

Czech University of Life Sciences Prague

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Diploma Thesis

**Unemployment in the Federal Democratic Republic of
Ethiopia: Causes and Possible Solutions**

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DIPLOMA THESIS ASSIGNMENT

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Economics and Management

Economics and Management

Thesis title

Unemployment in the Federal Democratic Republic of Ethiopia: causes and possible solutions

Objectives of thesis

Ethiopian economy, being non-oil-dependent, was one of the world's fastest growing economies reaching over 10% economic growth from 2004 to 2015 (as IMF reports). However, this positive dynamics was recently complicated by high inflation, difficult balance of payments situation and dramatic growth of unemployment rate.

The existing situation predetermined the interest to that topic and forced to find the answers to the questions that will become objectives of this Master Thesis:

1. What are the strongest sides of the Ethiopian economy?
2. Does economic growth affects unemployment in the country?
3. What is the relationship between education and unemployment?
4. What sectors of the economy employ the highest number of population?
5. Does urbanization influences unemployment?
6. Is there any link between political instability and unemployment in Ethiopia?
7. Are current policy interventions effective in terms of unemployment reduction?

Methodology

Descriptive analysis, thematic synthesis and regression analysis along with comparative techniques will be applied in the present Master thesis.

The proposed extent of the thesis

60-80 pages

Keywords

Ethiopia, unemployment, GDP, inflation, regression

Recommended information sources

GUJARATI, D N. *Econometrics by example*. London: Palgrave Macmillan Education, 2015. ISBN 978-1-137-37501-8.

HORNER, S. et al. The Impact of Higher Education on Unemployment [online] 2018. Available at: https://smartech.gatech.edu/bitstream/handle/1853/60545/econ_3161_research_paper.pdf

KIBRU, MARTHA. *Employment Challenges in Ethiopia*. Addis Ababa: Addis Ababa University press, 2012

LEVINE, L. Economic Growth and the Unemployment Rate [online] 2011. Available at:

https://digitalcommons.ilr.cornell.edu/key_workplace

LINDENBERG, M. – INTERNATIONAL CENTER FOR ECONOMIC GROWTH. *The human development race : improving the quality of life in developing countries*. San Francisco, Calif.: ICS Press, 1993. ISBN 1-55815-278-4.

LINDENBERG, M. – RAMÍREZ, N. – INSTITUTO CENTROAMERICANO DE ADMINISTRACIÓN DE EMPRESAS, – INTERNATIONAL CENTER FOR ECONOMIC GROWTH. *Managing adjustment in developing countries : economic and political perspectives*. San Francisco, Calif: ICS Press, 1989. ISBN 1-55815-053-6.

WOOLDRIDGE, J M. *Introductory econometrics : a modern approach*. Mason: South-Western Cengage Learning, 2009. ISBN 978-0-324-66054-8.

Expected date of thesis defence

2020/21 SS – FEM

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Electronic approval: 27. 1. 2021

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Electronic approval: 2. 2. 2021

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Declaration

I declare that I have worked on my diploma thesis titled "Unemployment in the Federal Democratic Republic Ethiopia: Causes and Possible Solutions" by myself and I have used only the sources mentioned at the end of the thesis. As the author of the diploma thesis, I declare that the thesis does not break copyrights of any their person.

In Prague on 31 March 2021

Acknowledgement

First, I would like to thank Almighty God for the gift of life and good health.

My appreciation goes to my supervisor Mgr. Elena Kuzmenko (Ph,D), Department of Economics and Management, for her guidance, constructive advice, and contribution to the success of this work

The realization of my study would not have been possible without the unconditional love, encouragement, and patience of Elelta Girmachew. My darling, thanks for always being there for me.

I would like to extend my gratitude to Vantage Consultancy for all the support. I would especially like to thank Mr. Ibrahim Mamma for his efforts and kindness in helping me secure funds for my study.

Finally, my most profound appreciation and thanks goes to my parents W/zo Senayet and Ato Mulugeta, and also my brothers Ato Nahom and Ato Tadios. I love you all very much.

Unemployment in the Federal Democratic Republic Ethiopia: Causes and Possible Solutions

Abstract

The growth of unemployment is one of the macroeconomic problems for most developing countries. It also created many social and economic problem in Ethiopia. This study examined Unemployment in the Federal Democratic Republic Ethiopia over a period 1988 – 2020, its causes and possible solutions by investigating the empirical relationship between Unemployment rate (UR), Real Gross Domestic Product Growth Rate (GDPGR), Secondary Education (SEGP), Urban Population Growth Rate (UPG), and Political Instability (PI). Main econometric tools used for the analysis were autoregressive distributed lag (ARDL) bounds testing to examine the cointegration relationship of the variables and Error Correction Model (ECM). To achieve the specified objective secondary data sources were used. The result of the analysis revealed that unemployment rate (UR) is strongly affected by the mentioned indicators both in the short run and long run. It also mentions some possible solutions focusing on alleviating unemployment.

Keywords: Ethiopia, Unemployment, GDP, Education, Urbanization, Political Instability, Co-integration, Error Correction Model

Nezaměstnanost ve Federativní demokratické republice Etiopie: Příčiny a možná řešení

Abstrakt

V dnešní době je růst nezaměstnanosti jedním z makroekonomických problémů většiny rozvojových zemí. Mnoho sociálních a ekonomických problémů v Etiopii je rovněž spojeno s nezaměstnaností. Tato studie se zabývá analýzou nezaměstnanosti v Etiopské federativní demokratické republice v období 1988–2020, jejích příčin a možných řešení a to pomocí zkoumání empirického vztahu mezi mírou nezaměstnanosti, mírou růstu reálného hrubého domácího produktu, sekundárním vzděláváním, rychlosti růstu městské populace a politickou nestabilitou. Hlavními nástroji ekonometrické analýzy zmíněných časových řad se staly ADRL metoda testování kointegrace a ECM (model korekce chyby). Výsledek analýzy odhalil, že míra nezaměstnanosti (UR) je ovlivněna zkoumanými exogenními proměnnými v krátkodobém i dlouhodobém horizontu. Rovněž zmiňuje některá možná řešení zaměřená na zmírnění nezaměstnanosti.

Klíčová slova: Etiopie, nezaměstnanost, růst domácího produktu, vzdělání, urbanizace, politická nestabilita, , kointegrace, model korekce chyby

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List of Abbreviations

CSA – Central Statistics Agency

ECM – Error Correction Model

EEA – Ethiopian Economic Association

GDPGR – Growth Domestic Product Growth Rate

GTP I – Growth and Transformation Plan I

ILO – International Labor Organization

IMF – International Monetary Fund

MOE – Ministry of Education

MoFED – Ministry of Finance and Economic Development

NBE – National Bank of Ethiopia

OECD – Organization for Economic Co-operation and Development

PI – Political Instability

SEGP – Secondary Education General Pupils

UPG – Urban Population Growth

UR – Unemployment Rate

WB – World Bank

WDI – World Development Index

1 Introduction

Unemployment can be defined as a state in which people can work and on a continuous demand for a job but cannot secure one or be out of work. Different factors cause unemployment; it has become a vital challenge for developing and developed countries. Thus, it has a concern of policymakers resulting economic instability and triggers social problems. Some of the instability caused by unemployment are social unrest, loss of human capital, high corruption, and increased crime. The psychological problem of unemployment results in annoyances, incompetence and drifts the youth population to all manners of criminal behavior. This macroeconomics problem affects an economy and its population directly and harshly. A low unemployment rate or full employment is the primary concern of any government as it increases the country's output. However, the high unemployment rate tells us the labor resources of the country are not used economically.

Consequently, the country's economic growth rate has a vital role in increasing or decreasing unemployment and is used as an overall status directing in the evaluation of the current performance in the economy. The unemployment issue has got better and great attention globally on one of the development agendas, the so-called Sustainable Development Goal (SDG) that includes 17 goals. The 8th goal stresses employment creation and well-mannered work in a given country. Developing countries like Ethiopia are countries that need special attention to improve living standards by reducing unemployment.

Ethiopia has gone through three politically distinct regimes that come with various forms of policy reforms and changes in the country's overall macroeconomics determinants. Ethiopia's economic history is associated with ups and downs of economic performance resulted from continuous famine, lack of a strong manufacturing sector, dependency on rainfall for agricultural products, and internal wars that take place to overthrow the government and retain power by the ruling government. This can be the reason for the high level of unemployment that present Ethiopia is confronting. When it comes to developing countries, Ethiopia is on the fastest economic growth path, but the aggregate unemployment rate is low because of the little utilization of the workforces that are vital for the contribution to the economy. Lack of creating enough job opportunities is a crucial

and urgent agenda of the Ethiopian government to absorb the potential labor force by adopting an applicable employment policy.

Hence, this study examines the causes and possible solutions of unemployment in the Federal Democratic Republic of Ethiopia by considering the variables such as economic growth, urbanization, education, and political instability. However, to the best of my knowledge, no studies were conducted using the variables mentioned above as a significant cause of unemployment in Ethiopia. Therefore, studying the issue of unemployment in Ethiopia from this perspective will help to formulate proper employment-related economic policies that help to suggest possible solutions in reducing unemployment.

2 Objectives and Methodology

2.1 Objectives

Ethiopian economy, being non-oil-dependent, was one of the world's fastest-growing economies reaching over 10% economic growth from 2004 to 2015, as International Monetary Fund (IMF) reports. However, these positive dynamics were recently complicated by high inflation, difficult balance of payments situation, and dramatic growth of unemployment rate. The existing situation predetermined the interest in the topic and forced to find the answers to the questions that will become objectives of this master thesis:

1. What are the strongest sides of the Ethiopian economy?
2. Does economic growth affect unemployment in the country?
3. What is the relationship between education and unemployment?
4. What sectors of the economy employ the highest number of population?
5. Does the urbanization influences unemployment?
6. Is there any link between political instability and unemployment in Ethiopia?
7. Are current policy interventions effective in terms of unemployment reduction?

2.2 Methodology

The analysis covers the period from 1988 to 2020 and employs secondary data of the following macroeconomic indicators: Unemployment Rate (UR), Real Gross Domestic Product Growth Rate (GDPGR), School Education General Pupils (SEGP), Urban Population Growth (UPG), and Political Instability (PI). All data were collected from the Ministry of Finance and Economic Development (MoFED), National Bank of Ethiopia (NBE), Ethiopian Economic Association (EEA), Ethiopian Ministry of Education (MOE), World Development Indicator (WDI), World Bank Dataset (WB), and Center for Systemic Peace.

The study uses both econometric and descriptive methods of data analysis. Descriptive statistical methods used to investigate the strongest sides of the Ethiopian economy reveal the majority of the workforce in the economy and current policy measures in reducing

unemployment. The econometric analysis employs ARDL cointegration tests and Error Correction Model (ECM) to identify long-term and short-term relationships among selected variables. In addition, post-estimation diagnostic tests of the model and interpretation of the results will be provided. Modeling is conducted with the use of the statistical package *STATA 15*.

3 Literature Review

3.1 Theoretical Literature on Unemployment

3.1.1 Working Definition and Concept of Unemployment

Similar to other markets, the labor market consists of demand and supply. Employees provide the supply, and employers provide the demand. The demand side consists of job applications or open vacancies that are available for the population. On the other hand, the supply side is the economically active population or the labor force, which contains both the unemployed and employed. The current situation in most countries prevails that demand for labor is less than the supply; thus, there is an overloaded supply of labor. This gap created between the supply and demand for labor is discussed as unemployment (Olsson, 2013). The International Labor Organization (ILO) reflects unemployment as the failure of an economy to generate employment for those seeking to work but no doing so. At the same time, they are actively available for employment and looking for opportunities to work. The concept of unemployment, by its nature, is vague and complex. It is crucial to explain some concepts of the term unemployment for a clear understanding.

Employed Labor Force: population employed is defined as a person above a certain age who is engaged in some kind of work activity in return for monthly salary, wage, or profit. In other words, employed labor force are those people who are involved in producing good and service as defined by Organization for Economic Cooperation and Development (OECD).

Economically Active Labor Force: as defined by the OECD, an economically active population covers all available labor for the supply of labor to produce goods and services. It refers to people who are already engaged in work or willing to participate in productive activities.

Unemployed Labor Force: A person in the working-age of the classification is unemployed but available for work or actively searching for jobs defined by ILO. This can be calculated by taking the difference between the economically active labor force and the employed labor force.

Economically Inactive Population: this is a person who is not currently available to provide labor or neither engaged in any kind of productive activities. These people are excluded from unemployment analysis and are not considered unemployed because they do not satisfy the definition of unemployment.

Unemployment Rate is defined as the percentage in the unemployed labor force ratio to the economically active labor force.

Most academicians mentioned that unemployment does not capture all the people who are not in employment but willing to take employment. Belchamber and Schetagne (2013) argued the concept of unemployment challenging a given economy. In the sense that house workers who work in household activities are not counted in the labor force or considered unemployed. Especially when it comes to developing countries, most households are engaged in house activity. Based on these facts and according to the authors, labeling people who are keeping their families inundated as economically inactive is quite invasive and incorrect.

Correspondingly, Clark and Summers (1982) mention people who have been laid off from aggressively searching jobs do not consider the labor statistics of the labor market, and the definition of unemployment shows high rates of labor force withdrawal. This definition reduces the picture of people under unemployment duration because of the increased number of discouraged people excluded from the labor force. Hence, the authors concluded that a distinct line drawn between unemployment and labor force withdrawal does not reflect the accurate picture of people who are currently facing enter the labor market. Clark and Summers (1982) suggest a more relaxed definition of unemployment where those who are actively searching for a job are not mandatory for inclusion. When the definition for unemployment is more relaxed and applied, the authors strongly suggested the rate of unemployment doubles in many developing countries. Also, the average relaxed unemployed rate in the least developed economies is higher than in the high-income economies. This is due to the concept of unemployment, excluding people from the labor force and considering precarious work as employment.

3.1.2 Different Schools of Thoughts View on Unemployment

The idea to explain unemployment attempts is to clarify the causes and effects of unemployment in different countries. Different kinds of literature provide many explanations for factors of unemployment. Some blame the economic system; others blame the increasing population growth and foreign debt. Besides, lack of aggregate spending, creativity, and innovation are also other causes used to explain unemployment.

Economists formulated many models at different times to explain the unemployment caused. In the 1920s and 1930s, during the great depression, economists like Keynes (1936) formulated models to explain the cause of unemployment. Lippmann and McCall (1976) explain that job offer, acceptance impact unemployment, and jobs, and the matching model was formulated by Mortensen (1970). Availability of jobs highly depends on skills of labor, level of education, experience, and the demand of the employer. Therefore, economists have observed ways to affect unemployment in different periods as in Keynesian, Post Keynesian, and classical. According to (Wagner, 2014) unemployment can be classified into seasonal, disguised, frictional, classical, structural, and cyclical unemployment. This classification of unemployment depends on the number of socio-economic circumstances.

The first is seasonal unemployment, which is also referred to as underemployment. When the person is not engaged in a type of work, he/she is proficient in delivering it. It happens when there is limited demand for a type of work to be performed for a particular period. For instance, when there are deadlines or climatic conditions where people took the job without their interest and lack proper training.

Disguised unemployment, which is the second type of unemployment, represents a situation where quite a lot of people are engaged in a job more than the required number of individuals required for the job. For example, in a manufacturing company, only ten people are enough, but if more than ten people are engaged in the production, it does not change the output of the production nor the efficiency. The added two laborers are counted in disguised employment, and this type of unemployment is also known as hidden unemployment.

The third is frictional unemployment. This unemployment is also referred to as search unemployment and, based on the circumstances of the unemployed individual, can be voluntary. It is frictional because unemployment happened within the time period of a job when an individual is searching for a new job or transitioning from one job to another. In most cases, it happens when individuals quit their jobs to search for another type of job in the market.

Classical unemployment, the fourth type of unemployment, occurs when more people are looking for a job, but the availability of jobs in the market is low. This shows real wages positioned above the market-clearing level. High real wages in an economy imply that firms cannot be profitable by employing all the laborers in the market. It means that the cost of employing additional labor is higher than getting a benefit from this extra employee.

The other unemployment is structural unemployment, this type of unemployment is long-lasting unemployment because of major shifts in the economy. Among many reasons, structural unemployment is caused by employees' lack of skill for the job, the job location might be far as job applicants are unable to move there, or the existing wage level is too low. Therefore, while there is job availability in the market, there can be a mismatch between what employees can provide and firms' demand.

The last type of unemployment is cyclical unemployment-related to the business cycle of growth and production of the economy or the cyclical socio-economic trend. When there is a recession in an economy, cyclical unemployment is very high, whereas output production is minimal. On the contrary, when there is a boom in the economy, calculated through GDP, cyclical unemployment will be deficient, whereas output production is maximum.

3.1.3 Classical Economy Theory in Unemployment

Classical theory always assumes the economy at a full employment rate, and there is no unemployment at any given point in time. This principle is that supply of labor always equals demand of labor at the current money wage rate. This implies an increase in labor

supply will drop the money wage giving more chances for workers to get employed. Similarly, a decrease in the supply of labor will raise money wage to eliminate the reduction. According to classical sense, voluntary unemployment is zero, but the sense is not feasible in the real world.

Collard (1996) analyzed classical theory and argues that the labor market has supply and labor demand. The supply of labor is derived from employees' desire to spend their time working or being productive, or having leisure time. There is a positive function between the supply of hours worked with real wage because the employees will supply more hours of work if a real wage rises. Demand for labor is a derived demand from the declining portion of the marginal product of labor. There is a negative function between the demand curve and real wage because if the wage increase, the quantity demand for labor will fall, and the opposite is correct. When the demand and supply of labor intersect, it is in equilibrium, determining full employment and equilibrium real wage rate.

Full employment does not necessarily mean the economy is operating under no unemployment, as frictional unemployment can exist under the current real market wage. For instance, if an individual feels less satisfaction greater than the benefit of work or the real wage, they will decide to quit the job. This will create voluntarism unemployment. This situation can arise from the availability of information, aspiration for a better job, dynamic nature of the labor markets, or the desire to transfer to a new opening company. The duration of being voluntary unemployed depends on the speed of information and the benefits cover for being unemployed.

3.1.4 Theory of Effective Demand in Unemployment

Keynesian theory assumes failure of the market and involuntary unemployment occurs because of low demand for products. If demand for products declines, companies may not be able to lower wages or sell products at a reduced price. This will lay off employees, and output will decrease. The aggregate demand level will increase total revenue, but the cost of production has to decline. If cost decrease and revenue increases, a reasonable level of profit can be earned. Thus, reasonable profit can help companies demand more workers, increase employment, and keep the unemployment rate lower.

Keynes (1936) thinks of unemployment as an involuntary that makes employment cyclical because of the up and down of aggregate demand. When the economy and profits are favorable, investors hire potential workers for maximization of output. When expectations about the future are feasible, both employments and investments will increase until an equilibrium point is reached. Economic expansion from the result of investments requires more workers since labor is considered a labor of production, keeping the unemployment drop. Suppose investment in the future is not promising. In that case, investors or companies hire fewer workers, and under this condition, equilibrium is attained where cyclical unemployment exists, due to the shortage of aggregate demand, mainly investment outflow. According to (Davidson 1998), post-Keynesian economists explore that involuntary unemployment can be caused by the volatility of exchange rates, inefficiency of available demand, and investors' insecurity to make the international movement of finance sustainable investment in order to reduce unemployment. Post-Keynesian economists also mention that unemployment can happen due to contractionary monetary policy, bringing a shortage in aggregate demand. Moreover, factors like price level increments and a higher level of inflation will decrease the real wage by creating more workers' demand.

In addition, Arthur Lewis (1954) develops the Lewis model, and this model assumes if there is a demand for labor and if there is a surplus of labor, then there will be a fixed wage rate. His explanation under this condition suggests that capitalists can make a profit. This profit earned by the capitalists creates a new opportunity to expand and reinvest in new investments. The new investment will require new workers and attracts more laborers from the labor supply. The process will shift the demand for labor to the right as labor productivity increases and keeps a decline of unemployment. Nevertheless, wage model efficiency can increase the unemployment level, indicating the unresponsive demand shifts to real wage. In this case, the model implies a shift in labor demand led to minor changes in the real wage.

3.1.5 Real Business Cycle Theory in Unemployment

In the real business cycle, unemployment is caused by economic growth fluctuations or the business cycle of an economy at a peak or slump. This up and down fluctuation in the economy affects unemployment; thus, the unemployment rate depends on economic growth. As the economy develops, the job opportunity is higher, and demand for employment raises resulting unemployment reduction. This theory explores that the growth of productivity of input is the leading cause of unemployment and employment. If the output growth is greater than the growth of input, then total factor productivity has increased. If total factor productivity is not growing, then both the economy and firms will become unproductive, which follows that reallocation of labor and capital is not achieved and will be used less beneficially (Chatterjee 1995 and 1999). One of the reasons for a factor of productivity to a slowdown in the advancement of technology. With slow developments of technology, improving the production of goods and services and enhancing workers' skills is challenging. Without new products invention, the prices for imported material will increase.

The stagnation of total factor productivity will slow down the co-movement in other significant variables. For instance, investment spending or consumption expenditure will not increase above the trend, and total hours worked and GDP will not be above the trend. When these major variables like consumption, investment, GDP, and hours of work decline, Solow's residual, which exemplifies labor productivity growth measured by the difference between actual and predicted growth or shocks, will decline, representing no technology progress and productivity. Thus, it will create an increase in unemployment.

3.2 Economic Growth Theories

Economic growth is the market value of goods and services produced by an economy over time. According to (Aleksynska 2014), it is commonly measured as the percent increase in real gross domestic product and usually expressed in per capita terms. Economic growth is calculated in real terms; for example, adjusted inflation eliminates the distorting effect of inflation on the price of goods and services produced. A growth rate is a trend in the average level of GDP over a period. An increase in the growth trend can result from efficient use of inputs such as labor productivity or physical capital energy. The increase in

population and expansion of territory can be another cause for extensive growth. GDP growth can rise and be achieved only by increasing the number of inputs available for use (Bjork, 1999).

The early growth theory was originated during the sixteenth and mid-eighteenth centuries in Europe, advocating an economic viewpoint known as mercantilism. Mercantilism ideology is a nation's economic power, nor growth is achieved when there is a favorable trade balance (when export is greater than import) through trading gold, silver, and precious metals. Hence, a country's economic wealth depends on the amount of those precious metals gained from exporting rather than importing. The revenue generated from such activity would increase domestic output while creating more employment options (Salavator, 1990).

Adam Smith, the wealth of nation (1776), is considered the first for the classical economic growth theory. The classical theory of economic growth is mainly based on the law of variable proportions. The theory proposes that increasing production factors such as labor and capital while keeping other technological change factors will raise output but at a diminishing rate that eventually approaches zero. According to Smith, population growth and investment are endogenous depending on the available means of subsistence and hardworking and saving of capitalists. When it says saving, it means the sum of reserves used not for personal consumption but the purpose of industrial. Classical growth theory overlooks technology and economies of scale, which are essential factors affecting economic growth.

The primary factor in the Keynesian model is the effectiveness of demand. It is explained as the growth of aggregate effective demand should add to the economic growth. According to economic values such as saving, investment, national income, and consumption, Keynes developed a theory that explains the change in the level of economic activities. He argues that during the rising of unemployment and recession, a reduction of income causes decrease investments, consumption, and savings. Consequently, according to John Keynes, in situations where there is no market leverage to increase the aggregate demand for helping business activities in the economy, the government should take a role

and implement macroeconomics such as fiscal policy and tax cuts or increasing government spending. Government investment in the economy injects income into business opportunities, job creation, employment, and demand. Keynesian economic growth's fundamental essence is an investment, which is considered the main economic growth factor that increases income growth (Keynes, 1936).

The neoclassical growth model framework was developed by Robert Solow (1956) and Trevor Swan (1956). This model assumes that the total output of an economy depends on the quantity and quality of physical capital employed, the number of laborers employed or involved, and the labor force's skills. This states that there are diminishing returns to labor and capital. Investment leads to capital accumulation, but due to depreciation, its stock or level continually decreases. The condition steady-state explains the diminishing returns to the capital with the increase in capital or workers and no progress in technology where economic output or worker reaches a point where capital per workers and economic output remains constant because annual investment equals annual depreciation. Thus, once the economy reaches the full equilibrium level, additional growth per worker will only happen if the productivity rises, and this rise is through improvements in the quality of labor forces or an increase in capital stock (Tewodros, 2015).

Endogenous growth theory explores increasing returns to scales linked to a faster pace of innovation and investment in the human capital. The main factors that play in endogenous growth theory are technical innovation, government, and human capital. Under this theory, the basic motive of profit maximization of firms is through the firm's technological progress by adapting new research and development methods. The government's role should be supporting entrepreneurs by policies to encourage new business and investments for job creation. The quality of human capital depends on the investment in education and health. It is the necessary condition for protecting intellectual property right in supporting the development of science and technology. Hence, the theory highly recognizes human capital as a critical growth element (Snowdon and R. Vane, 2005).

In general, the macroeconomics variable economic growth is fundamental and needs to be closely monitored by policymakers and the public. Alongside interest rate, inflation rate,

and balance of trade, the unemployment rate relationship with economic growth plays a more prominent role in generating an overview picture of a given country's economy and development level.

3.2.1 OKUN'S Law

Okun's law represents the inverse relationship between output and unemployment. According to Okun's empirical investigation, a decrease in GDP increases the unemployment rate (Okun A. M., 1962). It is also frequently used in analyses dealing with the Phillips curve for picturing a more general conclusion with policy implications relevant to the commodity market other than the labor market. Okun's law has different approaches: difference version, gap version, dynamic version, and production version approaches. Each approach comes with its constraints and advantages. The difference version is the only approach with purely statistical and easy calculations that can be calculated without any assumptions and available data. The gap version approach, dynamic version approach, and production function version approach have different methods applied to the data with assumptions and interpretations; however, the difference version approach simply regresses GDP growth changes in the unemployment rate.

a. The Difference Version Approach

This approach of Okun's law shows the change in GDP and unemployment rate. The difference version approach explains the change in the unemployment rate is equal to the sum of the change in real GDP times an estimated coefficient, estimated constant, and the error term. This version of Okun's law is simple for calculation, but it can only capture the contemporaneous between two variables.

b. The Gap Version Approach

Okun's second law version is called the gap approach where it links the gap between the unemployment rate and output. Under this approach, there is a potential output of economic measurements where the total output is attained if the resources are fully employed. The natural rate of unemployment is associated with a constant inflation rate. Both potential output and the natural rate of unemployment cannot be directly estimated from economic data. In this context, if the economy is operating at potential output, then

the unemployment rate will be at the natural level. If there is a high unemployment rate, then according to the gap version approach, there is underutilization of the economy (Javeid, 2011).

c. The Dynamic Version Approach

The dynamic approach of Okun's law includes the past and current GDP where it can impact the current level of unemployment. According to (Knotek 2007), in the other versions of Okun's law, some relevant variables have been omitted from the right side of the equation, and based on this suggestion dynamic version approach of Okun's law would have current and past real output growth and also past changes in the unemployment rate as variables on the right side of the equation. The reason that captures the changes in the unemployment rate and real GDP growth makes this approach differ from that of different version approach of Okun's law.

Economic theory recommends that a country's production from goods and services requires a combination of labor, technology, and capital. The unemployment rate is one factor that determines the total amount of labor used as an input, and another factor includes the population that is in the labor force and also the number of hours that employed workers use. Considering the factors mentioned above and adding capital and technology will bring the complete picture of what affects the output. This approach led to production-function versions of Okun's law, which combines theoretical production function or technology, capital, and labor to produce output with the gap-based version approach of Okun's law. This process allows economists to identify which resource is idle in the economy. Knotek (2007), in the production function version approach, in order to produce output, there must be an optimum combination of inputs. According to an economic framework that inputs labor, capital, and technology, which focuses on increasing labor force, technological advancement, and working hours, it affects GDP growth.

3.2.2 Human Capital Theory

The theory was first developed by Theodore Schultz in the 60s and later expanded by Gary Becker in "Investment in Human Beings" (Blaug, 1976) and Jacob Mincer in "Schooling,

Experience, and Earnings" (Burdett et al., 2011). The human capital theory explains that people are spending time to engage in something for an immediate need and more extended and future enjoyment; thus, it is the investment people spent in themselves that will increase the productivity of an economy (Olaniyan et al., 2008). The increase in productivity mainly comes from educating oneself to meet the essential skills required to compete in the labor market and meet the demand of the labor market or get a high salary by understanding the demand in the labor market. The theory stresses that education increases workers' productivity and efficiency by increasing the level of intellectuality of economically active and productive human capabilities showing individuals' effort to invest in education and training (Berntson et al., 2006).

Becker (1993) explains that individuals' education, training, and human capital development are critical investments to make. This is because the return to training investment can be envisaged in higher performance, better income level, and acquiring better career positions. Becker found out in his early work from investment in human capital analysis that, among other things, individuals' salary is positively related to the level of skills possessed, and the probability of unemployment for individuals tends to be negatively correlated to the level of skills acquired (Becker, 1993).

Time spent in education engagement for longer and continuous increase in the labor market participation provides an excellent opportunity to increase social mobility and autonomy (Naafs, 2012). The noticed image of education as a strategy to move up the social ladder and the imagined linkage of extended years of schooling to professional jobs have encouraged societies to invest in more informal education. However, education in developing countries has been recognized as a means of self-improvements and a better economic opportunity (Jeffrey, 2009). These opportunities for some groups are slim. In many cases, education has failed to appreciate people's employment outlooks and desire for better social mobility. However, in developing countries, people have continued placing their hope in the participation of schooling to find sustainable and professional jobs despite the majority of them having to wait for a long time until they secure a job. In addition to that, poor administration, low standard of training, and economic policies that do not favor firms' incentives are factors that contribute to poor return for training

investment in developing countries (Middleton et al., 1993). Companies and labor markets want to successfully recruit the best and productive workers with the required qualification and skills. Thus, human capital is crucial for labor in the market to encounter employment hindrances.

3.3 Empirical Literature on Unemployment

3.3.1 Unemployment and Economic Growth

Today, unemployment is one of the severe issues that are faced by both developed and developing countries. Different researches were conducted to tackle the issue, mainly to understand the cause and provide a sustainable unemployment solution. Unemployment can affect economic growth as the output produced is the function of employment level and the country's labor market. Unemployment and economic growth are always an essential concern of every country with economic level, particularly for countries working hard to bring better economic policies towards decreasing the unemployment rate and increasing economic growth. Most of the studies are conducted out of Ethiopia; however, some studies related to microeconomic variables such as demographic factors have been conducted.

A literature review by Kalim (2003) shows the work on determinants of unemployment in Pakistan by adopting a simple regression. The author analyzes the relationship between unemployment, a real growth rate of GDP, and population growth over the period of 1986 – 1999. The research comes up with an inverse relationship between unemployment and GDP and a positive relationship between population and unemployment. According to the result, population pressure can affect employment opportunities, and an increase in GDP growth can bring a decline in the unemployment rate. The study concludes with a recommendation of a strict population growth policy and generating employment opportunities that arise due to its high GDP rate. In the same country, the research examined unemployment determinants over a period 1976 – 2012 using autoregressive distributed lag (ARDL). The study examined the relationship between unemployment, population, inflation, and GDP. The result shows that GDP affects unemployment significantly in both the short and long run in Pakistan during the period mentioned (Maqbool et al., 2013).

A study investigated by O' Nwachukwu (2016) explores determinants of the unemployment rate in Niger from the period 1980 to 2016. The study conducted an ordinary least square method for estimation after considering Augmented Dickey-Fuller to test for a unit root. The explanatory variables the research incorporated are real gross domestic product, government expenditure, inflation rate, and first lag of unemployment. The result reveals that the first lag of unemployment and the real gross domestic product are not statistically significant in explaining Nigeria's unemployment. The result obtained from Nigeria is quite different from the result found in Pakistan. GDP can be statistically significant in some countries and statistically insignificant in certain countries from the above empirical research.

Previous research showed a macroeconomics factor affecting unemployment in China over the period 1982 – 2014. The study used explanatory variables such as gross domestic product growth, inflation, population, and foreign direct investment (FDI). The methodology applied an autoregressive distributed lag (ARDL) approach, augmented dickey fuller test (ADF), and unit root test. The study's result reveals GDP and population are statically significant in describing the unemployment rate that implies long-run relation between the other variables (Li et al., 2017). Macroeconomics determinants of unemployment in Brazil, Russia, India, and China (BRIC countries) study shows a panel data analysis considering explanatory variables such as economic growth, population, inflation rate, and interest rate over the period 2001 – 2013. The results reveal gross domestic product growth, trade volume, total investment, and industrial production growth are the main economic factors that lead to the reduction of unemployment (Gur, 2015).

The relation between economic growth and unemployment is also a major problem in Ethiopia that aims to achieve higher economic growth and reduce unemployment. A recent study conducted by (Serawitu 2020) on unemployment and economic growth in Ethiopia examines the descriptive relationship by relating Okun's law prediction with graphical trend analysis from the period 2009 – 2018. The result indicates that unemployment has a negative impact on Ethiopia's economic growth, explaining an increase in unemployment brings a decline in real GDP. The study suggests expanding the investment in both

nonagricultural and agricultural sectors that can engage more labor force to address labor market failure and improve labor force productivity and find creative ways of linking with other sectors.

Unemployment solution study related to socio-economic and demographic determinant was conducted by Abera (2013), it used descriptive and binary logistic regression. The study clearly illustrates household size, educational level, economic status, age, sex, and residence place significantly affect the unemployment of an individual in Ethiopia. Based on the results, the study suggests considering women's empowerment in order to create jobs and support the economic status of the population of the country. In a similar study, Fikre (2011) has examined urban unemployment determinants on household welfare. The methodology used a binary probit model estimation, and the result indicates that urban unemployment has a high relationship with education, age, and marital status. This relationship shows that unemployment can adversely affect household welfare and consumption expenditure of each household. The study concludes the negative effect of unemployment on household welfare where it suggested a higher quality of education reduces unemployment and increases the welfare of the economy. The policy of unemployment and labor market situation in urban Ethiopia comes with different constraints.

Dechasa (2014) explores unemployment and the labor market in Ethiopia by emphasizing the policy aspect. The study prevails the main constraints that are holding unemployment to decrease: tax rates, privatization, infrastructure facilities, insufficient microfinance, and credit institutions. A suggested recommendation by the researcher is to strengthen labor-intensive employment creation strategies for the younger population, adjusting the education program to create a skilled labor force and creating market access, microfinance, and credit institution, advancing in modern technologies, and providing institutional protection and regulations for both formal and informal sectors.

3.3.2 Unemployment and Education

A country's economic output has a direct and positive relationship with the population's education and skill development. People invest in education for a better life in the future, and the biggest challenge for a country's economy is when an educated person becomes unemployed. Many types of research have been conducted to explain the relationship between the level and effect of education on unemployment. Previous research showed a statistically significant relationship between years of schooling and unemployment (Cutler et al., 2015). The researcher stated that the unemployment rate is associated with poor life satisfaction and lower-income. It is further affirmed that the level of education performs a proactive role in reducing the high unemployment rate that can be created in an economy. Riddell and Song (2011) study considers the causal relationship between unemployment, education, and re-employment of unemployed workers by observing years of schooling. The variables mentioned above regression show the positive relationship between employment opportunities and level of education. A study in different US states discovered a negative correlation between education level and unemployment. There is no significance between university degree holders and the unemployment rate (Applegate et al., 2014). The study concludes that at least a high school diploma is sufficient to decrease the unemployment rate. Nunez and Livanos (2010) employed a comparative study between long-term and short-term unemployment relative to education. The result found that an academic degree is more effective in reducing the likelihood of short-term than long-term unemployment.

According to a study in a developed country, when education increases, the level of unemployment rate will reduce, but this is not always true for developing countries; as the level of education increases, the unemployment rate grows. The lack of proper infrastructure and the lack of skills matching essential by the labor market is one factor mentioned as a problem in a developing country (Bairagya, 2015). A study conducted in South Africa explores the relationship between education level and unemployment. A cross-sectional survey design was implemented with 120 questionnaires, and a multiple regression model was developed to find the relationship between the two variables. Based on the analysis, a positive relationship was established between unemployment and education. The finding was used as an opportunity for the country ministry of education to

align with government strategies that can reduce the unemployment problem in the country (Mpendulo Grabe and Mang'unyi, 2018).

Similar literature also explored the relationship between unemployment and education level in Palestine between 2005 and 2015. Education in the country increases at all levels, but Palestinian people are still facing an increase in unemployment over time. To understand the problem, the study examined four educational levels under 1-6 years of schooling, 7-9 years of schooling, 10-12 years of schooling, and those who above high school. Based on this year of schooling classification, the study indicates a positive relationship between the unemployment rate and higher educational levels. At the same time, there is a negative relationship with the lower education level (Salama, 2017).

The development of education in Ethiopia has many challenges, such as inadequate funds and incentives, well-equipped vocational and technical training associations, a progressive educational system, and a lack of managerial skills. Ethiopia is recording successes in terms of student enrolment; however, the education quality is the bottleneck of the country. An increase in the number of enrollments by itself is not sufficient to eliminate unemployment. However, the standard of quality plays a significant role in creating a qualified labor force. Under the title, youth unemployment challenges in Ethiopia indicate that educational attainment and unemployment have a negative relationship. This study was primarily based on descriptive and quantitative data collected from 400 youths selected from the country's main cities, and it used a questionnaire, FGD, and interview to collect the data (Tesfaye, 2015). On the other hand, contrary to Tesfaye's conclusion, Serneels (2007) stated unemployment is highly rigorous among well-educated people indicating a positive relationship. It concludes that the increase in educational attainment cannot keep pace with the demanded labor, particularly with jobs that require highly skilled labor.

3.3.3 Unemployment and Urbanization

Understandably, people migrate from rural areas to urban areas to get a job in the service or industry sector with economic progress. The main activity in the rural area is agriculture, even though non-farm activities are becoming essential. The population of the

world is becoming urbanized as more people are migrating to a well-developed city. This migration is due to the expansion of industry and urban areas development that gives hope for many people from the rural areas searching for jobs and a better living condition over a given period of time. A research paper by (Wajiha et al., 2012) has viewed the relationship between urbanization and unemployment across the globe through cross-country data of 2010, keeping other things constant. The data method used a non-probability sampling technique, and the result shows a positive relationship between the variable. The estimated parameters are linear, unbiased, and reliable, and also it does not suffer from multicollinearity and heteroscedasticity. It was found to be the relationship between urbanization and unemployment is negative for developed countries while there is a positive relationship for developing countries. Migration from rural to towns is on the increase in Africa.

Zohry (2002) researched Egypt's rural-urban migration and its impact on unemployment. The study is based on 242 questionnaire-based interviews in fieldwork of selected villages of the city. The study's final result revealed that migrating is tremendously linked with economic activity and the survival of a given family. Unemployment, low income, lack of rural job opportunities, and landlessness are the critical factors in the research as factors contributing to migration. The researchers showed how a higher urban growth rate slows down getting employed in big cities.

Isibor (2013) examined the effect of urbanization and unemployment on the Nigerian economy. The study was motivated by issues of urbanization and unemployment and their overall implication on the Nigerian economy's development. Using secondary data from 1989-2010 and analyzed using the ordinary least square method. The result showed that urbanization has a significant impact on unemployment and the economic performance of the country. For such kind, direct relationship with the studied variables, the author suggested the government's role to increase agricultural facilities' availability and expand education to the rural populace. An economic analysis by (Bakare 2011) examined Nigerian urban unemployment from the time period 1987-2008. A time-serious secondary data and parsimonious error correction method were obtained to investigate the significant relationship between unemployment and urbanization. According to the result,

urbanization has a positive effect at both short and long-run periods with a 1% level of significance. The econometrics result implies that unemployment in Nigeria results from an increase in the supply side of labor. As an effect of urbanization, the study suggested the need for government to embark on direct measures in making jobs available through the mechanization of agriculture.

While the urban centers are amassed in population, the rural areas are reducing in population. This activity is the major contributing factor for the global phenomenon of urban surplus in labor and is a factor that aggravates the serious urban unemployment problem. A recent research study on the impact of the rapid growth of urbanization and urbanism in Easter Ethiopia investigates the challenges and prospects (Telila, 2020). The research employed a qualitative research approach where the data collection method largely included focus group discussion, observation, and interviews. The empirical studies indicated that the urbanization process causes the demolishing of rural areas, causing land grabbing from these societies. Therefore, the study puts vast unemployment problems in urban areas adjacent to overcrowding in the city. The alarming rate in urban population growth impacts the living patterns of communities by majorly creating disguised unemployment.

A similar study is conducted on the nature and determinants of urban unemployment in Ethiopia (Nganwa and Mbaka, 2015). The main goal of the research is to analyze unemployment in the urban areas of the country. It employed micro-level data from urban employment and unemployment survey conducted between 2006 and 2011 by Ethiopian Central Statistics Authority. A logistic regression model was applied to analyze the relationship between the two variables. The study result showed that urbanization is high compared to the total unemployment rate. In conclusion, the study recommended that to reduce urban unemployment government must increase public and private labor market information and educational structure based on the demand of the current economy.

3.3.4 Unemployment and Political Instability

Across the globe, crisis on financial and economic activities brought soaring unemployment. Even before the global crisis, job satisfaction, including unemployment, was a general concern in most developing and developed countries. In developing countries, unemployment is aggravated by the rapid increase of population, which is noticeably higher than in other countries. Unemployment and underemployment are significant factors contributing to the social, economic, and political instability of nations.

Among many conducted types of research regarding political instability is incorporated with the relationship of economic performance in a country. These researches propose the risky political instability in relation to economic performance in both developing and developed economies. A study conducted by (Lucifora and Moriconi, 2012) investigated political instability relationship with labor market institutions. The study developed a theoretical model for a political process to lower future policy intervention yields, divert resources from the good public provision and social insurance, and select labor market institutions that generate wage rents. For testing the prediction, panel data from 21 OECD countries were selected for the time period of 1985-2006. According to the analysis, political instability measures are linked with lower unemployment benefits.

A recent study by (Imtiaz et al., 2020) analyzed the determinants of unemployment in Pakistan. A qualitative research method was used, and a structured questionnaire was used for data collection with a total of eighteen questions. The result showed that unemployment rises when there is an increase in political instability, and it is one of the significant factors for Pakistan's economy. Al-Shammari and Willoughby (2017) explored political instability determinants across the Middle East and North Africa region, emphasizing the Arab Spring-affected regions. The data took 19 countries in the above-mentioned regions from the time period 1991-2014. The research method used pooled ordinary least square, random effect, and fixed effect approaches. The research result indicates that political instability in the region strongly influences creating unemployment and unrest in economic performance indicators. It confirms that democracy leads to minor unrest.

Political instability occurs in countries where social inequalities, corruption, and political instability are high. Focusing on young people by providing equal economic opportunities and providing employment or expanding education opportunities can play a significant role in increasing the economic situations hampered by political violence. Moreover, unemployment by itself cannot explain the occurrence of political instability and conflicts in a country.

4 Practical Part

4.1 Retrospective View on the Ethiopian Economy

This section emphasizes the comprehensive history of the Ethiopian economy performance. The Ethiopian population is the second in Africa, with a total population of a 100million. They are three regimes in modern Ethiopian political-economic history. These three periods are categorized as the imperial era (pre-1974), the Dergue regime (socialist regime) between the year 1974 – 1991, and the Ethiopian People's Revolutionary Democratic Front regime (EPEDF) between the year 1991 till present. Under each government regulation, the country's performance is highly changing due to political reasons as it majorly created a problem of policy inconsistency, natural disaster famine, and internal wars.

The imperial regime (1930 - 1974), where the economy is dominated by subsistence agrarian with landlords, determines resource allocation and output distribution. The economic situation considered both strategies by supporting growth by export orientation and import-substitution. After the 1950s, a new economic policy is introduced to transform the agrarian-dependent economy into an agro-industrial economy. The idea came after considering improving industry and agricultural productivity and improving the living standards of all Ethiopians. The first Five-Year plan (1957 - 1961) of the country was introduced during the imperial regime to develop robust infrastructure, especially in communication and transportation. The intense attention in infrastructure helped connect urban areas with rural, expand health and education to get involved in processing industries and develop commercial agriculture. The Five-Year plan increased the gross national product (GNP) by 3.2% annually (Young, 2020).

However, other sectors such as manufacturing and mining failed to meet the first national plan's target. The second Five-Year plan (1962 - 1967) was established to be engaged in diversified production and increase the economy's productivity capability. In the second Five-Year Plan, the economy was expected to grow, but due to a lack of skilled laborers and underemployment, the economy could not achieve what is expected. This was followed by creating the third Five-Year plan (1968 - 1973), organized to develop agro-

industrial performance and manufacturing. The third plan was not successful as it cannot accomplish the transformation of the subsistence agrarian economy to agricultural manufacturing. Lack of governmental administrative skill and failure to identify resources are the primary reasons for the breakdown of all five-year national plans. To summarize the imperial period, the economy was mainly recognized as a market-oriented economic system and an economic performance that was not improved as expected.

The socialist or Dergue regime (1974 - 1991), or as it sometimes called the military government, transformed the market-oriented economy to a command economic system by establishing a socialist economy. The socialist economy created different institutions such as cooperatives and peasants' associations. The nationalization of foreign producers, domestic producers, distributors, and service providers is one of the majors move the regime adopted to the economy. It also nationalized extra houses, large manufacturing industries, banks, insurance companies, and land in the rural and urban areas. The economic performance of this regime has four phases. The first phase of the regime, 1974 – 1978, was recognized by poor economic performance due to the unindustrialized new policies and country-wide nationalization measures. The second phase of the socialist government, 1978 – 1980, showed a modest increment in the economy by the result of political stability, and agricultural products increased as a result of good weather. The third phase of the regime between 1980 – 1985 is known as the lousy performance of the economy as both manufacturing and agricultural sectors decreased because of severe drought. The last phase of the regime (1985 - 1990) is where the economy continued to stagnate despite the progress in weather conditions producing a better output in agriculture than the previous phase. Hence, the economy started to de-accelerate due to the civil conflict's increased intensity due to irregular growth patterns.

The Dergue regime in the overall economic activity was focused on central planning that supports and strengthens the public sector and undermines the private sector's role. In general, the Dergue regime exercised and adopted a socialist economic system with the intervention in all types of the major economic activities and nationalization of all property types, which took the economy to its worst performance.

After the fall of the Dergue regime, Ethiopia's transitional government called the Ethiopian People Revolutionary Democratic Front (EPDRF) was established in 1991. The new government reduced its involvement in the economy. It supported the private sector participation by introducing economic reforms such as export-oriented, labor-intensive, and industrial development strategies focused on agriculture. New economic policies created a favorable ground for both domestic and foreign investors. The Structural Adjustment Program (SAP), with the help of an international financial organization like the World Bank (WB) and International Monetary Fund (IMF), brought a broader change in the economy. In addition to that, the re-form measures like privatization, foreign exchange market liberalization, and export tax holiday increased the national economy's development process. One of the government's signature policies is the agriculture-led industrialization program, industrial development strategy, rural development strategy, and sectorial policies. Each policy is believed to bring productivity growth on small farms and reduction of unemployment through labor-intensive industrialization.

Another central policy adopted for structural transformation during this regime is through the First Growth and Transformation Plan (GTP I) and the Second Growth and Transformation Plan (GTP II). The economy was projected to grow in the First GTP over the planned five-year period (2010 - 2015). This implementation revealed the major gaps in the structural change of the economy. The gaps included lack of institutional transformation, lack of technological advancement, and no infrastructure design in starting heavy industrialization. The second GTP is the continuation of the first plan. It identifies the major structural transformations at a macro level over the period (2015 - 2020). The main objective of this plan is for manufactural sector development in order to boost the economy. In addition to that, the primary source of employment should be generated from the industrial and service sector. The gap identified under the GTP II is the shortage of power, which can interrupt the manufacturing sector's planned expansion. Great Ethiopia Renaissance Dam (GERD), which produces 6000 MW of electricity at full capacity, is believed to address the power shortage and contribute to the development of the manufacturing sector, and increasing the labor employed in the sector. In general, the liberalized economic system brought a relatively good economic performance compared to the other regimes.

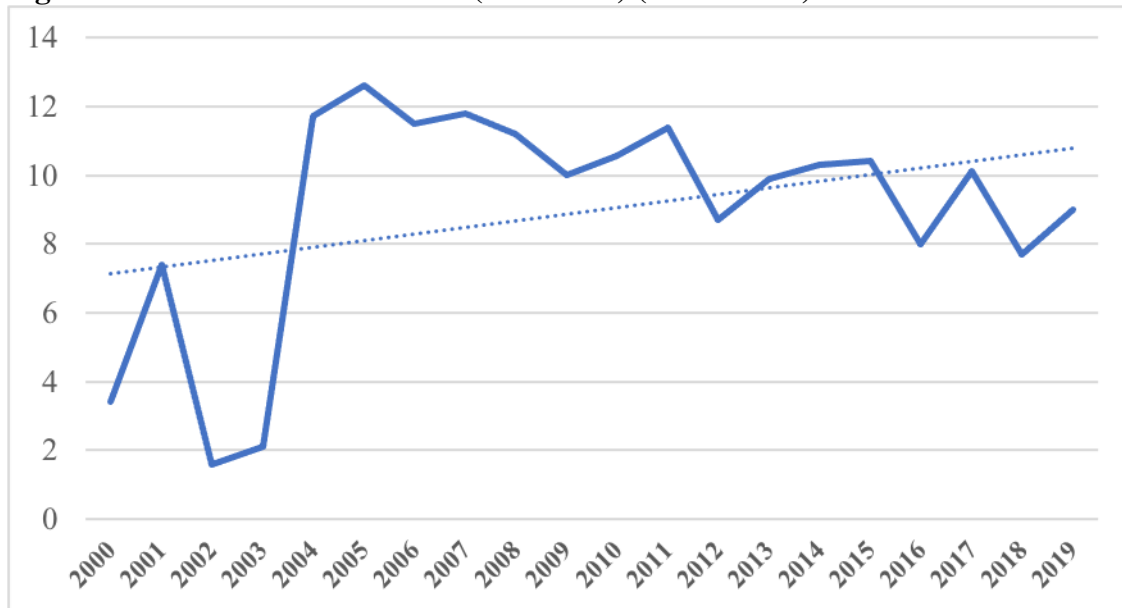
4.2 Descriptive Analysis

4.2.1 Current Overview of the Ethiopian Economy

Ethiopia has planned consecutive economic growth strategies after the end of the socialist economy, starting from Sustainable Development and Poverty Reduction Program (SDPRP) to the current Growth and Transformation Plan (GTP)-II. The latest development strategy of the country, GTP-II, designed aiming to serve the country as a foundation towards fulfilling the national vision of becoming a lower-middle-income country by 2025. In this strategic plan period, the country's economy is projected to experience an average yearly growth rate of 11% (MoFED, 2019). The plan explains agriculture has continued as the primary source of growth. Notably, it gives attention to high-value crops, industrial inputs, and export commodities. Besides the agriculture sector, it incorporates the government's commitment to creating a robust industrial sector growth, intending to be the manufacturing hub of Africa and accelerate structural transformation of the economy. Furthermore, supporting policy objectives such as redressing the macroeconomic imbalances, maintaining macroeconomic stability, human capital development, and building a climate-resilient green economy are included in GTP-II. The contribution and growth rate of all economic sectors remain different. This unbalanced sectorial growth in the economy engenders structural change, described by the shift of resources such as capital, labor, and other factors of production to emerging sectors of the economy.

Figure 1 below shows the Real GDP Growth Rate over time (2000 - 2019). As indicated in the figure, the Ethiopian economy has shown sustainable and robust growth since 2003 after decades of stagnant performance. The conceivable factors for the economy's low performance before 2003 were a long-lasting civil war, war with a neighboring country Eritrea, frequent drought resulting from bad weather, and heavy dependence on single sector agriculture. Furthermore, as depicted in the figure, the country's economic growth is volatile, showing ups and downs. This suggests the economic growth of the country was exposed to internal and external shocks. However, in recent years, the economy boldly shows a stable growth rate. This could have resulted from the extension of the economy by focusing on the agriculture sector and the other sectors.

Figure 1: Real GDP Growth Rate (annual %) (2000 - 2019)



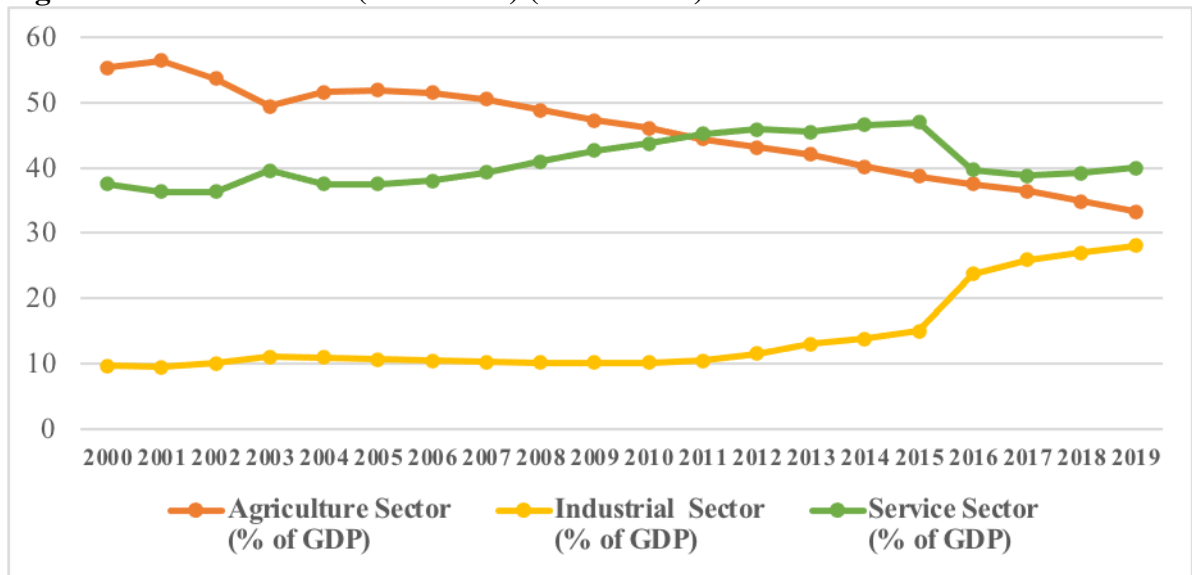
Source: Own Computation from National Bank of Ethiopia (NBE), 2021

Developed and growing economies' experience discovered that structural transformation has occurred as productive resources transferred from the low productive agriculture sector to manufacturing and service sectors. It, therefore, activates changes in the structure of demand, international trade, and the labor force. Additionally, it has the control of changing the country's resources from one sector to the other. As a result, business organization changes their direction towards the most profitable sectors. However, all growths do not cause structural changes. Structural change is recognized when the primary agriculture sector leaves its contribution to modern sectors such as manufacturing and service. To profoundly realize the state of the structural change in the Ethiopian economy, this study incorporated the country's economic growth into major sectors by their share of contribution to the GDP of Ethiopia.

As depicted in Figure 2, agriculture leads the Ethiopian economy by creating value addition for an extended period of time. However, the GDP contribution of agriculture has dropped since the 2000s. From 2000 to 2019, the agriculture sector loses its share by about 17% to reach about 33%. This is due to high development in the service and the manufacturing sectors, which recorded a share in the GDP by 40% and 28%, respectively, in 2019. Recently, the service sector took the leading position from agriculture, while the

industry sector remains in third place. All these changes witness the presence of structural change in the economy.

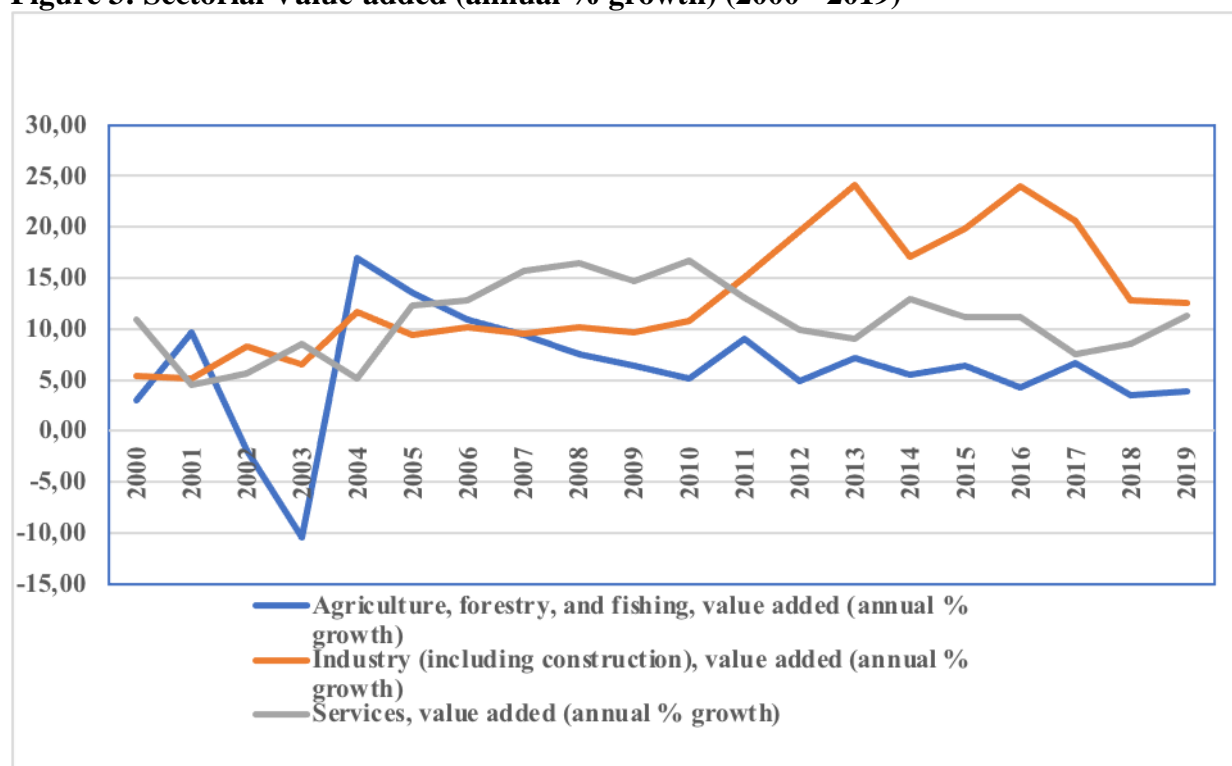
Figure 2: Sectorial Share (% of GDP) (2000 - 2019)



Source: Own Computation from National Bank of Ethiopia (NBE), 2021

The other approach used to measure a sectoral change in this study is an annual growth rate of value-added. Figure 3 below shows the value-added annual growth rate, which explains the net output after adding up all outputs. The service sector's value-added growth improved, and the industrial sector remains stagnant until the start of the first Growth and Transformation Plan (GTP I). According to FAO (2002), the agriculture sector's value-added in the economy for the period 2001 and 2002 was dropped dramatically. The primary reason for this was a shortage in rainfall as the sector is heavenly dependent on rain. However, observing the recent period (2011 - 2017), the industry sector has registered an overwhelming average growth rate of 20%, which is by far higher than the agriculture and service sector average yearly growth of 8% and 10%, respectively. This shows that the industry sector is an assuring sector and expected to overtake the second position overtime. It indicates that the economy will shift to the industrial sector in value addition and value-added growth rate. The data deceptively suggest that the agricultural sector's involvement is diminishing in value addition and value-added growth rates while the other two sectors' contributions increase. This, in turn, raises the expectation that the labor force will shift from the agricultural sector to the newly growing sectors.

Figure 3: Sectorial Value-added (annual % growth) (2000 - 2019)



Source: Own Computation from World Development Index (WDI) for Ethiopia, 2021

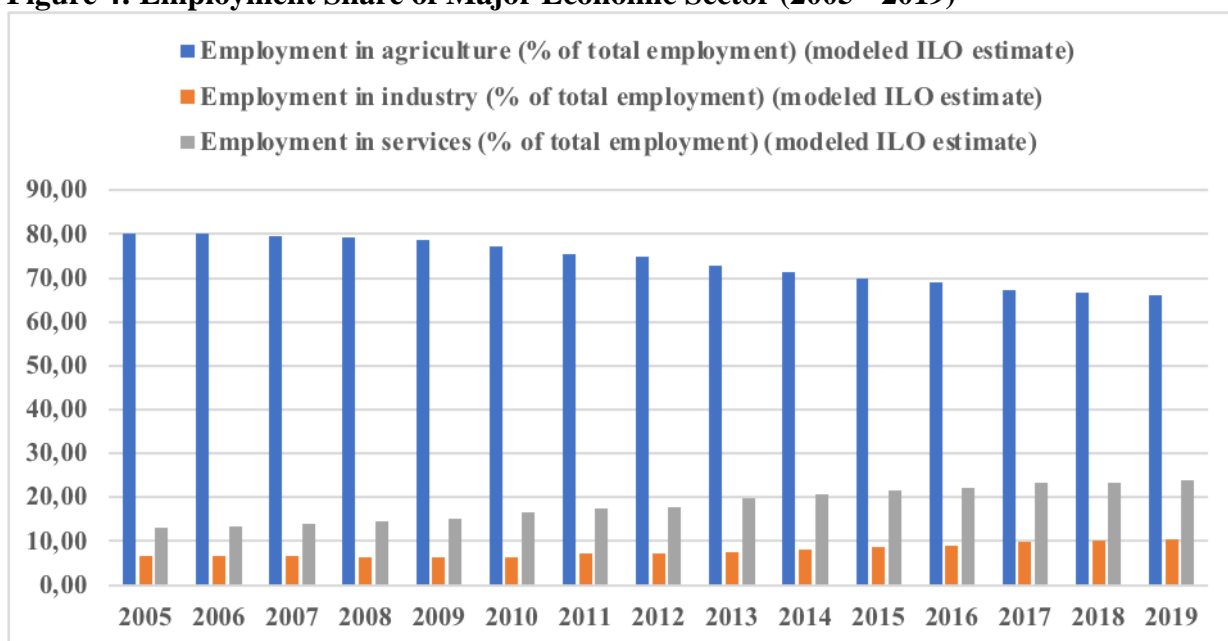
To summarize, the strongest side of the economy is found in the service sector. This sector plays a vital role in the contribution of total output growth, and it is an important sector to drive growth. Agriculture share in the total output declined, which paved the way for controlling the service sector. Policies should not undermine the role played by this sector as it can reduce unemployment by linking the productive labor force from the agriculture sector.

4.2.2 The Labor Force in the Ethiopia

In the above discussion, the study focuses more on the structural change in the economy from the production point of view. However, it is also essential to describe the employment shares of the three major sectors. As stipulated in figure 4 below, the agriculture sector's employment share declines over time even though it is not prompt as the observed decline in production share. Although the service sector overtook the position from agriculture in terms of value addition, agriculture still absorbs more than 70% of the labor force, indicating no significant change in economic structure from a labor composition point of view. As explained above, the production and employment share of major sectors of the

economy changed over time. The share of agriculture is declining while the service and industry shares are increasing.

Figure 4: Employment Share of Major Economic Sector (2005 - 2019)



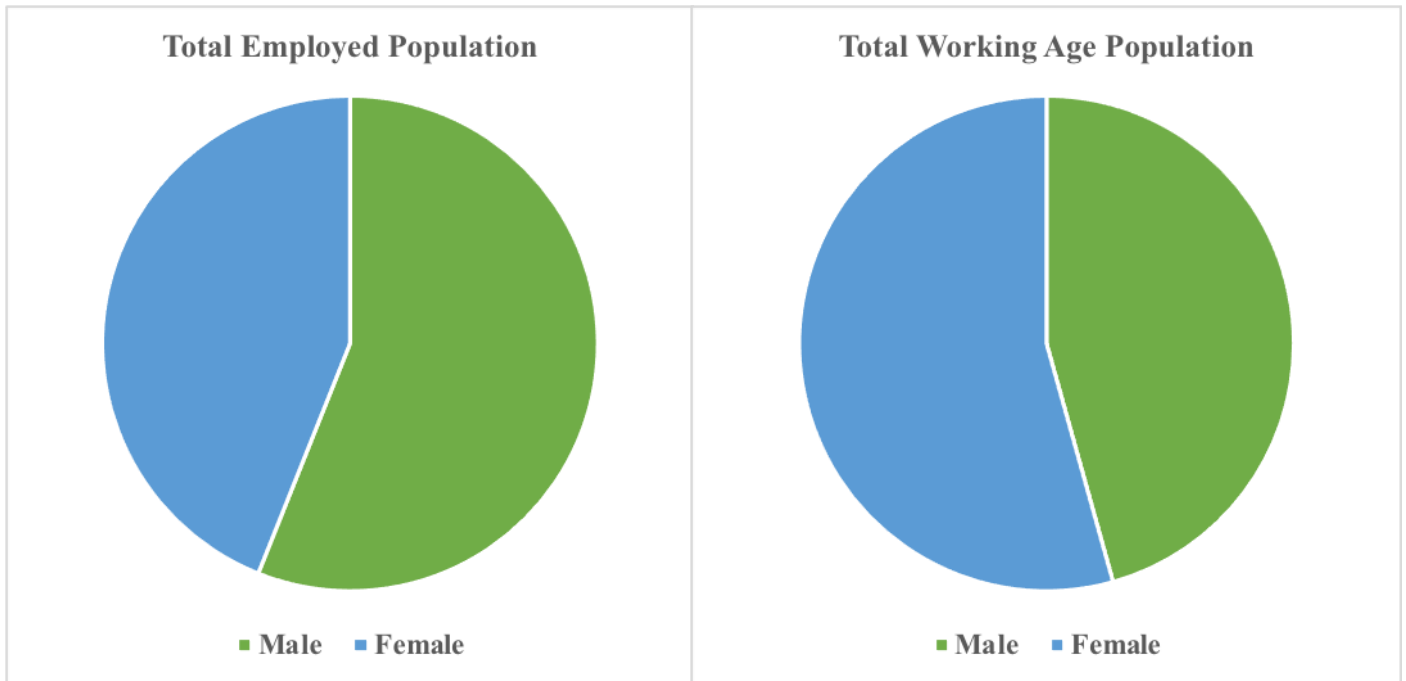
Source: Own Computation from World Development Index (WDI) for Ethiopia, 2021

The Ethiopia Central Statistical Agency (CSA) reports urban areas of the country employment and unemployment survey every year. According to the latest survey report in 2018, it depicts the primary occupation and status in the employment of main activity and terms of employment. Status in employment of a person indicates the level of involvement and degree of decision-making in his/her main activity. The working-age population defines the share of the working-age population out of the total population. The working-age population is defined by Ethiopian CSA between age ten and sixty-four. The total employed population shows the total number of people engaged in some work. It can incorporate those employed in salary, self-employed, or staff working for a family-owned business.

Figure 5 explains the urban working population aged ten years and above all over the country classified by gender and the total number of employed people out of the working population. According to the data, 54% of the total working-age population are male, and 46% account for female workers. Out of this total working-age population, 56% of males

are employed in the country's different economic sectors while 44% of females are engaged in work.

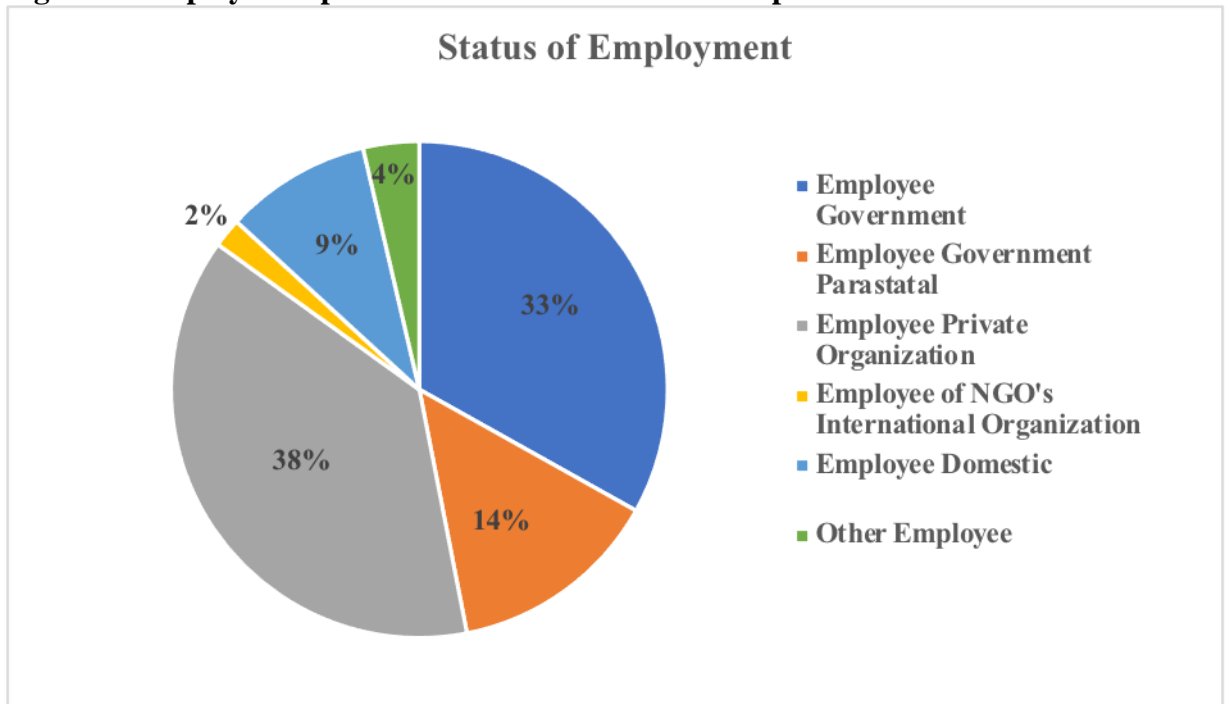
Figure 5: Working Age Population and Total Employed in 2018



Source: Own Computation from Ethiopian CSA, 2021

The total employed population is further disaggregating into government employees, employee's government parastatal, private organization employees, NGO's or international organization employees, employees of domestic, and other employees. Figure 6 describes the employed population of an urban area of Ethiopia. According to the Ethiopia CSA report in 2018, most of the population is employed in a private organization and accounts for 38% and followed by government employees with 33% of the total employed population. The employed population of urban areas in Ethiopia is engaged in various industrial divisions.

Figure 6: Employed Population of Urban Areas of Ethiopia in 2018

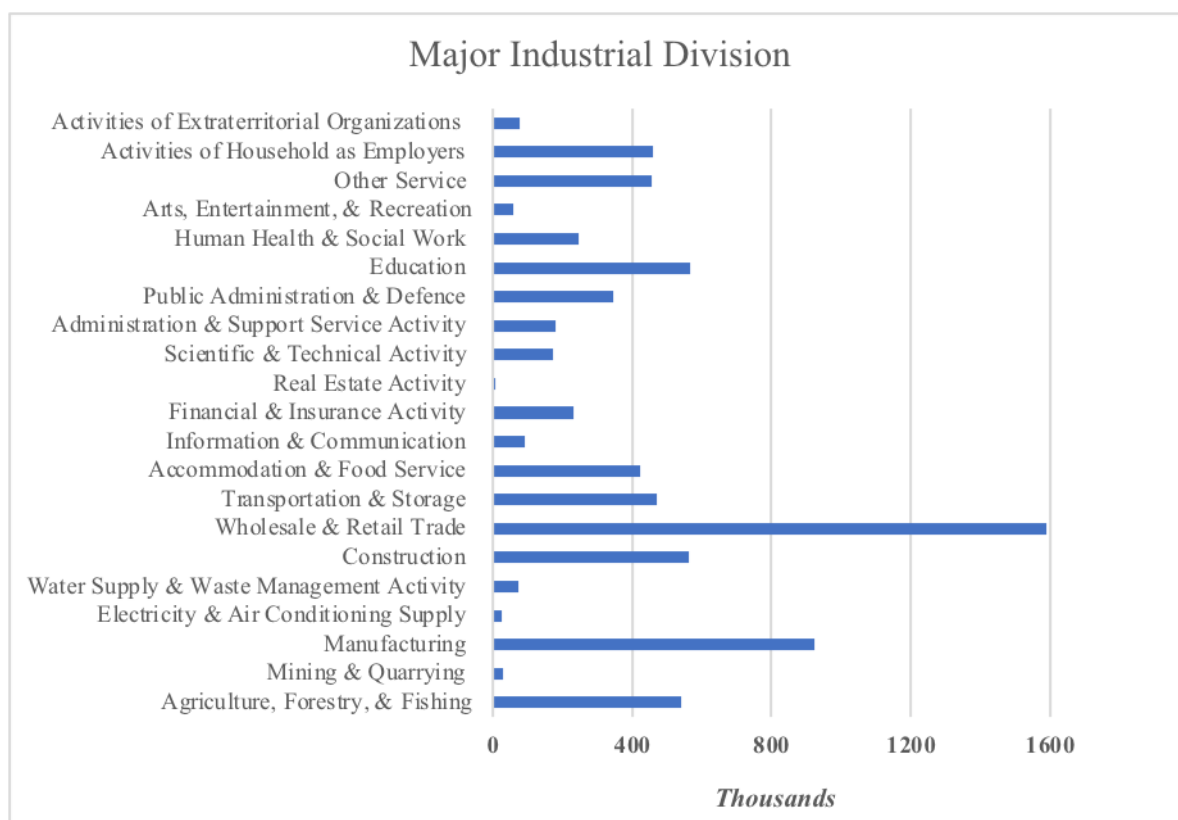


Source: Own Computation from Ethiopian CSA, 2021

The major industrial divisions are classified under four categories such as primary sector, secondary sector, tertiary sector, and quaternary sector. The primary sector deals with a natural resources by extracting and harvesting such as agriculture, forestry, fishing, mining, and quarrying. The secondary sector relates production process, which includes manufacturing and processing, and construction. The tertiary sector majorly includes companies that provide service to consumers, and it can be retailers, wholesalers, entertainments, and financial companies. The last category, the quaternary sector, deals with intellectual pursuits, including research and development, education, and business consulting. This Ethiopia CSA report in 2018 depicts the employed population of urban areas classified by major industrial division.

According to Figure 7, the majority population is under the tertiary sector involved in wholesale and retail trade activity out of the total employed. Next to that, manufacturing accounts for the majority of employment. Employment in the primary sector has a low contribution, which explains the country's growth when it comes to service and industry sectors.

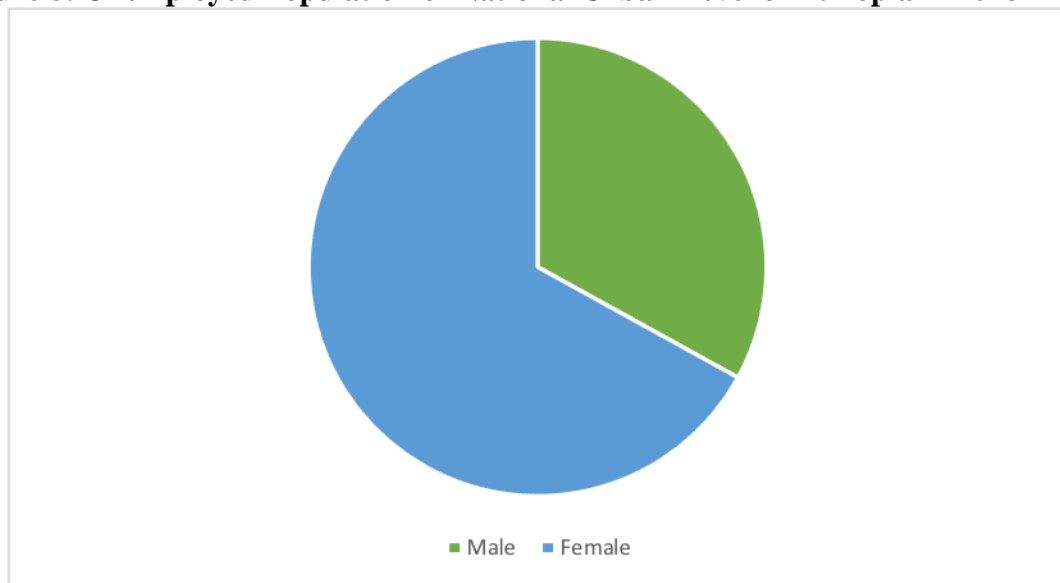
Figure 7: Employed Population according to Major Industrial Division in 2018



Source: Own Computation from Ethiopian CSA, 2021

The previous chapter has mentioned the currently employed population. It attempts to explain where most of the workforce engaged in a specific activity or enterprise in the economy is located. Here, this chapter discusses unemployment as an indicator to measure the extent of unutilized human resources in the economy at a given area in a given period of time. In other words, it shows the human labor that should be used in various economic development sectors but not used. This unutilized human resource has its own social and economic implications. According to a central statistics agency report on the urban Ethiopia employment and unemployment survey, it mentions unemployment is without work, currently available for work, and seeking work. Figure 8 shows the total figure for the unemployed population. As per the current status approach, the total number of unemployed populations in the national urban level was 1,770, 294 accounting for 33% and 67% for unemployed males and females.

Figure 8: Unemployed Population of National Urban Level of Ethiopia in 2018

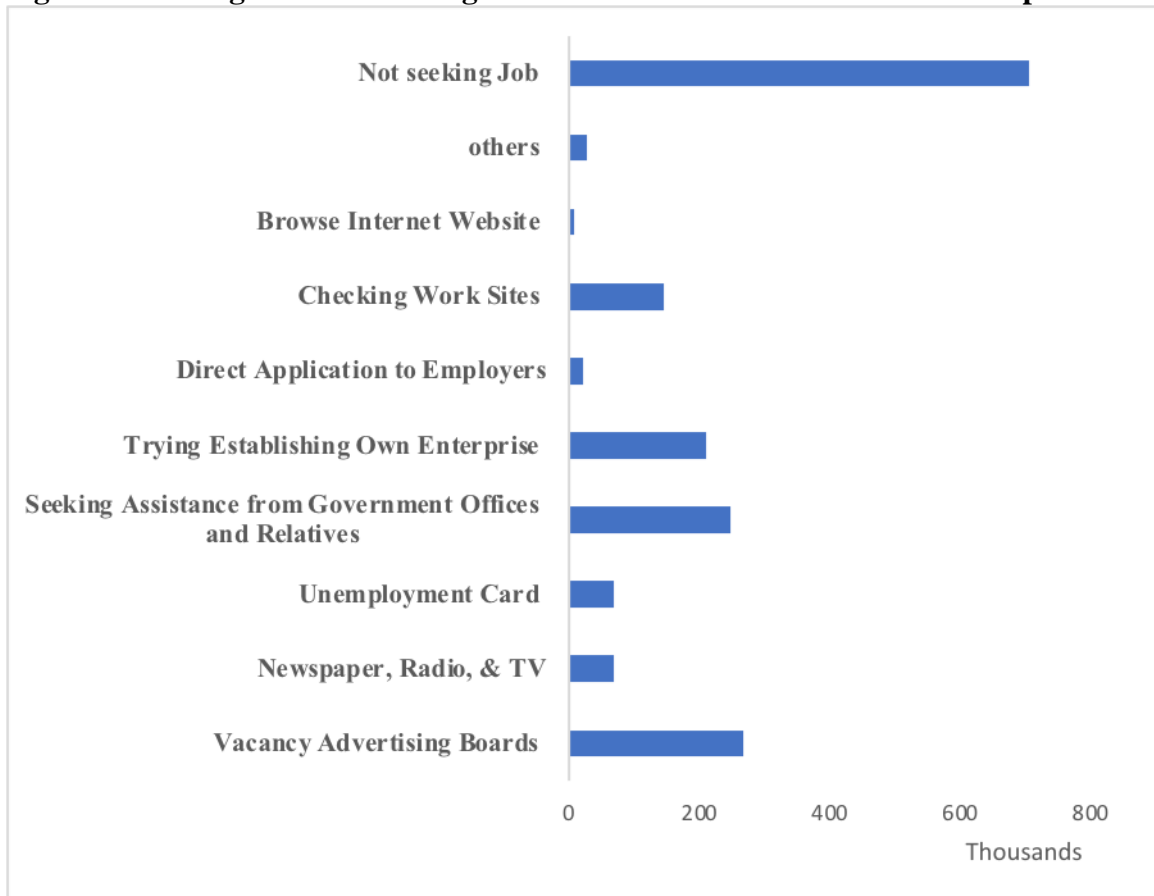


Source: Own Computation from Ethiopian CSA, 2021

According to the generalized unemployment definition, those who are considered unemployed are the people who are seeking a job but could not get a job. Based on this fact, the unemployed population of Ethiopia's urban areas seeking a job through numerous sources such as newspaper, radio, advertising boards, direct application to employers, and others is looked at under the statistical report survey.

Figure 9 illustrates the urban areas of seeking and not seeking work at the national urban level. From this data, 40% of the total unemployed population are not seeking a job, 15% are looking for a job through vacancy advertising boards, 14% seek assistance from the government, and 12% out of the total unemployed population are trying to establish their enterprise. Finding for jobs using technology by browsing the internet is very low as only 8% of the unemployed population is using this option

Figure 9: Seeking and Not Seeking Work at National Urban Level of Ethiopia in 2018



Source: Own Computation from Ethiopian CSA, 2021

4.2.3 Current Policy Measures to Reduce Unemployment

Policymakers in Ethiopia expressed an understanding of the country's comparative advantage that would alleviate employment creation performance and productivity. While Ethiopia is experiencing a solid economic performance, the macroeconomic indicator unemployment remains a significant obstacle. Low value-added services currently create more jobs in the country, but medium to high value-added manufacturing and service sectors create higher and productive jobs. As observed in the above sections, most Ethiopia jobs are low-productivity service sectors such as wholesale and retail trade, accounting for one in four jobs in the major cities. They are essential job creators with diminishing returns as the size of the market is very limited. On the other hand, medium to higher value-added business service sectors like financial services and information communication technology (ICT) services accounts for 4% of employment, according to Ethiopia CSA. Focusing on

shifting the lower productivity service sector to higher activities changes the economy's overall growth with a better-quality job in the future.

To address such problems and fill the unemployment gap in the three major sectors, the Ethiopian government established Jobs Creation Commission. It is established as per the proclamation 1097/2018, determining the executive organs' powers and duties. Furthermore, the regulation 435/2018 declared by the council of ministers mandated the commission to lead the job creation agenda, coordinate stakeholders, monitor, and evaluate performance (Job Creation Commission, 2018).

According to the Job Creation Commission Report in Ethiopia (2018), the Job Creation Commission's objective is to study and propose a general innervation to solve unemployment and provide a new vision of employment for Ethiopians with access to sustainable jobs. It aims to create a conducive business environment to create 14 million jobs by 2025, 20 million jobs by 2030, and guarantee new entrants to the labor force. The job creation plan for action has six main strategic objectives.

- a) Adopting job-rich macro policies: it is believed that macroeconomic stability is crucial for job creation in the public and private investments, refining the financial sector, and upgrading the job-rich macro-policies.
- b) Constructing vibrant local private sector: by restructuring the micro, small, and medium enterprise quality of business development can be improved.
- c) Developing human capital: the continuous demand change in the labor market can be addressed by human capital improvement, ensuring 21st-century skills. An entrepreneurial mindset is necessary to link between educational institutions and industries.
- d) Strengthening labor market intermediation and linkages: the development of a labor market information system helps to reduce the asymmetry of information and develops better linkage with the labor market

- e) Improving the labor market's inclusiveness: it acquires populations that are excluded from the labor market, such as disabilities, migrants, and refugees.
- f) Realizing the job-creation potential of the prospective high-yield sector: focusing on job creation of sub-sectors in the major three sectors of the economy such as agriculture, industry, and services.

In general, the current policy measure to reduce unemployment proposes plans where it - 1) encourages the private sector investment and foreign direct investments by creating an effective after-care strategy for investors to maximize job creation. 2) Investing in rural-urban linkage where development of infrastructure across urban areas bordering rural areas to connect essential services. 3) Gives access to land by improving land planning and administration to encourage farmers to become shareholders in commercial farms. 4) Working in logistics to optimize transport system and improving ICT utilization by increasing broadband network with special attention on trade corridors.

4.3 Econometric Analysis

4.3.1 Model Description and Variable Explanation

The economic model of the study in algebraic format is as follows:

$$Y_t = f(X_{1t}, X_{2t}, X_{3t}, X_{4t}) \dots \dots \dots (1)$$

$$UR = f(GDPGR, SEGP, UPG, PI) \dots \dots \dots (2)$$

Where

- Y_t Unemployment Rate (*% of total labor force*) (*modeled ILO estimate*)
- X_{1t} Real Growth Domestic Product Growth Rate (*annual %*)
- X_{2t} Secondary Education General Pupils (*in millions*)
- X_{3t} Urban Population Growth (*annual %*)
- X_{4t} Political Instability (*Points*)

The econometric implication of selected variables for unemployment rate in Ethiopia adopts the following linear regression model of log-transformed values:

$$\beta_1 \ln Y_{1t} = \gamma_0 + \gamma_1 \ln X_{1t} + \gamma_2 \ln X_{2t} + \gamma_3 \ln X_{3t} + \gamma_4 X_{4t} + u_t \dots \dots \dots (3)$$

Where

- ‘lnY_t’ is the vector of logged values of the dependent variable
- ‘β₁’ is the coefficient of the dependent variable to be estimated
- ‘γ₀’ is the intercept or constant
- ‘γ₁’ ‘γ₂’ ‘γ₃’ ‘γ₄’ are the coefficient of the independent variable to be estimated
- ‘t’ is the time period from 1988 – 2020 based on Gregorian Calendar
- ‘lnX_{1t}’ ‘lnX_{2t}’ ‘lnX_{3t}’ ‘lnX_{4t}’ are vectors of logged values of all the independent variables
- ‘u_t’ is the error term in time ‘t’

By transforming equation (3) in a form of equation where abbreviations are used instead of X and Y will take the following format:

$$\beta_1 LUR = \gamma_0 + \gamma_1 LGDPGR + \gamma_2 LSEGP + \gamma_3 LUPG + \gamma_4 PI + u_t \dots \dots \dots (4)$$

The econometrics technique employed in this study takes a procedure where the cause of unemployment is a function of major determinants. These are real gross domestic product growth rate (GDPGR), Secondary Education General Pupils (SEGP), Urban Population Growth (UPG), and Political Instability which are mentioned in the above equation.

The variables that this study uses are explained as following:

1. Unemployment Rate (UR) (*World Bank, 2020*): is the percentage of the total labor force without a job. Unemployed people are willing and have the desire to work but unable to get a job. It has a vital role in an economy by providing insight into its spare capacity or unused resources. In other words, unemployment increases when an economy slows down. Thus, this study captures Ethiopia's unemployment rate as a dependent variable and analyzes the relationship with other independent variables that are believed as the causes creating unemployment in the country. ILO modeled estimate series is taken for the study as there is no data available for the national estimate of unemployment in Ethiopia.

2. Real Gross Domestic Product Growth Rate (GDPGR) (*MoFED, 2019*): is a macroeconomic indicator in an economic output adjusted for price changes that can happen due to deflation or inflation. GDP is the total sum of manufacturers' investments, spending on consumptions, government expenditure, and net export over imports. Because of inflation, prices in the economy can increase and do not truly reflect the economy's growth. Due to this reason, the inflation rate must be subtracted from GDP to express real GDP growth, so-called real GDP. Hence, this study used the real GDP growth rate of Ethiopia to represent economic growth.
3. Secondary Education, General Pupils (SEGP) (*World Bank, 2020*): The number of students enrolled in general education programs of secondary schools also includes teacher training. Secondary education is highly and widely believed to provide all the essential skills for young people to participate in economic, social, and political scopes. In addition to that, secondary education is vital to be part of the increasing technological market economy. Thus, the study used general pupils in Ethiopia who are attending secondary education to capture the relationship between education and unemployment.
4. Urban population growth (UPG) (*World Bank, 2020*): refers to the urban population living in urbanized cities as defined by national statistical offices. The study considers how urbanization growth is affecting and related to creating unemployment in Ethiopia. The annual percentage of urban population growth is independent to see the relationship with the dependent variable.
5. Political Instability (PI) (*CSP, 2020*): is defined as the change in political leaders, policies, or situations of a country. It plays a role by affecting the rate of productivity in major sectors of the economy and lowering human capital accumulation. In this study, Ethiopia's polity index is used to understand the relationship between political instability and unemployment. Center for systemic peace has polity data series of different countries, which is highly used for political science research and it identify the points range between -10 to -6 as autocracies, -5 to 5 as anocracies, and 6 to 10 as democracy.

4.3.2 Model Specification

For selecting an appropriate model, it must go through specific steps such as a Pre-estimation test that includes Unit root test and lag length selection. Most macroeconomics time series variables show a trend with non-stationarity at a level. A non-stationary time series often leads to the problem of spurious regression. Results with spurious regression indicate a relationship between variables that do not exist. The other reason for testing stationarity before deciding which model to select is to determine integration order, whether the variables are all I (0), I (1), or I (2). Phillips and Perron (PP) and Augmented Dickey-Fuller (ADF) unit root tests are used to observe variables' stationarity at level or first differences. Each test is implemented with three different trend assumptions that are only intercepted, linear trend and intercept, and no intercept and no trend according to the variables' data collected method (Mallik & Chowdhury, 2001).

The null hypothesis in both tests is:

- H0: the series is non-stationary or has a unit root against the alternative hypothesis
- H1: the series is stationary or has no unit root

While working with ADF or PP test, statistics are less than the critical value in absolute terms. We fail to reject the null hypothesis. If the statistics are less than the critical value in absolute terms, we fail to reject the null hypothesis. ADF the most commonly used stationarity test in a time series analysis. The ADF test incorporates extra lagged terms of the independent and dependent variables in order to eliminate autocorrelation. According to (Gujarati 2004), the presence of unit root using the ADF test consists of three different equations, and it is presented as follows:

The general form ADF equation in which no intercept term and trend

$$Y_t = \delta Y_{t-1} + P_{i=2} \beta_i \Delta Y_{t-i+1} + \varepsilon_t \dots \dots \dots (5)$$

ADF equation with the auto regression including only intercept

$$Y_t = \alpha_0 + \delta Y_{t-1} + P_{i=2} \beta_i \Delta Y_{t-i+1} + \varepsilon_t \dots \dots \dots (6)$$

ADF equation, if autoregression includes the intercept and a trend

$$Y_t = \alpha_0 + \delta Y_{t-1} + P_{i=2} \beta_i \Delta Y_{t-i+1} + \alpha_1 t + \varepsilon_t \dots \dots \dots (7)$$

For the above three equations, the ADF test's null hypothesis is $\delta = 0$, and the alternative is $\delta < 0$. The rejection of this null hypothesis shows that the time series is stationary and does not contain a unit root. Y_t is a dependent variable in the model to be checked for stationarity at time t , ε_t is an error term with a time trend variable, Δ expresses the first difference, and P is the optimal lag length of each variable selected for the first difference term making white noise. The three equations' critical values are different, and "t" values are compared with the ADF table of critical values. Therefore, the ADF test is used for the unit root test in this study.

Moreover, before specifying the model, the maximum lag length should be considered. The optimal lag length is crucial as it helps us address over and under parameterizations and observe a degree of freedom. Residual autocorrelation can happen by adding too few lags, which can lead to regression residual that does not match with white-noise processes and makes the hypothesis rejected when it is true. In this case, the model will not capture the correct error where coefficients and standard errors will not be well-estimated. Including too many lags can also cause an increase in the mean-square forecast errors where it reduces the power of the test as it rejects the unit root null hypothesis (Gujarati, 2004). In our study, lag length selection criteria are adopted to determine the optimal lag length using Akaike Information Criteria (AIC) and Schwartz Bayesian Information Criteria (BIC).

After specifying the lag length of the model, a co-integration analysis is conducted. Usually, a macroeconomic variable with time series is non-stationary, but their linear combination is stationary. Co-integration is an econometrics technique used to analyze the non-stationarity between time series variables. In reality, an economic variable that has a unit root (non-stationary) moves together overtime considering the variables may become stationary. Making variables stationary by differencing only shows the short-run effect, while co-integration is interested in understanding the long-run relationship. According to (Gujarati 2004), there are three standard methods for testing co-integration, and these are the Engel-Granger two-step model (EG), Johansen Procedure, and Autoregressive Distributive Lag Approach (ARDL).

In EG, two-step model variables are tested for co-integration of the same order $I(1)$. EG's procedure is to first test the variables for their order of integration which follows estimating the long-run equation relationship with residual and finally testing the residual stationarity. If the procedure is satisfied with stationarity, we can say the variables are cointegrated, having a long-run relationship. To estimate the short-run relationship between variables in the EG two-step model, an error correction model (ECM) should be conducted. The problem considering the EG two-step model for co-integration analysis assumes there is one cointegrating vector. At the same time, there are more than two variables that are involved in the model. The other problem is that it categorizes variables as endogenous and exogenous with an implication of simultaneity problem. In this particular study, the ARDL procedure is selected to conduct co-integration between variables because it does not restrict the variables of interest to be integrated of the same order where it can be applied when variables are a mixture of integrated of order $I(0)$ and $I(1)$ or particularly integrated. It also allows the estimation of variables without separating them into exogenous and endogenous, and it shows how dependent variables respond overtime of a shock.

By economic observation, if two variables cointegrated and have a long-run relationship between them, estimation of error correction model is (ECM) is a must. By considering the long-run path, each variable is expressed by its first difference, which response to changes in other variables and the variable's deviation. The first step in time-series is to check the weather if the variables are at level or stationary. If not, the first difference of the variable and try again. In most cases, if the first level is not stationary, the first difference will be, and in case the first difference is not stationary, the second difference will be. Time series that are not stationary requires adjustment for estimation of the relationship among the variables. ECM takes co-integration for the understanding of the relationship among variables. According to (Hamilton 1994), ECM explains how variables are adjusted towards the long-run equilibrium state. In addition to that, long-run disequilibrium in the dependent variable is adjusted by a series of partial short-run adjustments. In doing so, a researcher can avoid an omission of important variables or constraints. Due to this reason, ECM is used for non-stationary series that are cointegrated. Moreover, the approach

captures both short-run and long-run effects of the model and provides transparent information about the real economic progress to the desired level.

A diagnostic test is a standard tool to specify a model before it can be used for forecasting. It is usually considered to detect model misspecification, which helps any model improve and indicates the validity of employing impulse-response functions and variance-decomposition analyses. A model must pass all the diagnostic tests to estimate an error correction model. The following are post estimation diagnostic tests that are included in the study:

1. Residual Vector Normality Test: The multivariate Jarque-Bera (JB) test is used to test normality. It helps to measure skewness and kurtosis of the series with those from the normal distribution. It is the most used post estimation diagnostic test in a time-series study. The formula to calculate the statistics are:

$$JB = \frac{N}{6} \left(S^2 + \frac{(K-3)^2}{4} \right) \dots \dots \dots (8)$$

N is the number of observations; S is coefficient of Skewness, K is a measure of kurtosis, and the test statistics distributed with 2 degrees of freedom. If the probability value of JB is less than 5% statistically then the residuals are not normally distributed and vice versa.

2. Error Vector Autocorrelation Test: It is also known as serial correlation. The test's primary role is to identify the relationship that exists in an econometric model where the current value of the regression residual and lagged values estimates the complete robustness and specification. Multivariate Breusch-Godfrey Lagrange Multiplier (LM) test is used in the study for identifying residual serial correlation up to some specified lag order. The null hypothesis for the test is H0: no serial correlation in residual and alternative hypothesis H1: there is a serial correlation in residual. Based on this, if the probability value of the test statistic is less than 5%, then we reject the null hypothesis, implying in the model there is a has serial correlation of residual terms.

3. Heteroscedasticity Test: The heteroscedasticity test for VECM is another important post-diagnostic test that considers White test residuals and investigates the Markov assumption to make sure the model has the best linear unbiased estimate (BLUE). This study adapted the Brush-Pagan-Godfrey test for the presence of heteroscedasticity. It also checks the residual levels and square terms, which helps identify the variance of the model's errors is constant or not. The null hypothesis for the test is H0: residuals are homoscedastic, and alternative hypothesis H1: explains residuals are heteroscedasticity. If the probability value of the test statistic is less than 5%, then we can reject the null hypothesis and assert that in the model we do have heteroscedasticity.

4.3.3 Descriptive Statistics

It is crucial to understand the study variables' behavior to take some corrective measures so that the variables are indubitably applicable for the estimation procedure. Table 1 below shows the variables' behavior and suggests absences of outliers in the data due to the mean values found between the maximum and minimum values.

Table 1: Descriptive Statistics of all Variables

Variable	Observation	Mean	Standard Deviation	Minimum	Maximum
UR	33	2.711939	0.5128009	2.075	3.714
GDPGR	33	6.657979	4.975315	-4.326261	12.64421
SEGP	33	2607392	1748495	712489	5662183
UPG	33	4.819567	0.5718902	4.02769	5.91
PI	33	-1.484848	2.79644	-8	1

Source: Own Computation, (2021)

Based on the above description of the variables, the unemployment rate has an annual mean of 2.7%, lying between the minimum and maximum values, which indicates the absence of outlier data. The real economic growth rate has annually increased by 6.7% on average, showing a minimum decline of 4.3% and a maximum increment of 12.6%. Similarly, urban population growth increased by 4.8% on average, showing a minimum of 4% and a maximum of 5.9%. When it comes to secondary enrollment of general pupils,

display the highest dispersion as indicated by the standard deviation. This indicated the abnormality of the variable, while other variables show the lowest level of standard deviation. Because of this occurrence, the variables appeared in the natural logarithm to eliminate the highest dispersion to some extent. Most importantly, it is easy to explain variables' effect on exogenous variables in terms of elasticity in the analysis.

4.3.4 Maximum Lag Length Selection

Deciding the maximum lag length helps to generate the white noise error terms. The objective is to select a number of parameters and can be selected by the most popular used methods such as sequential modified LR test statistics (each test at 5% level), the final prediction error (FPE), the Akaike information criterion (AIC), Schwarz information criterion (SC), and Hannan Quinn information criterion (HQ). A lag that provides the minimum value is selected as the optimal lag length, which describes among the information criterion which provides the majority lag that has been chosen as optimal lag length. All variables included in the analysis (except political instability, PI, since it is like dummy rather than numeric) are expressed in terms of elasticity by logarithmic transformation. Time-series analysis is sensitive to the number of lags included in the model. In the following table, the maximum lag length for the model is two, which is determined at the lower values of the information criteria automatically indicated by an asterisk (*). The full output of the analysis is attached in the appendix section B.

Table 2: Selection of Maximum Lag Length

Lag	LL	LR	DF	P	FPE	AIC	HQIC	SBIC
0	42.3742	-	-	-	0.004463	-2.577	-2.503	-2.341
1	61.8216	38.895	1	0.000	0.001254	-3.849	-3.761	-3.566
2	68.8863	14.129*	1	0.000	0.000828*	-4.268	-4.166*	-3.938*
3	69.6425	1.5125	1	0.219	0.000846	-4.251	-4.138	-3.872
4	71.0428	2.8005	1	0.094	0.000829	-4.278*	-4.142	-3.858

Source: Own Computation using STATA 15, (2021)

Note: * indicates the lag order selected by the respective criteria.

4.3.5 UNITROOT TEST

As clearly discussed under the model specification section, stationarity is essential for a time series analysis. A non-stationary variable leads to spurious regression result, where it does not give further meaning to the study. Based on this, the first step is to test the unit root on variables of interest. Therefore, the summary of the Augmented Dickey-Fuller (ADF) for a unit root result is presented below:

Table 3: Stationarity Test of all Variables at Levels and First Difference

Levels		
Variables	Without Trend	With Trend
LUR	-1.291	-3.260*
LGDPGR	-3.663**	-4.745***
LSEGP	-0.562	-2.245
LUPG	-1.895	-1.672
PI	-2.642*	-2.645
First Differences		
dLUR	- 4.023**	-2.353**
dLGDPGR	-3.680**	-4.752***
dLSEGP	-3.452**	-3.351**
dLUPG	-4.194 ***	-4.284 ***
dPI	-5.536***	- 5.562***

Source: Own Computation using STATA 15, (2021)

Note: (1) ***, ** and * denotes stationarity at 1%, 5% and 10% levels respectively. (2) All variables are tested in the maximum lag length of 2.

The ADF method test is performed with different trend assumptions that include using trend and or without trend. According to the analysis, logarithmic transformation of the unemployment rate (LUR) is non-stationary at a level since their respective absolute test statistic is lower than the 5% critical value, which is indicated by an asterisk. At the same time, it became stationary at first difference. Logarithmic transformation of real gross domestic product growth rate (LGDPGR) is stationary at both level and first difference regardless of the inclusion of trend analysis or not since the test statistics is higher than the critical value 5% level of significance as depicted by the asterisk sign. Logarithmic

transformation of urban population (LUPG) is non-stationary while it became stationary after first differencing. In addition to that, political instability (PI) shows stationarity at both levels and first differencing, as shown by the asterisk mark. Therefore, the result presented that all variables are integrated of order zero I (0) and I (1). For a reason mentioned above, it is possible to apply ARDL bound test as the variables are integrated of order zero or integrated of order one.

4.3.6 ARDL Bounds Test

The step after completing the unit root test and maximum lag length selection is testing for cointegration. Cointegration between variables suggested a long-run relationship between them, and the study applied ARDL bound test method. The null hypothesis of no long-run relationship (there is no cointegration) appears against the alternative hypothesis of the existence of a long-run relationship in the model under the ARDL bounds test. According to the ARDL bounds test, there is cointegration among the model variables because the F statistics are higher than the given upper critical bound values. As suggested in the table below, it leads to the understanding of which variables have a long-term relationship with the dependent variables.

Table 4: ARDL Bounds Test for Co-integration

Dependent variable	Function	F Statistic		Co-integration Status	
LUR	F (LUR LGDPGR, LSEGP, LUPG, PI)	13.05910***		Co-integrated	
Asymptotic Critical Values					
1% bounds		5% bounds		10% bounds	
I (0)	I (1)	I (0)	I (1)	I (0)	I (1)
3.74	5.06	2.86	4.01	2.45	3.52

Source: Own Computation using STATA 15, (2021)

Note: ***, ** and * denotes statistical significance at 1%, 5%, and 10% level, respectively.

The result of the ARDL bounds tests confirms a relationship among variables for the model as indicated by F statistics being above the upper bounds at all levels of significance. Thus, the result leads to the rejection of the null hypothesis of co-integration

(no long-run relationship), but rather the alternative of the variables shares the long-run relationship. In addition to that, the long-run relationship of all variables also confirms when the lagged levels of variables are statistically significant. The most important advantage of adopting the ARDL bounds test, unlike other traditional co-integration tests, is that it indicates the integration of each exogenous variable with the endogenous variable. In this regard, there is integration or a long-run relationship between logarithmic transformation of the unemployment rate (LUR) and those other exogenous variables at the current period as their p-values are less than a 5% level of significance. The full output of the analysis is attached in the appendix section C. Now the next stage includes estimating the long-run and short-run coefficients of the ARDL model.

4.3.7 Error Correction Method (ECM)

ECM estimates the long-run and short-run coefficients of the ARDL model once the co-integration of variables are identified. In the error correction model, the first difference of endogenous variable is regressed on a period lag of the co-integrating equation using the maximum likelihood estimation method. The short-run dynamics are captured by the differenced variables, while the long run is captured by level variables in the error correction model. There is also an error correction term indicating the speed of adjustment of the short term to its long-term equilibrium point in case of a shock reveal. The error correction results are presented in Table 5 below.

Table 5: Error Correction Model Estimation

Adjustment to the Equilibrium (ADJ)	
Variables	Coefficient
L.LUR	-0.496*** (0.114)
Long run	
LGDPGR	0.663** (0.203)
LSEGP	-0.364*** (0.0499)
LUPG	-1.040** (0.3)
PI	0.0205* (0.00802)
Short run	
D.LUR	0.800** (0.22)

D.LGDPGR	-0.297*** (0.0501)
LD. LGDPGR	-0.265*** (0.0402)
D.LSEGP	-0.322** (0.123)
LD. LSEGP	-0.165 (0.106)
D.LUPG	0.271* (0.126)
LD. LUPG	0.378*** (0.0726)
D.PI	0.00622 (0.00314)
LD.PI	0.00802* (0.00337)
Constant	3.065*** (0.665)
R-Squared	0.989
Adj. R-Squared	0.938
Observations	29

Source: Own Computation using STATA 15, (2021)

Note: (1) ***, ** and * denotes statistical significance at 1%, 5% & 10% level, respectively. (2) Standard errors in parentheses (3) D. is first difference operator (4) L. is lag operator

The above table shows the error correction term (ECT) coefficient lagged by one year of the given equation is statistically significant and has a negative sign as expected. The indication of a negative sign and magnitude bearing in between zero and one is the short-term adjustment to its equilibrium point in the long term. The error correction term lagged by one period (ECT (-1)) confirms the co-integration relationship at a 5% level of significance and also at a 1% level of significance. According to this, the error correction term's coefficient lagged by one year as depicted in ADJ is -0.496 indicating a rate of adjustment to the equilibrium point per annum in the next period in case of shock reveals to unemployment rate assuming other variables constant. This indicates the conjunction of short-term results in the long-term rather than divergence of a series far apart from the equilibrium. Besides the equilibrium adjustment, table 5 also presents the long-run and the short-run results of the model.

The first result shows that a percentage increment in the real GDP growth rate significantly increases the unemployment rate in the long term at a 5% level of significance. In comparison, it stabilizes the unemployment rate in the short term at a 5% level of significance and even at a 1% level of significance. A 1% increase in real GDP growth rate has an impact of 0.66% on the unemployment rate in the long-term *ceteris paribus*, during the study period. And, in the short term, 1% increase in real GDP growth rate in the past year declines unemployment rate by 0.29%, not only the past one year, but 1% increase in real GDP growth rate in the past two years declines unemployment rate by 0.26%, *ceteris paribus*.

When it comes to secondary education growth pupils (SEGP), a percentage increment of this variable significantly causes a decline in the unemployment rate in the long term at 5% level of significance and even at 1% level of significance and declining unemployment rate in the short term at 5% level of significance. In line with this, 1% increases in the SEGP significantly cause a 0.36% decline in the unemployment rate (alleviates unemployment rate) in the long-term *ceteris paribus*, whereas a 1% increase in SEGP in the past year significantly causes a decline of 0.32% in the unemployment rate in the short term, *ceteris paribus*. However, in the past two years, the change in SEGP does not affect the unemployment rate even at a 10% level of significance, *ceteris paribus*.

The third result shows that a percentage increment in the urban population growth rate (UPG) declines the unemployment rate in the long run at a 5% level of significance, while it enhances the unemployment rate in the short term at 1% level of significance. A 1% increase in UPG significantly causes a 1.04% decline in the unemployment rate in the long-term *ceteris paribus*, whereas a 1% increase in UPG two years back significantly causes an increment of 0.37% in the unemployment rate in the short term, *ceteris paribus*. But UPG from the previous year is significant at 10% level of significance and in statistics it is not common to consider a 10% level of significance and the research considers significance level at 5% and 1%.

The last result shows that a unit change in the political instability (PI) and the variable is significant in the long term and short term at a 10% level of significance. From statistical standpoint it is not common to consider or interpret a variable that is significant at 10% level of significance.

4.3.8 Granger Causality Test

Granger causality test identifies a casual direction between the interest of the variables. It needs to test the pairwise direction of causality by the granger method following co-integrated variables. This implies the identification of which variables affect the other variables and have an interaction effect. According to the granger causality test, if a co-integrating relationship is identified, then causality must exist in at least one direction. The table below presents the pairwise causality test among the variables of interest.

Table 6: Granger Causality Test Result

Null Hypothesis:	Obs.	F-Statistic	Prob.
LGDGPGR does not Granger Cause LUR	31	1.66574	0.2086
LUR does not Granger Cause LGDGPGR		2.30132	0.1202
LSEGP does not Granger Cause LUR	31	5.39922	0.0109**
LUR does not Granger Cause LSEGP		2.73974	0.0832*
LUPG does not Granger Cause LUR	31	3.06934	0.0636*
LUR does not Granger Cause LUPG		1.80133	0.1851
PI does not Granger Cause LUR	31	0.21820	0.8054
LUR does not Granger Cause PI		2.02384	0.1524

Source: Own Computation using STATA 15, (2021)

*Note: (1) ***, **, and * denotes statistical significance at 1%, 5% and 10% level, respectively; (2) computed at lags of 3.*

The granger causality test for this study shows that there is unidirectional granger causality between the displayed variables for those with a direct relationship with the unemployment rate. In this manner, the null hypothesis of percentage change of secondary education growth pupils (SEGP) does not granger causes the percentage of the unemployment rate is rejected at a 5% level of significance. This indicates the evidence that previous values of percentage change in the SEGP directly impact current and future values of the unemployment rate since it is statistically significant at a given level of significance. Then, we have evidence to say SEGP granger causes the unemployment rate (UR). However, there is no evidence that the unemployment rate can granger cause secondary education growth pupils as a test is statistically insignificant at 5% level of significance. This implies that SEGP is weakly exogenous to the unemployment rate, which means SEGP leads to the unemployment rate, but not vice versa.

In a similar way, there is evidence to reject the null hypothesis of a percentage change of urban population growth (UPG) does not granger causes unemployment rate at a 10% level of significance. This means previous values of UPG have a direct impact on current and future values of the unemployment rate since the test is statistically significant at a 10% level of significance. On the other direction, there no evidence to say the unemployment rate granger causes urban population growth depending on the result of its significance level. Thus, urban population growth is weakly exogenous to the unemployment rate.

Notwithstanding the granger causality test tells us the direction of causal effect in case of a co-integration, there may be no evidence to compare all variables included in the model and identify the causal direction in between them. It does not necessarily mean that there is no granger causality direction between the variables when a result is statistically insignificant. Nevertheless, the econometric method results imply only direct causal effects and does not encounter an indirect causal effect. In this regard, therefore, there is no evidence to say either a percentage change in GDP growth rate directly granger causes unemployment rate or vice versa. And similarly, there is no evidence to say either a political instability directly granger causes unemployment rate or vice versa during a spanning period.

4.3.9 Post Estimation Diagnostic Test

In order to check the validity of the model and reliability of the results on econometrics analysis, diagnostic checking tests are mandatory. Under this section, the econometrics test is checking the above model's specification, multicollinearity, non-existence of autocorrelation, normality of the model, and homoscedasticity of the error term. It is undertaken to assure the results are not spurious and to witness the robustness of the model. Each of the post diagnostic checking here below sequentially takes place and Table 7 below reports the results as follow:

Table 7: Diagnostic Tests

Testing Methods	Test Statistic Result
Breusch-Godfrey LM test	0.26**
Normality test	0.73**
Kurtosis test	0.42**
Heteroskedasticity test	0.42**

Source: Own Computation using STATA 15, (2021)

*Note: (1) ***, **, and * denotes statistical significance at 1%, 5% and 10% level, respectively*

The results show that the model stability is correctly specified. Variance inflation factor test is used to test the existence of multicollinearity in the model. To test the existence of multicollinearity, the null hypothesis of the non-existence of multicollinearity in the model would be accepted since the VIF is less than ten. However, the given critical value is used as a rule of thumb. The pairwise correlation among the variables is also displayed in the appendix section. It gives a meaningful relationship among the variables included in the model (See full output in appendix D1).

Breusch-Godfrey Lagrange multiplier test, on the other hand, is used to test the autocorrelation. The result leads to fail the rejection of the null hypothesis, which implies there is no serial correlation among variables and error terms because the probability test is significantly much higher than a given level of significance. Hence, there is no autocorrelation problem in the econometric model applied (See full output in appendix D2).

Similarly, the white noise test is applied by the Jarque-Bera test in favor of normality of error terms, which implies that error terms have zero mean and constant variance over time and indicate homoscedasticity. As shown in the table, there is a statistically significant normal distribution of error terms since statistic probabilities are much higher than a given level of significance. Besides, a plot graph of a standard normal distribution for each variable is attached at the end in appendix D4, indicating all variables are normally distributed. Thus, it indicates that the estimates are both consistent and efficient and the robustness of the model used.

In the end, the stability of residuals is tested in order to see further stability of the models, especially in line with the normality distribution of error terms. As expected, the residuals' stationary test shows that residuals are stationary at level, which implies the model is stable since residuals fluctuate within a given interval. Therefore, the model passed the stability tests given by the cumulative sum of recursive residuals (CUSUM) plot, and the graph is attached in appendix D5.

5 Results and Discussion

What are the strongest sides of the Ethiopian economy? The study tried to analyze the strongest side of the Ethiopian economy, and this economy has three major sectors that are classified as agriculture, industry, and service. After the end of Ethiopia's socialist economy, the new Federal Democratic Republic Ethiopia successively planned economic growth strategies. The latest developed strategy of the country is Growth and Transformation Plan II (GTP II). This plan explains agriculture as the primary source of growth. The involvement of each economic sector and growth rate remains different due to shifts in resources such as labor, capital, and technology. For a long period of time, agriculture leads the country's economy by creating value addition. However, later after the 2000s, the agriculture shares to the country's GDP were replaced by industry and service sectors. According to our descriptive analysis, the service sector's sectoral share took the leading position from agriculture, while the industry sector remains in third place. The other method to understand the strongest side of the economy is understanding the economic sectors' value addition to the annual growth rate. According to this study observation, the value-added contribution of the agriculture sector diminishes while the other two factors contribute to increasing *citrus paribus*. This needs a reform that will nurture the relationship between agriculture and the other two sectors.

The possible solution to give for agriculture and industry sectors is to support farmers where their products can be used as raw material or input in the industrial sector, commercialization, and farmers' modernization. This type of solution also helps to minimize rural-urban migration by reducing urban unemployment. The government has also needed to provide modern technologies and tested agricultural machinery to reduce disguised unemployment and create more productivity in the agriculture sector. Concerning agriculture and service sectors, the government should invest more in infrastructure and extension services to secure adequate market access to deliver farmers' products timely. Finally, the strongest side of the economy is on the service sector. However, sectoral linkages at an aggregate level are necessary to avoid seasonal, disguised, structural, and frictional unemployment.

Does economic growth affect unemployment in the country? Economic growth affects unemployment in Ethiopia. According to the econometric analysis conducted in this research, the estimation result for real GDP growth rate stabilizes the unemployment rate in the short run and increases the unemployment rate in the long run. An increase in high production leads to decreasing unemployment in the short run. This result confirms the validity of real business cycle theories. In addition to that, studies conducted by Kalim (2003), Gur (2015), Li et al. (2017), and Serawitu (2020) confirmed the negative relationship between real GDP growth rate and unemployment rate. Nevertheless, in the long run, an increase in high production leads to an increasing unemployment rate. This can happen in the long run because of cyclical unemployment. In the long run, cyclical unemployment could happen due to increased production where businesses might not have enough demand for labor to employ all those looking for work at that point within the business cycle. This result confirms the theory of effective demand. The possible solution to reduce the cyclical unemployment that can happen in the long run is for the government to work beyond the current three major economic sectors and create massive programs that can help the economy recover. In the meantime, since the physical asset is vital for the Ethiopian economy, the government should continue the current trend of investment in infrastructure, hydro powers, industries, and railways as they are essential for continued economic growth.

What is the relationship between education and unemployment? The relationship between education and the unemployment rate has a negative relationship in the Ethiopian economy. According to the econometric analysis conducted in this research, the estimation result for secondary education general pupils alleviates the unemployment rate in both the long run and short run. An increase in secondary education growth leads to decreasing unemployment rate. This result confirms the human capital theory's validity, which stresses how education increases employees' efficiency and productivity. In addition to that, studies conducted by Nunez and Liyanos (2010), Riddell and Song (2011), and Cutler et al. (2015) show the negative relationship between education and the unemployment rate. One possible solution to avoid educated unemployment is to create a strong linkage between education institutions and the labor market. Additionally, actions should be taken by the Ministry of Education in enhancing entrepreneurship skills by giving entrepreneurship as one course provided in all educational institutions. The activity will help a student think

about creating their own business rather than always searching for employers. It also reduces the chance of structural unemployment occurring as workers come with diverse skills.

What sectors of the economy employ the highest number of population? The agriculture sector employs the highest number of populations. According to this study observation, agriculture still absorbs more than 70% of the labor force. This explains no significant change in the economic structure from a labor composition point of view. However, eventually, the production and employment share of the major sectors are changing. The employment share of agriculture is declining while the other major sectors of the economy share in employment increase. In this regard, the Ethiopian Central Statistics Agency report on 2018 shows the majority employed population in the service sector are occupied in wholesale and retail trade activity, followed by the industry sector, which accounts for hiring employees. In general, the agriculture sector contribution in employment share decreases each year as service and industry sectors are increasing.

Does the urbanization influences unemployment? According to the econometric analysis conducted in this research, urbanization influences unemployment. The estimation result for urban population growth rate declines unemployment rate in the long run and increases unemployment rate in the short run. In other words, an increase in urban population growth has a negative relationship with the unemployment rate in the long run. In contrast, an increase in urban population growth rate has a positive relationship with the unemployment rate in the short run. The result is similar to the finding of Zohry (2002), Wajiha et al. (2012), and Telila (2020). The possible solution to avoid urban population growth to the unemployment rate contribution is to work vigorously in sectorial linkage at the sub-sector level. In doing so, we can reduce people that migrate from rural to urban areas. Most importantly, urban sprawl needs to be designed to develop more urban centers into rural areas.

Is there any link between political instability and unemployment in Ethiopia? The link between the country's political instability in relation to the unemployment rate is also observed in this research. The relationship between these variables is positive. Possible solutions to reduce political instability are eliminating social inequality, controlling high corruption, and avoiding ethnic tensions.

Are current policy interventions effective in terms of unemployment reduction? Currently, the Ethiopian government created a Job Creation Commission at a ministerial level to reduce unemployment. This commission's main objective is to study and propose a general intervention to solve unemployment and provide a new vision of employment to access sustainable jobs to create 14 million jobs by 2025 and 20 million jobs by 2030. Much attention is given to this commission and believed it would adopt job-rich macro policies, construct a vibrant local private sector, enrich human capital through education, strengthen labor market intermediaries, and work on the inclusive population by providing a labor market. The current policy measure to reduce unemployment should not only be the role of the job creation commission but also the national bank of Ethiopia through fiscal and monetary policies. Monetary policies would involve in cutting interest rates to encourage people to spend and invest. This, in turn, increases the aggregate demand and helps GDP to increase. Fiscal policy involves cutting taxes and increasing government spending. Disposable income increases with lower taxes and raises consumption by leading to higher aggregate demand and encouraging employment. Furthermore, supply-side policies at a micro-level need some concentration because they do not aim to support the overall aggregate demand. However, it can reduce unemployment caused by supply side factors such as frictional, classical, and structural unemployment.

To summarize, the government and city administrators should support the private sector and attract foreign direct investment in the industry sector to bring and allocate high employment creation.

6 Conclusion

This research's main objective is to investigate Unemployment in the Federal Democratic Republic Ethiopia: Causes and Possible Solution, ranging the time from 1988 – 2020. The study has investigated the long-run and short-run relationship between the unemployment rate and other economic variables such as real gross domestic growth rate, secondary education general pupils, urban population growth, and political instability using the ARDL bound test approach and Error Correction Model (ECM). No study was conducted on these variables in relation to Ethiopia's unemployment rate, and this study is critical to design proper employment-related economic policies.

Before considering ARDL bound test, all variables are tested for stationary properties using the Augmented Dickey-Fuller test. The result shows that variables are stationary at a level and at their first difference. This conforms to the main reason why ARDL bound test is used. In order to make the estimators, efficient diagnostic tests are examined. The result shows no evidence of multicollinearity and serial correlation, normally distributed residuals, and no evidence of heteroskedasticity problem. The presence of a long-run relationship between the unemployment rate and other economic variables is tested using ARDL bound test. It shows that F-calculated is higher than the upper bound critical value at a standard level of significance. Accepting this, an estimation of the short-run error correction model is checked. Based on that, the null hypothesis is rejected, which says there is no long-run relationship between exogenous and endogenous variables.

The econometrics analysis has shown that the real GDP growth rate (GDPGR) stabilizes the unemployment rate in the short run and increases the unemployment rate in the long run. When it comes to secondary education growth pupils (SEGP), a percentage increment of this variable significantly causes a decline in the unemployment rate in the long term the short term. A percentage increment in the urban population growth rate (UPG) declines the unemployment rate in the long run, while it enhances the unemployment rate in the short run.

In Ethiopia, the relationship between educational institutions and labor markets is fragile in helping students get a job or give recommendations for potential employers. Not only that,

but information about the labor market is not accessible, which is why people migrate to urban cities that aggravate unemployment. Private companies face challenges in getting skilled labor from the labor market, which goes back to the limited labor market information. Political instability in a different part of the city caused by different ethnic tensions is also a contributor in affecting investment and diminishing economic growth, and disturbing the labor relation with major economic sectors.

Considering the problem of unemployment, the following possible solutions are intended to solve it and bring economic welfare. They are increasing attention towards capital-oriented sectors, namely service and industry sectors, and supporting agricultural producers in financial services to expand the labor force's absorptive capacity of low skilled level. Supporting infant domestic industries and attracting foreign direct investment to form and promote jobs with special consideration in the industry and service sector. Working critically to improve the labor market information system is fundamental in improving the unemployment rate. Thus, creating a data bank of unemployed people with systematic data analysis reduces unemployment and studies the trend. To reduce the high skill mismatch problem, educational institutions should be responsive to the labor market demand and introduce entrepreneurship programs in education to strengthen the linkage between the labor market and educational organizations. Also, incubator centers should be settled for new labor entrants to equip the necessary skills and provide employment options. Promoting overseas employment by the government should also take place to increase remittance inflow that can contribute to the country's economic growth. Lastly, the country's job creation commission has a responsibility to lead job-related agendas in a strong, organized manner. The commission's intuition should be supported as it balances the demand and supply side of the labor market, and it needs to be valued to its continuity.

7 References

1. Abera, B., (2013). Socio-economic and Demographic Determinants of Unemployment in Ethiopia. Addis Ababa University, School of Graduate Studies.
2. Al-Shammari, N. and Willoughby, J. (2017). Determinants of political instability across Arab Spring countries. *Mediterranean Politics*, 24(2), pp.196–217.
3. Aleksynska., M., 2014. Deregulating Labor Markets: How robust is the analysis of recent IMF working papers? International Labor Office.
4. Applegate, J., Chiem, P. and Econ, C. (2014). Education and Unemployment Levels Before and After the Great Recession. <http://hdl.handle.net/1853/52868>
5. Bairagya, I. (2015). Socio-Economic Determinants of Educated Unemployment in India (working paper No. 343). The Institute for Social and Economic Change, Bangalore, India.
6. Bakare, A.S. (2011). The determinants of urban unemployment crisis in Nigeria: an econometric analysis. *Journal of Emerging Trends in Economics and Management Sciences*, 2, 184-192.
7. Becker, G. (1993). *Human Capital: A Theoretical and Empirical Analysis with special reference to Education*. Chicago: The University of Chicago Press.
8. Belchamber, G and Schetagne, S. (2013). What Counts as a Job? *Global Labor* (146). Johannesburg: University of the Witwatersrand.
9. Berntson, E., Sverke, M. and Marklund, S. (2006). Predicting Perceived Employability: Human Capital and Labor Market Opportunities. *Economic and Industrial Democracy* (27(2)), 223-244.
10. Bjork, G. J. (1999). *The Way It Worked and Why It Won't: Structural Change and the Slowdown of U.S. Economic Growth*. Westport, CT; London: Praeger.
11. Blaug, M. (1976). The Empirical Status of Human Capital Theory: A Slightly Jaundiced Survey. *Journal of Economic Literature*, [online] 14(3), pp.827–855.
12. Burdett, K., Carrillo-Tudela, C. and Coles, M.G. (2011). Human Capital Accumulation and Labor Market Equilibrium*. *International Economic Review*, 52(3), pp.657–677.
13. Chatterjee, S. (1995). "Productivity Growth and the American Business Cycle". *Business Review*, Federal Reserve Bank of Philadelphia, (September/October), 13-23.

14. Clark, K., Summers, L., Chamberlain, A., Dammann, R., Freeman, R., Hall, J., Medoff, C., Sims, D., Smith, J., Poterba, G. and Fenn (1982). *Nber Working Paper Series Labor Force Participation*: doi: 10.1088/1742-6596/710/1/012028.
15. Collard., D. (1996). Pigou and Modern Business Cycle Theory. *The Economic Journal* 106, no.437 (1996): 912-924
16. CSA (2018). *Statistical Report on Urban Employment Unemployment Survey*. The Federal Democratic Republic of Ethiopia.
17. CSP (2020). *Center for Systemic Peace Country Report Series*. [online] systemicpeace.org. Available at: <http://www.systemicpeace.org>
18. Cutler, D. M., Huang W., & Lleras - Muney, A. (2015). When does education matter? The protective effect of education for cohorts graduating in bad times. *Social Science & Medicine* 127, 63-73
19. Davidson, P. (1998). "Post Keynesian Employment Analysis and the Macroeconomics of OECD Unemployment," *The Economic Journal*, 108, 448, 817-831.
20. Dechasa, F., K. (2014): Unemployment and Labor Market in Urban Ethiopia: Trends and Current Conditions. *Sociology and Anthropology* 2(6): 207-218, 2014 <http://www.hrpub.org/> DOI: 10.13189/ sa.2014.020601.
21. Dimand, R.W. and Spencer, B.J., 2009. Trevor Swan and the neoclassical growth model. *History of Political Economy*, 41(Suppl_1), pp.107-126.
22. FAO (2002). *Special Report: Ethiopia Agriculture Sector Report*. [online] Fao.org. Available at: <https://www.fao.org>
23. Fikre, A., K. (2011); *Unemployment in Urban Ethiopia: Determinants and Impact on Household Welfare*. University of Gothenburg school of Business, Economics and Law
24. Gujarati, D. (2004): *Basic Econometrics: Fourth Edition*, McGraw-Hill Companies.
25. Gur, B. (2015). *An Analysis of Unemployment Determinants in BRIC Countries*. *International Journal of Business and Social Science*, [online] 6(1). Available at: http://ijbssnet.com/journals/Vol_6_No_1_Januaryr_2015/21.pdf.
26. Hamilton, J.D. (1994): *Time Series Analysis*, Princeton University Press, Princeton.
27. Imtiaz, S., Ali, A., Khan, Z., Ullah, M., Khan, M. and Jacquemod, J. (2020). Determinants of Youth Unemployment in Pakistan. *International Journal of Economics and Financial Issues*, 10(5), pp.171–177.

28. Isibor, I.S.I.O.M.A., 2013. The Effect of Urbanization and Unemployment on the Nigerian Economy. *Unpublished Thesis (B. Sc.). Caritas University.*
29. Javeid, U. (2011). Validity of Okun's Law, Empirical Evidence from Pakistan. punjab: Sodertorn University.
30. Jeffrey, C. (2009). Fixing Futures: Educated Unemployment through a North Indian Lens. *Comparative Studies in Societies and History* (51(1)), 182-211.
31. Job Creation Commission (2018). Federal Democratic Republic of Ethiopia Plan of Action for Job Creation Sustainable Jobs for All. [online] Jobs Creation Commission. Available at: <https://jobscomission.gov.et>
32. Kalim, R. (2003), Population and unemployment: A dilemma to resolve. *The IUP Journal of Applied Economics*, Volume 2, Issue 3, pp. 7-15.
33. Keynes J.M (1936). *The General Theory of Employment, Interest and Money.*
34. Keynes, J. (1936). *The General Theory of Employment, Interest and Money.* London: Harcourt.
35. Knotek, I. (2007). How Useful is Okun's Law? Kansas: Federal Reserve Bank of Kansas City.
36. Lewis, A (1954). Economic Development with Unlimited Supplies of Labor. *Manchester School*, 22, 139-191
37. Li, C., Chew, X., Bee, Y., Li, R., Tan, H., Twe, W. and Yee, K. (2017). Macroeconomic Factors Affecting Unemployment Rate in China. [online] Available at: <http://eprints.utar.edu.my/2542/1/BF-2017-1303383.pdf>.
38. Lippman, S. A. and J. McCall (1976), The economics of job search: A Survey. *Economic Inquiry*, Volume 14, Issue 2, pp. 155-189. <http://dx.doi.org/10.1111/j.1465-7295.1976.tb00386.x>
39. Lucifora, C. and Moriconi, S. (2012). Political Instability and Labor Market Institutions. [online] Available at: <http://ftp.iza.org/dp6457.pdf> [Accessed 31 Jan. 2021].
40. Mallik, G., & Chowdhury, A. (2001): Inflation and economic growth: evidence from four south Asian countries. *Asia-Pacific Development Journal*, 123-135.
41. Maqbool, M.S., Mahmood, T., Sattar, A. And Bhalli, M.N. (2013). Determinants of Unemployment: Empirical Evidences from Pakistan. *Pakistan Economic and Social Review*: <http://doi.org/10.4172/2162-6359.1000390>

42. Middleton, J., Ziderman, A. and Adams, A. (1993). *Skills for Productivity: Vocational Education and Training in Developing Countries*. Oxford: Oxford University.
43. MoFED (2019). *Ethiopia Growth and Transformation Plan I*. [online] Green Growth Knowledge Platform. Available at: <https://www.greengrowthknowledge.org>.
44. Mortensen, D. T. (1970), Job search, the duration of unemployment, and the Phillips curve. *The American Economic Review*, Volume 60, No. 5, pp. 847-862. <http://www.jstor.org/stable/1818285>
45. Mpendulo Grabe and Mang'unyi, E. (2018). Exploring Relationships between Education Level and Unemployment. *ResearchGate*, [online] 7(2). Available at: https://www.researchgate.net/publication/324996339_Exploring_Relationships_between_Education_Level_and_Unemployment [Accessed 24 March. 2020].
46. Naafs, S. (2012). Navigating School to Work Transition in Indonesia Industrial Town: Young Women in Cilegon. *the Asian Pacific Anthropology* (13(1)), 49-63.
47. Nganwa, P. and Mbaka, P. (2015). The Nature and Determinants of Urban Youth Unemployment in Ethiopia. *Public Policy and Administration Research*, [online] 5(3).
48. Nunez, I., & Livanos, I. (2010). Higher education and unemployment in Europe: an analysis of the academic subject and national effects. *Higher Education* 59, 475-487
49. O' Nwachukwu, C. (2016). *Determinants of the Rate of Unemployment in Nigeria*. [online] Xiamen University, China: Wang Yanan Institute for Studies in Economics: https://mpira.ub.uni-muenchen.de/81125/1/MPRA_paper_81125.pdf.
50. Okun, A. M. (1962). Potential GNP: its measurement and significance. Proceedings of the Business and Economic Statistics Section (pp. 98-104). newheaven: American Statistical.
51. Olaniyan, D.A and Okemakinde, T. (2008), 'Human Capital Theory: Implications for Educational Development', *European Journal of Scientific Research*, Vol. 24, No. 2 p 158
52. Olsson, O. (2013). *Essentials of Advanced Macroeconomic Theory*. ISBN-13: 978-0415685085
53. Riddell, W. C., & Song X. (2011). The impact of education on unemployment incidence and re-deployment success: Evidence from the US labor market. IZA Discussion Paper No. 5572.

54. Salama, A. (2017). Discuss the Relationship Between Unemployment and Level of Education in Palestine. *Károly Ihrig Doctoral School of Management and Business*: DOI: 10.13189/ sa.2014.020601.
55. Salvator., D (1990). theory and problems of international economic: third edition; Fordham University, New Work.
56. Serawitu, A. (2020). Unemployment and Economic Growth in Ethiopia. *International Knowledge Sharing Platform*, 10(3). Dire Dawa Management and Kaizen Institute, Dire Dawa, Ethiopia.
57. Serneels, P. (2007). The Nature of Unemployment among Young Men in Urban Ethiopia. *Review of Development Economics* (11(1)), 170-186.
58. Smith, A., 1937. *The Wealth of Nations* (1776). ISBN-10 : 1505577128
59. Snowdon, B. and Vane, H.R., 2005. *Modern macroeconomics: its origins, development and current state*. Edward Elgar Publishing.
60. Telila, S.T. (2020b). The Impact of Rapid Growth of Urbanization and Urbanism in Eastern Ethiopia. *Journal La Sociale*, [online] 1(3), pp.34–44. Available at: <http://www.newinera.com/index.php/JournalLaSociale/article/view/136>.
61. Tesfaye Legesse. (2015). Challenges and opportunities of youth unemployment: the case of Burayu town. *Master's thesis*. Addis Ababa university, Addis Ababa.
62. Tewodros Gebru (2015). *Determinants of Economic Growth in Ethiopia: A time series analysis*: Addis Ababa University published master thesis.
63. Wagner, B. (2014). Types of Unemployment And their impact on the Montana Economy. [online] Available at: http://lmi.mt.gov/Portals/193/Publications/LMI-Pubs/Articles/2014/0214-Types_of_Unemployment.pdf [Accessed 5 Jan. 2021].
64. Wajih, H., Turk, N. and Zahid, H. (2012). (PDF) How can urbanization be the cause of unemployment across the world? DOI: 10.1177/016001769401600110
65. World Bank (2020). *World Development Indicator/Data Bank*. [online] worldbank.org
66. Young, H.L., 2020. *The Legacy of State Farms on Ethiopia's Spatial Structural Transformation*.
67. Zohry, A. (2002). *University of Sussex at Brighton Centre for the Comparative Study of Culture, Development and the Environment (CDE) Rural-to-Urban Labor Migration*

8 Appendix

A: Data Set for Econometrics Analysis

Variable	Unemployment Rate (% of total labor force)	Real Growth Domestic Product Growth Rate (annual %)	Secondary Education General Pupils	Urban Population Growth (annual %)	Political Instability (Polity Index)
Year	UR	GDPGR	SEGP	UPG	PI
1988	2.87	0.91	842,750	5.91	-8
1989	2.91	0.35	873,876	5.76	-8
1990	2.94	4.06	870,262	5.61	-8
1991	2.97	-4.33	858,846	5.46	0
1992	3.0	-3.69	775,211	5.51	0
1993	3.08	12.00	712,489	5.49	0
1994	3.10	1.70	714,622	5.38	1
1995	3.21	5.37	747,146	4.78	1
1996	3.34	10.18	810,604	4.45	1
1997	3.44	5.09	889,650	4.31	1
1998	3.55	-1.44	973,014	4.22	1
1999	3.71	6.00	1,056,379	4.17	1
2000	3.49	5.35	1,186,963	4.16	1
2001	3.28	7.42	1,486,806	4.14	1
2002	3.13	1.63	1,695,955	4.14	1
2003	2.94	-2.10	1,785,655	4.11	1
2004	2.72	11.73	2,053,593	4.09	1
2005	2.50	12.64	2,382,129	4.05	1
2006	2.37	11.54	2,869,032	4.03	-3
2007	2.27	11.79	3,238,978	4.10	-3
2008	2.21	11.19	3,467,133	5.16	-3
2009	2.34	10.04	3,574,877	5.15	-3
2010	2.34	10.57	3,853,280	5.17	-3
2011	2.30	11.39	4,170,276	5.19	-3
2012	2.28	8.70	4,535,121	5.20	-3
2013	2.25	9.94	4,469,611	5.09	-3
2014	2.22	10.30	4,404,101	5.05	-3
2015	2.19	10.41	4,676,544	4.99	-3
2016	2.17	7.96	4,823,555	4.94	-3
2017	2.12	10.21	4,970,565	4.87	-3
2018	2.08	7.70	5,191,169	4.83	-3
2019	2.08	9.04	5,421,563	4.78	1
2020	2.08	6.06	5,662,183	4.75	1

Source: Own Elaboration based on Collected Data and Own Computation

B: Lag Length Selection Criteria

Selection-order criteria

Sample: 1992 - 2020

Number of obs = 29

lag	LL	LR	df	p	FPE	AIC	HQIC	SBIC
0	42.3742				.004463	-2.57753	-2.5037	-2.34179
1	61.8216	38.895	1	0.000	.001254	-3.84976	-3.76117	-3.56687
2	68.8863	14.129*	1	0.000	.000828*	-4.26802	-4.16466*	-3.93798*
3	69.6425	1.5125	1	0.219	.000846	-4.25121	-4.13308	-3.87402
4	71.0428	2.8005	1	0.094	.000829	-4.27881*	-4.14592	-3.85448

Endogenous: LUR

Exogenous: LGDPGR LSEGP LUPG PI _cons

Source: Own Computation using STATA 15

C: ARDL Bound Test

Test Statistic	Value	k
F-statistic	13.05910	2

Critical Value Bounds

Significance	I0 Bound	I1 Bound
10%	2.45	3.52
5%	2.86	4.01
2.5%	3.25	4.49
1%	3.74	5.06

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LUR(-1))	-0.241423	0.203565	-1.185975	0.3013
D(LUR(-2))	0.067952	0.194230	0.349853	0.7441
D(LUR(-3))	0.761475	0.240265	3.169313	0.0339
D(LGDPGR)	0.033534	0.017961	1.867083	0.1353
D(LGDPGR(-1))	-0.272351	0.044149	-6.168935	0.0035
D(LGDPGR(-2))	-0.149029	0.028966	-5.144885	0.0068
D(LGDPGR(-3))	-0.062327	0.015635	-3.986223	0.0163
D(LSEGP)	-0.489438	0.146198	-3.347785	0.0286
D(LSEGP(-1))	-0.173330	0.113210	-1.531048	0.2005
D(LSEGP(-2))	-0.197403	0.091825	-2.149782	0.0980
D(LSEGP(-3))	-0.051634	0.077592	-0.665450	0.5422
D(LUPG)	-0.259586	0.109867	-2.362723	0.0774
D(LUPG(-1))	0.414101	0.094192	4.396354	0.0117
D(LUPG(-2))	0.281480	0.110419	2.549212	0.0634
D(LUPG(-3))	0.149742	0.099659	1.502544	0.2074
D(PI)	0.001786	0.002546	0.701600	0.5216
D(PI(-1))	0.003470	0.005119	0.678022	0.5350
D(PI(-2))	0.006537	0.003367	1.941480	0.1242
D(PI(-3))	0.008889	0.003803	2.337111	0.0796
C	3.038159	0.707027	4.297089	0.0127
LGDPGR(-1)	0.338194	0.063614	5.316389	0.0060
LSEGP(-1)	-0.180299	0.028845	-6.250551	0.0033
LUPG(-1)	-0.532543	0.183131	-2.907987	0.0438
PI(-1)	0.008755	0.004726	1.852663	0.1376
LUR(-1)	-0.474825	0.125391	-3.786770	0.0193

R-squared	0.990085	Mean dependent var	-0.012273
Adjusted R-squared	0.930594	S.D. dependent var	0.038012
S.E. of regression	0.010014	Akaike info criterion	-6.626478

Sum squared resid	0.000401	Schwarz criterion	-5.447774
Log likelihood	121.0839	Hannan-Quinn criter.	-6.257323
F-statistic	16.64260	Durbin-Watson stat	2.459773
Prob(F-statistic)	0.007131		

Source: Own Computation using STATA 15

D: Post Estimation Diagnostic Test

D1: Multicollinearity Test

Variable	VIF	1/VIF
LUPG	1.79	0.558278
PI	1.76	0.567169
LGDPGR	1.59	0.630442
LSEGP	1.52	0.656391
Mean VIF	1.67	

Source: Own Computation using STATA 15

D2: Autocorrelation Test

Breusch-Godfrey LM test for autocorrelation

lags (p)	chi2	df	Prob > chi2
2	2.716	2	0.2572

H0: no serial correlation

Source: Own Computation using STATA 15

D3: Normality and Heteroskedasticity Test

```
White's test for Ho: homoskedasticity
  against Ha: unrestricted heteroskedasticity

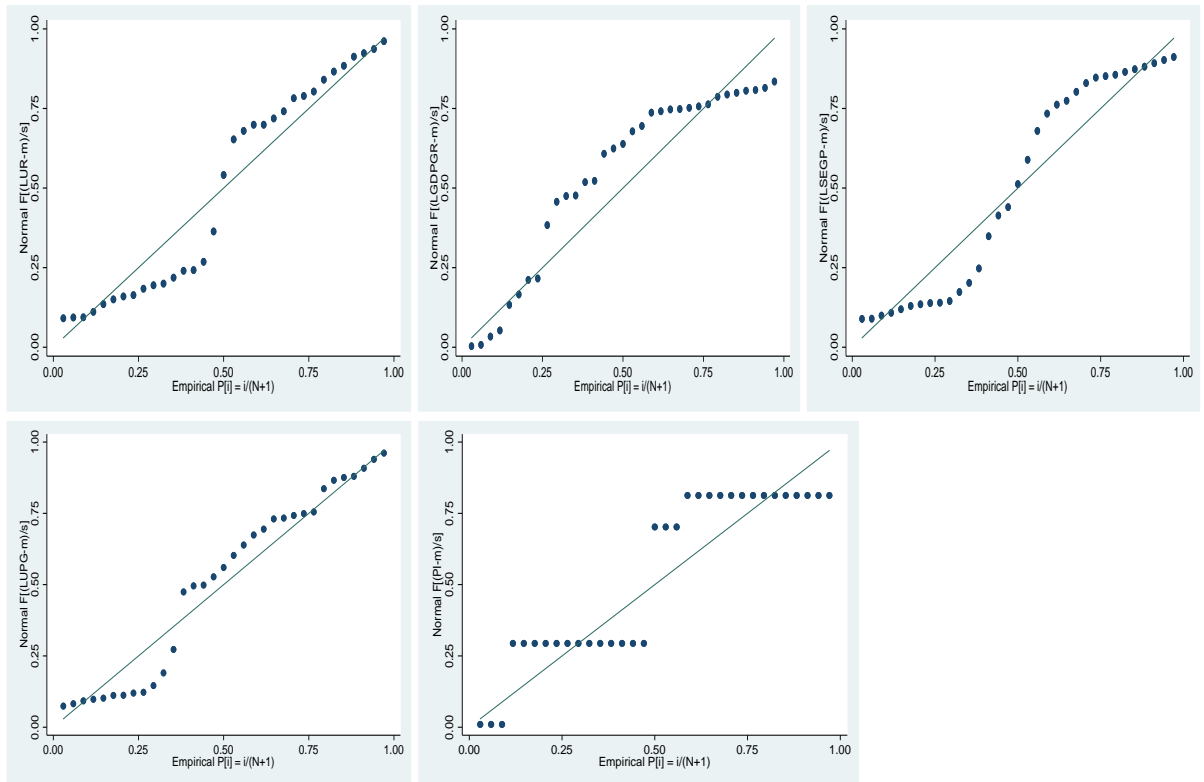
      chi2(30)      =      31.00
      Prob > chi2   =      0.4154
```

Cameron & Trivedi's decomposition of IM-test

Source	chi2	df	p
Heteroskedasticity	31.00	30	0.4154
Skewness	6.92	10	0.7331
Kurtosis	0.65	1	0.4185
Total	38.57	41	0.5790

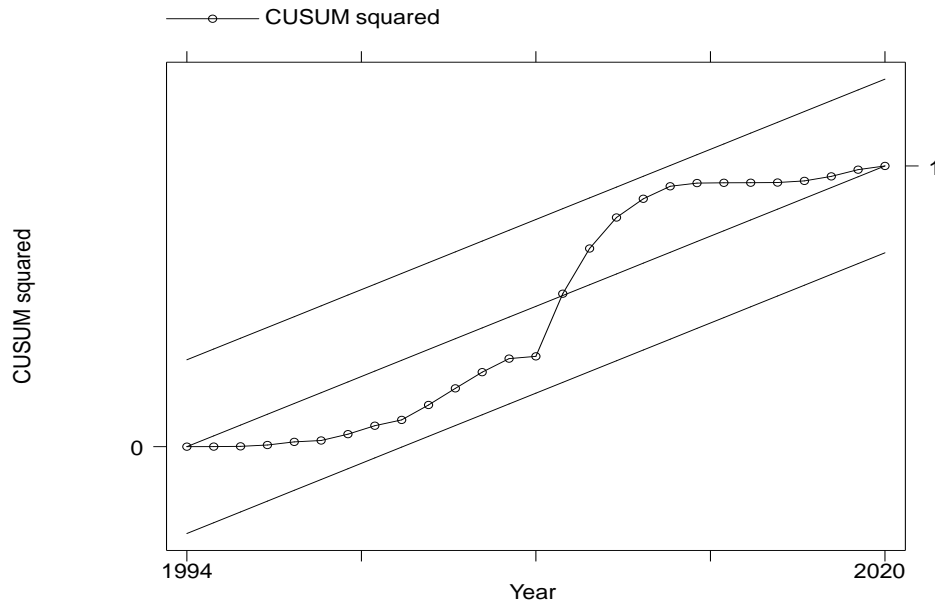
Source: Own Computation using STATA 15

D4: Standard Normality Plot of each Variable



Source: Own Computation using STATA 15

D5: Cumulative Sum of Recursive Residuals



Source: Own Computation using STATA 15

E: Error Correction Model Test

Sample: 1990 - 2020		Number of obs = 31				
Log likelihood = 119.5613		R-squared = 0.989	Adj R-squared = 0.9383			
		Root MSE = 0.0094				
D.LUR	Coef.	Std.Err.	t	P> t	[95% Conf. Interval]	
ADJ LUR L1.	-0.49605	0.114311	-4.34	0.007	-0.7898907	-0.2022
LR						
LGDPGR	0.66339	0.203294	3.26	0.022	0.1408054	1.185974
LSEGP	-0.36446	0.049907	-7.3	0.001	-0.492746	-0.23616
LUPG	-1.0398	0.299541	-3.47	0.018	-1.809797	-0.26981
PI	0.020524	0.008022	2.56	0.051	-0.000975	0.041146
SR						
LUR						
D1.	0.800423	0.219659	3.64	0.015	0.2357708	1.365074
LGDPGR						
D1.	-0.29747	0.050128	-5.93	0.002	-0.4263248	-0.16861
LD.	-0.26483	0.04023	-6.58	0.001	-0.3682436	-0.16142
LSEGP						
D1.	-0.32218	0.122644	-2.63	0.047	-0.6374485	-0.00691
LD.	-0.16532	0.106112	-1.56	0.180	-0.438093	0.107447
LUPG						
D1.	0.271461	0.126072	2.15	0.084	-0.0526162	0.595539
LD.	0.378021	0.072605	5.21	0.003	0.1913846	0.564657
PI						
D1.	0.006219	0.003142	1.98	0.105	-0.001857	0.014295
LD.	0.008025	0.00337	2.38	0.063	-0.006375	0.016687
_cons	3.065428	0.665349	4.61	0.006	1.355094	4.775762

Source: Own Computation using STATA 15