



**ADDIS ABABA UNIVERSITY
COLLEGE OF BUSINESS AND ECONOMICS
DEPARTMENT OF ECONOMIC**

**MACROECONOMIC DETERMINANTS OF UNEMPLOYMENT
IN ETHIOPIA: TIME SERIES ANALYSIS**

BY:

HAILU DABA

**A THESIS SUBMITTED TO SCHOOL OF GRADUATE STUDIES OF ADDIS
ABABA UNIVERSITY, FOR PARTIAL FULFILLMENT OF THE
REQUIREMENTS OF MASTERS OF SCIENCE IN ECONOMICS
[ECONOMIC POLICY ANALYSIS]**

May, 2025

Addis Ababa, Ethiopia

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DECLARATION

I hereby declare that the Master's thesis report titled, Macroeconomic Determinants of Unemployment in Ethiopia: A Time series Analysis ,submitted by me for the partial fulfillment of the requirement of Masters of Science in Economics [Economic Policy Analysis] in Addis Ababa University, school of Graduate studies , except the duly acknowledged literature of others, is my own original unaided work and has not been submitted earlier either to Addis Ababa University or to any other institution for the fulfillment of the requirement for any degree. I also declare that no chapter of this thesis report in whole or in part is lifted unincorporated from any earlier work done by me or others. Finally, I declare that all part of this work has been carried out by me under the guidance and supervision of Mesele Arya (PhD).

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This is to certify that the thesis prepared by Hailu Daba Ayana entitled: Macroeconomic Determinants of Unemployment in Ethiopia: A Time series Analysis, and submitted in partial fulfillment of the requirements of the Degree of Master of Sciences in Economics (Economic Policy Analysis) complies with the regulations of the university and meets the accepted standards with respected originality and quality.

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TABLE OF CONTENTS

ACKNOWLEDGMENT.....	I
LIST OF TABLES.....	IV
LIST OF FIGURES	IV
List of Acronyms	V
Abstract.....	VI
CHAPTER 1 INTRODUCTION.....	1
Introduction.....	1
1.1 Background of the Study	1
1.2. Statement of the Problem.....	2
1.3. Objectives of the Study.....	3
1.4. Research Questions.....	4
1.5. Research Hypothesis.....	4
1.6. Methodology of the Study	4
1.7. Significance of the study.....	4
1.8. Limitations	6
1.9. Organization of the study.....	6
CHAPTER TWO	7
REVIEW OF LITERATURE	7
2.1. Concepts and Definitions.....	7
2.2. Theoretical Review	8
2.2.1. Unemployment Views in Different Schools of Thought	8
2.3. Empirical Literature Review.....	12
2.3.1. Unemployment and Its Macroeconomic Determinants	12
CHAPTER THREE	24
RESEARCH METHODOLOGY.....	24
3.1. Type and Sources of data.....	24
3.2. Variables of the Research and their Description.....	25
3.3 Definition of Variables in the Study	26
3.4. Method of Estimation and Data Analysis	27
3.4.1. Test for Stationary of the Data.....	27
3.4.2. Lag Selection Criteria	29

3.4.3. The Test for Co integration.....	30
3.4.4. Vector Error Correction Model (VECM)	32
3.5. Model Diagnostic Tests	32
3.5.1. Breusch-Godfrey Serial Correlation LM Test	32
3.5.3. The Breusch-Pagan test for Heteroscedasticity	33
3.5.4. Jerque Bera Normality Test	34
3.5.5. Model Stability Diagnostic	35
CHAPTER FOUR.....	36
RESULTS AND DISCUSSIONS OF THE FINDINGS	36
4.1 A Descriptive Analysis	36
4.1.1. Unemployment rate in Ethiopia	36
4.1.2 Unemployment and Macroeconomic Determinants in Ethiopia (1993-2023).....	37
4.2. The Unit Root Test of Variables in Study	38
4.3. Akaike Information Criteria (AIC) of Lag Length Selection	42
4.4. Analysis of Co integration: The Johansen Test for Co Integration	42
4.4.1 Relationship between Unemployment and Macroeconomic Variables results interpretation in the long run.....	45
4.4.2 The short run Dynamic Relationship between Unemployment and Macroeconomic determinants (Vector Error Correction Model).	49
4.4.3 Relationship between Unemployment and Macroeconomic Variables and results interpretation in the short run.....	51
4.5 Model Diagnostic Tests	52
4.5.1 Test of Residual Autocorrelation.	52
4.5.2 Normality test.....	52
4.5.3 Test for Hetroskdascity.....	53
4.5.4 Model Stability condition Test.....	53
CHAPTER FIVE	55
CONCLUSION AND POLICY IMPLICATION.....	55
5.1. Conclusion	55
5.2. Policy Implication.....	56
5.3. Recommending Further Studies.....	56
REFERENCES	58
APPENDIX.....	63

LIST OF TABLES

Table 3. 1 Description of the variables in the study.....	26
Table 4. 1 Results of ADF unit root tests at level.....	36
Table 4. 2 Result of ADF Unit root Test Result at the First Differenc.....	37
Table 4. 3 Results of PP Unit Root tests of Variables at level.....	40
Table 4. 4 The Result of the Phillips- Perron Unit Root Test (first Differencing).....	40
Table 4. 5 The Selection of Lag Order Using AIC	42
Table 4. 6 The Trace Statistics Result of Johansen Test of Co integration	43
Table 4. 7 the Maximum Eigen Value Result of Johansen Co Integration.....	44
Table 4. 8 The Normalized Co integration Coefficients (1 Co-integrated equation)	45
Table 4. 9 the Result of short Run influence from Vector Error Correction Model.....	49
Table 4. 10 Autocorrelation Test	52
Table 4. 11 Jarque Bera test result	52
Table 4. 12 Cameron & Trivedi's decomposition of IM-test	53
Table 4. 13 Eigenvalue stability condition	54

LIST OF FIGURES

Figure 4. 1 unemployment trend in Ethiopia (1993-2023)	36
Figure 4.2 Unemployment and macroeconomic determinants in Ethiopia (1993-2023).....	37

LIST OF ACRONYMS

ADF	Augmented Dickey Fuller
AIC	Akaike Information Criterion
CPI	Consumer price index
CSA	Central Statistical Agency
CUMSUM	Cumulative Sum
CUMSUMSQ	Cumulative Sum of Squares
ECM	Error Correction Model
EEA	Ethiopian Economics Association
GDP	Gross Domestic Product
HQIC	Hannan-Quinn and Information Criterion
ILO	International Labor Organization
I (1)	Integrated of Order One
LM	Lagrange Multiplier test of residual serial correlation
LR	Likelihood Ratio
MOFEC	Ministry of Finance and Economic Cooperation
NBE	National Bank of Ethiopia
OLS	Ordinary Least Squares
PP	Phillips-Perron
SBC	Schwarz Bayesian Criterion
VECM	Vector Error Correction Model
WB	World Bank

ABSTRACT

The purpose of this paper was to examine empirically the long-run and short-run relationships between unemployment and its macroeconomic determinants over 1993-2023, comprising gross domestic product (RGDP), foreign direct investment (FDI), external debt (EXDE), Government effectiveness (GOEF), and Political instability (POST) in the country. The World Development Index (WDI), the International Labor Organization (ILO), annual reports, and published research were the sources of the data. The Augmented Dickey Fuller (ADF) and Philips-Perron (PP) tests are used to test the data for unit root, and the results indicate that all of the study's variables are non-stationary at level and stationary in their initial differences. Johansen cointegration analysis and the Error Correction model (ECM) testing methodology were used in this investigation. The study's conclusions show a positive and significant relationship between political instability and government effectiveness, a negative and significant relationship between real GDP and foreign direct investment, and a short-term, positive but negligible relationship between external debt and unemployment. In the long run there is positive and statistically significant relationship between unemployment and gross domestic products, foreign direct investment (FDI), external debt as well as negative and significant relationship between Government effectiveness and Political instability in the country for the period under examination. The study recommends that Ethiopia should use proper planning and strategic policy interventions to achieve higher sustainable economic growth with Real growth domestic product (RGDP) growth, foreign direct investment (FDI), External debt (EXD), government effectiveness (GOEF) and Political stability (POST). Finally the study suggests macroeconomic policies and strategies focusing on increasing economic growth, focusing on agriculture, enhancing infant domestic industries instead of attracting FDI and address the appropriateness of each economic sector for their attractiveness of unemployed groups, reduce external loan and safe itself from external debt overhang, increase aggregate supply and consolidate the existing entrepreneurship, with improved rule of law and government effectiveness and should give due attention to reduce unemployment in Ethiopia.

Key words: *Johansen co integration, determinants, macroeconomic, unemployment, Ethiopia*

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Unemployment is one of the most common chronic health problems worldwide. It is obvious that joblessness was and is a key issue for every nation worldwide, whether developed or not. Economic growth and development have always been essential to human society, therefore both individuals and international groups are concerned about them. Even while unemployment fluctuates depending on the state of the economy and other factors, it is still one of the biggest problems in the globe.

On the other hand, high and persistent unemployment may be viewed as a barrier to economic growth. Unemployment means lower global demand and investment in human capital. As a consequence of human capital erosion, the long-term unemployed partially or completely lose their qualifications, while their skills become obsolete in times of rapid technological advancement. Furthermore, fiscal costs (lower budgetary revenues and higher social spending) that arise contribute to lower public investment and increased public debt and, in the long run, hinder growth opportunities. Furthermore, there are a number of detrimental effects of unemployment, including despair, annoyance, animosity, and the slow inclination of jobless adolescents toward various forms of criminal activity. A healthy society is eventually undermined by conditions like unemployment, financial difficulties, poverty, homelessness, crime, frustration, and a host of other issues like family strife and dissolution, social isolation, lack of confidence, and low self-esteem. The rapidly rising rate of unemployment in developing countries and Africa has been a major source of concern not only for international developmental bodies such as the United Nations, African Development Bank, and the African Union, but also for scholars and policymakers

The unsettling concern is understandable given that unemployment gives rise to other socially related problems, such as drug abuse and an increase in the general crime rate, both of which slow down economic growth in the continent). Consistent with Riaz and Zafar (2018), efforts to reduce unemployment begin with a thorough understanding of the determinants of unemployment.

Despite having one of Africa's fastest rates of economic growth, Ethiopia is unable to effectively employ the labor force needed to sustain economic expansion.

In other words, by implementing suitable employment laws, the government was unable to provide enough job opportunities to accommodate prospective labor forces. Although the economy is expanding, unemployment is rising, especially in metropolitan areas, and the issue is more severe for young people. Many young Ethiopians are currently migrating to Europe and the Middle East. Everywhere they go, they encounter difficulties. Therefore, the Ethiopian government has made addressing unemployment a top priority. Various experts have identified a number of elements that influence national unemployment.

Generally speaking, the rapid economic growth of recent years has not been able to raise the standard of life for the majority of inhabitants or generate enough job opportunities. Ethiopia, a rapidly growing African country, has the highest rate of unemployment. Unemployment has different causes, and its consequences are substantial and insightful. Unemployment in Ethiopia, predominantly among higher education graduates, obstructs economic growth and prosperity.

Unemployment increases annually in Ethiopia. For instance, unemployment 2.251% and 3.935% in 2013 and 2023, respectively, as sourced from World Bank Indicator (2024). This high unemployment rate problem for each year indicates that it is necessary to investigate the macroeconomic determinants of unemployment in Ethiopia.

To find out if macroeconomic factors help lower unemployment, numerous research have been done on developing nations. These studies' findings are considerable and important, and they provide pertinent policy recommendations that would allow these nations to benefit from understanding the key macroeconomic factors that influence unemployment. Therefore, in order to support the nation's practices for sustainable economic growth, the Ethiopian government must address the issue and examine the policies that were previously used by these governments to reduce unemployment. An empirical investigation to determine the macroeconomic determinants of unemployment is essential.

1.2. Statement of the Problem

The main objective of any country's economic growth agenda is to offer better living standards to the nation. According to Eita and Sahiwal (2020), unemployment has a great impact on growth and development, and it causes a waste of economic resources or idle resources, the productive labor force, and affects the long-run growth potential of an economy. If people cannot find jobs in their home country, they may be invited to relocate to another country to obtain jobs. This can be harmful to the future of a nation, particularly if other nations are

attracting brain drain. Therefore, if this problem is uninterrupted in any economy by the concerned body, it could also be a major factor in deteriorating the economic growth and development. Moreover, Unemployment leads to erosion of a healthy society (Muhammad et al., 2013).

Another explanation may be that if people are left with no alternative, they are more likely to join an uprising as an alternative way of generating earnings (Ural 2006). For instance, the recent uprising in Ethiopia, principally in 2016 in Amhara, Oromia region, and other parts of the country that toppled the respective regime, is motivated for many reasons, among which the major socioeconomic problem was the rising unemployment from young graduates from different colleges. It also plays a vital role in reducing productivity (Babine, 2016).

Furthermore, previous studies in Ethiopia have examined the determinants of unemployment. Few studies tend to concentrate on the incidence of unemployment in specific categories, and the policy aspect of the labor market is found to be more explored in the microeconomic context but less explored in the literature, at least in the context of the macroeconomic determinants of unemployment in Ethiopia. There are many literature reviews on unemployment conducted in different countries, but most of the studies conducted on unemployment in Ethiopia focused on urban areas and were limited to youth, causes, and determinants of unemployment in that area.

To the best of the researcher's knowledge, no previous work has been done in the current spirit of the country, and there is no literature that includes qualitative and non-economic variables such as government effectiveness and political instability to study macroeconomic determinants in Ethiopia in the recent period. This evidence provides for the researcher, as a study on macroeconomic determinants of unemployment at the national level is very uncommon in Ethiopia. Therefore, this study investigates the impact of macroeconomic variables on unemployment at the national level using a 30 years annual time series data (1993–2023).

1.3. Objectives of the Study

The overarching goal of the macroeconomic factors influencing unemployment in Ethiopia between 1993 and 2023 are examined in this paper. Given this overarching goal, this research endeavors to accomplish the following particular goals:

- To identify the long-run relationship between macroeconomic determinants and unemployment.

-
- To identify the short-run relationship between macroeconomic determinants and unemployment.

1.4. Research Questions

- What is the long-run relationship between macroeconomic determinants and unemployment?
- What is the short-run relationship between macroeconomic determinants and unemployment?

1.5. Research Hypothesis

- **Null hypothesis:** Macroeconomic variables have no relationship with unemployment in the short- and long-run.
- **Alternative hypothesis:** Macroeconomic variables are related to unemployment in the short and long run.

1.6. Methodology of the Study

In accordance with the study objective of examining the relationship between unemployment (UNE) in Ethiopia and five macro variables: real growth domestic product (RGDP), foreign direct investment (FODI), external debt (EXDE), government effectiveness (GOEF), and political instability (POST).

The data collected in the study were secondary data. The data were mainly sourced from the World Development Indicators (World Bank), annual reports, and published studies. The data from the World Development Indicator (WDI) can be reliable because many studies have employed data published by this institution. The following model is developed by the study using yearly data on unemployment as well as other independent variables: political instability, economic growth, foreign direct investment, external debt, and government effectiveness. For all variables, Due to the lack of organized data on the chosen macro variables from both local and foreign data sources, the researcher used WDI as the same data source for consistency.

$$UU = f(\text{RGDP, FODI, EXDE, GOEF, POST,}) \dots\dots\dots (1)$$

$$Ut = \beta_0 + \beta_1 \text{RGDP}t + \beta_2 \text{FODI}t + \beta_3 \text{EXDE}t + \beta_4 \text{GOEF}t + \beta_5 \text{POST}t + \epsilon t \dots\dots\dots (2)$$

1.7. Significance of the study

The results of this investigation are thought to highlight future procedures regarding the unemployment issue and offer a valuable addition to the empirical foundation required for a

correct grasp of the earlier approaches. It would create awareness and provide elaborate ideas and important guidance to society, government, policymakers, economists, research, and other organizations that are of great interest in unemployment and the relationship between macroeconomic variables.

To the best of the researcher's knowledge, this study uses descriptive and econometric studies to provide additional background information on the primary macroeconomic factors for scholars and policymakers.

Additionally, this study contributes to the body of knowledge by demonstrating the connection between unemployment and RGDP, FODI, EXDE, GOEF, and POST in the Ethiopian economy.

Moreover, Ethiopia's government aims to reach a lower-middle income status by 2030. To continue Ethiopia's successful path towards becoming a middle-income country, the results of this study may be used as input to achieve this objective. Even bearing in mind the result of this research output is also very important in order to achieve a year development plan (2020/21–2030): a pathway to prosperity aims.

Not only these contributions. The study also has the following significance: -

First, by analyzing the effects of RGDP growth, foreign direct investment, external debt, government effectiveness, and political instability on the unemployment rate, a significant relationship may prove whether these variables have significant effects. Future studies may thus find this useful if they wish to investigate the variables that could influence the unemployment rate in further detail.

Second, at the conclusion of this investigation, suggestions and implications will be made in relation to the research problems throughout the entire study. It is anticipated that this study will provide policymakers, scholars, and economists with useful information about the variables influencing Ethiopia's unemployment rate. By doing this, they might be able to identify the variables affecting the unemployment rate. This would give policymakers useful suggestions about what may be done based on the nature of the relationship between unemployment and GDP growth, external debt (EXDE), foreign direct investment (FODI), government effectiveness, and political stability. Similar to this, authorities might modify national macroeconomic plans in response to important factors influencing Ethiopia's long-term unemployment rate.

Last but not least, this study might contribute to future potential researchers who are interested in undertaking their research on the issue in the case of Ethiopia, and other African countries may obtain variables that greatly affect unemployment to predict the unemployment rate. It will also contribute to the researcher conducting this study to be as familiar as possible with the subject matter of macroeconomic determinants and unemployment.

1.8. Limitations

The availability of data is actually the biggest obstacle facing researchers in impoverished countries like Ethiopia. Similar difficulties experienced by Ethiopian researchers in particular and African researchers in general were present in this study. This study investigates the relationship between five variables: Real GDP growth, foreign direct investment, external debt, government effectiveness, and political stability. Unemployment is affected by several factors, other than the explanatory variables used in this study. The other macroeconomic variables may be export, interest rate, corruption, inflation, population growth, money supply, income, exchange rate, etc.

Another drawback is that certain significant literature might not be discovered because pertinent resources, including statistics, reports, or articles, are not readily available. Researchers will carry out this investigation in the future using more recent data and resources and from a more thorough standpoint.

1.9. Organization of the study

This is how the rest of the study is organized. The introduction, problem statement, research objective, research questions, hypotheses, limitations, and significance of the study are all presented in the first chapter. The Second Chapter reviews the theoretical and empirical literature and identifies research gaps that have not yet been studied or investigated. Chapter three will present the study area, data collection methods, and data analysis methods. Chapter four discussed the findings of this study. Finally, Chapter five will put concluding remarks and proposes policy implications and recommendations.

CHAPTER TWO

REVIEW OF LITERATURE

This section, which is further subdivided into two parts: a theoretical and an empirical evaluation of the literature, focuses on the critical and systematic review of earlier researchers' works that are closely related to unemployment and specific macroeconomic causes (explanatory variables).

While the latter concentrates on the empirical results of earlier experts, the former deals with concerns pertaining to how unemployment is defined and conceptually considered by various scholars.

2.1. Concepts and Definitions

The idea of unemployment is wide and complicated by nature. It is necessary to clarify some of the concepts in order to have a comprehensive grasp of unemployment.

Economically Active Labor Force: According to the United Nations System of National Accounts (UNSNA), any individuals of either sex who provided labor for the production of goods and services are considered to be part of the economically active population. To put it another way, it describes those who are working or who are available to participate in profitable or productive activities.

Employed Labor Force: People over a certain age who work for pay, salaries, profits, or family gains in cash or in kind during the reference period are considered employed. According to UNSNA, employed people are more broadly defined as individuals who are involved in economic activity to generate commodities and services. Important employment metrics in this context include the employment-to-population ratio, employment by industry and occupation, employment status, hours worked, and compensation.

Economically Inactive Population: People who are neither employed nor available to perform labor are referred to here. Because they do not fit the criterion of unemployment, economically inactive populations are not regarded as unemployed people and are not included in the unemployment study.

Unemployed Labor Force: A person of working age (15 or older) is considered unemployed if they are available for work and actively sought employment within the past month, according

to the International Labor Organization (ILO). According to this definition, it is computed by subtracting the employed labor force from the economically active labor force.

Unemployment Rate: is calculated by multiplying the number of unemployed workers by the number of economically active workers.

2.2. Theoretical Review

2.2.1. Unemployment Views in Different Schools of Thought

Unemployment theory aims to explain the origins and consequences of unemployment in different countries. The causes of unemployment are explained in a variety of ways by economic literature. Some attribute the problem to economic systems, while others attribute it to other elements like population increase and foreign debt. Nevertheless, some views attribute the issue to outside factors, such as shocks or unforeseen circumstances, while others contend that labor market structures and technology are the root causes of unemployment. Moreover, other views claim that the unemployment issue can only be explained by inadequacies in overall spending and innovation.

Unemployment occurs when a person actively searching for employment is unable to find work. Because it raises poverty rates, inhibits economic progress, and encourages crime and other social ills, unemployment is undesirable. Several causes of economic instability, as outlined by Kyei and Gyeke (2019), are that unemployment is the cause of crime, the erosion of human capital, misery, and social unrest.

Economists have developed a variety of models over time to explain the issue of unemployment. For example, during the Great Depression in the 1920s and early 1930s, economists like Pigou (1929) and Keynes (1936) developed a variety of models to explain the reasons behind unemployment. The job and matching model were developed by Mortensen (1970), and Lippmann and McCall (1976) clarified how job offers and acceptance affect unemployment. The offer of employment is contingent upon the local demand, education, work experience, and labor abilities. As a result, various economists have examined the classical, Keynesian, and post-Keynesian theories of unemployment in different historical times.

According to unemployment can be classified as follows:

The first is seasonal unemployment, which happens when there is a restricted demand for a certain kind of labor to be done during a specific time of the year due to variables like deadlines

or the weather. People consequently wind up performing tasks for which they are untrained or uninterested. This generally happens when someone isn't given the kind of employment they are good at. He might be competent and skilled, but not for the work he can do. Another name for it is under-employment.

The second kind of unemployment is called hidden unemployment or disguised unemployment. It depicts a situation where an action involves more persons than are necessary for the action to be carried out. More workers than are needed are involved in disguised employment.

The other type of unemployment that arises from switching jobs is called frictional unemployment. This time frame is elective and sometimes referred to as search unemployment, depending on the circumstances of the jobless person.

The final kind of unemployment, known as classical unemployment, is when more people are looking for work but are having trouble finding it. This suggests actual wage unemployment. Real wages are above the market-clearing level in this instance. Generally speaking, unemployment is the state of not having a job, being unemployed, or the percentage of persons who are able to work and actively seek employment but are unable to do so.

Numerous theoretical frameworks exist for linking specific macroeconomic variables to unemployment. The establishment of sufficient job possibilities is one of the main markers of a macroeconomic economy that is stable.

Economics specifies a number of theoretical streams to comprehend the unemployment issue, such as Keynesian aggregate demand theory, classical theory of labor supply and demand, output growth theory (Osun's law, 1962), and Phillips curve inflation theory (Phillips, 1958). However, the empirical findings are not only conflicting with other theories that invalidate Okun's rule in Nigeria, but they also make the unemployment argument inconclusive. In light of the various theories of unemployment that have produced conflicting and ambiguous empirical findings elsewhere, it is valuable to add to this discussion by empirically examining the macroeconomic factors that influence unemployment in Ethiopia.

The aggregate demand (Keynesian theory): According to Keynes (1936), unemployment occurs if there is not enough aggregate demand in the economy to provide jobs for everyone who desires to work. With regard to cyclical unemployment, when the number of unemployed workers is above the number of job vacancies, some workers remain unemployed even if full employment is attained and all open jobs are filled.

According to the Keynesian theory, the total demand for the goods and services that businesses produce determines unemployment. The main contention is that businesses can grow and hire more people when there is a high level of aggregate demand (Raifu, 2017). According to this idea, a lack of aggregate demand is the source of unemployment. In contrast to classical economists, Keynesian economists maintain that involuntary unemployment is a feature of the economy. However, considering that persons who are unemployed voluntarily are willing to work for less than the minimum wage, this has been criticized for failing to explain labor market failure (Yellen, 1984). This was a reaction to this shortcoming.

Yellen Efficiency Wage Hypothesis: The efficiency wage theory, which Yellen (1984) examined, explains why businesses are hesitant to reduce salaries and hire more people. According to the premise, there are four advantages to paying greater wages: lower turnover, better morale, a decrease in employee shirking because losing a job would be more expensive, and an improvement in the average caliber of job candidates (Yellen, 1984).

Numerous research has looked into the theoretical factors that contribute to unemployment. The macroeconomic factors that influence unemployment in both industrialized and emerging nations have been the subject of some research, while others have examined the factors from a microeconomic standpoint. A variety of theoretical models are also pertinent to the study of unemployment determinants. Monternsen (1970) and Lippman and McCall (1976) introduced a widely used framework for a model of job search. According to this model, the probability of obtaining and accepting job offers determines how long people are predicted to be unemployed. A person's attractiveness to employers is influenced by a variety of characteristics, including education, experience, abilities, and local demand circumstances. This model makes the assumption that a person's minimum acceptable wage determines the likelihood that they will accept an employment offer. The expense of job searching, unemployment income, the projected distribution of salary offers, and the likelihood of receiving further job offers all influence the reservation wage, which is the lowest acceptable wage.

Marxian theory: Marx (1863) presented his unemployment theory and explained the nature of the capitalist mode of production to overburden some workers while custody the rest as a reserve army of unemployed paupers. Marxists share the Keynesian idea about the relationship between economic demand and employment, but with the caution that the market system's propensity to cut wages and decrease labor participation at an enterprise-level causes a requisite decrease in aggregate demand in the economy as a whole, causing crises of unemployment and

periods of low economic activity before the capital accumulation phase of economic growth can continue. Inherent within the unstable capitalist system and the periodic crises of mass unemployment are expected. The function of the working class within the capitalist system is to provide a "reserve army of labor, which creates downward pressure on wages. Marx (2008), this reserve army of labor fights among themselves for scarce jobs at lower and lower wages.

Okun's Law: The connection between GDP growth and the unemployment rate is explained by Okun's law. Theoretically, if all other factors remain same, a country's GDP will fall by roughly 2% for every 1% increase in the unemployment rate. It is anticipated that this relationship would be detrimental to both parties. The greater fluctuations in GDP relative to the unemployment rate can be attributed to several factors. For example, a drop in the multiplier effect as the money supply rises lowers the amount reported in unemployment statistics since firms want more workers, unemployed people are more likely to leave the labor market, and working hours are shorter and labor productivity is lower.

Demand and supply for labor (classical theory): Classical theory states that labor supply and demand account for unemployment. It makes the case that labor demand is derived demand, which declines as the pay rate rises and is dependent on the demand for goods made by labor. Conversely, the labor force, which rises in tandem with real earnings, determines the labor supply. The foundation of classical theory is the idea of perfect competition and a free market. As a result, an equilibrium level of wages and employment is produced by the intersection of labor supply and demand. Classical economics therefore contend that when the free labor market is distorted, an excess of labor is produced, which leads to unemployment. The theory does, however, make the assumption that real wages will swiftly adjust to bring the labor market back to equilibrium. As a result, while structural and frictional unemployment may endure, involuntary unemployment is a transient issue.

2.3. Empirical Literature Review

2.3.1. Unemployment and Its Macroeconomic Determinants

Unemployment is a serious issue since it can have a negative impact on the nation's gross domestic product as well as on economic wellbeing, crime, human capital deterioration, suffering, and social instability. A nation's output is determined by the degree of employment in that nation. To determine the macroeconomic factors that contribute to unemployment, numerous research have been carried out. The majority of these research were carried out in Ethiopia; nevertheless, there aren't many studies that focus on microeconomic aspects such home location and demographics, which ignores the macroeconomic issues that influence unemployment. Below are a few of these studies conducted both inside and outside of Ethiopia:

The literature that is currently available in Ethiopia that delves further into this one labor market theme focuses on three groups.

Enhancing the idea of unemployment and outlining its empirical operationalization are the goals of the first group.

A second group looks for the structure of the unemployment rate using the parameters of regionalization, age, sex, race, and educational attainment. In order to identify relationships with other macroeconomic variables, the last group examines the overall unemployment rate. Consequently, this study supports the third group.

Real Growth Domestic Product and Unemployment

Gaber (2018) found that economic growth had a significant negative impact on unemployment whilst inflation and labor force movement restrictions had a positive significant effect on unemployment by using multiple regression analysis from to 1994-2017 in Palestine, even if the term should not be specified as a short run or in a long rub or in both cases.

Four main factors have been found to have a significant impact on the unemployment rate by prior academics. These include foreign direct investment (FODI), population (POPU), GDP growth (GDP), and inflation (INFERA). For the primary calamity that often impacts the employment rate, inflation can be taken into account. It falls under the category of an essential component of the market economy (Chen Li Xuen et.at al., 2017).

Maqboo et al. (2013) found that economic growth, inflation, foreign direct investment (FDI), and population growth were significant factors that influenced unemployment in Pakistan using autoregressive distributed lag (ARDL).

Folawe and Adeboj (2017) find that economic growth has an insignificant reducing influence on unemployment, whereas inflation has a significant positive impact on unemployment in Economic growth, population, inflation, interest rates, currency rate fluctuations, and other factors influencing the unemployment rate in those nations were all evaluated by ECOWAS between 2001 and 2013. The findings indicate that inflation, followed by population growth, is the primary driver of rising unemployment in the BRIC nations. The primary economic elements that contribute to a decrease in unemployment include increase in the gross domestic product, trade volume, total investment, and industrial product. This conclusion contradicts the Phillips curve theory by showing that inflation worsens the impact of unemployment, as suggested by Friedman (1968) and Phelps (1967). Like Solow's growth model, population expansion is a factor that raises unemployment.

Thirwall (1989) notes that a larger economy is more capable of employing more people than small economies. In contrast, a study done by Abdul-Khaliq et al. (2014) found that an increase in economic growth had a deleterious effect on employment in Arab nations.

O’Nwachukwu and Chinedu et al. (2016) examined the factors influencing Nigeria's unemployment rate between 1980 and 2016 by estimating the model using the ordinary least squares (OLS) approach and testing for the unit root using the Augmented Dickey-Fuller. Five explanatory variables were used by the researcher: real gross domestic product, population, initial lag of unemployment, inflation rate, and government spending. Although the initial lag of unemployment and real gross domestic product are not statistically significant in explaining unemployment in Nigeria, the results show that government spending, the inflation rate, and population are statistically significant in explaining variations in unemployment. This is quite different from the result obtained by Kalim’s et al. (2020) in Pakistan. These studies demonstrate that while the impact of a nation's GDP is statistically inconsequential in some countries, it is considerable in others.

The unemployment problem is growing quickly, and jobless rates have risen sharply in many nations in recent decades. The rise in unemployment has numerous causes. Weak economic performance and issues with the structure of the labor market are the two most significant factors. To put it another way, this issue has both structural and macroeconomic components. These considerations have made it difficult for many economies to provide enough jobs to accommodate all of the new job seekers.

Other researchers found a strong relationship between unemployment and GDP growth, inflation, and population increase, but they did not identify which variable had the biggest effect. The current unemployment rate was significantly influenced by the GDP, consumer price index, and prior unemployment rates, but not by the exchange rate. These results showed that the chosen macroeconomic factors had a major impact on unemployment. According to the study's findings, GDP growth and the unemployment rate have a substantial negative association in the short term but a positive one in the long term. According to Micheni and Muturi (2019), GDP growth and the unemployment rate decline over the short and long terms, respectively.

Endashaw Sisay Sirah (2020) The long-term unemployment reduction changes by roughly 44% for every percentage change in real gross domestic product, which is significant at the five percent significance level, assuming all other factors remain constant. Since a rise in GDP is a sign of economic expansion and creates jobs, the autoregressive distributed lag model was applied in Ethiopia to lower the unemployment rate. First, the unemployment rate in Ethiopia is negatively and negligibly impacted by the real gross domestic product lag. At lags two and three, however, the GDP and the unemployment rate have a statistically positive association. According to the findings, a one percent increase in GDP's lag two and lag three causes a short-term increase in unemployment of 34% and 9%, respectively. According to this research, Ethiopian growth is not immediately conducive to the creation of jobs. Ethiopian economic strategies have failed to lower unemployment rates despite relatively high growth rates because of the disparity between the type of growth attained and its effect on unemployment.

The findings indicate a negative correlation between economic growth and unemployment. A one percent rise in real gross domestic product results in a short-term decrease in unemployment of 0.70% and a long-term reduction of 3.52%, both of which are quite substantial. Employment expansion generates high production, which in turn generates high economic growth and lowers unemployment. Economic growth has a highly substantial long-term impact on unemployment, suggesting that real gross domestic product growth has a bigger effect on unemployment. Therefore, Ethiopia's economic growth is the primary macroeconomic factor influencing unemployment in the country (Bekele, 2019).

Foreign Direct Investment and Unemployment

The empirical literature on FDI can be divided into three broad groups concerning foreign direct investment. The first group concluded that FDI reduced unemployment in the host country.

Accordingly, there was a negative relationship between FDI and unemployment. Second, there is a positive relationship between FDI and unemployment. The third group finds no relationship between FDI and unemployment.

Dechasa (2014) carried out a study on trends and current conditions in urban Ethiopia's labor market and unemployment, concentrating on conceptual, analytical, and policy-relevant explanations of the state of the labor market and unemployment in urban Ethiopia. He discovered that a number of issues, including privatization, tax rates, the availability or insufficiency of credit and financing, and infrastructure facilities, limited the development of jobs in both the public and private sectors. The researcher suggests addressing the issue of low job creation by implementing labor-intensive employment creation strategies for the expanding pool of young, skilled workers and providing the informal sector with formal training, institutional protection, modern technology, access to the market, and credit institutions.

Some studies have observed a positive relationship between FDI and unemployment. Bayar and Sasmaz (2017) suggested that brownfield investment was the cause of a positive relationship between FDI and unemployment among 21 emerging economies. A Wusterland-Durbin-Hausman co-integration test and Augmented Mean Group (AMG) were used to study the long-run effect of FDI on unemployment for the period 1994-2014. The results show an insignificant effect of FDI inflows on unemployment in Egypt, South Africa, Greece, Hungary, Indonesia, Chile, Qatar, Peru, and Malaysia. A positive relationship between FDI and unemployment was observed in Brazil, China, the Czech Republic, India, Korea, Poland, Thailand, and Turkey.

Folawewo and Adeboje (2017) examined the macroeconomic factors influencing unemployment: actual data from the West African economic community, including fully modified ordinary least squares panel data estimation methodologies for annual data from 1991 to 2014, as well as fixed and random effects. An empirical analysis was conducted at the sub-regional, Francophone, and Anglophone country levels as well as at the aggregate ECOWAS data level. The result shows a low employment elasticity of growth in the area, with GDP growth having a decreasing but insignificant impact on the unemployment rate. Unemployment is not positively impacted by inflation, proving the Phillips curve concept to be false. The study's positive effect of labor productivity on the unemployment rate, which represents a trade-off between employment and labor productivity, is another significant discovery. Furthermore, whereas population expansion has a rising influence on unemployment, FODI and external debt have a weakly negative effect.

According to other research, unemployment has a favorable correlation with both the population and external debt. Nevertheless, it has a negative correlation with foreign direct investment and gross domestic product. The study also demonstrated a strong and inverse association between inflation and unemployment over the medium and long terms (Bhalli et. al, 2019).

According to an empirical investigation, foreign direct investment (FDI) has a favorable and significant impact on economic growth, as do other factors including human capital, economic infrastructure, and capital accumulation. Furthermore, there are more open economies, greater financial investments in infrastructure, and more political participation in the anti-corruption movement (Adhikary, 2015).

Unemployment is a socioeconomic phenomenon in which part of the labor force is not engaged in the production of goods and services. In actual economic life, unemployment appears to be an excess supply of labor over demand. The bounds testing approach demonstrates that there is a long-run relationship between the unemployment rate and real gross domestic product, foreign direct investment, population growth, inflation rate, and external debt. This study performed diagnostic checks, the results show that there is no serial correlation, no conditional heteroscedasticity, and no specification error and there is a normal distribution in the ARDL model (Malika et al., 2019).

According to Bibhuti (2020), economic freedom has a significant positive effect on foreign direct investment inflows in both global and regional analyses encompassing 156 countries between 1995 and 2016.

Sovbetov & Moussa (2017) the unemployment model (with macroeconomic variables) was estimated using the Engle-Granger two-step econometric procedure. The results revealed a negative relationship between unemployment and inflation. Unemployment responds absolutely if real output is below potential output, and if wages add to intensification in investment, unemployment is reduced significantly. The results verify that the Phillips curve holds for Namibia and that unemployment can be condensed by increasing aggregate demand.

Moreover, Keynes viewed a negative relationship between FDI and unemployment. He stated that unemployment, which was caused by a gap between consumption and income due to a decline in total effective demand in times of recession, needs to be reduced by supporting investment opportunities, whether domestically or internationally (FDI). That is, he asserted on the other hand, Ricardo (1821) supported the positive relation between FDI and unemployment

through formulating jobless growth theory which states that there is a negative relationship among investment, output expansion and job creation because capital investment is a perfect substitute for labor in the economy. Thus, when FDI inflows adopt capital-intensive production techniques within their MNCs, this reduces the demand for labor, thus raising unemployment (Onanuga et al, 2018).

According to Irpan (2016:3), some foreign investors prefer to bring their own unskilled labor force, thereby exacerbating unemployment in the host country. Foreign direct investment brings new capital into the host country, new skills, managerial expertise, new jobs, and networking of local companies to the international family of businesses, further helping ease unemployment (Johnny et al. 2018).

Xuen, Bee, Hsien, Yen, and Yee (2017) investigated the macroeconomic factors affecting the unemployment rate in China. This study focuses on macroeconomic factors affecting the unemployment rate in China by studying the long-run relationship between 1982 and 2014. The proposed independent variables are Inflation, GDP growth, population, and FDI, which affect China's unemployment rate.

Bekele (2019) discovered a short-term negative correlation and a long-term positive correlation between unemployment and foreign direct investment (FDI). At the 1% level, FDI is statistically significant in both situations. In the short term, a percentage increase in foreign direct investment results in a 0.073% drop in unemployment. The findings of Zeb et al. (2014) are comparable to this one. Over time, however, when FDI rises by 1%, unemployment rises by 0.42%.

In Ethiopia, several factors affect the negative relationship between them. Domestic investment is insufficient for the development process, and overseas capital in the form of foreign direct investment (FDI) is required to supplement its growth objectives. Therefore, foreign direct investments have been regarded in recent years by governments of developing countries as one of the best alternatives to fuel their economic growth, meet their investment needs, and compensate for their shortcomings (Alalawneh and Nessa, 2020).

The short-run elasticity of foreign direct investment has a positive effect on unemployment in all lags. Empirical research does not always confirm an inverse relationship between unemployment and foreign direct investment. Therefore, we can confidently assume that FDI shows a short-run positive influence on unemployment, and As the FDI inflows increase in a

country, unemployment reduces because FDI provides new opportunities and thus helps in reducing unemployment (Endashaw Sisay Sirah, 2020).

Unemployment and External Debt

External debt is a portion of its total debt that it has acquired from other governments and international financial organizations like the World Bank (WB) and International Monetary Fund (IMF). External debt is the total amount of actual current and contingent liabilities due to foreign nationals who need the money or who will eventually have to pay principal and/or interest. Foreign debt is another name for external debt. Reasonable debt inflows and economic growth are positively correlated, according to theoretical models of debt and growth. These models suggest that weak capital inflows are advantageous to capital-scale nations. The evidence does, however, also associate lower economic growth with bigger debt inflows. One example is the well-known debt overhang hypothesis. This suggests that a nation's estimated debt service increases as its output level does. As a result, both local and foreign direct investments are discouraged and the returns from investments in a nation are subject to a high marginal tax by external creditors. The relationship between debt accumulation and unemployment reduction is also the subject of numerous controversial empirical investigations. To determine the factors that contribute to unemployment, some empirical research use external debt as a macroeconomic variable in their analysis.

Ohwofasa et al. (2012) analyzed Nigeria's external debt, debt service payments, balance of payments, and foreign direct investment using the ordinary least squares (OLS) method. The findings indicate that while foreign direct investment has a negative effect on unemployment, external debt has a beneficial effect.

However, Otoi and Pokhariyal (2016) evaluate the long-term impacts of Kenya's economic factors that contribute to youth unemployment, and the analysis's findings show a negative correlation between external debt and foreign direct investment. By contrast, Bhalli et.al (2019) Analyze the connection between unemployment and external debt. The findings indicate that Pakistan's unemployment rate is not statistically impacted by external debt. He also implied that funds obtained from lenders were not properly used in the course of economic activity and that corruption was responsible for part of the losses.

Furthermore, Argaw (2013) investigated, using a macro-econometric model, how Ethiopia's external debt affected economic growth between 2000 and 2010. She discovered that Ethiopia's GDP is positively impacted by foreign exchange reserves and external debt service payments,

suggesting that Ethiopia's external debt stimulates rather than inhibits economic growth. In contrast, Ramakrishan (2017) demonstrates a nonlinear and negative correlation between debt and growth. Along with budgetary considerations and effective use of investments, the researcher also suggests expanding debt relief for Ethiopia.

Isaev and Masih (2020) investigated, using Australia as a case study, the relationship between trade openness, unemployment, and private sector foreign debt from 1988 to 2016. To investigate the possibility of a theoretical long-term link between these variables, they used the autoregressive distributed lag (ARDL) cointegration technique. The outcome shows that there is long-term equilibrium between the variables, and that the rise in Australia's unemployment rate is correlated with the private sector's share of foreign debt buildup. Additionally, the researcher advises policymakers that lowering the foreign debt of the private sector is likely to lower the unemployment rate.

Nguyen (2018) investigated, using a vector autoregressive (VAR) model technique, the link between Vietnam's external debt, economic growth, unemployment, and public spending from 1987 to 2016. The findings show a positive correlation between GDP and national spending, GDP, and external debt. Additionally, it demonstrates a positive correlation between unemployment and GDP, national spending, and external debt. Because a higher level of external debt results in lower unemployment rates nationwide, the study suggested that the government handle external debt effectively.

Similarly, Ijirshar (2022) demonstrated that while external debt service had a short-term and long-term negative influence on Nigeria's annual growth rate, external debt stock had a favorable effect on economic growth. However, Shkolnyk and Koilo (2018) examined the connection between emerging economies' economic growth and external debt from 2006 to 2016. They discover a negative correlation between emerging economies' economic growth and external debt. Gur et al., (2018) used panel data to analyze the factors that contributed to unemployment in the BRIC nations between 2001 and 2012.

Dejene Bekele (2019), discover that external debt is statistically significant at the 1% level and has a beneficial effect on unemployment throughout the long and short terms. Short-term unemployment rises by 0.18% and long-term unemployment rises by 1.59% for every 1% increase in foreign debt. Ethiopia has a lengthy history of debt revenue, according to empirical findings. Ethiopia is regarded as one of Africa's most indebted nations, having borrowed enormous sums of money from various organizations across the globe (Fekadu, 2014).

Unemployment and political instability

Political, social, and economic instabilities are the main characteristics of the countries in the IGAD region. All member countries in the region have struggled with political instability and challenges to the regime. Like many African states, most peace and security problems in the region emanate from internal problems such as the nature of states and political parties, religious and ethnic tensions, income inequalities, and external interference. Currently, these eight nations of the region are the first in the list of the most unstable countries in the world, which shows how severe the problem is in the region than in other parts of the world. Indeed, many African states in conflict are strong in the wrong functions of the state, effective only in the maintenance of regime security and safeguarding the interests of political parties and colluding individuals or groups (Haider et al., 2018).

In most developing countries, widespread unemployment among young people is often a key reason for political and social movements; these economies are mostly characterized by continuing regional conflicts and difficult political transitions (Bernards & ILO, 2016). IGAD countries are characterized by political, social, and economic instabilities, and unstable activities, civil wars, and coup d' états are their manifestations. The problem is fifty years of protracted, chronic, and complex conflicts, such as society–state, state-state, and society–society conflicts reflecting interracial, inter-religious, and inter-occupational tensions (Alshyab, 2019).

Without a doubt, political stability in Africa is threatened by unemployment. Unemployment frequently leads to political instability in a nation because unemployed people are more likely to engage in antisocial behavior. Since the government doesn't give them jobs, they believe it is useless. In Africa, where the population is highly dependent on the government, people would often use any means necessary to get their problems resolved (Riechi, 2019).

The study examines the microeconomic determinants of youth unemployment in the Middle East and North Africa (MENA) region using unique and novel data on young people aged 15–29 from 2016. The results show that being male and graduating from public school increases the probability of being unemployed. Moreover, job concerns, corruption, and unequal rights in society were also found to have a positive incidence of unemployment. However, we find that enhancing gender equality in the labor market, education, family codes, and political participation decreases the probability of employment.

Similarly, the results indicate that improving economic inclusion in the post-Arab Spring period decreases the probability of unemployment (Fakih et al., 2020).

Asha (2019) Investigated the relationship between the “youth bulge” and political unrest to understand when and why young Iraqis resort to violence or disruption. In Iraq, widespread youth unemployment combines with high levels of political exclusion, sectarian politics, militarization, perceptions of injustice, frustrated aspirations, war-related trauma, and the rapid breakdown and transformation of traditional institutions, such as families and tribes. Together, these factors (and others not covered in this review) produce violence at specific times. A systematic study of how Iraq’s youth “bulge” affects the country’s political dynamics is warranted. Similarly, the empirical analysis does indeed suggest that young male bulges are more likely to increase the risk of conflict in societies where male secondary education is low. This suggests that the availability of large cohorts of poorly educated youths can support armed conflict (Sambanis, 2020).

Unemployment and government effectiveness

Unemployment remains one of the most critical challenges for policymakers worldwide owing to its profound socioeconomic implications. As a complex and multidimensional issue, it is often influenced by economic, political, and governance-related factors. The persistence of unemployment exacerbates poverty, social exclusion, and inequality while negatively impacting economic stability and growth (Sihombing and Sitorus, 2024).

The labor market's failure to absorb a growing workforce and offer quality jobs can lead to long-term negative outcomes, including skill erosion, mental health deterioration, and strained social welfare systems. Given the multi-faceted nature of unemployment, understanding its root causes and the role of governance structures is essential for developing effective policy interventions. A key focus of recent research has been on the role of governance quality in mitigating unemployment.

Effective governance can create an enabling environment for economic activity by ensuring transparency, accountability, and the rule of law, all of which contribute to a stable labor market. However, political inclusiveness and the degree of voice and accountability in governance systems may introduce additional complexities. More politically inclusive nations tend to have strong labor protection and welfare programs, which may contribute to structural unemployment, particularly if market rigidities are introduced. Understanding the delicate balance between good governance and labor market dynamics is essential for effectively

addressing unemployment. The complicated economic problem of unemployment significantly affects both the social stability of a nation and the wellbeing of its citizens. To mitigate unemployment, governments implement various labor market, macroeconomic, and training policies (Shand et al. 2021).

Sitorus S. a., (2024) Highlights the detrimental consequences of unemployment, including diminished self-confidence, skill deficits, heightened stress levels, mental health challenges, and financial instability. In response, governments utilize several measures to combat unemployment, such as fiscal and monetary policies, foreign investment incentives, trade promotion, and support for small and medium-sized enterprises (SMEs), tourism development, and employment guarantees. These strategies aim to create a more robust labor market and enhance overall economic stability.

alf et al. (2024) further investigate the relationship between governance quality and unemployment in the Middle East and North Africa (MENA) region by comparing the pre- and post-Arab Spring periods.

Silalahi and Walsh (2023) Explore the interconnections among government policies, worker empowerment, and unemployment, focusing on their implications for social welfare and economic stability. Utilizing a mixed-methods approach, this study analyzes policy evaluations, labor market statistics, and qualitative insights. The results indicate that the effectiveness of policies varies significantly; specific workforce development programs and educational initiatives show promise for reducing unemployment rates.

This study contributes to the growing body of literature on the relationship between governance quality and unemployment. While previous studies have explored the effects of governance on economic growth (Hasan, 2010; Brad, 2024), few have focused explicitly on unemployment as a labor market outcome in unemployment studies (Ronaghi and Scorsone, 2023).

The long-term correlations between this variable and its drivers in Ethiopia have not been thoroughly studied, despite the fact that Johansen cointegration models have been discovered in the international literature. Because of these factors, as well as the recent shift in the political and economic landscape, it is imperative to analyze the dynamics of unemployment and its causes in Ethiopia in greater detail.

To study these macroeconomic variables with that of the unemployment rate, methodologies such as the Augmented Dickey-Fuller (ADF) unit root test, Phillips–Perran unit root test, and

Johnson Co-integration approach are used. Their results indicate that all the variables in these studies are significant to the unemployment rate, which proves that a long-run relationship exists between them.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1. Type and Sources of data

In accordance with the study objective of examining the relationship between unemployment (UNE) in Ethiopia and five variables: real growth domestic product (RGDP), foreign direct investment (FODI), government effectiveness (GOEF), external debt (EXDE) and political instability (POST). The data collected in the study were secondary data. The collection of data period is from 1993 to 2023 in collaboration with the observation of a total of 30 samples.

All data were collected on different bases. The percentage of the labor force that is unemployed is calculated using the national estimate. GDP per capita growth, which is a measure of yearly GDP and foreign direct investment (FODI) intake into Ethiopia as a proportion of GDP, is used to calculate GDP growth. Political stability is determined by estimating the absence of violence or terrorism. Effectiveness of government as determined by Government Effectiveness: Estimate.

In accordance with the study objective of examining the relationship between unemployment (UNE) in Ethiopia and five macro variables: real growth domestic product (RGDP), foreign direct investment (FODI), external debt (EXDE), government effectiveness (GOEF), and political instability (POST).

The data were mainly sourced from the World Development Indicators (World Bank), annual reports, and published studies. The data from the WDI can be reliable because many studies have employed data published by this institution.

Using annual data on unemployment and additional independent factors, such as economic growth, foreign direct investment, external debt, government effectiveness, and political instability, the study develops the following model. Due to the lack of organized data from both domestic and foreign data sources about the chosen macro variables, the researcher employed WDI as the data source for all variables for consistency. Other researchers have used this reliable data source; for instance (Muhammad et al. (2019), Aurangzeb (2015), Folawewo & Adeboje (2017) and Xuen et al. (2017).

3.2. Variables of the Research and their Description

In order to achieve its goals, the study looked at the variables that researchers employed at various points in time. For instance, Endashaw Sisay Sirah and Muhammad Ahmad Mazher (2020) use external debt (EXDE), population (POPU), real growth domestic product (RGDP), foreign direct investment (FODI), and inflation (INFL) to consider the short- and long-run relationships between unemployment and these macroeconomic variables. Bekele (2019) and many other scholars have used macroeconomic variables to identify the relationship between unemployment and macroeconomic variables.

The Variables in this study were similar to those used by Endashaw Sisay Sirah and Muhammad Ahmad Mazher (2020). However, in order to accomplish the study's goal, the variables were chosen based on the actual circumstances of the Ethiopian environment, and the variables in this study were altered by include the factors like as government effectiveness (GOEF) and political stability (POST), and the variables were not used in the work of Endashaw Sisay Sirah and Muhammad Ahmad Mazher (2020) and other scholars for this specific objective as far as the researcher is aware.

Thus, the dependent variable of the research Unemployment (UNE) which is most commonly used to measure economic growth and development in Ethiopia. The explanatory variables were real growth domestic products (RGDP), foreign direct investment (FODI), external debt (EXDE), government effectiveness (GOEF), and political instability (POST).

Table 3.1 Description of the variables in the study

Variables of the study	Description the Variables	Expected
Unemployment (UNE)	A person is considered unemployed if they are able and willing to work but are not doing so at the moment. This is determined by the overall unemployment rate (also known as the total labor force)	
Real growth domestic product (RGDP)	The entire market value of all finished goods and services produced in Ethiopia each year, expressed in terms of GDP	+

Foreign Direct Investment (FODI)	The difference between inflow and out flow of capital to establish enterprises.	+
External debt (EXDE)	The accumulation of money borrowed from international institution.	-/+
Political Stability (POST)	Absence of Violence/Terrorism: measure perceptions of the possibility of political instability and/or politically motivated violence, including terrorism.	-/+
Government Effectiveness (GOEF)	Measures the quality of public services, the quality of the civil service and the quality of policy formulation and implementation, and the credibility of the government's commitment to its stated policies and it considers the quality of public services, the quality of community service and how independent it is from governmental constraints, the quality of policy formation and implementation, and the dependability of the government's assurance of these policies.	+

3.3 Definition of Variables in the Study

Unemployment (UN): Real gross domestic product, population growth, inflationary pressure, capital inflow, external debt, the proportion of imports to exports in GDP, and interest rates all have an impact on this dependent variable. When someone is able and eager to work but is not employed at the moment, they are said to be unemployed.

Real Gross Domestic Product (RGDP): GDP is the GDP divided by the population at the middle of the year. GDP adjusted for inflation is this. the entire market value, at a fixed price, of all finished goods and services produced in Ethiopia each year.

According to this study, there should be a substantial negative correlation between GDP and unemployment. This implies that a lot more employment openings for jobless individuals arise as the economy grows. As a result, unemployment is decreased.

Net Foreign Direct Investment (NFDI): the distinction between the amount of money coming in and going out to start businesses. Ethiopia is now the most popular FODI destination in Africa, which could lead to a large number of job openings for its inhabitants. Thus, this has a detrimental impact on unemployment.

External Debt: is the accumulation of funds obtained through loans from foreign organizations. It is anticipated that the near term will have a detrimental impact on unemployment since it drives the nation's economic expansion. However, the ratio of that country's gross domestic product determines the advantage to the borrower.

Government effectiveness (GOEF): evaluates the standard of civil service, public service, policymaking, and implementation, as well as the legitimacy of the government's adherence to its declared policies and reflects on the excellence of public services, the excellence of the community service and its amount of independence from governmental pressures, the excellence of policy implementation and development, and the reliability of the government's guarantee of these policies.

Political Stability (POST): Absence of Violence/Terrorism: Measure perceptions of the possibility of political instability and/or politically motivated violence including terrorism

3.4. Method of Estimation and Data Analysis

3.4.1. Test for Stationary of the Data

Given the possibility of a random walk for economic variables, it is clear that the notion of stationarity is important when analyzing time series data. Stationary data is also necessary for the model to function properly. Otherwise, the model's output will be erroneous since its R² is overstated based on its understated t-value. Actually, there are a number of unit root tests, including Ng–Perron, Kwiatkowski-Phillips-Schmidt-Shin (KPSS), Philips Perron (PP), Dickey Fuller, Augmented Dickey Fuller (ADF), and Elliot-Rothenberg-stock point optimal (ERSPO).

Nonetheless, this study used PP and ADF, the two most widely used unit root test methodologies. Gujarati (2004) and Gujarati and Porter (2009) claim that because ADF incorporates the actual process of performing the unit root test, it is the most popular model for the test. For a more extensive and intricate collection of time-series models, the ADF is an enhanced Dickey-Fuller test. In conducting the Dickey-Fuller test, the error term is assumed to be uncorrelated. If the error terms are correlated, the DF test is useless. However, in time-series

data, error terms are likely to be correlated. If the error term is correlated, the augmented Dickey (ADF) test should be employed. Moreover, According to Alrabba (2017), the Augmented Dickey-Fuller test, which looks at whether the unit root hypothesis exists as a null hypothesis, is one of the most widely used tests for time series stationarity.

One benefit is that it yields a unit root result with a lag in regression value. In the regression model, any serial correlation can be cleaned by include the lagged variable in the unit root test. The work of Dickey and Fuller (1979), who studied the unit root test of time series in vector autoregressive models, provided support for this.

H0: $\gamma=0$, non-stationary time series; so, it has unit root problem.

H1: $\gamma<0$, Stationary time series; so, it has no unit root problem.

However, this study also used the PP unit root test since it introduced a non-parametric adjustment to the model, which helped it overcome the drawbacks of ADF. Enders (1995) claims that the PP unit root test was put forth by Phillips and Perron (1988) as a substitute for ADF. In contrast to ADF, which adds an extra lag, the PP test recommends using non-parametric adjustment to the model to derive the error term. Furthermore, the findings of the ADF unit root test are frequently checked using the widely used and heterogeneously distributed Phillips–Perron unit root test. Additionally, it gives the researcher confidence in two ways: results from ADF and PP are same, and judgments on the existence or absence of the unit root in the study's variables will be safer and more secure.

Therefore, the stationarity of the variables—constant, trend, and neither—will be examined to ensure that they are reliable. In addition, the unit root test is used to ascertain the sequence of variable integration for both the ADF and PP tests at level and first differencing.

The ADF with trend and constant, as well as the model without trend and constant, are thus represented as follows: In accordance with Odusanya and Atanda (2010), Equation (3.2) represents the ADF model without a constant or intercept, whereas equation (3.3) represents the model with a constant. In equation (3.4), the trend and the intercept are both included. The following are the equations used:

$$\Delta Y_t = \delta \alpha y_{t-1} + a_i + \mu t \dots\dots\dots (3.1)$$

$$\Delta Y_t = \alpha_0 + \alpha Y_{t-1} + i \Delta Y_{t-i} + \omega t \dots\dots\dots (3.2)$$

$$\Delta Y_t = a_0 + \alpha_1 Y_{t-1} + \alpha_2 t + i \Delta Y_{t-1} + \omega t \dots\dots\dots (3.3)$$

ωt = represents stochastic Variable while

Y_t = represents time series variables in the study The alternative hypothesis (H1) in the ADF unit root test is that the variable is stationary, while the null hypothesis (H0) is that a series has a unit root (non-stationary). The variables are assumed to be stationary (no unit root) if the null hypothesis in the enhanced Dickey fuller is rejected. As a result, the variables are prepared for econometric analysis. The variables cannot be used in model analysis if the null hypothesis is not rejected. Because econometric work requires stationary data, we continue until the variables are prepared for use in the analysis.

H0: a series contains a unit-root (non-stationary)

H1: variables are stationary (there is no unit root)

The time-series data's degree of stationarity varies depending on the variable. A time series is considered integrated of order one, I (1), for example, if it becomes stationary following initial differencing. After the second differencing, the time series is integrated with order two, I (2), if it becomes stationary. It is integrated with order zero I (0) if the initial time series is stationary. Cointegration occurs between two time series when a linear combination of two I (1) series is stationary. Co-integration, thus, suggests a long-term link between the variables.

As stated by Maddala (1992), the Philips-Perron unit root test yields reliable estimates, particularly when structural fractures are present:

$$Y_t + \mu_1(t) + \alpha_0 Y_{t-1} - \Delta Y_{t-1} + u_t \dots\dots\dots (3.4)$$

In this case, T is the number of observations utilized in the PP unit root test, and m is the lag duration. The Newey and West bandwidth, as proposed by Newey and West (1994), is used to determine the lag length to be employed in the Phillips Perron Unit root test

3.4.2. Lag Selection Criteria

Another crucial component of contemporary econometric analysis is the selection of the lag order. The maximum lag length of the model is determined using Vector Autoregressive (VAR) lag order selection criteria. With a majority vote, the lag duration criterion is chosen based on each criterion's minimum value and taking into account the well-known criterion for economics research.

Due to its popularity, the AIC was utilized in this investigation. Furthermore, it is supported by the majority of criteria and is often utilized in contemporary literature. Most statisticians and

economists agree that Johansen co-integration is a multivariate extension of ADF. While Johansen's maximum likelihood test works with all cointegrated vectors, the Augmented Dickey Fuller test's unit root test looks at a linear combination of variables.

3.4.3. The Test for Co integration

The next step is to determine if the variables move together over time after verifying the data series for the unit root and choosing the lag duration. The premise is that, even though variables are trending, there will always be a difference between them if they have a long-term relationship. Consequently, figuring out how many cointegrating equations there are is the primary goal of co-integration. This demonstrates the significance of co-integration since its absence suggests that the variables have no long-term link, according to Dickey et al. (1991). Therefore, it is impossible to perform any analysis of the long run behavior of the variables unless the co-integration tests verify the existence of co-integration.

Furthermore, Hossain (2015) cites Hall and Henry (1989) as saying that if and only if the difference between the variables has no unit root, the long-term link between them can be identified.

This study uses a co-integration-based VAR model, as recommended by Johansen (1991, 1995). Because it performs better in multivariate time series and allows for vector autoregression analysis, the Johansen co-integration test is the primary choice for this investigation. Furthermore, the number of cointegrating equations over the long term is provided by the Johansen test. Next, the multivariate unit root test known as the Johansen test for co-integration can estimate the parameters of these cointegrating connections between variables as well as the co-integration rank in the multivariate situation. The outcomes of the Johansen test for co-integration also help determine the next model to use. In particular, it allows the unrestricted vector autoregression and vector error correction model to be preferred. Additionally, it has the benefit of being able to work with a multivariate time series' several co-integrating vectors. Johansen's process begins with a VAR of order P, as seen in equation 3.6 below.

$$Y_t = K + \Delta Y_{t-1} + \dots + \Delta Y_{t-p} + u_t \dots\dots\dots (3.5)$$

The integrated vectors are typically order of one, and y_t represents a $n \times 1$ integrated vector. Consequently, the VAR model can be expressed as follows to estimate the first difference:

$$\Delta Y_t = K + B + \Delta Y_{t-1} + \dots + u_t \dots\dots\dots (3.6)$$

In this case, $P=$ and $\pi i = a0 +$

The next step is to read the number of cointegrating vectors and make decisions. Johansen (1988, 1989) and Johansen and Juselius (1990) suggested two tests for this purpose. The two methods are the trace test statistics and maximum eigenvalue test statistics.

Trace Test Statistics: Johansen identified this maximum likelihood ratio in 1988. When characteristic roots are very near to zero and the null hypothesis is that the number of co-integrating vectors is fewer than or equal to the co-integrating relations, the trace statistics in the Johansen methodology's trace test will be tiny.

At least one co-integration, however, disproves the null hypothesis and supports (reflects) the existence of long-term correlations between the variables.

$$\pi trace = -(1 - \gamma) \dots \dots \dots (3.7)$$

Where: λ_i represent the i th largest Eigen value of matrix Π and T shows the number of Observations included in the estimation.

$$\tau_{\max} = -T \log(1 - \gamma r + 1) \dots\dots\dots (3.8)$$

Where, $-\gamma r + 1$ represent largest squared Eigen value of $r+1$.

The Maximum Eigen Value Statistics: Johansen (1988) created this additional test, which pits the alternative of $r+1$ co-integrating relations against the null hypothesis of exactly r co-integrating relations. The test is expressed as:

$$\tau_{\max} = -T \log(1 - \gamma r + 1) \dots\dots\dots (3.9)$$

Were,

$-\gamma r + 1$ represent largest squared Eigen value of $r+1$.

The discrepancy between Johansen's (1988) maximum eigenvalue and trace statistics can be said to be within their null and alternative hypotheses. The former requires that the alternative of $r + 1$ cointegrating vectors is used to test the null hypothesis of $r = 0$, whereas the later assumes that r cointegrating relations are evaluated against the alternative of $r+1$ cointegrating relations. According to the majority of research, the Johansen test of co-integration is very sensitive to the chosen lag length. This research uses the Akaike Information Criterion (AIC) in order to overcome this sensitivity.

3.4.4. Vector Error Correction Model (VECM)

Introducing and running a vector error correction model to obtain a short-run relationship between explanatory variables and the explained variable is estimated if the following steps are successful.

Initially, the log of the study's time series must be stationary in the initial differences. Accordingly, the variables ought to be incorporated into order one. The unit root tests for PP and ADF are used to verify this. The report of Johansen Co-integration is the second step. The reports of maximum and trace eigenvalues are taken into account in this investigation. In order to estimate the VECM, both must report the existence of a cointegrating link. The short- and long-term features of the variables can be examined using the vector error correction model. This study uses the VECM to analyze the short-term effects of explanatory factors on the endogenous variable of unemployment.

3.5. Model Diagnostic Tests

To ensure non-spurious regression, the following diagnostic procedures were carried out.

3.5.1. Breusch-Godfrey Serial Correlation LM Test

One of the most frequent tasks in empirical studies is to check for autocorrelation in a time series. This test was created as a result of Breusch and Godfrey's (1978) work. In contrast to the Durbin-Watson test of serial correlation, the Breusch-Godfrey Serial Correlation LM test is the most commonly used test of serial correlation. If the dependent variable in the study has lagged values, Durbin's son test is invalid. Furthermore, higher-order serial correlations cannot be analyzed using the Durbin-Watson statistic. The Breusch Godfrey Serial Correlation LM test was used in this investigation because it works well with higher levels of serial correlation, including AR (1), AR (2), AR (3), and R (p). For the purposes of this study, two situations were taken into consideration. The LM serial autocorrelation test for the transformed LM test is provided by:

$$LM = n- \dots\dots\dots (3.14)$$

where m is the number of restrictions and K is the number of estimated coefficients.

When there is the lagged dependent variable, LM test statistics is given as: -

$$LM \approx \chi^2 \dots\dots\dots (3.15)$$

Where, should be obtained from the regression result.

In this study there is a suspect that that ut is first order serially correlated and thus the LM test equation to be applied is

$$ut = \rho_1 + ut-1 + \varepsilon_t \dots\dots\dots (3.16)$$

Here, $N(0, \delta^2)$ and $t = 1993 \text{ to } 2023$ Where, ε_t represent error term which is first order serially correlated

When ut is above first ordered this LM test can be used which is another advantage of Breusch Godfrey Serial Correlation LM tests.

$$= \rho_1 - 1 + \rho_2 - 2 + \rho_3 - 3 + \varepsilon_t \dots\dots\dots (3.17)$$

The Null hypothesis of Breusch-Godfrey Serial Correlation LM test is that

H0: $\rho_1 = 0$ meaning that there is no serial correlation while the alternative is

HA: $\rho_1 \neq 0$. The alternative hypothesis says that there is serial correlation in the model, which is undesirable. The LM test statistics and the associated probability determine whether to reject the null hypothesis.

We do not reject the null hypothesis if the probability of the LM test is higher than 5%. This suggests that the model is devoid of serial correlation, which indicates that the desired outcome and the model are good and suitable for use in forecasting and additional analysis. Serial correlation is an issue with the model, though, if the null hypothesis is rejected with a probability of less than 0.05.

3.5.3. The Breusch-Pagan test for Heteroscedasticity

Heteroscedasticity, which is true variance and covariance even when the ordinary least squares estimator is unbiased, is a significant risk when doing regression analysis. In order to address the issue of heteroscedasticity in linear models, Breusch and Pagan created this test in 1979. By using this test, one can determine whether the estimated variance of the residuals is influenced by the explanatory factors' values. At this point, heteroscedasticity can be said to exist.

The following is one possible format for the Breusch-Pagan test for heteroscedasticity in multivariate time series:

$$Y_i = \beta_0 + \beta_1 x_i + \dots + \beta_k x_{ik} + u_i \dots\dots\dots (3.18)$$

Where, Y_i is the dependent Variable, β s elasticity and $X_i \dots X_{ik}$ are explanatory variables, and u_i is stochastic error term

The model's variance, $\text{Var}(u_i) \neq \text{const}$, which represents the functions of the study's explanatory variables, is now the suspect.

The alternative hypothesis in the heteroscedasticity test was heteroscedasticity, while the null hypothesis was that the model was homoscedastic. The following explanation applies to this:

H0: $\sigma^2_i = \text{constant}$: there is homoscedasticity

HA: $\sigma^2_i \neq \sigma^2$: Heteroscedasticity

The Breusch-Pagan test static for heteroscedasticity, which is provided below, determines whether to reject the null hypothesis.

$$LM_{**} = ESS \dots \dots \dots (3.19)$$

Whereas the sum of squares in the regression typically explains ESS, the probability should, as usual, also be taken into account in the heteroscedasticity test. When the model is suitable for predicting and desired, it is not necessary to reject the null hypothesis of homoscedasticity. A constant variance (homoscedasticity) in the model is thus implied when the probability associated with the LM_{**} test is more than 5% and H_0 is not rejected. Other than that, the model features heteroscedasticity and no constant variance.

3.5.4. Jerque Bera Normality Test

In time-series analysis, this test of Normality is one of the most commonly used tests. In 1987, Jerque and Bera devised the Jerque-Bera histogram normality test. Jerque Bera's test of Normality uses skewness and kurtosis in a multivariate econometric analysis. Because of the Jerque–Bera normality test's full power and widespread use in multivariate empirical research, this study also used it to verify that the study model was normal. The Jarque–Bera test of normality, named for Carlos Jarque and Anil K. Bera, also offers the benefit of offering a goodness-of-fit test to determine whether the skewness and kurtosis of time-series data match those of a normal distribution. A multivariate time series' main skewness can be found as:

$$S = \dots \dots \dots (3.20)$$

The multivariate time series' skewness is represented by S,

And Win stands for the elements of matrix W

$$W = UU \dots \dots \dots (3.21)$$

Where U stands for the matrix of remainders derived from the equation's variable estimation.

SU shows the upper triangular matrix

And, the major of multivariate Kurtosis is given as

$$K = \dots \dots \dots (3.20)$$

Where K is the Jerque Bera normality test's Kurtosis.

W stands for matrix W elements.

The null hypothesis in the Jerque Bera normality test

(Ho) is that time series data is normally distributed while the alternative hypothesis

(HA) is that they are not normally distributed. In the Jerque–Bera normality test, the rejection of H_0 therefore indicates that the model in question is not normal. It is implied that the model is normal and desirable in the analysis and forecast, though, if the null hypothesis is not rejected. In Jerque Bera, the likelihood associated with the test determines whether H_0 is rejected. If the test's probability is less than 0.05, the H_0 of Jerque Bera ought to be disregarded. It is appropriate to reject the H_0 of Jerque Bera if the test's associated probability is less than 0.05. If the probability is larger than 0.05, H_0 cannot be rejected and the model is normal; otherwise, the null hypothesis will be accepted, suggesting that normality is absent. With respect to the quantity of observations, the Jerque Bera test was computed as follows.

3.5.5. Model Stability Diagnostic

One of the most crucial econometric analytical jobs is stability diagnostics.

CHAPTER FOUR

RESULTS AND DISCUSSIONS OF THE FINDINGS

This chapter presents and discusses the findings of an econometric analysis of annual time series data from the World Development Indicator (WDI), as well as annual reports and published studies from 1993 to 2023, in an effort to investigate the relationship between unemployment and macroeconomic determinants in Ethiopia.

4.1 A Descriptive Analysis

4.1.1. Unemployment rate in Ethiopia

As the skilled labor population graduated from Ethiopia's vastly enlarged universities and colleges, labor supply outpaced demand despite robust economic expansion. Both the public and private sectors make minimal contributions to labor force employment. The nation's unemployment rate for educated workers is rising. In Ethiopia, neither the industrial sector nor the agricultural sector can take in unskilled workers. The employment challenge for Ethiopia is rooted in its inability to diversify its economy and promote productive employment, along with the fast-growing labor force. Consequently, there is growing interest in pro-employment sectoral policies within integrated policy frameworks aimed at generating employment and having more inclusive growth paths. The unemployment trend In Ethiopia from 1993 to 2023 is shown in figure.



Figure 4. 1 unemployment trend in Ethiopia (1993-2023)

Source: Own computation from Stata 13 soft ware

According to Figure 4.1, the overall unemployment rate increased between 19993 and the 2000s before declining in the 2010s. When compared to other years, the unemployment rate was greatest in 2020's.

4.1.2 Unemployment and Macroeconomic Determinants in Ethiopia (1993-2023)

Recently, Ethiopia is among the African nations that have had strong economic growth in the last ten years. In contrast to the typical growth rates of Sub-Saharan nations, the average growth rate from 2003–04 to 2015–16 was 11% (NPC, 2015/16). Employment creation and labor intensity are important considerations in Ethiopian development strategies and sectoral targeting when deciding which sectors should receive priority in governmental initiatives.

Ethiopia has a sizable labor force, similar to the majority of developing nations. It is now commonly acknowledged that, when properly mobilized and utilized effectively, labor is an essential resource.

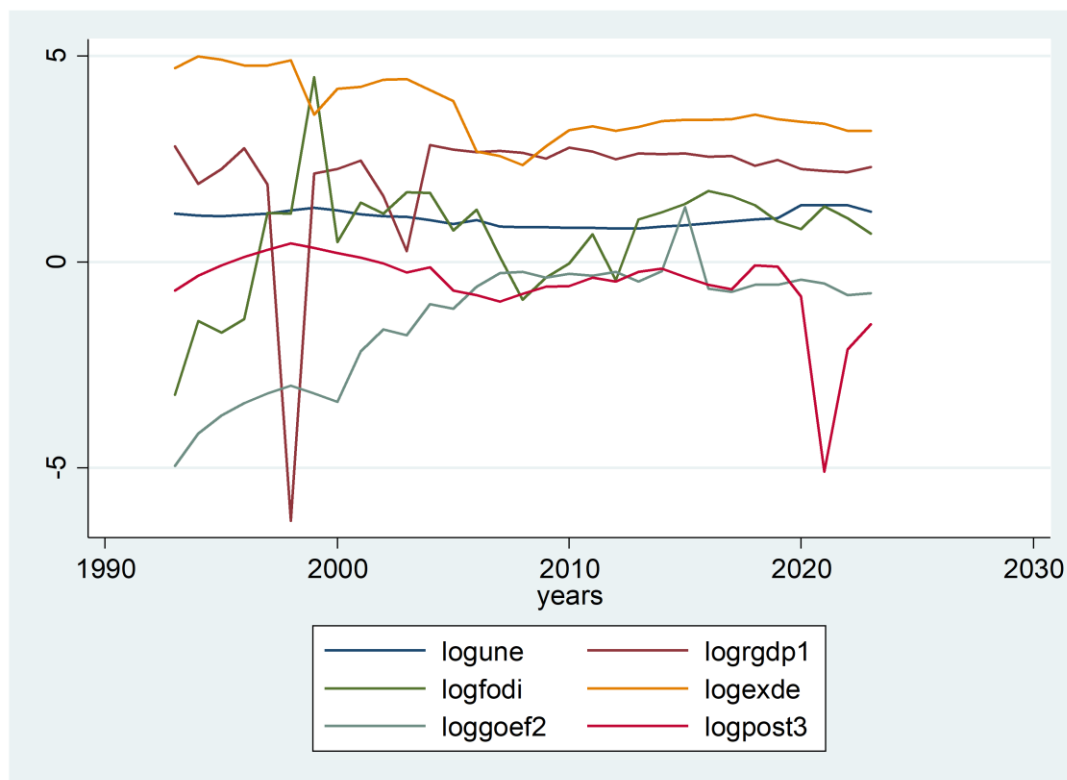


Figure 4. 2 Unemployment and macroeconomic determinants in Ethiopia (1993-2023)

Source: Own computation from Stata 13 soft ware

4.2. The Unit Root Test of Variables in Study

It is often known that one of the main issues with studying econometric correlations between variables is spurious regression.

Because stationary data are necessary for analysis, the unit root test is one of the essential requirements of econometric studies, as was stated in the methodology section. If the data are not steady, they show relationships between the variables that do not exist and have no explanation. The sequence in which the variables are integrated is crucial in attempting to solve this issue. The order of variable integration is ascertained using the unit root test.

A visual visualization of the time series in the study is usually advised before the formal unit root test. These kinds of graphical plots can offer preliminary hints regarding the probable characteristics of the time series.

This kind of trend in the series raises the possibility that the mean of all the variables mentioned above is fluctuating, which could indicate that they are not stationary at their level. In econometric research, this intuitive sense serves as a crucial foundation for more formal assessments of unit roots.

Formally, both ADF and PP were used in this study's unit root test. The outcomes of the Phillips-Perron and Augmented Dickey-Fuller unit root tests are covered in this section. The results of the PP unit root test at level and first differencing are displayed in Tables 4.3 and 4.4, respectively, while the ADF unit root test results are displayed in Tables 4.1 and 4.2 below.

Table 4. 1 Results of ADF unit root tests at level

Variables	Augmented Dickey Fuller (ADF)Test Equation (Level)				None	5% Critical Value
	Constant	5% Critical Value	Trend	5% Critical Value		
LOGUNE	-0.046**	-1.950	-1.089**	-3.544	-1.297**	-2.989
LOGRGDP	-1.610**	-2.654	-2.800**	-3.548	-2.941**	-2.992
LOGFODI	-1.914**	-1.950	-2.562**	-3.584	-2.867 **	-2.989
LOGEXDE	-1.238**	-1.950	-1.905**	-3.548	-1.207**	-3.000
LOGGOEF	-1.734	-1.950	-1.272**	-3.584	-2.367**	-2.989
LOGPOST	-1.856	-1.950	-3.484**	-3.584	-2.368**	-2.989

Source: Own computation from Stata 13 soft ware

Note ** Shows that the unit root (the null hypotheses) is not rejected at the 1%, 5%, and 10% levels of significance.

The critical values for constant are -2.652 and -1.602 for 1% and 10% levels of significance, respectively.

The critical values for trend are -2.654, and -1.602 for 1% and 10%, respectively.

And the critical values for none are -3.723 and -2.625 at 1% and 10% levels, respectively.

Table 4. 2 Result of ADF Unit root Test Result at the First Difference

Variables	Augmented Dickey Fuller (ADF) Test Equation (First Difference)						I(d)
	Constant	5% Critical Value	Trend	5% Critical Value	None	5% Critical Value	
LOGUNE	-2.707*	-1.950	-4.581*	-3.584	-4.589*	-2.989*	I (1)
LOGRGDP	-6.177*	-1.950	-5.937*	-3.588	-6.057*	-2.992*	I (1)
LOGFODI	-3.881*	-1.950	-3.939*	-3.588	-3.840*	-2.992*	I (1)
LOGEXDE	-3.313*	-1.950	-5.742*	-3.584	-3.380*	-2.992 *	I (1)
LOGGOEF	-4.665 *	-1.950	-5.947*	-3.588	-6.720*	-2.989*	I (1)
LOGPOST	-5.149 *	-1.950	-5.326*	-3.588	-6.786*	-2.989*	I (1)

Source: Own computation from Stata 13 soft ware

At the 1%, 5%, and 10% levels of significance, the null hypothesis (that is, the variables are stationary) is rejected.

For the 1% and 10% levels of significance, Constant's critical values are -2.655 and -1.601, respectively.

For 1% and 10%, the critical values are -4.352 and -3.233, respectively, for the constant and trend. Additionally, at the 1% and 10% levels, the critical values for none are -3.730 and -2.626, respectively.

The null hypothesis in the Augmented Dickey-Fuller unit root test is that the series has a unit root, while the alternative hypothesis is that it does not. While the ADF test showed extremely highly significant findings at the first differencing, it is conceivable to declare that all series at their level failed to reject the null hypothesis.

The null hypothesis could not even be disproved at the 10% significance level at their level. However, when variables are different, even at the 1% significance level, the variables strongly reject the null hypothesis.

Clearly, the variables are stationary at their initial differencing but not at their level according to the Augmented Dickey Fuller's unit root test. In order to identify the ADF test's shortcomings, I intend to cross-check the ADF results in this study using the Phillips-Perron unit root test. The PP test is an alternate technique to the ADF that makes use of non-parametric bandwidth modification. Below are the PP unit root test findings at both their levels and in their first differencing.

The results of the PP test at the series level are displayed in Table 4.3, and next The PP test for unit root for the variables' initial differencing is displayed in Table 4.4.

Ho: Unit root, which is not stationary

H1: Stationary Unit Root Absent

Table 4. 3 Results of PP Unit Root tests of Variables at level

Variables	Phillips-Perron (PP) unit Root Test Equation (Level)					
	Constant	5% Critical Value	Trend	5% Critical Value	None	5% Critical Value
LOGUNE	-0.049*	-7.380	-2.991*	-18.280	-3.522*	-12.660
LOGRGDP	-4.331*	-7.380	-18.097*	-18.280	4.29*	-12.660
LOGFODI	4.36*	-7.380	-14.706*	-18.280	3.889*	-12.660
LOGEXD	-0.554*	-7.380	-7.723*	-18.280	-4.692*	-12.660
LOGGOEF	-3.800 *	-7.380	-6.052*	-18.280	-4.638*	-12.660
LOGPOST	4.62*	-7.380	-17.817*	-18.280	-11.826*	-12.660

Source: Own computation from Stata 13 soft ware **Note:** * denotes that the PP test at the 1%, 5%, and 10% levels of significance contains unit root (non-rejection of the null hypothesis).

For the 1% and 10% levels of significance, the critical values for constant are -12.100 and -5.340, respectively.

The trend's critical values are -23.140 for 1% and -15.840 for 10%, respectively. Additionally, at the 1% and 10% levels, the critical values for none were -17.472 and -10.280, respectively.

Table 4. 4 The Result of the Phillips- Perron Unit Root Test (first Differencing)

Variables	Phillips-Perron (PP) unit Root Test Equation (First Differencing)						I(d)
	Constant	5% Critical Value	Trend	5% Critical Value	None	5% Critical Value	
LOGUNE	-26.844*	-7.364	-29.039*	-18.204	-26.926*	-12.628	I(1)
LOGRGDP	-39.745*	-7.364	-39.750*	-18.204	-39.744*	-12.628	I(1)
LOGFODI	-41.372*	-7.364	-42.600*	-18.204	-41.720*	-12.628	I(1)

LOGEXDE	-31.132*	-7.364	-31.853*	-18.204	-31.734*	-12.628	I(1)
LOGGOEF	-33.086*	-7.364	-37.108*	-18.204	-34.626*	-12.628	I(1)
LOGPOST	-35.607*	-7.364	-35.759*	-18.204	-35.616*	-12.628	I(1)

Source: Own computation from Stata 13 soft ware

Note: * indicates that the null hypothesis—that is, that the variables are stationary—is rejected at the 1%, 5%, and 10% levels of significance.

For the 1% and 10% levels of significance, the critical values for constant are -12.060 and -5.332, respectively.

The critical values for trend and constant are -15.792 and -23.012, respectively, for 1% and 10%. At the 1% and 10% levels of significance, the critical values for none are -17.472 and -10.280, respectively.

Ho: The presence of unit root test (non-stationary)

H1: The Absence of unit root test (Stationary)

The alternative hypothesis in the Phillips-Perron unit root test is that there are no unit roots in the relevant series, while the null hypothesis is that there is a unit root. The PP offers the benefit of cross-checking and identifying the limitations of the ADF test, even if the null and alternative hypotheses of the ADF and PP are identical.

The null hypothesis of the unit root at the level in the PP is also not rejected, as was mentioned in the case of the ADF test. At a level of 10%, none of the series are even noteworthy. Since obtaining a stationary time series for analysis is the primary goal, the variables are different. The first difference among the variables, however, caused each series to become stationary when the Phillips-Perron unit root test was used. Although the 5% threshold of significance is typically taken into consideration, all variables become significant even at the 1% level.

In general, the unit root tests show that variables are not level-stationary and need to be differenced in order to make the data in the analysis stationary. Consequently, the data's first differencing is stationary. The ADF and PP unit root tests both unequivocally verify this fact. Stated differently, both tests confirmed that the variables are stationary at their first difference but have unit roots at the level. The conclusion that variables are stationary at their initial difference and, hence, I (1), is now safe and adequate. A heterogeneous order of integration throughout the study does not affect the Johansen test for co-integration because the data are verified for stationarity.

4.3. Akaike Information Criteria (AIC) of Lag Length Selection

The choice of lag length is actually one of the most crucial econometric analysis mechanisms, much like the unit root test, since variations in the number of lags can alter the analysis's findings and the conclusions and policy recommendations that are derived from empirical research.

As shown in Table 4.5 below, an AIC is utilized in this study since it is the most well-known and backed by the majority of the criteria.

VAR Lag Order Selection Criteria								
Endogenous variables: Logunelogrgdplogfodilogexde Loggoef Logpost								
Exogenous variables: C								
Date:02 /04/ 25 Time: :35								
Sample: 1993 TO 2023								
Included observations:31								
Lag	LogL	LR	df	P	FPE	AIC	SC	HQ
0	-155.983				.00655	11.9987	12.0843	12.2867
1	-75.6421	160.68	36	0.000	.000264	8.71423	9.31362	10.73
2	-16.979	117.33	36	0.000	.000077	7.03548	8.14863	. 10.779
3	7631.73	575.37*	36	0.000	2.4e-06	2.03947*	3.66638*	7.51078*
4	.	.	36	.	0*	.	.	
* Indicates lag order selected by the criterion								
LR: sequential modified LR test statistic (each test at 5% level)								
FPE: Final prediction error								
AIC: Akaike information criterion								
SC: Schwarz information criterion								
HQ: Hanna-Quinn information criterion								

Table 4. 5 The Selection of Lag Order Using AIC

Source: Own Computation from Stata 13.0 econometric software

The Akaike information criterion suggests a lag order of 3, which is supported by most other selection criteria, including the Hannan-Quinn information criterion (HQ), Schwarz information criterion (SC), and sequential modified LR test statistic (LR), as shown in Table 4.5. Only the final prediction error chose lag 4, which is not in agreement with the majority. Consequently, the analysis was conducted using Lag 3.

4.4. Analysis of Co integration: The Johansen Test for Co Integration

The unit root test and lag length selection are followed by the Johansen test for co-integration in the majority of econometric and empirical studies. Currently, it is seen that the study's variables are integrated of order one; hence, I (1). ADF and PP unit root tests verified this. The

number of cointegrating vectors in the model is the next query. This question was addressed by Johansen Co-integration, which was carried out for this reason. The maximum eigenvalue statistics and trace tests were carried out using the methods suggested by Johansen and Juselius (1990).

Because it yields various findings for varying numbers of lags, the co-integration test is actually highly sensitive to the number of delays chosen. As recommended by the criterion, the lag number employed in this study is 3, and the lag was chosen by the AIC in order to reflect the issue of sensitivity of the Johansen test. Trace statistics and maximum Eigen value statistics with a 5% critical value were employed in the co-integration test. (See below, Table 4.6).

Table 4. 6 The Trace Statistics Result of Johansen Test of Co-integration

Hypothesized No. of CE(s)	Eigen value	Trace Statistic	0.05 Critical Value
None *	.	210.2817	94.15
At most 1	0.96999	112.1045	68.52
At most 2	0.83662	61.3783	47.21
At most 3	0.63395	33.2390	29.68
At most 4	0.55354	10.6598*	15.41
At most 5	0.23999	2.9760	3.76
At most 6	0.10083		.

Source: Own estimation from Stata 13.0 software using time series data, 2025

The trace statistics value indicates that there are at least four co-integrating equations because the Johansen's test value of 10.6598 is less than the crucial value of 15.41, as shown in Table 4.6 above.

Because the likelihood is higher than 5%, the null hypothesis that there are at least four cointegrating vectors cannot be rejected at this time; therefore, the null hypothesis that there are at least four co integrating equations will be accepted. Because the Johansen test value of 105.4075 is higher than the critical value finding of 66.52, the null hypothesis that there is no co-integration is rejected for trace statistics.

However, the existence of a long-term relationship between unemployment and the explanatory factors cannot be sufficiently established by the rejection of the null hypothesis under trace statistics alone.

When the results of the trace and maximum eigenvalue tests support the same hypothesis, the long-run model can be applied safely. Table 4.7 below displays the results of the Maximum Eigen value statistics, which are also presented for one cointegrated equation at the 5% level of significance.

Ho: There is at least one co-integration vectors

H1: There is no one co-integration Vectors

Table 4. 7 the Maximum Eigen Value Result of Johansen Co-integration

HypothesizdNo. of CE(s)	Eigen value	Max-Eigen Statistic	0.05 Critical Value
None *	.	98.1772	39.37
At most 1	0.96999	50.7262	33.46
At most 2	0.83662	28.1392	27.07
At most 3	0.63395	22.5792	20.97
At most 4	0.55354	7.6838	14.07
At most 5	0.23999	2.9760	3.76
At most 6	0.10083		

Source: Own Computation from stata 13.

The number of cointegrated equations indicated by the trace statistics is further supported by the findings of the maximum eigenvalue statistics (Table 4.7).

The null hypothesis cannot be rejected because the maximum Eigen value statistic result, 7.6838, is less than the equivalent 5% critical value, 14.07. Since the critical value of the 5% result, 7.6838, is less than 14.07, the null hypothesis that there is no co-integration for the highest Eigen value is rejected.

Because the variables have long-term associations, it is now highly safe to conclude that they will move together in the long run. This suggests that there is a long-term relationship between Ethiopia's unemployment rate and the explanatory factors.

Table 4. 8 The Normalized Co-integration Coefficients (1 Co-integrated equation)

LOGUNE	LOGRGP	LOGFOI	LOGEDE	LOGGOEF	LOGPOST	C
1.0000	.0649516	.3635928	.1143449	-.2574234	-.9901394	-.534394
	[0.0000]	[0.0000]	[0.0000]	[0.0000]	[0.0000]	
	(.012806)	(.015341)	(.023375)	(.014591)	(.0456941)	

Source: Own Computation from Stata 13.0, using time series data, 2016

Note: The coefficients' significance at the 5% and 10% levels is denoted by ** and ***, respectively. The p-values are indicated by the numbers in [], while the standard errors are displayed by the values in (). C doesn't change.

As Table 4.8, the overall macroeconomic variables considered in this study significantly explain unemployment in Ethiopia.

4.4.1 Relationship between Unemployment and Macroeconomic Variables results interpretation in the long run

I) Unemployment and Real Gross Domestic product

In the long term, the normalized coefficients of variables are one of the benefits of using the Johansen test for co-integration. Even if in most cases negative relationship is expected, in contrast, Table 4.8 shows the long run effect of Real GDP on unemployment is positive and significant at 5% significance level. Other things being constant, as real GDP is increased by 1%, unemployment has leads to increase of 0.064951%, which reverses the Okun's Law, which describes the inverse relationship between GDP growth and unemployment.

It was unexpected and not in line with the previous anticipation that the RGDP showed a positive indication. This might have been the situation.

Creative Destruction: During periods of rapid growth and technological change, businesses might experience an "creative destruction" effect. This means that some jobs become obsolete

due to new technologies, leading to increased unemployment as workers in those roles are displaced, and unemployment can rise even during periods of economic growth if there are structural issues in the economy. For example, if the skills of the workforce do not match the demands of the growing economy, or if there are significant regional disparities in job opportunities, unemployment can persist even with high GDP growth, as well as an increase in unemployment during periods of rapid growth if the economy is experiencing a significant expansion that disrupts existing market structures. This finding is consistent with research by Micheni and Muturi (2019), which found that GDP growth and the unemployment rate have a strong negative association in the near term but a positive link in the long term. Muturi, W. (2019) demonstrates that GDP growth and the jobless rate both rise in the short and long terms.

II) Unemployment and Foreign Direct Investment

The relationship between foreign direct investment (FDI) and unemployment is one of the most controversial relationships in the economic literature, as there is no consensus on this relationship, and it differs from one country to another.

As seen in Table 4.8, the main finding is that there is a positive and statistically significant relationship between FDI and unemployment in the long run in Ethiopia. In this case, FDI statistically is significant at 1% level. Other things remaining constant, in the long run, unemployment increases by 0.3635928% as FDI increases by 1%.

In Ethiopia, several factors affect the negative relationship between them. This might be due to the fact that FDI is directed towards capital-intensive industries as well as short-term employment labor-intensive industries. As indicated in many studies, labor productivity is very low in Ethiopia compared to other developing countries; this low level of labor productivity results in foreign investors bringing foreign citizens to the host countries each year (Berhe et al.2017).

On the other hand, the impact of foreign direct investment on infant domestic firms may lead to an increase in their cost of production, hence minimizing the labor force that exacerbates the unemployment rate of the country; thus, the paper suggested that the government should be working to attract FDI in labor-intensive industries that rely on local products and expertise in sectors that do not provide only seasonal or short-term employment and improve the quality of labor by providing training programs that can improve their skills and add to their knowledge to increase the relative competitiveness of domestic labor.

This finding is the same as some studies Bayar and Sasmaz (2017) that observed a positive relationship between FDI and unemployment, where suggested that brownfield investment was the cause of a positive relationship between FDI and unemployment among 21 emerging economies. In case of Ethiopia, in the long run, unemployment increases by 0.42% as FDI increases by 1%. In Ethiopia, there are some factors that affect the negative relationship between unemployment and Foreign Direct Investment, Bekele (2019).

The positive impact and significance of foreign direct investment are also confirmed by empirical evidence, such as Palate et al. (2017) and Mucuk and Demirsil et al. (2019). Even while they were unable to determine whether the association was short-term, long-term, or both, other researchers have also discovered a positive correlation between FDI and unemployment. Macroeconomic Determinants of Unemployment in Africa: Tsaurai Kunofiwa (2020). All four of the econometric approaches used in this panel data analysis approach—fixed effects, random effects, pooled ordinary least squares, and dynamic generalized methods of moments—produced results indicating that foreign direct investment (FDI) increased unemployment on the African continent. The researcher suggested that African authorities make sure they put policies in place that guarantee FDI inflows result in lower unemployment rates on the continent.

III) Unemployment and External Debt

As expected, external debt has positive impact on unemployment in long run, and statistically significant at 1% level. Ceteris paribus, as one percent increase in external debt, leads to an increase in unemployment of 0.1143449% in the long run. Empirical results suggest that Ethiopia has a long history of debt revenue. Ethiopia has borrowed huge dollars from different institutions worldwide and is classified as a highly indebted country in Africa (Fekadu, 2014). Every year, the country is obliged to pay many dollars to external institutions, which retards the growth of the economy. Ohwofasa et al. (2018) also confirmed the positive impact of external debt on unemployment. Hence, the stock of external debt affects unemployment positively and significantly in Ethiopia and also has positive impact on unemployment both in short and long run and statistically significant at 1% level. A one percent increase in external debt leads to an increase in unemployment by 1.59% in the long run (Dejene bekele 2019).

IV) Unemployment and government effectiveness

As expected, Government Effectiveness has negative impact on unemployment in long run, and statistically significant at 1% level. Other things being constant, as government effectiveness is increased by 1%, unemployment is decrease by -0.26%.

Government effectiveness has a significant effect on unemployment rates. A more effective government can reduce unemployment by fostering economic growth, implementing policies that support job creation, and addressing structural factors in the labor market. Conversely, ineffective governance can hinder economic growth and lead to higher unemployment and others Positive Impact of Government Effectiveness are: Good Governance, Promoting investment, Reducing income inequality, Rule of Law, Regulatory Quality, Social Stability, Economic Growth, Skills Training and Labor Market Policies, and Social Safety Nets: Effective governments provide social safety nets, such as unemployment benefits and welfare programs, to support individuals during periods of unemployment and Negative Impact of Ineffective Governance prevent social unrest, Economic Instability, Corruption and Bureaucracy, Lack of Investment in Human Capital, Poor Policy Implementation: Ineffective governments may implement policies that are poorly designed or implemented, leading to unintended consequences and hindering economic growth and job creation. Generally, this study recommends that since the government's effectiveness plays a crucial role in shaping unemployment rates, the government should pay attention to effectiveness, which is measured by factors such as the rule of law, regulatory quality, and control of corruption that can significantly impact unemployment rates.

This finding aligns with those of Saidova (2023) and Zhong (2024); the findings from both the FGLS and GMM regression analyses shed light on the multifaceted relationships between governance quality, political inclusiveness, and unemployment in South Asian Countries. The results suggest that governance-related factors such as the rule of law and government effectiveness have a negative impact on unemployment.

This study illuminates the intricate interplay between governance quality, political inclusiveness, and unemployment in South Asian countries. The results indicate that governance-related factors such as the rule of law and government effectiveness significantly influence unemployment rates. Specifically, improved governance appears to correlate with lower unemployment levels, underscoring the vital role that strong institutions and effective governance play in shaping labor market outcomes.

V) Unemployment and political instability

Even if Political instability and unemployment rates have a complex relationship, this study suggests that political instability can contribute to higher unemployment and vice versa.

As expected, political instability has negative impact on unemployment in long run and statistically significant at 1% level. Other things being constant, as political instability is increase by 1%, unemployment is decrease by 0.9901394%.

Political instability affects unemployment in many ways: Reduced investment and job creation, discouraging investment, both domestic and foreign, decreased economic growth, reduced labor demand, social unrest and violence, increased risk of conflict, erosion of trust in government and subversive activities.

This result is the same as the result of (Azeng and Yogo 2018) political instability originates in high uncertainty, which may decrease labor demand and therefore increase unemployment.

4.4.2 The short run Dynamic Relationship between Unemployment and Macroeconomic determinants (Vector Error Correction Model).

Table 4. 9 the Result of short Run influence from Vector Error Correction Model

Error Correction: D (LOGune)				
Variables	Coefficient	Std. Error	t-Statistic	Prob.
Speed of Adjustment	-.3006298	.13088	-2.30	0.022
D (LOGUNE (-1))	.5088314	.3147742	1.62	0.106
D (LOGUNE (-2))	.5102914	.3593726	1.42	0.156
D (LOGRGDP (-1))	-.0245872	.0097185	-2.53	0.011
D (LOGRGDP (-2))	.001293	.0129847	0.10	0.921
D (LOGFODI (-1))	-.0633288	.0277391	-2.28	0.022
D (LOGFODI (-2))	-.0344781	.0158589	-2.17	0.030
D (LOGEXDE (-1))	.0039175	.069463	0.06	0.955
D (LOGEXDE (-2))	.0470285	.0595902	0.79	0.430
D (LOGGOEF (-1))	.0397934	.0389603	1.02	0.307

D (LOGGOEF (-2)	.0589251	.0314942	1.87	0.061
DLOGPOST (-1)	.2831146	.1033428	2.74	0.006
DLOGPOST (-2)	.3367747	.1113094	3.03	0.002
C	.0360312	.0175314	2.06	0.040

Source: Own Computation from stata 13

The long-term impact of explanatory factors on unemployment has been the main focus of the co-integration analysis. A vector error correction model was constructed in order to investigate the short-term impact of the explanatory variables on unemployment. Two significant benefits come from running an error correcting model. In addition to providing an estimated short-run coefficient, it can also indicate the rate of adjustment or the point at which short-run dynamics converge to the long-term. The speed of adjustment in this case is -0.3006298, indicating that the time series has fully adjusted to the long-run equilibrium. The short-term dynamic association between unemployment and explanatory factors for the studied time is displayed in Table 4.9.

As shown in Table 4.9, the short-run dynamics equilibrate to the long-run dynamics with the speed of adjustment (ECM). ECM (-1) is the lag value of one period of error terms that is determined from the long-run relationship. The value of ECM implies the process of adjustment is about 30.063% of the last year's disequilibrium in the dependent variable from its equilibrium path will be corrected in the current year. As expected, the sign of the ECM term is negative implies that approximately 30.063% of any movement into disequilibrium is corrected within one period. This confirms the convergence of the short-run equilibrium to the long-run (because the sign of the speed of adjustment (ECM) is negative and significant). Thus, the results confirm Samargandi, Fidrmuc, and Ghosh (2013). The ECM equation is as follows:

$$ECM = \ln UNE - (0.0245872 * \ln RGDP + (0.0633288 * \ln NFoDI + 0.0039175 * \ln Exde - 0.0397934 * goef + 0.2831146 * post$$

[0.011]
[0.022]
[0.955]
[0.307]
[0.006]

As indicated in Table 4.9, the long-run elasticities are higher than the short-run elasticities, implying that, in the long run, determinants are relatively more responsive in explaining unemployment than in the short run.

4.4.3 Relationship between Unemployment and Macroeconomic Variables and results interpretation in the short run

I) Unemployment and Real Gross Domestic product

The estimation result shows a negative and significant relationship between unemployment and economic growth in the short run, other things being constant: as real Gross domestic product increases by one percent, unemployment is reduced by 0.0245872 in the short run.

II) Unemployment and Foreign Direct Investment

As seen in the Table 4.9, foreign direct investment (FDI) and unemployment are related negatively in the short run; in this case, FDI is also statistically significant at 1% level. Other things being constant, as foreign direct investment increase by one percent foreign leads to unemployment by decrease 0.0633288% in the short run. This result is similar to the findings of (Dejene bekele, 2020) and (Sharif et al, 2022).

III) Unemployment and External Debt

Different forms expected external debt have positive impacts and statistically significant at 1% level of unemployment in short. Other things being constant a one percent increase in external debt leads to an increase in unemployment by 0.0039175% in the short run.

IV) Unemployment and government effectiveness

The same to prior expectations, as seen in the Table 4.9, government effectiveness (goef) and unemployment are related negatively in the short run; in this case, goef is also statistically significant at 1% level. Other things being constant, as government effectiveness increase by one percent leads to unemployment by decrease 0.0397934% in the short run.

V) Unemployment and political instability

The same as prior expectation, as seen in the Table 4.9, political stability (post) and unemployment are related negatively in the short run; in this cases post is also statistically significant at 1% level. Other things being constant, as political stability increase by one percent leads to unemployment by decrease 0.2831146% in the short run.

4.5 Model Diagnostic Tests

There is no doubt that diagnostic testing is the backbone of econometric analysis, as it helps to strengthen the variable. In addition, for any meaningful full research work, exemplification of analytical tools is very important. The model should be free from fear of spurious results.

4.5.1 Test of Residual Autocorrelation.

Since the null hypothesis that there is no auto correlation cannot be rejected with a given probability that is higher than the 5% level of significance, the model is free from any serial correlation. Up to lag three, the test's null hypothesis states that there is no autocorrelation. Therefore, it is reasonable to say that the model does not show serial correlation in the UNE model.

Table 4. 10 Autocorrelation Test

Lag	Chi2	DF	Prob > chi2
1	38.1324	36	0.37267
2	51.9311	36	0.4167
3	42.1982	36	0.22067

Source: Own computation stata econometric software 13

4.5.2 Normality test

Johansen points out that the log probability for the VECM is calculated under the presumption that the residuals are independently distributed and have the same normal distribution (Johansen, 1995). The model's residuals are jointly normally distributed, according to the null hypothesis. The table below reports the results of the Jarque-Bera test of normality.

Table 4. 11 Jarque Bera test result

Equation	chi2	df	Prob > chi2
D_logune	0.342	2	0.84275
D_loggdp	5.463	2	0.06513
D_logfodi	17.906	2	0.00013
D_logpexde	11.543	2	0.00312

D_loggoef	0.149	2	0.92819
D_logpost	8.941	2	0.01144
ALL	44.344	12	0.00001

Source: Own computation stata econometric software 13

The test statistics for all equations combined are shown in the Table's results, which refute the null hypothesis that the model's residuals are normally distributed. However, for the full model, the null hypothesis is rejected at the 5% level of significance.

4.5.3 Test for Heteroskedasticity

The decomposition of the IM test by Cameron and Trivedi was conducted in this study.

H0: homoscedasticity

H1: unrestricted heteroskedasticity

chi2 (20) = 26.61

Prob > chi2 = 0.1466

Table 4. 12 Cameron & Trivedi's decomposition of IM-test

Source	chi2	df	9
Heteroskedasticity	25.61	20	0.1266

Source: Own computation stata econometric software 13

The null hypothesis of the model's homoscedasticity is not rejected based on the above table because the probability associated with it is 0.1466, which is more than 0.05 (5%). However, heteroscedasticity is not a very serious issue in time series analysis.

4.5.4 Model Stability condition Test

The stability of the estimated VECM should also be evaluated. Stability is considered the strength of the model in econometric analysis. The stability of this study was established to strengthen its analysis. For stability, the moduli of the remaining r eigenvalues must be strictly less than unity.

Table 4. 13 Eigenvalue stability condition

Eigenvalue	Modulus
1	1
$-.7079721 + .4897836i$	.860879
$.1021521 + .8266834i$	.832971
$.1021521 + .8266834i$	.832971
$-.4227412 + .483271i$	.642076
$-.4227412 + .483271i$	.642076
$.3110014 + .4178845i$	.520912
$.3110014 + .4178845i$	.520912

The VECM specification imposes 4-unit moduli.

Source: Own computation stata econometric software 13

The above Table shows that the eigenvalues satisfy the stability condition. Therefore, the model was stable.

CHAPTER FIVE

CONCLUSION AND POLICY IMPLICATION

5.1. Conclusion

This study attempted to investigate the relationships between unemployment and explanatory variables in Ethiopia employing annual time-series data from 1993 to 2023 and a partial equilibrium analysis. It uses five variables and thirty observations.

Despite its rapid expansion, the Ethiopian economy faces significant challenges due to unemployment, one of the study's explained variables. Therefore, addressing the connection between Ethiopia's unemployment rate and macroeconomic factors is crucial since it establishes a starting point for developing a long-term solution. Furthermore, as unemployment is a complex macroeconomic phenomenon, reducing it supports economic growth.

The results of this study provide testament to the intricacy of the unemployment rate, particularly in developing nations like Ethiopia. Real domestic product, foreign direct investment, external debt, government effectiveness, and political instability are some of the macroeconomic factors that are linked to unemployment in Ethiopia.

According to the estimation results, political instability, government effectiveness, external debt, real domestic products, and foreign direct investment are all stationary in their initial differences but non-stationary at level. Both the ADF and PP tests verified this. Stated otherwise, the variables being examined are integrated in order one (I (1)). After determining that each variable had a unit root at levels, the current study used the Johansen co-integration analysis to determine whether a long-term relationship existed between the variables. It discovered that all of the explanatory variables were statistically significant at the conventional 5 percent level.

The findings reveal that there is a negative and significant relationship between Real GDP and foreign direct, a positive and significant relationship between government effectiveness and political instability, and a positive and insignificant relationship between external debt and unemployment in the short run. In the long run, there is a positive and statistically significant relationship between unemployment and gross domestic products, foreign direct investment (FDI), and external debt, and a negative and significant relationship between government effectiveness and political instability in the country for the period under examination.

5.2. Policy Implication

It is impossible to overlook the problem of unemployment in a modern economy. This is because governments in both wealthy and developing countries wish to keep unemployment under control. Authorities cannot overlook the consequences of unemployment in this area since it has a terrible impact on economic wellbeing, crime, the depletion of human capital, unhappiness, and social instability, and it impacts every person through an increase. According to the study, economic expansion is ineffective in attracting more unemployed people, and Ethiopia's unemployment rate cannot be successfully reduced by boosting GDP growth rates.

The following point of recommendations are given by the researchers.

- The government should address the appropriateness of each economic sector for the attractiveness of unemployed people, and Ethiopia should focus on the development of labor-intensive projects and consolidate new entrepreneurial entrants of current entrepreneurship operations to build more opportunities and absorb a wide pool of unemployed people.
- Moreover, a comprehensive approach should be taken by the government, which addresses both the structural challenges of the labor market and the underlying governance issues, and is essential for fostering sustainable economic development and improving the overall well-being of citizens.
- As nations navigate the complexities of unemployment in a rapidly changing global landscape, these insights can guide policymakers in crafting effective evidence-based strategies that yield positive outcomes for their populations.

In general, the report advises Ethiopia to employ smart policy interventions and appropriate planning in order to attain greater sustainable economic growth with real growth domestic product (RGDP) growth, foreign direct investment (FDI), external debt (EXD), political stability (POST), and government effectiveness (GOEF).

5.3. Recommending Further Studies

Without a doubt, this field needs extensive follow-up research because unemployment impacts everyone's daily lives. Furthermore, research into the variables influencing unemployment in every nation is ongoing. This is because unemployment one of the complicated phenomena with many faces.

In addition, in this globalized twenty-first century, every country wants to utilize the human resources of its nations and has a very high level of unemployment. These conditions show that there is wide room for further research in Ethiopia regarding this issue.

Other interesting researcher can improve this study with many ways: -

- Increase the time period,
- Trend of each variable,
- their short and long run causality,
- Look the influence of corruption and climate change by considering them as dummy variable,
- Alternatively looking this study by including other African countries,

They can study the impacts of inequality in the economy, which leads to a difference in income per capita, and finally affect the unemployment rate in the country.

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APPENDIX

Annex 1: The Maximum Eigen Value Result of Johansen Co Integration

Hypothesized No. of CE(s)	Eigen value	Max-Eigen Statistic	0.05 Critical Value
None *	.	98.1772	39.37
At most 1	0.96999	50.7262	33.46
At most 2	0.83662	28.1392	27.07
At most 3	0.63395	22.5792	20.97
At most 4	0.55354	7.6838	14.07
At most 5	0.23999	2.9760	3.76
At most 6	0.10083		

Annex 2: The short run Dynamic Relationship between Unemployment and Macroeconomic determinants (Vector Error Correction Model).

Error Correction: D (LOGune)				
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Speed of Adjustment	-.3006298	.13088	-2.30	0.022
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D (LOGRGDP (-1))	-.0245872	.0097185	-2.53	0.011
D (LOGRGDP (-2))	.001293	.0129847	0.10	0.921
D (LOGFODI (-1))	-.0633288	.0277391	-2.28	0.022

D (LOGFODI (-2))	-.0344781	.0158589	-2.17	0.030
D (LOGEXDE (-1))	.0039175	.069463	0.06	0.955
D (LOGEXDE (-2))	.0470285	.0595902	0.79	0.430
D (LOGGOEF (-1))	.0397934	.0389603	1.02	0.307
D (LOGGOEF (-2))	.0589251	.0314942	1.87	0.061
DLOGPOST (-1)	.2831146	.1033428	2.74	0.006
DLOGPOST (-2)	.3367747	.1113094	3.03	0.002
C	.0360312	.0175314	2.06	0.040

Statistical Behavior of the Model

R-squared	Mean dependent variable	
Adjusted R-squared	S.D. dependent variable	
S. E. of regression	Akaike information criterion 8.99035	
Sum squared residual	Schwarz criterion 11.4892	
Log likelihood -77.36008	Hannan-Quinn criterion. 9.772959	
F-statistic	Durbin-Watson stat	
Probability(F-statistic)		

Annex 3: The Normalized Co integration Coefficients (1 Co-integrated equation)

LOGUNE	LOGRGP	LOGFOI	LOGEDE	LOGGOEF	LOGPOST	C
1.0000	.0649516	.3635928	.1143449	-.2574234	-.9901394	-.534394
	[0.0000]	[0.0000]	[0.0000]	[0.0000]	[0.0000]	
	(.012806)	(.015341)	(.023375)	(.014591)	(.0456941)	

Annex 4: Jarque Bera test result

Equation	chi2	df	Prob > chi2
D_logune	0.342	2	0.84275
D_loggdp	5.463	2	0.06513
D_logfodi	17.906	2	0.00013
D_logpexde	11.543	2	0.00312
D_loggoef	0.149	2	0.92819
D_logpost	8.941	2	0.01144
ALL	44.344	12	0.00001

Annex 5: Autocorrelation Test

Lag	Chi2	DF	Prob > chi2
1	38.1324	36	0.37267
2	51.9311	36	0.04167
3	42.1982	36	0.22067

Annex 6: Eigenvalue stability condition

Eigenvalue	Modulus
1	1
-.7079721 + .4897836i	.860879
.1021521 + .8266834i	.832971
.1021521 + .8266834i	.832971
-.4227412 + .483271i	.642076

$-.4227412 + .483271i$	.642076
$.3110014 + .4178845i$	.520912
$.3110014 + .4178845i$	.520912