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The Link between Human Capital, Unemployment and Economic Growth in Ethiopia

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The Link between Human Capital, Unemployment and Economic Growth in Ethiopia

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Advisor: Mulugeta G. (PhD)

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The Link between Human Capital, Unemployment and Economic Growth in Ethiopia

Addis Ababa University School of Commerce

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Board of Examiners Approval

This is to certify that the thesis entitled "The link between Human Capital, Unemployment and Economic growth in Ethiopia" is prepared by Tsegaab Mitiku in partial fulfillment of the requirements for the award of the degree of Master of Science in Development Economics, as per the regulation and procedures of the university and accepted standards with respect to originality and ethicality.

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Statement of Certification

This is to certify that Tsegaab Mitiku has carried out her research on the topic entitled **"The link between Human Capital, Unemployment and Economic growth in Ethiopia''** under my guidance and supervision. Accordingly, I hereby assure that this work is appropriate and standard enough to be submitted for the award of Master of Science Degree in Development Economics.

_____

Advisor: Mulugeta G. (PhD)

February 2021

Addis Ababa, Ethiopia

DECLARATION

I, Tsegaab Mitiku, hereby assert that the thesis work entitled "**The link between Human Capital, Unemployment and Economic Growth in Ethiopia**" submitted to Addis Ababa University, College of Business and Economics, School of Commerce, Department of Economics, is an original work done by me under the guidance of Mr. Mulugeta G. (PhD).

This project work is submitted in partial fulfillment of the requirements for award of master's degree in "Development Economics". To the level of due-diligence I have done, the results embodied in this thesis have not been submitted to any other academic entity for the award of any degree or diploma.

Tsegaab Mitiku

GSE/2622/10

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Acronyms

AIC…… Akaike Information Criterion

AR (1)…… Autoregressive Order One

ARDL…… Autoregressive Distributed Lag

ADF……..… Augmented Dicky Fuller

CGE…….. Computable General Equilibrium

CUSUM……. Cumulative Sum of Recursive Residuals

CUSUMSQ…… Cumulative Sum of Squares of Recursive Residuals

DF……..…... Dicky Fuller

DW……. Durbin Watson

ECT…….. Error Correction Term

EEA/EEPRI…….. Ethiopian Economic Association/Ethiopian Economic Policy Research Institute

GDP……..… Gross Domestic Product

ILO…… International Labor Organization

MOFED……. Ministry of Finance and Economic Development

NBE……..… National Bank of Ethiopia

ABSTRACT

*This study investigates the link between human capital, unemployment and economic growth in Ethiopia over the period 1980/81-2018/19**.** 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 and unemployment on Economic growth. Both in the long run and short run, human capital index in the form of **years of** schooling and returns to education has a positive impact on the level of output whereas Unemployment rate shows a negative relationship. The value of coefficient of error correction term (**-0.7061)** shows about **70.661percent** annual adjustment towards long run equilibrium. Unlike its long run significant impact, labor force participation rate has no significant short run impact on the economy. The above results have an important policy implication. The findings of this paper imply that economic performance can be improved when human capital index based on years of schooling and returns to education show an overall increment. Such enhancements to a great extent affect human efficiency which prompts improved public yield. Henceforth strategies should be intended to make institutional limits that expansion school enrolment and returns to education by reinforcing the foundation of instructive organizations that produce quality labor.*

Key Words: Economic policy, Economic Growth, Unemployment, Human capital, GDP

Chapter One: INTRODUCTION

1.1. Background

In analyzing economies that are registering continuous growths like japan and united states over the last hundred years, Becker (1993) wrote on his book that the expansion of scientific and technical knowledge that came through the expansion of education all over the country as the main reason that raises labor productivity and other inputs in production. Starting from the elementary school then to high school and finally to college education helped them achieve a continuous growth.

Ethiopia has seen remarkable economic growth, poverty reduction and progress in social development in the last decade and a half. But the country remains among the set of low human development countries around the world and has seen little change relative to others. A key concern is that economic growth has been driven by the growth in agriculture and services sectors, contributing 37 and 47 percent of GDP in 2015/16. Education continues to lag with close to half of Ethiopians unable to read or write and a low mean years of schooling rate. And significant barriers to gender equality and women's economic empowerment remain, with high unemployment and segregation into low-skilled and informal work. In order to accelerate human development progress, structural transformation to higher value-added and more sustainable growth patterns is needed. (UNDP, 2018)

Human capital is a broad concept that encompasses education and health together. The concept of education incorporates issues like schooling and school system, nutrition, training, research and development (R& D), technology, innovation and many other more human interactions. David et al (2009) pointed it out that, healthy, physically able workforce has been the basis of successful economies and was a key element of eighteenth- and nineteenth-century industrialization. The issue of human capital is therefore one of the study variables proposed in this research.

Samiullah (2014) considered Human capital as being the main determinant of economic structure that which could influence efficiency of economic growth and improvement of the various areas, uncovered the advancement of accepted practices. Human capital is assumed to have a very positive effect on economic growth and economic development of a society. The proposed research will try to learn the role human capital in relation to unemployment and economic growth of the country.

The contribution of human capital to economic growth of the country remained underdeveloped. The recent data on human development index posted by United Nation Development Programme, ranked Ethiopia 173st out of total 187 countries surveyed in July 2014. The rank is the same to the last year grade but come down from 171st in 2010. The 2014 HDI ranking process was made based on three indices namely life expectancy, education and income indices. Ethiopia is among low human development group, in which the majority African countries found except for Libya, Seychelles, Tunisia and Algeria which are included under very high human development. Ethiopia continued to be considered as least-developed country (LDC) in human capital. The country has traditionally been among the most educationally disadvantaged in the world, and the majority of its population has had little access to schooling. Only 36% of the country's adult population (15 and over) is literate (UNDP, 2018)

Unemployment is another macroeconomic issue being major focus of economic policies, especially in developing economies. William and Michael (2009) stated that unemployment and inflation are the two main problems that arise from economic instability. It is found hardly possible to completely avoid unemployment. It is pointed out by David (2005) that only with the lower labor costs and greater flexibility that follows from labor market deregulation and a smaller welfare state can there be hope of achieving anything close to full employment. It can be understood from these evidences and empirical studies how hard it is to realize zero unemployment. The proposed study, however, tried to investigate interaction of unemployment with the economic growth.

Of the macroeconomic instabilities, unemployment is one which affects the lives of many. It still remains being a major problem in developing and also developed countries. Its effect is profoundly deep developing economies like Ethiopia. Regardless of the double digit economic growth the country has been reporting, unemployment is among the big challenges that is

affecting the lives of many in the country. High value adding industries are only emerging which makes job seeking competition intense. Ethiopia, categorized under developing world, not only suffers from high unemployment but also have a lower level of human capital that is considered vital for economic growth. Low level of nutrition, literacy and life expectancy determine the level of human capital which is very low. Though human capital can be influenced by countless factors, the proposed study will emphasizes on its link with unemployment and economic growth.

As in many developing countries, Ethiopia's labour supply by far exceeds labour demand and the labour market is heavily segmented, with important distinctions occurring between formal and informal employment, private and public job markets and wage employment and self-employment. A disproportionate share of formal employment activities are found in cities while a substantial amount of informal sector workers are self-employed agricultural workers in rural areas.(EEA, 2010)

Same report also shows that the trends of unemployment in the country is also characterized by higher urban unemployment despite an overall rise and female unemployment rates climbed to about three-fold of in the 1999 and 2005 labour force surveys. This gap was observed in both the rural and urban areas. Unemployment by literacy status showed that about three quarters of the unemployed population in urban centres areas are literate while only about one quarter of unemployed population in the rural areas are literate.

1.2. Statement of the problem

Economic growth can be affected by various factors. Economists even differentiate real and nominal economic growth to distinguish whether there has been a real growth in the economy taking in to account inflation. A mere change in price level may not indicate economic growth. According to UNDP (2018), Ethiopia has been registering a remarkable level of economic growth in the past decade. There is a little explanation with regard to the role of various economic growth factors like, human capital and unemployment, however. The proposed research tried to identify a link between economic growth, unemployment and human capital in Ethiopia during specific period of time.

Human capital, which measures skills, education, capacity and attributes of labour that influences their productive capacity and earning potential, is determined by national educational standards in an economy. **According to Gary Becker** (1964), human capital is determined by education, training, medical treatment, and is effectively a means of production. Increased human capital explains the differential of income for graduates. To this end, human capital is presumed to have high importance for influencing rates of economic growth and considered as study variable for this research.

As to what Becker put, in Ethiopia, graduate unemployment relative to total unemployment is increasing from time to time with a higher graduate unemployment growth rate than the employed one. In a nutshell, graduate unemployment is increasing in Ethiopia. Additionally, nearly 80 percent of the workers in the agricultural sector are illiterate, and 11 percent have between one and four years of primary schooling; workers have on average some 1.7 years of schooling. By contrast, in the formal sector, percent of the workers are illiterate and workers have on average more than 7 years of schooling. While educated farmers are expected to be more willing to adopt new farming techniques, to be able to manage their production better, and to be generally more productive, the results show that farmer's average years of schooling have no influence on agricultural productivity. (Kassa, 2010) It is assumed such components of human capital might have played in realizing the reported economic growth and will be considered in the study accordingly.

Additionally, according to UNDP (2018), the overall level of education still remains low. There is also high gender and rural-urban disparity: 32 percent of men and 51 percent of women aged 10 years and above were illiterate in 2013; nationally only 8.1 percent (9.8 percent for men and 6.4 percent for women) had at least completed secondary education. While the level of education is better for urban areas, it is still low in general; only 28 percent had a high school certificate or above while 17 percent had no education. The picture in 2016 is similar: 48 percent and 30 percent of all men and women aged 15 to 49 years respectively were illiterate, and regional variations are high. There is a large difference between the illiteracy rate of rural and urban women 57 percent versus 16 percent. More than 70 percent of Ethiopians are under 30 years of age, with urban youth unemployment at 22 percent compared to 17 percent for all ages. Moreover, more than a quarter of all urban jobs are informal. While informal jobs provide one

avenue out of poverty, limited working conditions (working hours, workers' rights, and exposure to risks) imply that informality is unsustainable.

One could reason out the cause behind the increasing level of graduate unemployment as the expanded level of education in the country but the report above shows the low level of education attainment compared to other developing countries. In one side the rising level of unemployment for graduates is a big issue which needs a due attention and in the other side attentions must be given to the low level of educational attainment in the country.

The proposed study aimed at providing more explanation on the story of economic growth through identifying a link and correlation among economic growth, unemployment and human capital. Inter variable correlation was investigated by employing appropriate models. With the assumption of a study on the relationship between human capital, economic growth and unemployment in Ethiopia could provide more explanation since all the three major variables were investigated.

Zerihun (2015), on his study of the determinants of economic growth in Ethiopia, found that both physical capital (gross investment) and human capital (expenditure of health and education) have positive effect on Ethiopian economic growth using self-constructed indices of health and education as a proxy for human capital. On an investigative study conducted by Samiullah (2014) on impact of human capital on unemployment taking time series data in Pakistan, a proxy of average years of schooling was used for human capital and it is concluded that the health and education sector of the country improved the rate of unemployment in the country diminishes and the other way around because health and education are negatively related to unemployment. As a result, the major finding of the study is that all the human capital indicators (including health and education) considered in the study has significant effect on increment or abatement in the unemployment rate.

Moreover, an empirical study on examination of the relationship between economic growth and human capital a study made by Kassa (2006) on the relationship between human capital and economic growth revealed that human capital has insignificant impact on the level of output using average years of schooling as a proxy for human capital.

In the aim of giving more elaboration on the link among economic growth, unemployment and human capital, the study used human capital index as a proxy to measure human capital in Ethiopia. Human capital index is relatively new measure for capturing and tracking the state of human capital development because of this it is preferred than the other measures available. . Furthermore to examine on any identifiable correlations in the variables, the study used HCI calculated based on Penn World Table which makes an empirical researches with a focus on human capital comparisons more viable. It is calculated based on average years of education and an estimated rate of return to education from the Mincer (1981) equation.

1.3. Objective of the study

1.3.1. General Objective

The objective of the study is to find out the link between economic growth, human capital and unemployment in Ethiopia taking 1980/81 to 2018/19 time series data.

1.3.2. Specific objectives

Beneath the general objective forwarded above, the following are identified to be major specific objectives of the proposed research:

- Find the link between economic growth and human capital
- Investigate a link between economic growth and unemployment.
- Discover the relationship between labor force participation rate and economic growth in Ethiopia.
- Explore the effect of official development assistance on economic growth in Ethiopia.
- Discover the effect of total export on economic growth in Ethiopia.

1.4. Research questions

With the aim of realizing the research objectives identified above, the research tried to answer the following research questions.

1. What is the link between economic growth and human capital?

2. What link does exist between economic growth and unemployment?
3. What is the long run and short run effect of human capital and unemployment on economic growth?

1.5. Significance of the study

The proposed research will have its own contribution in different aspects. Having addressed each research questions, the findings and results are expected to have the following significances.

- **Serving as input for policy makers:** The major study areas (i.e: Unemployment, Human Capital, Economic Growth) have policy and national strategy aspects. With careful analysis of conclusions to be made based on data analysis, policy makers and strategists can utilize the research findings for various decision-making aspects.
- **Improving existing knowledge base of the study areas:** The research is believed to play in contributing to knowledge accumulation and enhancing learning bases of the study areas.
- **Improving National Knowledge Base:** It is known fact there is not much research in the underdeveloped world in general, and Ethiopia in particular. This make it difficult for review of relevant literatures. The proposed research area is assumed to play its role in solving this and improving national knowledge base**.**
- **Reference:** The research and its findings will play an important by serving as one of important literatures and reference points for academicians, students and other interest groups or individuals.
- **Supporting Economists:** The study will have its role in the economic analysis and serve the society of economists more than other professions.

1.6. Scope of the study

The study is employed in Ethiopia using secondary data from 1980/81-2018/19. It stated the possible relationship in the study variables. The major focus of the study was analyzing the relationship among human capital, unemployment and economic growth. The specific role of

human capital and related potential relationship with the other factors, unemployment and economic growth were studied.

The study focused on investigating any potential link among economic growth, unemployment and human capital in general terms. Despite many sub variables can affect interaction the study variables, the research focused only on their link taking a time series data. This limits the research focus to provide elaborated explanation on the study variables.

1.7. Limitation of the study

The first potential limitation of the study is with regard to data availability and related inconsistencies that is faced during analysis and collection from relevant entities. Appropriate statistical data clearing and analysis approaches and software (STATA) is utilized to sole the limitation of data inconsistency.

The other limitation of the study is related to the data collection method used. Only secondary data was used and no primary data was collected. Data triangulation and relevant analytical procedures will only be in relation to the data collected. In the third is, there research focused on explaining sub variables that affected the major selected study variables.

1.8. Organization of the Thesis

The research report has five major sections. The first chapter focused on introduction and most content of this proposal. Discussion of the study area, statement of the problem, research questions, Research significances, scope of the study, limitation of the study this section of introducing the report organization. The second chapter emphasized on reviewing of relevant literatures. The first section of the chapter focused on theoretical reviews and second part has detail empirical literatures reviews.

The third chapter focused on methodological concerns of the study. Model specification and research approaches are emphasized here. The fourth chapter of the report focused on data presentation, results discussion and explanation. All the secondary data collected are organized, checked for missing values and discussed for results. The fifth chapter focused on summarizing, concluding results and forwarding recommendations based on specific findings of the study.

Chapter Two: Literature Review

2.1. Introduction

This chapter of the study focuses on review of relevant literatures. The chapter has three major parts, part one being review of related literature and the second part on reviewing empirical studies conducted. The third part introduces to the employed conceptual framework. All materials that are believed to have link with the study focus area are reviewed accordingly.

2.2. Theoretical Literature

One of the most important concepts to understand how well the economy performs is how the economy employs its resources and how the economy utilizes its labor force. According to Mankiw (2001), keeping labor force employed is a paramount concern of policymakers in order to have consistence economic growth. On the other hand, unemployment is a major problem almost all countries of the world.

In today's world, human capital is the fundamental factor of development. No country can have a sustainable economic growth without substantial investment in human capital. According to Laroche and Merette (1999), cited in Zerihun (2014), human capital is at least two centuries old economic concept, but its incorporation into the mainstream of economic analysis and research is a new and lively development. The need for this development became apparent in the 1950's, when the application of empirical economic research to the concerns about economic growth and about income distribution revealed major defects not only in our understanding of each but also in our way of thinking about these matters. Human capital refers to education, health, on-job training and the skills acquired through interaction of people or societies. In more technical term, human capital is defined as the aggregation of the innate abilities and the knowledge and skills that individuals acquire and develop throughout their lifetime.

The concept of the human capital is concerned with all aspect of human development which is created by investing time and effort in transformation and transaction activities in order to create tools or assets today that increase income in future. Therefore, all human –made capital introduce creating new opportunities as well as practicing economy (Surya Bahadur, 2017).

Adam Smith (1776) and Irving Fisher (1906) first considered human abilities as a form of capital and later Schultz (1963) brought the concept of investment in human capital and its measurement. Schultz, Mincer and Becker also found a way to measure rate of return to human capital investments.

Allan Fisher (1946) accentuated on the monetary component of instructive approach and the need to think about schooling as an instrument of financial strategy later. He thought about that before, human advancement had been an excessive amount of debilitated by disregard of human resources. Schooling ought to be favored on the grounds that it not just improved the effectiveness of the human factor, however it additionally improved the uniformity of pay dissemination.

Schultz (1961) and Becker (1962), as citied by Gebrehiwot (2013), are among the principal human resources scholars. As indicated by them, training expands person's expertise and subsequently their human resources. A higher expertise level in the labor force builds the creation limit. Yet, they didn't think about human resources as endogenous factor to development.

Solow (1957) and Cass (1965) are among the individuals who previously showed human resources as endogenous factor in the financial development condition. Over the long pull, supported positive development pace of yield per capita is just clear if there are proceeds with progresses in innovative information as new products, new business sectors, or new cycles. On the off chance that there is no innovative advancement, at that point the impacts of consistent losses would in the long run cause monetary development to stop. At the point when we keep on giving individuals increasingly more of similar capital merchandise without designing new uses for the capital, at that point the additional capital merchandise become excess and in this manner the peripheral result of capital will get immaterial. This thought is caught officially by expecting the negligible result of cash-flow to be carefully diminishing in the load of capital (Aghion and Howitt, 1998; Gebrehiwot, 2013). As such, accepting consistent losses to scale, they said that as capital per laborer expands, development of the economy eases back down until it arrives at the consistent state and the lower the underlying degree of pay per capita the higher is the anticipated development rate (Weil, 2009). However, the model can't clarify the presence of

nonstop monetary advancement like the instance of East Asian creating economies (Zarra-Nazhad and Hosainpour, 2011)Lucas (1988) and Romer (1990), who are the famous proponents of this theory, indicated deliberately created technological changes as an explanatory variable in their growth model. For endogenous growth theorists, it is not only technology which determines the growth of a given nation, but there are other factors (such as human capital) that are not captured by the neoclassical growth model.

Mincer (1981) clarified the idea of compensation difference because of variety in the measures of human resources stocks not because of the crude work. He considered the profits to training are not just private. There are additionally other non-financial and social gets back from training. As citied by Gebrehiwot (2013), the impacts of instruction on Gross domestic product development and on the profit of others (by making them more gainful) are likewise different types of money related social advantages/returns. Past the financial advantages, instruction may have non-money related advantages to people just as to the general public all in all.

2.2.1. The Modern Theory of Growth and Human Capital

Modern economic theory explains economic growth as an outcome determined by technological change, accumulation of individual skills, and existing incentives under which economic decisions are being taken, including decisions to acquire physical and human capital. Human capital stocks are considered a key production factor in the enterprise as well as in the economy as a whole. The accumulation of human capital leads to increased efficiency and productivity, and to more inventions. Accordingly it contributes fundamentally to development on the miniature and macroeconomic levels. (Simeonova-Ganeva, 2010)

The models of economic growth and human capital measure the immediate and indirect impacts of progress in the human resources stock on development. The immediate impacts are identified with labor productivity, and the indirect – to the changes in total factor productivity resulting from the increase or decrease of human capital.

The models of human capital influence on economic growth can be classified according to the analytical approach used and the mechanism of influence of human capital on growth. The analytical approaches used in modern models of economic growth are further classified as

theoretical studies and empirical studies. Neo classical and endogenous models are among the mechanism of influence.

2.2.2. Human capital and neoclassical growth theories

Schultz (1961) and Becker (1962) are among the first human capital theorists. Neoclassical growth theory argues that long-term economic growth is determined solely by the accumulation of factor inputs such as physical capital and labor. Studies uncover a critical commitment from specialized advancement, which is characterized as an exogenous factor. Solow (1957) and Cass (1965) are among the individuals who first shown this. They propose the combination hypothesis of growth which treats technology as the sole long run determinant of growth. (Gebrehiwot, 2013)

In the long run, sustained positive growth rate of output per capita is only apparent if there are proceeds with progresses in innovative information or technological advancement as new merchandise, new business sectors, or new cycles. On the off chance that there is no innovative advancement, then the effects of diminishing returns would eventually cause economic growth to cease.

2.2.3. Human capital and endogenous growth theories

The methodology presented by Romer (1990), in light of the hypothesis of Nelson and Phelps on technological dispersion embraced the possibility that the driving force of development is the human capital stock which decides the capacity of economies to grow technologically. Subsequently it is likewise called the technological advancement approach. This gathering of models considers the linkage between all out factor efficiency (taken to address technological improvement in a given economy), and the normal degree of human resources. Major endogenous models of human capital influence on economic growth are those of Romer (1990), Rebelo(1991), Benhabib and Spiegel (1994), de la Croix (2002), and so forth

2.2.4. Okun's Law

In his 1962 article, Okun presented empirical relationships connecting the rate of unemployment to real output. It catches the contemporaneous relationship between's yield development and developments in joblessness—that is, the means by which output growth differs all the while with changes in the unemployment rate. The boundary b is regularly called "Okun's coefficient." One would anticipate that Okun's coefficient should be negative, so quick yield development is related with a falling unemployment rate, and moderate or negative yield development is related with an increasing unemployment rate. The proportion "– a/b" gives the pace of rate of output growth consistent with a stable unemployment rate, or how rapidly the economy would regularly have to develop to keep a given degree of unemployment.

Changes in unemployment rate= a +b*(Real output growth) …… okun's Law

From the growth theory models it very well may be reasoned that education and innovations are relied upon to raise the social and political cognizance and supply the labor required in the creation of economy. Therefore, secondary, technical and higher educations were accentuated to fill this need. Nonetheless, in late worldwide setting, education has gone past being viewed as a method for improving production designs, rather it is required to be a component for assuaging poverty through gainful employment. Following okun's law, unemployment rate is expected to have a negative relationship with economic growth.

2.3. Empirical Review

Whereas the field of human capital theory was officially established in 1960, critical empirical research supporting the field had been led since the 1950's. Although few economists would object that education critically affects macroeconomic growth, observational proof is hard to decipher. While microeconomic impacts are plainly archived in the writing and generally unambiguous, this isn't the situation for macroeconomic impacts. A huge number of experimental investigations were done to test the impact of human capital on economic growth. Notwithstanding, generally, these investigations don't come to dependable outcomes. (Kassa, 2006)

Jacob Mincer (1981) showed from the framework of aggregate production function that the growth of human capital is both a condition and a consequence of economic growth. 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.

A study made by Kassa (2006) on the relationship between human capital and economic growth in Ethiopia, revealed that human capital has insignificant impact on the level of output. The result contrary to microeconomic studies could be due to the deteriorating quality of education in the expansion of the sector. Zerihun (2014) and Gebrehiwot (2013) came to appear with an opposite result. They found a positive relationship between human capital and economic growth in the long run using co-integration analysis and ARDL Approach respectively. Both came to conclude that long run investments in education and health promotes economic growth.

Khalafalla and Suliman (2012) used simultaneous equation models to study the link between 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 stages list square method, they found that quality of health and education has a positive impact on economic growth and total factor productivity in Sudan.

On an empirical study on the relationship between human capital and unemployment, Samiullah (2014) found an inverse relationship between human capital and unemployment in Pakistan over the period of 1981-2010 using johansen co-integration and Vector Error Correction Modelling (VECM) approach. The conclusion goes as follows; well educated, technically skilled and physically fit workforce are able to work more and have a better chance to be employed that can lead to a reduction of unemployment level.

In Nigeria, Adejumo (2017) also examined the impact of human capital development in employment generation for the period 1970-2014. Auto Regressive Distributed Lag approach was used and concluded that the level of human capital is insufficient to reduce unemployment. It has a good policy implication towards reduction of unemployment in Nigeria.

Moreover, an empirical study on examination of the relationship between economic growth and unemployment in Sub-Saharan African Countries by Muhammed (2016), it is found that there is bidirectional relationship between GDP per capita and unemployment; GDP per capita and population growth; there is a unidirectional relationship between GDP per capita and FDI; there is a bi directional relationship between Population growth and unemployment and also FDI and Population growth. It is found that unemployment and economic growth are negatively related the long run in SSA countries.

In Sweden Backman, Tuicu and Simko (2015) analyzed determinants of human capital accumulation by using human capital index, based on education, creativity and health. Cross-sectional regressions, was chosen to analyze the determinants. The determinant with the biggest impact turned out to be cultural diversity, followed by specialization in knowledge-based manufacturing.

Many literatures here studied the relationship between unemployment and human capital or its relationship with economic growth. It was hard to find a literature that links human capital with unemployment and economic growth. The aim of this study is to say something about the relationship that could exist between human capital, unemployment and economic growth in Ethiopia.

Chapter Three: Research Methodology

3.1. Introduction

This chapter discussed specification of models and methodology that is used to investigate the relationship between human capital, unemployment and economic growth in Ethiopia. It is followed by explanation of variables and sources of data that will be employed.

3.2. Data Sources and Measurement of Variables

The study utilized secondary data for the period from 1980/81-2019/20. The majority of the data is gathered from National Bank of Ethiopia (NBE), Penn World Tables (PWT) and World Bank Development Indicators (WDI).The data for real GDP and Total exports were gotten from National Bank of Ethiopia (NBE) and the data for human capital index was gathered from Penn World Tables (PWT) where the rest of the data (unemployment, labor force and Official Development assistance were taken from World Bank Development Indicators (WDI).

3.3. Definition and Measurement of Variables

The descriptions and measurements of the dependent and the explanatory variables that the model included in this paper are explained as follows:

i. Real GDP (GDPt):

Real GDP is the aggregate sum of the market value of all domestically produced final goods and services adjusted for inflation or deflation. It is taken as a proxy for economic growth (dependent variable).

ii. Human Capital Index

It is measured in units of productivity relative to a benchmark of complete education and full health. It combines health and education into a measure of the human capital. Therefore, higher level of human capital development in the form of education is expected to have a positive effect on economic growth. It is calculated based on years of schooling and returns to education.

Using human capital index is a relatively new measure for capturing and tracking the state of human capital development". An index is compiled using a more comprehensive array of indicators than the classical definitions of human capital. In consequence, human capital index captures multi–dimensional concept. (Simko & Tuicu ,1973)

iii. Gross Export

It is an estimation of value added by an economy in producing goods and services for export. A rise in gross export stimulates an increase in aggregate economic growth. It is expected to have a positive effect on economic growth.

iv.Labor Force participation rate

Theoretically, labor force is a significant component for sustainable rate of economic expansion. It could be the he driving force of growth for labor intensive economies like Ethiopia. Yet, on the off chance that it couldn't be utilized proficiently and on the off chance that it is less gainful, it could be a burden for the economy because of high rate of unemployment.

v. Official Development Assistance

Official development assistance is government aid designed to promote development and welfare of developing nations. It could have different relationship with economic growth. It could be positive or negative depending on the efficient use of it.

vi. Unemployment rate

It is the percent of labor force that is not currently employed but could be. It is one indicator of economic condition of a nation since its rise shows poor performance of economic condition. It is expected to have a negative impact on economic growth.

3.4. Method of Data Analysis

This study used both descriptive and econometrics data analysis methods such as the augmented dickey fuller, ARDL bounds test for co-integration test, Autoregressive Distributed Lag (ARDL)

approach and Granger causality to investigate the long run and the short run dynamics of the model.

3.4.1 Stationarity and non-stationarity of time series data.

The concept of "stationarity" is related to the properties of stochastic processes. Time series data is thought to be stationary if the mean, variance and covariance of the series are independent of time. (Gebrehiwot, 2013). On the other hand, non-stationarity in a time series occurs when there is no constant mean, no constant variance, or both of these properties. It is not possible to expect to utilize simple OLS to estimate long-run linear relationships between variables in this case which will lead to spurious regression /non-sense economic analysis where R-squared is approximating unity, t and F-statistics look significant and valid. Thus, we will be obliged to erroneously inferring that there is a relationship between two unrelated non-stationary series. This kind of problem (unit root problem) can be addressed by differencing the data set (Gujarati, 2004). If the variable is stationary without differencing, then it is integrated of order zero, I(0). A variable is said to be integrated of order one, or I(1), if it is stationary after differencing once, or of order two, I(2) if differenced twice. In order to decide the level of stationarity, a unit root testing is carried through the Augmented Dicky-Fuller (ADF) test.

3.4.2. Unit root testing

Augmented Dicky-Fuller (ADF) test is one of the widely used approaches of unit root testing. The simplest beginning stage for testing stationarity is an autoregressive model of order one, AR (1) (Gujrati, 2004)

3.4.3 Autoregressive Distributed Lag (ARDL) Approach

In order to analyze the link between Economic growth, Unemployment and Human Capital in Ethiopia in the short run, the ARDL model specification is utilized to show the relationships and dynamic interactions between these three variables utilizing Autoregressive Distributed Lag (ARDL) co-integration test popularly known as bound test. According to Liew (2004), the ARDL model is valid by taking adequate number of lags and the optimal lag length for the first

difference of regressions is selected by the optimal value of Akaike (AIC), Schwarz (SIC) and Hannan-Quinn (HQC).

The next step is testing for cointegration to check for the existence of such a long-run relationship between economic variables. After testing for cointegration, if the variables are cointegrated then there exists an error correction representation or long run relationships between economic variables in other words. The Error Correction Model (ECM) can be derived from ARDL model through a simple linear transformation, which incorporates short run adjustments with long run equilibrium without losing long run information. (Smith, 1991)

The ARDL model is specified as:

$$\Delta \ln RGDP_t = \alpha 0 + \alpha 1 lnRGDP_{t-1} + \alpha_2 lnHCI_{t-1} + \alpha_3 lnEXP_{t-1} + \alpha_4 lnLF_{t-1} + \alpha_5 lnODA_{t-1} + \alpha_6 lnUNEMP_{t-1} + \sum_{i=1}^{\rho} \theta_{i1} \Delta lnRGDP_{t-1} + \sum_{i=1}^{\rho} \theta_{i2} \Delta lnHCI_{t-i} + \sum_{i=1}^{\rho} \theta_{i3} \Delta lnEXP_{t-i} + \sum_{i=1}^{\rho} \theta_{i4} \Delta lnLF_{t-i} + \sum_{i=1}^{\rho} \theta_{i5} \Delta lnODA_{t-i} + \sum_{i=1}^{\rho} \theta_{i6} \Delta lnUNEMP_{t-i} + \varepsilon_t$$

Where, α_0 is the drift component, ε_t is the stochastic error term, Δ is the first different operator, the parameters α_{0-6} represent the long-run parameters, while θ_{1-6} represents short-run parameters of the model to be estimated. lnRGDP is the natural log of real GDP, lnHCI is the natural log of human capital index, lnEXP is the natural log of total export, lnLF is the natural log of labor force participation rate, lnODA is the natural log of official development assistance and lnUNEMP is the natural log of unemployment rate. ρ is the optimal lag length and β_{1-6} are the coefficients to be estimated in the model.

3.4.4. Granger Causality Test

Granger causality test is utilized to test the causal direction. It is normally tested in the context of linear regression models to check whether there is a uni-directional or bi directional relationship among economic variables.

Chapter Four: Results and Discussion

4.1. Introduction

In this study annual time series data covering the period from 1980/81 to 2018/19 is used. The variables are real gross domestic product and human capital index, total export, labor force participation rate, official development assistance and unemployment rate. In this section, descriptive and econometric findings, analysis and interpretation of results are presented.

4.2. Descriptive statistics Analysis

The pattern for official development assistance shows 162 percent increment in 1991 from the period of 1980/81. Where as in the year 2000 there was 35.84 percent decline compared to the record in 1991. In 2019, the highest value was recorded from the period given.

The lowest export performance was recorded in 1991 which is 279, 026 ETB showing 65 percent decline compared to 1982 which is 809,625 ETB. In 2019 the highest value was recorded compared to past records achieved.

Figure 1: Official Development Assistance and Gross Export in ETB Pattern

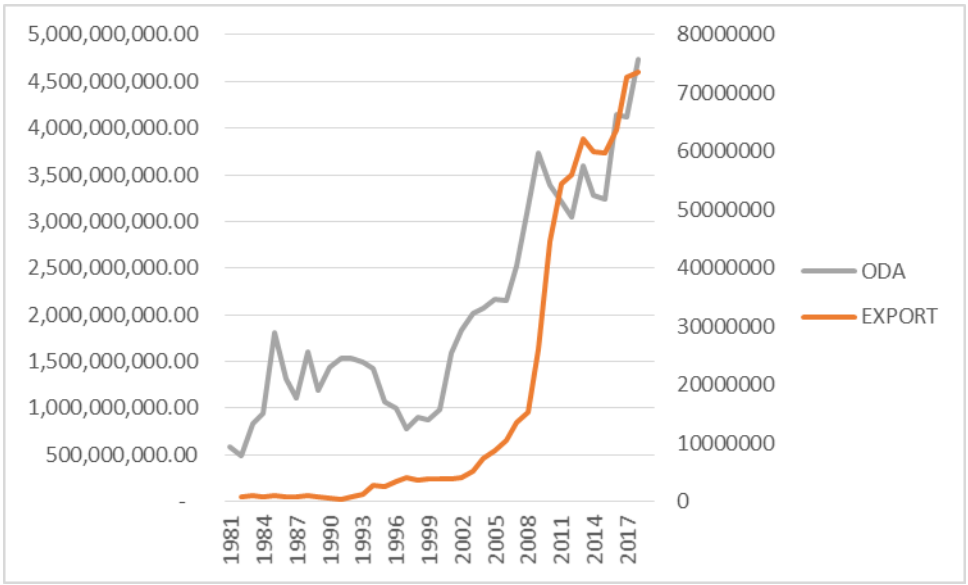
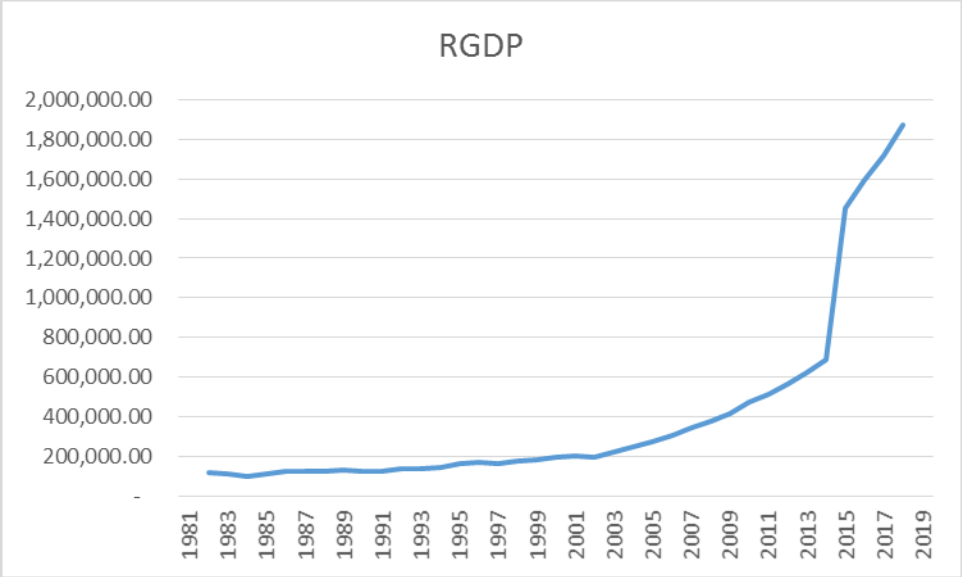
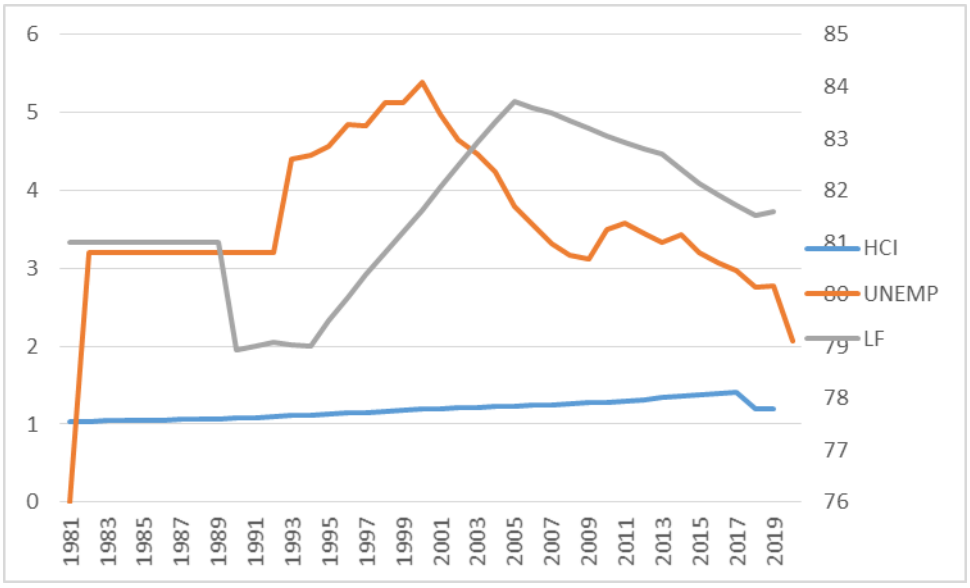


Figure 2: Real GDP Pattern



Real GDP has shown an increment from the period of 1991 to 2019 except for the year of 2002 where a decline of 4229.80 was recorded from last year record. The year 1991 is marked as a control of power by EPRDF, where many economical shifts occurred in the country.

Figure 3: Human Capital Index, Labour Force Participation Rate and Unemployment rate of pattern



The trend for labour force participation rate shows the highest value in 2005 which is 83.71 percent. The overall trend shows the range for labour force participation rate lies between 79 and 84 percent from 1980 to 2019.

Unemployment rate shows an increasing trend from the period of 1992 up to 1999, where the highest unemployment rate was recorded from the given period. From 1999 onwards it has shown a decline from 5.3 percent to 2 percent in 2019.

The calculated HCI based on PWT shows an upward trend up to 2017 which is 1.41.Ethiopia has the lowest HCI compared to some African counties as figure 4 shows. South Africa has the highest HCI followed by Uganda and Tanzania. Rwanda also showed an improvement over the last decade.

Figure 4: Human Capital Index of Ethiopia, South Africa, Uganda, Tanzania Senegal and Rwanda

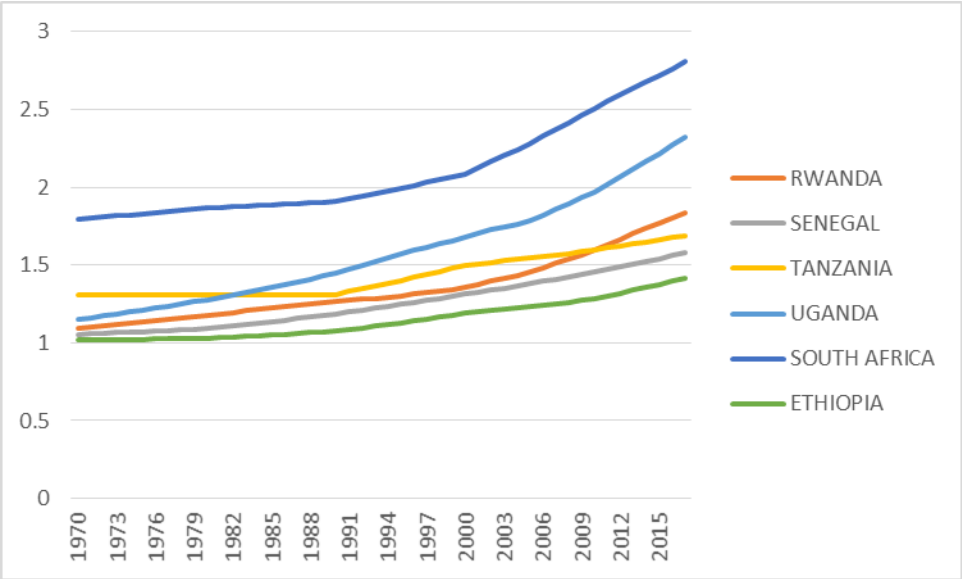


Table 1: Descriptive Statistics of the Economic Variables (1980/81-2018/19)

Variable	Mean	Std. Dev.	Min	Max
RGDP	400414.9	473580.9	101802.6	1874689
HCI	1.184582	0.110149	1.03417	1.414671
EXP	1.83e+07	2.53e+07	279026	7.36e+07
LF	81.49782	1.421433	78.937	83.707
ODA	2.02e+09	1.15e+09	4.86e+08	4.73e+09
UNEMP	3.678128	0.7968683	2.075	5.386

Source: Author's own Calculation.

The real GDP varies from 101,802.6 to 1,874,689 ETB with an average and standard deviation of 400,414.90 and 473,580.9 ETB respectively.

Total export averages 18,300,000 ETB with a standard deviation of 25,300,000 ETB and varies from 279,026 in 1991 to 73,600,000 ETB in 2018.

Labor force participation rate varies from 78.94% to 83.70% and in average 81.5% of the population were employed or actively seeking for job for the period of 1980-2018/19. Similarly,

the average unemployment rate for the given period is 3.6% with 2.1% minimum and 5.4% maximum being recorded in this period.

4.3. Econometric Analysis

4.3.1. Unit Roots Result

The time series under consideration must be checked for stationarity before running a regression. The stationaity of the data in this study is checked using Augmented Dickey fuller (ADF) test.

The hypothesis to be tested is:

H_0: The series is non-stationary or has a unit root against the alternative hypothesis

H_1: The series is stationary or has no unit root

Table 2: Augmented Dickey Fuller test results at level and first difference

Variables (At level and 1st difference)	**t-stat (with intercept but no trend)**	**t-stat (with intercept and trend)**
LnRGDP	2.552	-0.593
Δ LnRGDP	-3.873***	-5.014***
LnHCI	-1.492	-1.283
Δ LnHCI	-1.831**	-0.849
LnEXP	0.046	-2.420
Δ LnEXP	-3.299**	-3.229
LnLF	-0.935	0.983
Δ LnLF	-2.870*	-2.833
LnODA	-1.252	-2.261
Δ LnODA	-3.832***	-3.742**
LnUNEMP	0.179	-0.132
Δ LnUNEMP	-2.319**	-3.000

Source: Author's own Calculation.

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

The above table depicts the results for the time series in level forms. Non-stationarity was never rejected implying that all the time series variables in levels have unit root and are integrated of order one; I (1). All the first differenced series are thus found to be without unit roots so being stationary.

Since all the variables in levels are of the same order; I (1), there is a possibility that these variables are co integrated. The existence of a co integrating relationship implies the existence of long-term relationship in the variables.

Co-Integration Test Analysis

Following the unit root test, next task of time series analysis is testing for co-integration which is whether the linear combination of the variables is also stationary or not.

Estimating the lag length of autoregressive process for a time series is a crucial econometric exercise in most economic studies. According to Liew, Venus Khim-Sen (2004) that Akaike's information criterion (AIC) and final prediction error (FPE) are preferred than the other criteria under study in the case of small sample (60 observations and below), in a way by minimizing the chance of under estimation while maximizing the chance of recovering the true lag length. For small sample size studies, AIC and FPE are recommended for the estimation the autoregressive lag length. (Liew, 2004)

The hypothesis is stated as:

H_0: No co-integration equation

H_1: H_0 is not true

Table 3: Optimal Lag Length Selection Criteria

Lag	LogL	LR	FPE	AIC	HQIC	SC
0	**129.35**		**3.5e-11**	**-7.0486**	**-6.95656**	**-6.78197**
1	**334.612**	**410.52**	**2.3e-15***	**-16.7207***	**-16.0764***	**-14.8542***
2	**369.504**	**69.784***	**2.9e-15**	-16.6574	-15.4608	**13.1911**

* indicates lag order selected by the criterion: Author's own calculation

The optimal lag order selection criteria by looking at AIC and FPR criteria is one (1).But also the other criterions (HQIC and SC) also show that the optimal lag for this model is one (1).

After running the stationarity test and choosing the optimal lag selection, one can proceed to the analysis of cointegration results.

Table 4: Bounds Test (ARDL)

Bound Test for the model (1 1 0 2 0 1)		
Test statistic	**Value**	**K**
F-statistic	4.978	5
Critical Value Bounds		
Significance	**I(0) Bounds**	**I(1) Bounds**
10%	2.26	3.35
5%	2.62	3.79
2.5%	2.96	4.18
1%	3.41	4.68

Source: Author's own Calculation.

As it is depicted in Table 3, the calculated F statistics 4.978 is higher than the Pesaran, Shin, and Smith (2001) and Narayan (2005) upper bound critical values at 1% level of significance indicating the existence of a long-run relationship among real GDP, Human Capital index Gross Export, labor force, official development assistance and Unemployment.

Table 5: Short Run Analysis

Model (1 1 0 2 0 1) **Dependent variable: lnRGDP**		
Regressor	**Coefficient**	**P-value**
Constant	56.31391***	0.002
lnHCI	0.8499406	0.257
lnHCI(-1)	5.913907***	0.004
lnEXP	0.0488622	0.317
LnLF	0.033539	0.993
lnLF(-1)	-0.9208766	0.870
lnLF(-2)	-9.395939	0.097
lnODA	-0.1204146	0.258
lnUNEMP	-0.8392399**	0.04
LnUNEMP(-1)	-0.3925431	0.232
ECM (-1)	-0.7060942	0.0001

Source: Author's own Calculation.

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

As it is shown table 5, the estimated coefficients of one year lag of Human Capital index and Unemployment have the expected signs that are statistically significant at 1 and 5percent respectively. The other variables, Export, Labor force and Official Development assistance are statistically insignificant.

A percentage change in first lag of Human Capital index is associated with a 5.9 percent on average increment in real GDP, ceteris paribus. Whereas for unemployment a percentage change of Unemployment rate is associated with 0.84 percent in average decline in real GDP, ceteris paribus.

The error correction term coefficient is -0.7060942 showing that 70.6 percent annual adjustment towards long run equilibrium.

Estimated Long-Run Error Correction Model Using ARDL Approach

After confirming the existence of long-run co-integration relationship among the variables, the estimated long-run relationship between the variables are estimated and presented in the table below.

Table 6: Error correction representation for the selected ARDL model

Model (1 1 0 2 0 1) **Dependent variable: lnRGDP**		
Regressor	**Coefficient**	**P-value**
Constant	56.31391***	0.002
lnHCI	9.658867***	0.000
lnEXP	0.0674163	0.292
lnLF	-14.68243***	0.000
lnODA	-0.1641859	0.221
lnUNEMP	-1.743038***	0.000

Source: Author's own Calculation.

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

In the long run, the error correction model represents human capital index, labor force and unemployment are significant at 1% level. The rest estimated coefficients are statistically insignificant.

The coefficient for HCI (9.66) shows in the long run, holding other things constant, a one percent change in HCI is associated with 9.66 percent increment in real GDP, same applies for unemployment and labor force. Both coefficients have a negative sign showing one percent change in labor force participation rate and unemployment rate is associated with 14.6 percent and 1.7 percent decline in real GDP. The sign of labor force which is negative could be because of high unemployment rate where the labor force is a burden to the economy.

Table 7: Granger Causality Test

Null hypothesis	Causality	Prob.
lnRGDP does not Granger cause lnHCI	lnRGDP→ lnHCI	0.003***
lnHCI does not Granger cause lnRGDP	-	0.390
lnRGDP does not Granger cause lnUNEMP	lnRGDP→ lnUNEMP	0.005**
lnUNEMP does not Granger cause lnRGDP	lnUNEMP→ lnRGDP	0.011**

There is a Uni-directional causal relationship from HCI to real GDP while a Bidirectional relationship is identified between real GDP and unemployment. The bidirectional relationship between real GDP per capita and unemployment implies that unemployment is not only a cause for real GDP change but it is also an effect. On the other hand, when the lag length of the ARDL model increases to two, there is no any significant causality between real GDP, human capital index and unemployment.

Diagnostic Tests

To check the verifiability of the estimated model, some diagnostic test is undertaken. The results reported in the table below indicate that there is no error autocorrelation and heteroskedasticity, and the errors are normally distributed.

Table 8: Diagnostic Tests Results

Test	Results	Prob.
DW Statistic	1.961477	-
Normality test	5.688	0.0588
Heteroskedasticity Test	36.00	0.42
Breusch-Godfrey LM Test	0.048	0.8261

Source: Author's own Calculation.

The test for autocorrelation is the Durbin-Watson d-statistic and Breusch-Pagan-Godfrey test. The test for normality is based on Jarque-bera test, and the test for heteroskedasticity is based on

White test. From the above result it can concluded that the model is free from serial correlation with a normally distributed error term and normally distributed data in the model.

Stability Test

To determine whether there is a structural break or not, cumulative sum test for parameter stability is used. The table and figure below display tests for stability of the ARDL models by rejecting the null hypothesis of no structural break.

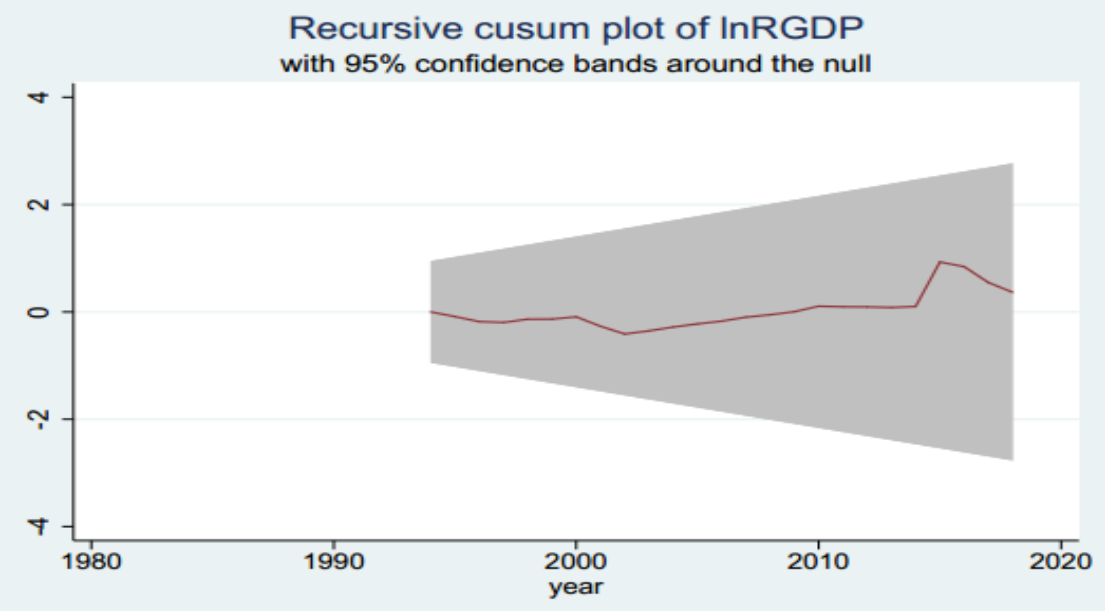
Table 9: Stability Test

Cumulative sum test for parameter stability			
Test Statistic	**1% Critical value**	**5% Critical value**	**10% Critical value**
0.3369	1.1430	0.9479	0.850

Source: Author's own Calculation.

In the graph below, the red line, which is the cumulative sum, lies within the shaded area the model lies within the 5% significant level indicating that the null hypothesis that the model is stable cannot be rejected.

Figure 5: Cumulative sum test for parameter stability



Chapter Five: Conclusion and Policy Implication

5.1. Conclusion

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

The main finding of this paper is that both in the long run human capital (proxied by human capital index) is the main contributor to real GDP rise. In other words, the result shows that economic performance can be improved through the improvement of human capital. Holding other things constant, a one percent change in human capital (proxied by human capital index) brought 9.66 percent change in real GDP. However, unemployment rate has a negative impact on the economy. The findings of this research regarding the long run positive impact of human capital are consistent with the endogenous growth theories (mainly developed by Lucas (1988) , Romer (1990), Mankiw, Romer and Weil (1992) which contend that human capital improvement prompts productivity improvement and thereby output growth. In Ethiopia the finding of this research is also similar to Gebrehiwot (2013). Concerning the result of unemployment (proxied by unemployment rate) is also consistent with okun's law.

The error correction coefficient term, in the short run is 0.7060942 showing about 70.66 percent annual adjustment towards long run equilibrium.

The estimated short-run model reveals that human capital is the main contributor to real GDP (one period lagged value). When human capital index increases by one percent, real GDP increases by 5.9 percent. While the same percentage change of unemployment rate resulted in about 0.84 percent decline in real GDP.

A causality test result indicates that there is a Uni-directional causal relationship from human capital index to real GDP while a Bi-directional relationship is identified between real GDP and unemployment rate.

3.2. Policy Implication

The policy implications drawn from the results of the study are put as follows. In order to improve economic growth, human capital, which is based on years of schooling and returns to education, needs to be given priority in the country. Furthermore, to accomplish economic growth, more resources ought to be given to educate the residents of the country. Measures like this generally affect human productivity which prompts improved public yield to create institutional capacity that increase years of schooling and improve returns to education. In that way the graduate unemployment which is increasing at alarming rate would decrease if the returns to education are rising.

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Annex

```
. summarize (RGDP HCI EXP LF ODA UNEMP)
```

Variable	Obs	Mean	Std. Dev.	Min	Max
RGDP	37	400414.9	473580.9	101802.6	1874689
HCI	39	1.184582	.110149	1.03417	1.414671
EXP	37	1.83e+07	2.53e+07	279026	7.36e+07
LF	39	81.49782	1.421433	78.937	83.707
ODA	38	2.02e+09	1.15e+09	4.86e+08	4.73e+09
UNEMP	39	3.678128	.7968683	2.075	5.386

```
. varsoc lnRGDP lnHCI lnEXP lnLF lnODA lnUNEMP, maxlag(2)

  Selection-order criteria
  Sample:  1984 - 2018                        Number of obs     =        35
```

lag	LL	LR	df	p	FPE	AIC	HQIC	SBIC
0	129.35				3.5e-11	-7.0486	-6.95656	-6.78197
1	334.612	410.52	36	0.000	2.3e-15*	-16.7207*	-16.0764*	-14.8542*
2	369.504	69.784*	36	0.001	2.9e-15	-16.6574	-15.4608	-13.1911

```
  Endogenous:  lnRGDP lnHCI lnEXP lnLF lnODA lnUNEMP
   Exogenous:  _cons
```

```
. ardl lnRGDP lnHCI lnEXP lnLF lnODA lnUNEMP, maxlag(2) aic

ARDL(1,1,0,2,0,1) regression

Sample:        1984 -        2018                 Number of obs      =         35
                                                  F(  10,      24)   =     224.15
                                                  Prob > F           =     0.0000
                                                  R-squared          =     0.9894
                                                  Adj R-squared      =     0.9850
Log likelihood =  36.430186                       Root MSE           =     0.1032
```

lnRGDP	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
lnRGDP						
L1.	.2984533	.185752	1.61	0.121	-.0849201	.6818266
lnHCI						
--.	.8499406	.7314754	1.16	0.257	-.6597505	2.359632
L1.	5.913907	1.878251	3.15	0.004	2.037387	9.790427
lnEXP	.0488622	.0478587	1.02	0.317	-.0499134	.1476378
lnLF						
--.	.033539	4.059102	0.01	0.993	-8.344036	8.411114
L1.	-.9208766	5.561247	-0.17	0.870	-12.39873	10.55697
L2.	-9.395939	5.435975	-1.73	0.097	-20.61524	1.823362
lnODA	-.1204146	.1038152	-1.16	0.258	-.3346786	.0938495
lnUNEMP						
--.	-.8392399	.3860231	-2.17	0.040	-1.635952	-.0425274
L1.	-.3925431	.3200525	-1.23	0.232	-1.053099	.2680129
_cons	56.31391	15.84988	3.55	0.002	23.60137	89.02645

```
. matrix list e(lags)

e(lags)[1,6]
    lnRGDP  lnHCI  lnEXP  lnLF  lnODA  lnUNEMP
r1       1      1      0     2      0        1
```

```
. ardl lnRGDP lnHCI lnEXP lnLF lnODA lnUNEMP, lags(1 1 0 2 0 1)ec

ARDL(1,1,0,2,0,1) regression

Sample:       1983 -       2018                 Number of obs     =         36
                                                  R-squared         =     0.5506
                                                  Adj R-squared     =     0.3709
Log likelihood =  37.963205                       Root MSE          =     0.1012
```

D.lnRGDP	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
ADJ						
lnRGDP						
L1.	-.7060942	.1793119	-3.94	0.001	-1.075394	-.3367945
LR						
lnHCI	9.658867	1.335574	7.23	0.000	6.9082	12.40953
lnEXP	.0674163	.0625671	1.08	0.292	-.061443	.1962755
lnLF	-14.68243	2.738528	-5.36	0.000	-20.32253	-9.042325
lnODA	-.1641859	.130736	-1.26	0.221	-.4334419	.10507
lnUNEMP	-1.743038	.2675525	-6.51	0.000	-2.294073	-1.192004
SR						
lnHCI						
D1.	-5.963987	1.807882	-3.30	0.003	-9.687391	-2.240584
lnLF						
D1.	10.35999	5.016449	2.07	0.049	.0284231	20.69156
LD.	9.493133	5.285385	1.80	0.085	-1.392321	20.37859
lnUNEMP						
D1.	.3897391	.3131106	1.24	0.225	-.2551242	1.034602
_cons	56.65219	15.35725	3.69	0.001	25.02334	88.28104

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