibrium in the dynamic model. It is one lagged period residual obtained from the estimated dynamic long run model. The coefficient of error correction term indicates how quickly variables converge to equilibrium.

The estimated short-run model reveals that education expenditure is the main contributor to real GDP change followed by public expenditure on health and growth capital formation respectively. Secondary school enrolment and official development assistance affect economic growth negatively which is unexpected sign.

Table 4.7: Error correction representation for the selected Autoregressive Distributed Lag model: ARDL selected based on Akaike Information Criterion

Variable	Coefficient	Std.error	t-statistic	Prob.
$\Delta lnLF$	0.0939	0.1346	0.683	0.4993
ΔlnGCF	0.1705	0.0267	6.382***	0.0000
Δln EDUEX	0.4951	0.0678	7.295***	0.0000
ΔlnHEALTHEX	0.1625	0.0491	3.306***	0.0023
ΔlnODA	-0.0308	0.0115	-2.675**	0.0115
ΔlnSCHENROL	-0.1554	0.0333	-4.656***	0.0001
ΔlnCointEq(-)	-0.8275	0.0876	-9.444***	0.0000

Source: eviews 9.0 result

Notes: ***, **, * indicates statistical significant at 1%, 5% and 10%, respectively.

After the acceptance of long-run coefficients of the growth equation, the short-run ECM model is estimated. The error correction term (ECM) is the speed of adjustment to restore equilibrium in the dynamic model. It is a one lagged period residual obtained from the estimated dynamic long run model. The coefficient of the error correction term indicates how quickly variables converge.

From the above table 4.7, similar to the long run result, capital formation (gross capital formation) and human capital (proxy by education expenditures and health expenditure) have

positive impact on economic growth in Ethiopia and statistically significant at 1 percent significance level in the short term. Whereas school enrolment and official development assistance are negative and statically significance impact on economic growth which is similar result to long run result at 1% and 5% level of significance . Similarly, Abbas (2001) analyzed the impacts of human capital on economic growth in Pakistan and Sri Lanka. The results show that human capital represented by primary schooling enrolment rates has negative impact on economic growth for Pakistan and Sri Lanka. Additionally, human capital measured by secondary and higher schooling enrolment rate has positive and significant impact on economic growth for both countries in the sample. Nevertheless, the increase in enrolment rate is not sufficient to sustain the growth. What is more important is how the amount is utilized and quality of graduated secondary education. Many graduated secondary education has no meet the increasing demand for a more skilled labour force especially in private company.

Similarly to this thesis result Mohamed etal(2011) also got a primary and tertiary education level for instants has negatively and significant impact on economic growth in the short run but tertiary education found positively significant in long run. Adopted new technology for manufacturing and service sector has benefit for graduate higher education among people to produce more quality production.

On the other hand, labor force is positive relationship with real GDP which is similar to long run result, but still statically insignificance impact on economics growth of Ethiopia. As a result a one percent increases in capital formation will result in 0.1705 percent increase in real GDP in the short run. Similarly, a one percentage increase in education expenditure and health expenditure will result in 0.4951 percent and 0.1625 percent increase in real GDP. This is similar result with Teshome (2006) and Tewodros (2014) found positive impact of human capital development on economic growth in Ethiopia using public spending on education and health sector as a proxy for human capital.

The error correction coefficient, estimated at -0.8275 is highly significant and has the correct negative sign. This shows that there is a very high speed of adjustment to equilibrium. The highly significant error correction term (i.e. 82.75%) further confirms the existence of a stable long run relationship

4.6. Long Run ARDL Bounds Tests for Co-integration

The study applied the methodological approach called ARDL model also known as bound test approach. As the result indicted the bound test (F-statistic) value is larger than the upper bound critical value both for Pesaranetal. (2001) and Narayan(2004), which indicates there is a long run relationship between real GDP and capital formation, human capital(education expenditure, health expenditure, school enrolment and official development assistance) ,and labor force in long run during the study period   .

As justified by unit root test all the variables of the study are integrated of order one so co − integration tests are possible. Both the trace and maximal Eigen value tests reveal that there are only one co-integrating vectors in the system at 5% level of significance. This suggests the existence of long-run relationship between the variables. . It may also be possible to use the Engle- Granger two-step procedure to test for co integration. But, the Engle-Granger method tests the presence of only one co-integrating relationship and does not reveal whether there may be other such relationships.

The first task in the bounds test approach of co-integration is estimating the ARDL model specified using the appropriate lag length selection criterion. In this paper Akaike Information Criterion (AIC) was taken as a guide and a maximum lag order of 2 was chosen for the conditional ARDL model. Then F-test through the Wald-test (bound test) is performed to check the joint significance of the coefficients. The F test is conducted by imposing restrictions on the estimated long-run coefficients of real GDP, labor force growth, gross capital formation, education expenditure, health expenditure, school enrolment and official development assistance.

Since we determined the stationary nature of the variables, the next task in the bounds test approach of co-integration is estimating the ARDL model specified using the appropriate lag-length selection criterion. According to Pesaran and Shine (1999) for the annual data are recommended to choose a maximum of two lag lengths. From this, a lag length that minimize AIC is 2. In addition to this, we have also used AIC to determine the optimal lag because it is a better choice for smaller sample size data as this study. Apart from this, AIC found to produce the least probability of under estimation among all criteria available (Liew et al., 2004) as cited in Tewodros (2014).

Wald test is conducted by imposing restrictions on the estimated long-run coefficients of real GDP, gross capital formation, education expenditure, health expenditure, school enrolment and development assistance. The computed F-statistic value is compared with the lower bound and upper bound critical values provided by Pesaran et al. (2001) and Narayan (2004).

Table 4.8 calculate F statistic

Lag length	F statistic
2	4.539

Source: eviews 9.0 result

Table 4.9 upper and lower bond values

k-6 Critical values	Upper bond values	Lower bond values
1%	3.5	4.43
2.5%	2.75	3.99
5%	2.45	3.61
10%	2.15	3.23

Source: eviews 9.0

From the above result in table 4.8 and 4.9 there is higher F statistic or f statistic is higher than from the upper bond and lower bond values at 1% level of significance. This implies that the null hypothesis of no long-run relationship is rejected; rather accept the alternative hypothesis (there is long-run relationship) Therefore, there is relationship among the variables in long run.

4.7. Granger Causality Results

A granger causality test is made to identify the direction of causality between the dependent variable (real GDP) independent variables such as human capital (proxy by education expenditure, health expenditure, and school enrolment and official development assistance), labor force and growth capital formation. In order to test the causality pair wise granger causality test was employed.

Table 4.10: Pair wise granger causality test

Null hypothesis	F statistic	P value
LNLF does not Granger Cause LNRGDP	2.757	0.105
LNRGDP does not Granger Cause LNLF	4.971	0.03**
LNGCF does not Granger Cause LNRGDP	0.6896	0.4
LNRGDP does not Granger Cause LNGCF	15.70	0.0003***
LNHEALTHEX does not Granger Cause LNRGDP	5.804	0.02**
LNRGDP does not Granger Cause LNHEALTHEX	0.075	0.78
LNEDUEX does not Granger Cause LNRGDP	10.04	0.003***
LNRGDP does not Granger Cause LNEDUEX	0.0020	0.96
LNSCHENROL does not Granger Cause LNRGDP	2.93	0.086*
LNRGDP does not Granger Cause LNSCHENROL	0.07	0.78
LNODA does not Granger Cause LNRGDP	3.49	0.069*
LNRGDP does not Granger Cause LNODA	0.177	0.676

Source: eviews 9.0 result.

 Note: The signs *** and ** indicate the significance of the coefficients at 1% and 5% level of significance respectively.

 The concept   of causality involves the effect of past values of one or more of the variables on the current value of the other. In a causality test as first proposed by Granger (1969), we consider the null hypothesis that lnRGDP does not granger cause lnHEALTHEX, lnEDUEX, lnSCHENROL, lnODA, lnLF, lnGCF and vice versa. These tests confirm the application of a single dynamic model rather than a simultaneous equation model. It helps to test whether economic growth has got an impact on the human capital level in the country and vice versa. Our result shows that human capital which is proxy by lnHEALTHEX ,lnEDUEX ,lnSCHENROL ,lnODA is causal relation with lnRGDP that is at 1%, 1%, 10%, 10% level of significances respectively. But, lnRGDP is the cause only for labor and growth capital formation at 5% and 1% level of significances. This shows that human capital is the cause for economic growth and there is no feedback effect of economic growth on the level of human capital. Causality may be

positive or negative cause. From the above result growth formation, education expenditure, health expenditure and labor force are the cause for the improvement of economic growth, while school enrolment and official development assistant are the cause for reduction of economic growth.

CHAPTER FIVE: CONCLUSION AND POLICY IMPLICATION

5.1 conclusions

The main objective of the study was to analyze the impact of human capital development on economic growth in Ethiopia using real GDP, as a proxy for economic growth. To determine the impact of human capital (education expenditure, expenditure on health, school enrolment and official development assistance) on economic growth (real GDP), the study has used the ARDL Approach to co-integration and the error correction model (ECM).

Human capital occupies a central role in modern thinking about growth. Despite a large literature on the matter, there is a lot to be learned: there is no consensus of its role in growth and development, presumably because this role varies across different institutional settings and national environments. All the variables except official development assistance are non-stationary at level while they are stationary after taking their first difference.

The empirical result showed that both physical capital (gross investment) and human capital (expenditure of health and education) are found to have positive impact on Ethiopian economic growth during the study period and statistically significant at 1 percent significance level. The findings of this research concerning the long run positive impact of the education and health human capital are consistent with the endogenous growth theories (mainly advocated and/or developed by Lucas (1988) , Romer (1990), Mankiw, Romer and Weil (1992) which argue that improvement in human capital (skilled and healthy workers) leads to productivity improvement and thereby output growth. A one percent increase in capital formation (gross capital formation) results in 0.206 and 0.1705 percent increase in real GDP in long run and short run, respectively. Likewise, a one percent increase in human capital through expenditure of health and education will result in 0.196 and 0.598 percent increase in real GDP in long run and 0.1625 and 0.4951 percent in short run, respectively.

The school enrolment and official development assistance has negative impact in economic growth during the study period in both long run and short run, which is not consistent with the endogenous growth theories (mainly advocated and/or developed by Lucas (1988) ,Romer (1990), Mankiw, Romer and Weil (1992) which argue that improvement in human capital (skilled and healthy workers) leads to productivity improvement and thereby output growth. A

one percent increase in school enrolment (primary, secondary and tertiary) will result in 0.188 and 0.0308 percent decline in real GDP in long run and short run, respectively. Similarly, Abbas (2001) analyzed the impacts of human capital on economic growth in Pakistan and Sri Lanka. The results show that human capital represented by primary schooling enrolment rates has negative impact on economic growth for Pakistan and Sri Lanka. Additionally, human capital measured by secondary and higher schooling enrolment rate has positive and significant impact on economic growth for both countries in the sample. Nevertheless, the increase in enrolment rate is not sufficient to sustain the growth. What is more important is how the amount is utilized and quality of graduated secondary education. Many graduated secondary education has no meet the increasing demand for a more skilled labour force especially in private company. Mohamed etal(2011) also got a primary and tertiary education level for instants has negatively and significant impact on economic growth in the short run but tertiary education found positively significant in long run. Adopted new technology for manufacturing and service sector has benefit for graduate higher education among people to produce more quality production.

Similarly, a one percent increases in official development assistance will result in 0.031 and 0.1554 percent decline in real GDP. From the study conclude that without efficient and sound policy, strong institutional structure foreign assistance to governments is dangerous because it increases the power of the elite in the recipient governments, leads to corruption and hinders economic growth. It also discourages the growth of private sector investments, encourages public sector led growth.

However, the study found that labor force has statistically insignificant impact on economic growth with positive sign in the long run. The improvement of structure of institution that is educational institution is critical for the quantity and quality of human capital that is generated and for the uses to which it is put. The structure of the institution will determine, for example, how human capital is put into growth enhancing activities and how much into other activities.

A causality test result shows that human capital which is proxy by health expenditure, education expenditure, school enrolment and official development assistance is causal relationship with real GDP at 1%, 1%, 10%, 10% level of significances respectively. But, real GDP is the cause only for labor and growth capital formation at 5% and 1% level of significances. This shows that

human capital is the cause for economic growth and there is no feedback effect of economic growth on the level of human capital.

The direction of the education sector has also been top down usually following the donor's perspective and is politically motivated. Human capital is just one aspect of the economy that enters into the determination of growth. Simply providing more schooling may yield little or nothing in the way of economic growth in the absence of other elements such as the appropriate market, legal and governmental institutions and suitable policy environment in other sectors of the economy to support a functioning modern economy. School enrolment by itself is not a sufficient engine of growth. In this direction the study also questions the economic policy directions, which could have been perverting the contribution to economic growth that would have been made from an expansion in educational investment. Major initiatives toward reforming education could have substantial success in the economy. Addressing the issue of relevance and quality of education; the institutional workings of the labor market and employment conditions; and having a comprehensive database (information) related to the workings and relationships of education, labor and the economy would essentially help tap the contributions that could be made from education. The institutional framework that regulates the employment relationship including the legal framework for standards at work, pay scheme bases and related issues must be comprehensively analyzed and dealt with. The study ultimately points towards the importance of an institutional and political environment conducive to growth.

5.2. Policy Implications

In order to achieve economic growth, more resources should be devoted to education, health and physical capital formation. Such measures have a large impact on human productivity which leads to improved national output. In order to enhance the contribution of the human capital, the government of Ethiopia has allocate adequate finance which will help to work on quality of education and providing basic health services to the society. Thus educated and healthy societies will bring technology and innovation, which is believed as a spring board of economic growth.

The results also suggest that greater attention should be given to school enrollment and development assistance and government should introduce policies which can induce innovation and promote to increase economic growth. Besides that, government should provide more

opportunity job to balance with increasing enrollment rate to achieve high income economy in order to adjust the negative impact of school enrolment and official development assistance. Human capital is just one aspect of the economy that enters into the determination of growth. Simply providing more schooling may yield little or nothing in the way of economic growth in the absence of other elements such as the appropriate market, legal and governmental institutions and suitable policy environment in other sectors of the economy to support a functioning modern economy.

The government and concerned body should strive to create institutional capacity that improve school enrolment and improve development assistance. That means, the policy makers and the government should center on securing more resources and structures that are essential and appropriate for better school enrolment and development assistance. Such measures should focus not only on creating new institutional capacity, but also on strengthening and changing the existing institutional setups of the education and health sectors of Ethiopia that produce quality manpower.

In addition, the government should also continue its leadership role in creating enabling environment that encourage better investment in education and health by the private sector. Because, healthier participation of the private sector in the education and health sectors can speed up the creation of human capital in Ethiopia.

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