



ADDIS ABABA UNIVERSITY

SCHOOL OF POSTGRADUATE STUDIES

DETERMINANTS OF UNEMPLOYMENT IN ETHIOPIA

ZERU NIKEDIMOS

June, 2023

Addis Ababa, Ethiopia

ADDIS ABABA UNIVERSITY
SCHOOL OF COMMERCE
DEPARTMENT OF ECONOMICS

DETERMINANTS OF UNEMPLOYMENT IN ETHIOPIA

ZERU NIKEDIMOS

THESIS SUBMITTED TO ADDIS ABABA UNIVERSITY COLLEGE OF BUSINESS AND
ECONOMICS SCHOOL OF COMMERCE IN PARTIAL FULFILLMENT OF THE
REQUIREMENTS FOR THE AWARD OF MASTER OF SCIENCE DEGREE IN
DEVELOPMENTAL ECONOMICS

ADVISOR: BERHANU DENU (Ph.D.)

June, 2023

Addis Ababa, Ethiopia

DECLARATION

I, **ZERU NIKEDIMOS**, declare that this research paper entitled “Determinants of Unemployment in Ethiopia” is my original work submitted for the award of the fulfillment of the requirement for the degree of Master of Science in development economics at Addis Ababa University. It has not been presented for the award of any degree or other similar titles in any other institutions of higher learning to the best of my knowledge, and all resources used have been duly acknowledged.

Student _____

signature _____

Date _____

Place of Submission: School of commerce, AAU

Addis Ababa, Ethiopia

STATEMENT OF CERTIFICATION

Here with, I state that Zeru Nikedimos has carried out this research work entitled '**Determinants of Unemployment in Ethiopia**' under my supervision. This study is original in nature and has not been presented for a degree in any university, which all sources of materials used for the study have been duly acknowledged and it is sufficient to submit for the partial fulfillment of Master of Science in Development Economics.

Advisor:

Name: Berhanu Denu (PhD)

Signature

Date

Addis Ababa University
School of Commerce
Department of Economics

This is to certify that the thesis prepared by Zeru Nikedimos entitled **‘Determinants of Unemployment in Ethiopia’** submitted in partial fulfillment of the requirements for the Degree of Master of Science in Development Economics complies with the regulations of the university and meets the accepted standards with respect to originality and quality.

Approved by board of Examiners:

Department Head	Signature	Date
_____	_____	_____
Advisor	Signature	Date
_____	_____	_____
Internal Examiner	Signature	Date
_____	_____	_____
External Examiner	Signature	Date
_____	_____	_____

ACKNOWLEDGMENT

First of all, I would like to thank almighty God for his endless protection in accomplishing my study. Next, I would like to express special gratitude to my advisor **Dr.Berhanu Denu**, for his constructive, critical and valuable comments through the research work and professional support and guidance that made this work possible.

I would like to extend my special thanks to Mulugeta Gadissa, Abebe Fekadu , Tesfaye Geleta and Fantahun Aynalem for their contribution to advising and providing information.

I am also largely beholden to thank Fantaw biyargo, Melakamu, and Tadesse for their contribution in directing and discussing the application of ARDL model and dealing with the Stata software.

I need to acknowledge also my beloved family, my mother, (Hadera Abay) my father (Nikedimos Tesfay), and My beloved uncle (Ato Alemseged Hailu) for their advice and financial assistance.

I am also indebted to thank Ephrem, Muez and Tewolde for their comment and discussion on my thesis. Furthermore, I would like to say thank you to my wife (Tesfanesh Amare) and my kids (Edrias Zeru, Yohannes Zeru, and Momona Zeru) for your love and assistance throughout my Master's study.

Finally, my thanks also go to all my brothers and sisters Mr. Ephrem Atakliti , Muez Tesfay and Tewolde Yohannes . Metselal, Aster, Absara, Helen and Hewan.

My colleagues, Hailmecheal, Birhan, Neway, Zelalem, Getachew, Biniam and Tamru thank you so much for your cooperation when I need your help.

Table of Contents

DECLARATION	i
STATEMENT OF CERTIFICATION.....	ii
ACKNOWLEDGMENT.....	iv
LIST OF TABLES AND FIGURES.....	vii
ACRONYMS.....	ix
ABSTRACT.....	x
CHAPTER ONE: INTRODUCTION	1
1.1 Background of the Study	1
1.2 Statement of the Problem.....	2
1.3 Objectives of the Study	5
1.3.1 General Objective	5
1.3.2 Specific Objectives of the Study.....	5
1.4 Research Questions.....	5
1.5 Significance of the Study	5
1.6 Scope and Limitations of the Study	6
1.7 Organization of the Study	7
CHAPTER TWO: REVIEW OF RELATED LITERATURE.....	8
2.1 Theoretical Literature Review	8
2.1.1 Concepts and Definitions of Unemployment.....	8
2.1.2 Views on Unemployment from Schools of Thought	9
2.1.3 Unemployment: Causes, Costs, and Overview	13
2.2 Empirical Literature Review.....	14
2.2.1 Unemployment in Ethiopia	14
2.2.2 Unemployment and Its Determinants.....	15
2.2.3 At World Level	22
2.2.4 At Africa Level	22
2.2.5 At Ethiopian Level.....	23
2.3 Conceptual Framework of the Study	24
CHAPTER THREE: RESEARCH METHODOLOGY.....	26
3.1 Research Design.....	26
3.2 Research Approach	26

3.3 Data Types, Sources and Methods of Data collection	26
3.4 Method of Data Analysis	26
3.4.1 Specification of the Model.....	27
3.4.2 Pre-Estimation Tests	28
3.4.3 Autoregressive Distributed Lag (ARDL) regression model	30
3.4.4 Non-Linear ARDL (NARDL) Regression Model	31
3.4.5 Definition, Measurement and Hypothesis of the variables under Study.....	33
3.4.6 Post-Estimation tests: Model Diagnostic Tests for ARDL and NARDL models	35
CHAPTER FOUR: RESULTS AND DISCUSSIONS	36
4.1 Overview of the Unemployment Rate in Ethiopia	36
4.1.1 The Relationship between Unemployment Rate and Economic growth rate.....	37
4.1.2 Unemployment Rate and inflation relationship	39
4.1.3The relationship between Unemployment rate and Real effective exchange Rate	40
4.1.4. The relationship between Unemployment and Foreign direct investment.....	41
4.1.5 Descriptive Statistics of the Study Variables	43
4.2 Econometrics Analysis.....	44
4.2.1 Results of Pre-Estimation Test.....	44
4.2.2 Linear ARDL Model Results	45
4.2.3 Non-Linear ARDL Model Results	51
CHAPTER FIVE	54
SUMMARY OF THE FINDING, CONCLUSION AND POLICY RECOMMENDATION.....	54
5.1 Summary of the Findings.....	54
5.2 Conclusion	55
5.2 Policy Recommendations.....	56
REFERENCES	58
APPENDICES	63

LIST OF TABLES AND FIGURES

List of Tables

Table 3.1 Diagnostic tests	33
Table 4.1 summary statistics of the study variables (1990 to 2021).....	43
Table 4.2 Unit Root Test.....	44
Table 4.3 ARDL Bounds cointegration test results	45
Table 4.4 ARDL linear Model Result.....	49
Table 4.5 Non Linear ARDL result	52

List of figures

Figure 2.1 classical unemployment	9
Figure 2.2 conceptual framework	24
Figure 4.1 Trend of Unemployment Rate in Ethiopia	37
Figure 4.2 Trend and relationship between Unemployment rate and Economic growth rate	39
Figure 4.3 Trend and Relationship between Unemployment rate and inflation	40
Figure 4.4 Trend and relationship between Unemployment rate and real effective exchange rate	41
Figure 4.5: Trend and relationship between Unemployment and Foreign direct investment.....	42
Figure 4. 6 CUSUM and CUSUM square stability tests (Unemployment rate equation)	50
Figure 4.7: CUSUM and CUSUM square stability tests (Non-Linear ARDL model)	53

ACRONYMS

ARDL	Autoregressive Distributed Lag Model
BRIC	Brazil, Russia, India, and China
ETB	Ethiopian Birr
REER	Real Effective Exchange Rate
GDP	Gross Domestic Product
FDI	Foreign Direct Investment
ETTO	Ethiopian Tourism and Trade Organization
ILO	International Labor Organization
IMF	International Monetary Fund
LDCS	Least Developed Countries
LFPR	Labor Force Participation Rate
OECD	Organization for Economic Co-operation and Development
OLS	Ordinary Least Square
PRSP	Poverty Reduction Strategy Paper
UK	United Kingdom
USA	United States of America
VAR	Vector Autoregressive
VECM	Vector Error Correction model
WB	World Bank
WEF	World Economic Forum

ABSTRACT

The unemployment rate has been the most persistent issue in both developed and developing nations. Thus, all the relevant ideas, key factors, and concepts had been discussed at first including the macroeconomic factors that affect the unemployment rate in Ethiopia. This study is an attempt to investigate the determinants of unemployment in Ethiopia. The yearly data was used from the period 1990 to 2021. Unit root test is used to check the stationarity of the variables and employed Autoregressive Distributed Lag Model (ARDL) regression method. In Addition, Nonlinear ARDL model has been employed to detect the symmetric impact of different variables on unemployment rate in Ethiopia. When we come to the long run ARDL result all four variables namely (economic growth, real effective exchange rate, inflation and foreign direct investment) were a significant determinant of unemployment rate in Ethiopia. , in the long run, the lag of the natural logarithm of total unemployment has a positive and significant effect on the current unemployment level. The effect of economic growth on the level of unemployment in the long run, economic growth expressed as (natural logarithm of RGDP) has a negative and significant effect on the unemployment rate. Slow economic development dynamics will raise the long-term unemployment rate (non-employment growth). All variables except foreign direct investment affect unemployment rate negatively they decrease Unemployment, while foreign direct investment affect unemployment rate positively. Finally, the researcher recommended that the Ethiopian government should to consider in its policies and strategies to create more jobs and to efficiently utilize the abundant labor force available in the country. Moreover, the government authorities should efficiently utilize the capital resource generated locally or donations and grants from abroad (like the revolving fund) in job creation

Keywords: Unemployment, Economic growth, Nonlinear ARDL mode

CHAPTER ONE: INTRODUCTION

1.1 Background of the Study

Due to its social and economic implications, unemployment is a subject that policy makers in both emerging and wealthy nations are very concerned about (Casado et al., 2020; Marti & Puertas, 2021). Governments have a responsibility to make sure their citizens enjoy social welfare and general well-being. Only when a country reaches low unemployment and poverty levels is sustainable growth conceivable. A societal ill that impedes progress and development is unemployment (Drosos et al., 2021).

Numerous things influence unemployment. Economic growth is the most important element that has effect on unemployment. It is a common misconception that Okun's Law rules the relationship between the unemployment rate and economic growth. A high rate of economic growth might theoretically lower unemployment (Prasetyo & Kistanti, 2020). While the Philip Curve indicates a negative association between the two variables, some researches have shown a positive, negative, or negligible correlation (Abu, 2019). Furthermore, studies are increasingly linking unemployment to other macroeconomic indicators and other macro level variables.

According to Haffert et al. (2021), the COVID-19 epidemic, which has afflicted practically every country, would result in a 5.7% worldwide unemployment rate in 2022. According to estimates, there will be 205 million jobless individuals worldwide in 2019, which is more than the 187 million anticipated before COVID. After the epidemic, there will be a "new normal." The slower-than-expected growth indicates less employment creation, which will raise the unemployment rate. A creative approach to policymaking is required in this circumstance.

One of the biggest problems the world is now experiencing is unemployment (Oluwajodu et al., 2015). It significantly affects growth and development overall, especially when coupled with population growth and rising poverty. It reduces an economy's capacity for long-term growth and wastes economic resources like the labor force that is available for employment. Private and societal issues including an increase in crime, suicides, poverty, drunkenness, and prostitution are brought on by unemployment (Alemu, 2020).

No matter how differently developed their economies are, all African nations now face a serious challenge in the form of unemployment. Due to a shortage of work possibilities, people frequently are forced into underemployment, meaning that their job is either unrelated to their field of study or their specialty. Ethiopia has the fastest-growing economy in the region and is the second populated country in Africa next to Nigeria. During 2007/08 to 2017/18, the economy grew strongly and broadly, averaging 9.9% annually versus a regional average of 5.4%. With a per capita income of \$790, it is also among the lowest. Although Ethiopia's extreme poverty rate dropped from over 46% in 1995 to 23.5% in 2016, more than 25 million people there continue to live in poverty.

Governments and policy officials are concerned about unemployment in many African nations for a variety of reasons. First off, a sizeable portion of the population in these nations is made up of young people (Kowal et al., 2020). The young's must be skillfully directed into productive endeavors in order to break the cycle of poverty and underdevelopment (Debebe and Bessie, 2020). Furthermore, as we can see from recent events in many emerging nations, social upheaval and political turmoil are closely tied to high rates of young unemployment that foster a sense of despair among the youth (International Labour Organization, 2013). Without a doubt, this will encourage future insecurity, illegal immigration, and armed conflict (Aniche, 2020). As a result, the issue has to be properly addressed.

Following some recent economic structural reforms, Ethiopia has showed rapid economic development. The economy's growth performance has been quite impressive, especially over the past 20 years. In 2019, real GDP increased by 7.4%.¹ Despite such fast development, it has not succeeded in creating enough jobs to support the majority of the rapid population rise (Berhe, 202; Biru et al., 2021). General unemployment continues to be a major socioeconomic problem for the nation.

1.2 Statement of the Problem

Researchers and politicians, as well as international development organizations like the African Union and the United Nations, are deeply concerned about the fast-growing rate of unemployment in emerging nations and Africa (Lala, 2020; Mutize & Nkhalamba, 2021). The disturbing worry is reasonable considering that unemployment contributes to other societal issues like drug usage and

an increase in overall crime, all of which impede the continent's economic progress. According to Cieslik et al. (2022), it has become crucial for all governments, particularly those in Africa, to develop policies and strategies that guarantee a decrease in unemployment on the continent. According to Riaz and Zafar (2018), increasing attempts to lower unemployment starts with a full grasp of the factors that contribute to it. The reasoning inspired the author to conduct this study so that African authorities would have a place to start by outlining the consequences of unemployment factors for policy (Fagbeme, 2021)

Ethiopia is one of the African countries with a population which is expanding reasonably quickly and a burgeoning economy, therefore effective management and use of its labor force are crucial (Teka, 2022). In this regard, it is important to constantly examine the economy's ability to absorb the available labor force, and a suitable employment strategy should be implemented as a result. It is common practice to consider the nation's employment and unemployment rates as general indicators when assessing the state of the economy. One of the most significant data sources for information on the prospective labor force of the nation is the labor force survey. Therefore, it is crucial to reflect on the existing work circumstances and anticipate future changes through the study of job status (Lindsey et al., 2022).

The problem of unemployment affects both developed and developing nations. However, the degree and influence may vary. The unemployment rate has been declared as the most obstinate issue in together developed and developing nations, according to Fakim et al. (2020). For instance, the maximum unemployment rate was 26.4 % and the minimum was 16.8 % in Ethiopia in 2022, 33.56% in South Africa, 5.7% in China, 2.5% in Japan, 7.4% in France, 8.3% in Brazil and Sweden, and 3.7% in the US, according to the World Bank's data base (2022). Due to the COVID-19 pandemic, the worldwide financial crisis, which caused a fall of total output and resulted in job losses, unemployment has recently risen. Above 200 million people were jobless worldwide in 2022. However, although high, jobless rates have decreased in low-income nations during the current crisis. Even empirical research that agrees on the same list of drivers of unemployment cannot agree on how each variable influences unemployment, which further demonstrates that this subject is still open for debate. For instance, Gaber (2018), Afolayan (2019), Dincer (2019), Riaz and Zafar (2018), Mattei & Pistorresi (2019), Baah-Boateng (2016), and Achdut & Refaeli (2020)

noted that unemployment decreased as a result of economic growth, whereas Kerckhoffs et al. (1994) and Alrayes and Wadi (2018) were unable to identify a direct correlation between the two.

In addition, there aren't many studies on unemployment in Ethiopia. Setlhodi (2019) investigates the causes, incidence, and duration of young unemployment and concludes that the rate of unemployment was high in 1994 at 50%, with a mean length of roughly 4 years. For individuals aiming for well-paying public sector employment and for those whose dads work in government, the waiting period is shorter.

Like other countries on the continent, Ethiopia has a sizable youth population; as of the time of writing, 72% of the population was under 30 years old. At first glance, the official unemployment rate, which is merely 8% in 2021 (and was only 4.5% in 2013), provides the false impression that unemployment is not a significant problem in the nation, particularly in 2013. This is the outcome of the official data presentation, which averages rural and urban statistics even though the former is far smaller. While the unemployment rate in urban areas is 18% in 2021 (16.5% in 2013), it is just 5.2% in rural areas in 2021 (and insignificant at 2% in 2013).

The current study differs from prior once on a number of grounds. First, both the size of observations and variables are extended to macro-level as appropriate as the econometric models employed. Second, there are many literature reviews on unemployment conducted in different countries but most of the studies conducted on unemployment in Ethiopia focused on the urban areas and additionally limited to the youth, causes, and determinants of unemployment in that area. This evidence provides for the researcher, as a study on macroeconomic determinants of unemployment at national level is very uncommon in Ethiopia. Thus, this study differs by investigating the impact of macroeconomic variables on unemployment at a national level using a 31 years annual time series data (1990- 2020/21). Hence, this study was extended to a more current period to examine long and short run impacts of macroeconomic variables.

Based on the above-mentioned reasons, the researcher examined the factors affecting unemployment in Ethiopia using time series data. In addition, the author conducted this study for several reasons, one of which is the complex link between unemployment, poverty, and inequality. The researcher believes that additional empirical studies on unemployment determinants are essential if the academic community is to make any difference in our society or contribute to the

Millennium Development Goal of eradicating poverty. If unemployment rates continue to rise, the goal will not be achieved.

1.3 Objectives of the Study

1.3.1 General Objective

The general objectives of the research were to identify the factors affecting unemployment in Ethiopia.

1.3.2 Specific Objectives of the Study

Specifically, the research was trying to

1. Identify the trend of unemployment in Ethiopia
2. Examine the determinants of the unemployment rate and variables affecting the unemployment rate in short and long run in Ethiopia.
3. To indicate policy implications that will be used to equilibrate the supply and demand side of labor force in Ethiopia.

1.4 Research Questions

The general research question is what are the determinants of unemployment in Ethiopia?

Specifically, the research will answer the following specific research question.

1. What is the trend of unemployment in Ethiopia?
2. What are the relationships between the unemployment rate and variables affecting the unemployment rate like in the long run and short run in Ethiopia?

1.5 Significance of the Study

Unemployment causes misery, social unrest and hopelessness for the unemployed. In Ethiopia, the existence of high unemployment is a source of concern to policy makers as well as the general citizenry, because employment provisions can be used to check the performance of the economy.

If unemployment is left unchecked, it will go a long way hindering any economic development plans of the country. It is on this note that unemployment in Ethiopia with its resulted effect has been treated in this study. This work will be of valuable help to policy makers.

The policy makers use different strategies to prevent unemployment in Ethiopia, they include changing the pattern of production in order to create employment through entrepreneur innovation known as Youth Enterprise with Innovation (YOUWIN) programmes; emphasis should be placed on the production of essential goods which use the labour-intensive techniques.

It helps the leaders to realize that rapid full employment desired by every country can only be possible if it was combined with wage and price controls, so as to recognize the nation's social, political, cultural and educational life in commensuration with the national socialist principles. Through these findings and subsequent recommendations of this study, unemployment will be eradicated. It will provide an insight into the relevant literature and help to lie bare the causes and effects of unemployment in Ethiopia.

1.6 Scope and Limitations of the Study

There are some limitations of this work; mostly the secondary data are used in the study because of the difficulties encountered in the gathering of the primary data given the nature of the study which is the aggregate level of the economy. This research has methodological, theoretical and geographical limitations. Regarding to the methodological limitation the research was only limited to time series analysis using ARDL and Non ARDL model. The other methodological limitation was the time period was limited to 1990 to 2021 only. Regarding the theoretical limitation the research only focused on macroeconomic determinants of unemployment in Ethiopia without considering at micro and household level. Regarding the geographical limitation the research was only limited only in the Ethiopia. Based on secondary data spanning the years 1990 to 2020, the study was done to establish the relevance of various macroeconomic variables that impact Ethiopia's unemployment rate.

The absence of information caused a lot of hindrance; some relevant variables may not be included in the research model due to lack of reliable data on them. This study cannot be said to have exhausted all the relevant details on the nature of the relationship between unemployment and economic growth as a result of the above reasons. This work has a number of challenges which include inadequate finance and shortage in the availability of relevant materials.

1.7 Organization of the Study

The rest of the paper was presented as follows. Chapter two deals with a review of the literature (theoretical and empirical), Chapter three covered research methodology, Chapter four deal with data presentation and analysis, including both descriptive and econometric analysis, and Chapter five be devoted to summary, conclusion, and recommendation.

CHAPTER TWO: REVIEW OF RELATED LITERATURE

2.1 Theoretical Literature Review

2.1.1 Concepts and Definitions of Unemployment

The issue of unemployment has not just lately become a concern. Although it has always been an issue, it is currently becoming increasingly serious. As a result, several researches have been conducted globally. Some of the findings are described in this section. The definition of an unemployed person is someone of working age (16 and up), jobless, able and available to work, and actively looking for a job. This means anyone without a job who is reaching out to contacts about jobs or applying to positions. This definition of unemployment is specific and rigid, it doesn't just include "anyone who doesn't have a job."

We may call it with fancy names and give it attachments, but The Lumen Learning Course (2005) is of the view that Unemployment moreover can also be alluded to as simply joblessness, a scenario that happens when individuals are without work and are effectively looking for a business. They further illustrate that amid periods of subsidence, an economy ordinarily encounters increasing unemployment rates. 'Hence, we see the numerous proposed causes, results, and arrangements for unemployment (U.S. Bureau of Labor Statistics, 2020).

'On the other hand, Chappelow (2020) argues that Unemployment occurs when a person who is actively searching for employment is unable to find work. Adding that unemployment is often used as a measure of the health of the economy. Supporting the thought, Mlatsheni and Leibbrandt (2011) point out the extraordinary prevalence of unemployment and worklessness as perhaps the single most important contributor to the persistence of social exclusion on a large and momentous scale. '

'Measured by the unemployment rate, which is basically the number of unemployed people divided by the number of people within the labor force, points sourced from the U.S. Bureau of Labor Statistics (2020) which goes on to lay more information on the impact of unemployment on the economy. '

- Unemployment occurs when workers who want to work are unable to find jobs, which lowers economic output; however, they still require subsistence.
- High rates of unemployment are a signal of economic distress, but extremely low rates of unemployment may signal an overheated economy.
- Unemployment can be classified as frictional, cyclical, structural, or institutional.
- Unemployment data are collected and published by government agencies in a variety of ways.

2.1.2 Views on Unemployment from Schools of Thought

Since the political economy's foundation, unemployment has been a source of worry and is perceived as a global issue. The aggregate market analysis, which includes aggregate supply and demand, is the main topic of the macroeconomic theory. This theory combines Keynesian and Classical economics. While Keynesian economics is predicated on the idea that aggregate demand is the major source of uncertainty, making government intervention essential, classical economics is predicated on the idea that flexible prices assure market equilibrium, maintaining full employment. However, the monetary policy and the fiscal policy the two primary policies are used to carry out macroeconomic policy. By managing the money supply, central banks carry out the monetary policy. A fixed interest rate is continually maintained by shifting the money supply.

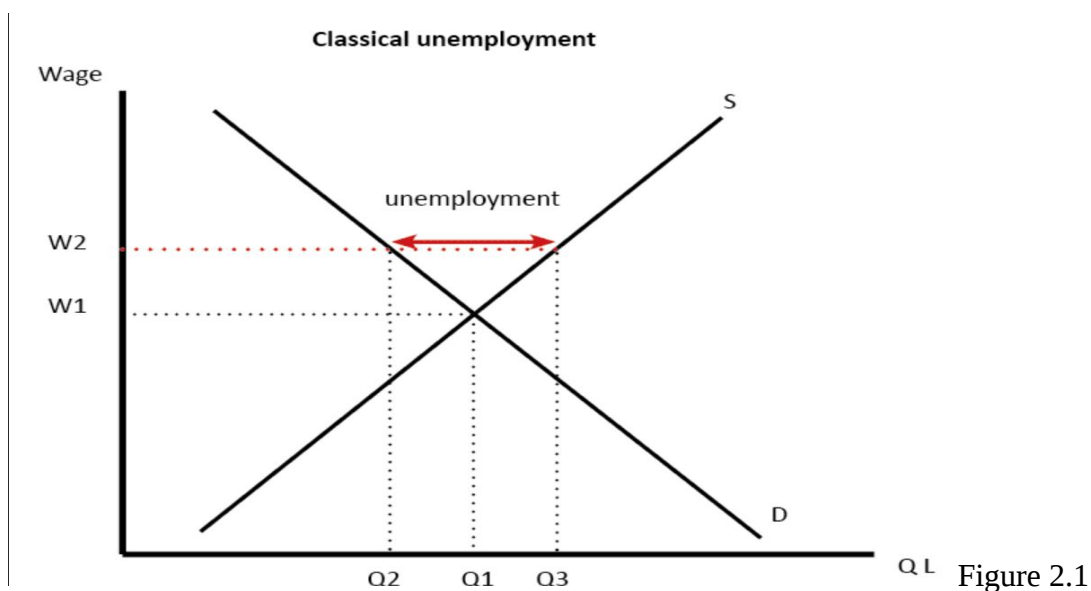
The Keynesian and Classical Theories of Unemployment both provide justifications for why unemployment increases in an economy. Both of them belong to distinct schools of thought and have opposing viewpoints on unemployment. The Classical school was founded before Keynes, and its views were regarded as the main economic theories to follow.

2.1.2.1 A Classical Economic Theory of Unemployment

Based on classical theories of unemployment, full employment exists in every economy. The traditional view presupposes that there is never any unemployment. This is so because, at the current money pay rate, the supply and demand of labor will always be equal. In other words, if the supply of labor increases for whatever reason, the salary will decrease. Consequently, additional personnel may be hired. Similar to this, if there is a labor scarcity, the increase in pay

would end the shortfall. Therefore, there won't be any voluntary unemployment in the traditional sense. However, there is always some unemployment in the actual world.

The classical theory of the labor market, as outlined by Pigou (1933) and Solow (1981), consists of supply and demand for labor. The demand for labor is derived from the shrinking fraction of the labor's marginal product. The quantity demand for labor which is a negative function of real wages. The decision of a worker to work part-time or not determines the amount of labor that is available (leisure).. Demand and supply for labor intersect at a clearing point in an equilibrium economy, which establishes the equilibrium real wage rate and full employment. Sweezy (1940:807) explains that, aside from frictional obstacles, Pigou's "theory of unemployment" would not exist if wage-earners did not regularly stipulate for a rate of pay greater than the "equilibrium level."



From the above figure, Classical Unemployment = $Q3 - Q2$. The quantity of labor would be $Q1$ in a free market. However, with wages remaining at $W2$, the supply ($Q3$) exceeds the demand ($Q2$).

2.1.2.2 A Keynesian Economic Theory of Unemployment

The common Keynesian model seen in textbooks explains how, given a fixed level of nominal wage and money stock, the degree of unemployment is determined. The nominal salary is fixed,

but why? The standard response is that it is institutionally set or that employees experience financial illusion (Kawai, 2023).

The conventional wisdom holds that full employment will eventually be achieved by adjusting nominal wage and price levels. Businesses will find it lucrative to reduce their nominal pay and hire jobless people if there is unemployment. No impact on output or unemployment would result from a fixed investment demand. Since real wages for employees decrease, consumer demand decreases, nominal prices drop and equilibrium is restored at the previous levels of output and unemployment (Buthelezi, 2023).

The so-called Keynes effect, however, is generally acknowledged to be the mechanism by which a change in the nominal price level would tend to boost investment. The amount of money needed for transactions will decrease as the nominal price level declines. As a result, there will be more money available to finance investments. The increasing availability of loanable money will likely result in a decrease in interest rates and an increase in investment. Up until full employment is restored, the process remains ongoing (Li & Lin, 2023).

According to Keynes (1936), unemployment is an involuntary event, which is compatible with the traditional perspective (i.e no voluntary unemployment). This indicates that employment is cyclical and that it fluctuates in response to changes in aggregate demand. When there are positive economic and financial prospects, investors invest and hire people to generate production. Investments and employment rise until equilibrium is established when future expectations are supported by reality. Because labor is a key production ingredient and the size of the economy grows as a result of significant investment spending, businesses are compelled to hire more people, which lower unemployment.

This theory states that the intersection of aggregate demand and supply, which is the point of the effective demand, which may be smaller than the full employment equilibrium, results in the equilibrium of supply and demand for labor. On the other side, when there are negative predictions for the economy's future, the private sector makes less investments and hires fewer people. Due to the lack of aggregate demand, particularly investment spending, equilibrium is reached when there is cyclical unemployment.

Additionally, Arthur Lewis (1954) created what was known as the Lewis model, in which he made the assumption that if there was a labor supply excess and a certain demand for labor, the pay rate would be constant. Lewis argued that under these circumstances, capitalists do generate some degree of profit. A portion of the earnings will be reinvested by the capitalists in new capitals. This additional investment will provide new employment opportunities and draw labor from labor-scarce rural areas to metropolitan centers (urban area). The capitalists will make more money off of this rise in employment, and more money will lead to more investment, employment, and revenue. As a result, when labor productivity increases, demand for labor will move to the right, indicating a decline in unemployment. The efficiency wage model, however, can result in unemployment, suggesting that the actual pay is not sensitive to changes in demand. Thus, the model suggests that changes in labor demand cause both big and minor movements in real wages. According to the model, when economic growth changes, labor demand spreads outward, the real pay stays the same, and unemployment trends lower (Romer, 2012).

2.1.2.3 Unemployment in the Real Business Cycle Theory

While both classical and Keynesian theories agree that social welfare is negatively impacted by disequilibrium produced by departure from full employment, actual business cycle unemployment is caused by the existence of economic growth fluctuations (boom or slump). Thus, it means that fluctuations in economic t have an impact on the level of unemployment; as a result, the unemployment rate is influenced by national economic growth. Numerous work possibilities will become available as the economy grows, leading to more employment and a decrease in unemployment. According to Okun's law, the real gross domestic product is lost by 2% to 3% for every percentage point by which the actual unemployment rate exceeds the so-called "natural rate" of unemployment.

The decrease in total factor productivity has a number of explanations. Technology development is the first problem. The Solow's residual, which measures the growth in labor productivity and is assessed by the gap between actual and expected productivity growth, will fall when consumption, investment, gross domestic product, and hours of labor decline. Because productivity and technology do not advance in this situation, unemployment increases.

2.1.3 Unemployment: Causes, Costs, and Overview

Olsson (2009) argues that since labor is not a "normal" item, there is no situation in which labor demand and supply are equal at the equilibrium pay rate. Instead, there is an excess supply of labor since the supply is more than the demand due to pay rates that are higher than equilibrium in most nations throughout the world.

Understanding the causes and effects of unemployment is crucial for potential action. This section will cover the factors that contribute to unemployment and how they may change slightly across industrialized and developing nations. We'll also touch briefly on the expenses associated with unemployment. Previous research on the subject will be reviewed in order to comprehend the makeup of the labor market in urban Ethiopia.

2.1.3.1 Causes of Unemployment in Developed and Developing Countries

One of the topics that economists argue the most is what causes unemployment. The primary culprit, according to Keynesian economics, is insufficient aggregate demand in the economy. Unemployment may result from real wage rigidity, which Mankiw (2002) defines as "the refusal of wages to adapt until labor supply matches labor demand."

The reasons why salaries are set higher than the equilibrium pay rate in the actual world may be divided into three major categories. According to the efficiency wages principle, more pay encourages employees to put in more effort and lessen slacking off. As a result, employers raise wages. According to "the insider-outsider paradigm," labor unions and contracts prohibit companies from lowering salaries (Romer, 2005; Olsson, 2009). This model's main presumption is that labor unions exclusively work to further the interests of its members (the insiders) who are already employed and have no concern for those who are not members (the outsiders). Firms and insiders agree to do this in order to exclude outsiders from the labor market and so increase unemployment. The search and matching model, which stresses the heterogeneity of people and jobs as the source of unemployment, offers another reason for higher than equilibrium wages. Finding the appropriate individual for the right job is challenging due to the variety of employees' talents and interests, information asymmetry, and the qualities of positions; this leads to unemployment.

According to the World Bank (2007), increased internal migration, a high literacy rate, and a growing young labor force are some of the probable factors contributing to urban unemployment in Ethiopia. According to Haile's 2003 study, some of the key factors contributing to poverty in emerging nations, particularly Ethiopia, are the country's fast-expanding labor force, mediocre to middling macroeconomic performance, low levels of job creation, and low levels of aggregate demand.

2.1.3.2 Costs of Unemployment

Frightening may be the effects of unemployment. Previous unemployment has a deterrent effect on future labor force participation, wages, and welfare in general (Haile, 2003). The unemployment of their parents has an impact on the children. Dao and Longani (2010) found that children of unemployed parents often do worse in school in the near term. In the long run, a child's chance of earning a living is decreased by a parent's lost income due to unemployment. Through its negative effects on the unemployed economic, social, and psychological well-being, unemployment has a detrimental impact on health and death.

2.2 Empirical Literature Review

2.2.1 Unemployment in Ethiopia

Since there are not many studies that specifically address unemployment in Ethiopia, this research focuses on those that do. Krishnan (1996) investigates the impact of education and family background on employment in Ethiopia and finds that while the family background (particularly the father's education) significantly influences entry into higher status private employment, it has little bearing on entry into lower status private employment. Education has a good impact on employment entry into the public sector.

According to a study by Dendir (2006) on the length of unemployment in urban Ethiopia, completed spells last an average of 3 years, and incomplete spells an average of 4.7 years. Teenage adolescent unemployment rose between 1994 and 2000, and it was greater for women. According to this study, those from households with at least a secondary education are less affected.

In their study Denu et al. (2005/07) concluded that youth unemployment has a significant impact on them and that there are important differences within the youth group regarding location (urban vs. rural). Youth unemployment in urban areas was 7.2%, however, it was 37.5% in rural areas, where there was a significant percentage of underemployment. In 1999, the unemployment rate for young women was 17.3%, compared to 6.9% for their male counterparts. In terms of education, 44.5% and 32.6% of the young people without jobs were illiterate or had only completed basic school. The study finds that, as a result of policy changes made by the present administration to support the private sector, the private sector has a significant impact on employment.

Although there are differences in the types of businesses, industries, and worker characteristics, the Ethiopian urban labor market is characterized by low pay. Even though women are still comparatively less competent, their participation in the labor market and rate of literacy is rising. The labor market is segmented, with a big unemployed population, a sizable informal sector with poor salaries, and a majority of women engaged in both the formal private and public sectors. In urban Ethiopia, women are disproportionately more affected by unemployment and receive lesser pay (World Bank, 2007).

Serneels (2004) examines the prevalence and length of unemployment in urban Ethiopia with a focus on youth using the 1994 Ethiopian Urban Socio-Economic Survey. According to Serneels, the average length of unemployment is 4 years, with lower periods for youngsters whose parents work in government. A third of the adult men were hired by the public sector, which was also mentioned as the main employer. The frequency and length of unemployment are found to be negatively correlated with household welfare.

2.2.2 Unemployment and Its Determinants

Being unemployed may have a serious negative impact on social instability, criminality, human capital loss, suffering, and economic well-being. As a result, unemployment can have an impact on the nation's GDP. The employment rate affects the output that a nation produces. Several research has been done to determine the macroeconomic factors that influence unemployment. The majority of this research was carried out outside of Ethiopia, however few studies focused on microeconomic variables, such as demographics and residency, have been carried out, missing the

macroeconomic elements that influence unemployment. The list below includes a few of these investigations, both domestically and abroad.

Dechasa (2014) conducting a study on trends and present conditions in the labor market and employment in Ethiopia. And he discovered that a variety of issues, including privatization, tax rates, a lack of or inadequacy of finance/credit, and infrastructural facilities, restrained the development of jobs in both the public and private sectors. The researcher also suggests adopting labor-intensive employment creation strategies for arranging access to markets, credit institutions, and providing institutional protection for the informal sector to address the issue of low levels of job creation.

Abera (2013) used binary and descriptive logistic regression to examine the socioeconomic and demographic features that impact unemployment in Ethiopia. The findings show that a person's unemployment in Ethiopia is significantly influenced by their age, educational attainment, economic standing, marital status and gender of the family head. This study also suggests that, in the short term, it's crucial to empower women and provide manual labor occupations.

In Fikre's (2011) study, binary probit model estimation was used to analyze the factors that contribute to urban unemployment and its effects on household welfare. The findings suggest that factors such as age and level of education beyond the primary level influence urban unemployment in Ethiopia. They also suggest that unemployment hurts household consumer spending and, consequently, household welfare. According to the study, one additional jobless household member causes the household's per-capita real consumer spending to fall by 4.6 percent. Additionally, it shows that since unemployment hurts household welfare, attempts to lower unemployment will almost certainly boost welfare. In this situation, greater education quality is thought to lower unemployment and hence improve well-being.

Assaad (2000) used both binomial and multinomial logit models to experimentally analyze several factors that contribute to unemployment in Egypt. These models help to explain labor force participation and how that participation is distributed between employment and unemployment. It also shows that, unless the head of the home is unemployed, there is no consistent relationship between poverty and youth unemployment among newly arrived adults.

Kalim (2003) used a straightforward regression to examine the factors that determine unemployment in Pakistan. Over the years 1986 to 1999, the researcher looked at the relationships between unemployment and real GDP growth rates. Highly significant findings indicate that a strong GDP growth rate can lower the unemployment rate while population pressure can reduce job prospects. The study suggests that in order to provide jobs for the economy, a rigorous population policy and a high GDP rate may be aimed.

Bhalli et al (2013) used autoregressive distributed lag to evaluate the factors that contribute to unemployment in the same nation from 1976 to 2012. (ARDL). In contrast to Kalim's model, they looked at the actual link between the unemployment rate and external debt. The empirical finding demonstrates that during those times, Pakistan's unemployment is greatly impacted both short- and long-term by the gross domestic product. Additionally, they discovered that Phillips curve exists in both the short- and long-term. The Friedman-Phelps theory of the link between unemployment and inflation conflicts with the long-term presence of the Phillips curve, which was proposed in 1968.

Eita and Ashipala et al. (2010) investigated the factors that contributed to unemployment in Namibia between 1971 and 2007. They used two-step Engle-Granger econometric techniques to estimate macroeconomic variables. Additionally, they discovered a positive correlation between pay rate and unemployment in their study as well as a negative correlation between investment and unemployment. It suggests that raising investment will dramatically lower unemployment. Additionally, they discovered that the outcomes matched Okun's law, Harrod-Domar, and Phillips curve analyses.

After utilizing the Augmented Dickey-Fuller to check for a unit root, O'Nwachukwu and Chinedu et al. (2016) used the ordinary least squares (OLS) approach to estimate the model and analyze the factors that affected Nigeria's unemployment rate between 1980 and 2016. The researcher used five explanatory variables, including real gross domestic product, population, initial lag of unemployment, inflation rate, and government spending. The results show that government spending, inflation rate, and population are statistically significant in explaining variations in unemployment. The outcome achieved in Pakistan by Kalim et al. (2003) is substantially different from this.

Gur (2015) used panel data analysis to look at the macroeconomic factors that influence unemployment in the BRIC nations. The researcher considered factors such as population growth, inflation, interest rates, change in the value of the currency, and other variables that impact the unemployment rate in various nations between 2001 and 2013. The outcome demonstrates that inflation, followed by population growth, is the major contributor to rising unemployment in the BRIC nations. The key economic elements that contribute to a decrease in unemployment include an increase in the gross domestic product and industrial production. This result is in line with Friedman (1968) and Phelps (1967), proving that the Phillips curve hypothesis is incorrect and that inflation exacerbates the effects of unemployment.

2.2.2.1 Foreign Direct Investment and Unemployment

Ethiopia and other developing nations require financial assistance from the international community to undergo structural change. Foreign direct investment (FDI) has so far been welcomed in large amounts, which has helped the country's economy develop and its employment rate rise. Through an increase in the country's gross domestic product, greater employment results in higher living standards for its citizens (GDP). The classical view holds that labor has a role in production. There are several research that looks at the connection between FDI and unemployment, and the majority of them show that declining FDI has a negative and considerable impact on the employment rate. While FDI has little effect in certain nations, it has a substantial influence on others when it comes to reducing unemployment. The impact of FDI on host economies has generated debate. Numerous empirical findings and theoretical conclusions on host economies do not concur.

Irpan et al. (2016) used an autoregressive distributed lag (ARDL) model to analyze the association between FDI and unemployment in Malaysia from 1980 to 2012. They discovered that FDI and GDP all had a large impact on Malaysia's unemployment rate. Zeb, Qiang, and Sharif (2014) included additional explanatory factors including corruption, population size and the decline in unemployment in Pakistan from 1995 to 2011. They looked at those factors' influence on unemployment using multiple regression analysis.

In addition, Jayaraman and Singh (2007) used a multivariate model to investigate the connection between FDI and employment in Fiji. They concluded from their study that Fiji's employment is

positively and significantly impacted by both GDP and FDI. This study examined the unidirectional causation between FDI and GDP in the near term and between FDI and employment in the long run. This suggests that foreign direct investment affects employment levels favorably over the long term as opposed to temporarily. Mucuk and Demirsil (2013), however, looked at the link between FDI and unemployment in seven emerging nations between 1981 and 2009. The outcome demonstrated a long-term, positive association between FDI and unemployment, however, there are regional variations. Additionally, they discovered that FDI causes unemployment to decline in Thailand while rising in Turkey and Argentina. They also concluded that the acquisitions and mergers that make up brownfield investment, which has a negative impact on unemployment, are what policymakers should concentrate on in order to increase job prospects. For most developing nations where agriculture dominates the economy, this type of intervention is crucial.

Additionally, efficiency-seeking FDI may result in greater unemployment as a result of export substitution and re-imports than employment as a result of increased exports to host nations (Agarwal, 1996). FDI inflows and outflows do not affect the overall unemployment rate. Foreign direct investment and unemployment have a favorable and significant association, according to Palt (2011), who looked into the topic. According to a 2011 ILO report, investment growth has a significant and advantageous impact on job growth. An increase in investment growth of one percentage point would result in a rise in job growth of 0.12 percentage points. Additionally, ILO's 2012c analysis confirms that employment is favorably and significantly impacted by both public and private investment rates.

2.2.2.2 Unemployment and Foreign Exchange

Numerous studies have looked at the link between the real exchange rate and unemployment, which has generated a lot of debate because of the varied conclusions about the nature of the relationship between them. Some research concluded that there is a positive association between the real exchange rate and unemployment, whereas other studies came to the opposite conclusion. The following studies are reviewed: The impact of the real exchange rate on the unemployment rate in certain Latin American nations was examined by Frenkel and Ros (2006). This study concluded that the real exchange rate has a considerable impact on the unemployment rate.

Using monthly data from the years 2009 to 2011, Shaari et al. (2013) examined the impact of oil prices and the currency rate on unemployment in Malaysia. The Johansen VAR-based Co-integration is used in this work. The investigation discovered a protracted link between the unemployment rate, oil price, and exchange rate. Additionally, the findings showed that while the oil price has no impact on unemployment, the exchange rate has a short-term impact on it.

Ayen (2014) explored how currency devaluation affected Ethiopia's GDP between 1998 and 2010. It was determined that currency devaluation has a short-term natural effect on GDP and a long-term contractionary effect. The findings also showed that while public spending has a negative impact on GDP, monetary policy has a favorable impact. According to this study, the Ethiopian government intervenes in the market to maintain market stability rather than letting supply and demand decide the value of Ethiopian currency. Additionally, this study strongly suggested the value of and beneficial impact of monetary policy on GDP.

2.2.2.3 Unemployment and Economic Growth Perspective

Between 1998 and 2010, Ayen (2014) examined the effects of currency depreciation on Ethiopia's GDP. It was discovered that currency devaluation had both a long-term contractionary effect and a short-term natural effect on GDP. The results also demonstrated that while monetary policy has a positive influence on GDP, public spending has a negative impact. This analysis suggests that rather than allowing supply and demand to determine the value of Ethiopian money, the government of Ethiopia intervenes in the market to preserve market stability. This study also made a compelling case for the importance of the positive effects of monetary policy on GDP.

In order to evaluate the relationship between unemployment and economic growth, Akeju and Olanipekun (2018) used the Okun's law in Nigeria and the ECM and ARDL Johansen cointegration test. This investigation revealed a significant relationship between unemployment and economic growth.

Between 1994 and 2010, Abdul-khaliq (2021) examined the relationship between unemployment and GDP growth in nine Arab nations. He discovered a notable inverse link between population growth and unemployment rates and a negative impact of growth on the unemployment rate. Rahman, [31] investigated the connections between GDP, GDP per capita, literacy rate, and

unemployment rate in OECD nations and discovered that GDP is not substantially correlated with any of these variables.

2.2.2.4 Population, Labor Force Participation Rate, and Unemployment

Our understanding of population increase has evolved greatly throughout time. Population expansion was once viewed as a hindrance to the progress of the economy. Today, however, it is thought of as precious human resources. There was no correlation between population growth and labor force growth. One explanation is that not everyone is likely to be willing to work. The percentage of persons in various age groups also influenced the expansion of the labor force (T. N. Krishnan, 1992). The average person's income rises in nations with rapid growth. People were no longer obliged to work in the labor force to survive as a result of this (Abraham, 2009).

According to studies, unemployment in Russia rose by 52.3% when population growth increased by 1%.(Sadikovaa, Faisala, & Resa, 2017). Population expansion reduces unemployment over the long term, according to a study conducted in Pakistan (Maqbool, Mahmood, Sattar, & Bhalli, 2013). A favorable association between the variables was seen in India, China, and Pakistan. Regression analysis, Granger Causality, and co-integration were used. Additionally, Granger Causality found a unidirectional association between unemployment and population exclusively in China (Dr. Aurangzeb & Asif, 2013).

Using the Generalized Method of Moments Estimation, the study investigated the link between LFPR and unemployment between a selected group of 13 developing nations (1995-2006) and a group of 22 OECD countries (1993-2008). In both instances, a rise in LFPR was accompanied by a rise in unemployment. However, emerging nations' unemployment rates increased more rapidly than did wealthy countries (Lee & Parasnis, 2014). The study conducted in Turkey used the labor force participation rate as an independent variable. Data for two age groups (>5 and 15 to 24) from quarter three of 1988 to quarter four of 2013 were analyzed. Long-term unemployment was shown using the Vector Error Correction model to be independent of LFPR (Tansel, Ozdemir, & Aksoy, 2015).

2.2.3 At World Level

Macroeconomic determinants of unemployment are not only confined to economic growth but also other macroeconomic variables, such as inflation (as illustrated by the Phillips curve) that determines unemployment. For instance, Bhattarai (2016) assessed unemployment–inflation trade-offs in Organization for Economic Co-operation and Development (OECD) countries. The study found long-run cointegration between unemployment and inflation among the OECD economies. The unemployment rate varies significantly among these economies. In a single country study, Mazumder (2011) examined the stability of the Phillips curve in India. By using a sample period from 1970 to 2008, the study revealed that there is a negative relationship between inflation and unemployment, thereby verifying the existence of the Phillips curve in India.

Several other studies have verified the trade-off between inflation and unemployment, thus confirming the Phillips curve hypothesis (Abu, 2017; Doğan, 2012; Mihajlović & Marjanović, 2020). Other studies have negated the presence of the Phillips curve hypothesis (Orji, Anthony-Orji, and Okafor (2015). Furthermore, volatility in inflation is a concern in many countries, which can pose a threat to employment. This justifies the studies on this issue, which include Feldmann (2012), who examined the impact of inflation volatility on unemployment in 20 industrial countries over the period from 1972–2003. The empirical findings revealed that higher inflation volatility induces a higher unemployment rate. The results are robust to changes in specification or sample size.

2.2.4 At Africa Level

Researchers have examined the relationship between inflation and unemployment (Phillips curve), and economic growth and unemployment (Okun's law) over time. For instance, Abu (2016) examined the presence of Okun's law in Nigeria. The study used an ARDL technique with yearly time series data spanning from 1970–2014. They found that the unemployment rate has a long-term negative and statistically significant effect on economic growth by confirming the existence of Okun's law in Nigeria. In a recent study, Chuttoo (2020) assessed the impact of unemployment on economic growth in Mauritius to validate Okun's law. The study found that GDP per capita and unemployment are not significantly cointegrated, implying that unemployment doesn't influence Mauritius' economic growth, hence invalidating Okun's law hypothesis. This finding is consistent with the results of Doğan (2012) and Villaverde and Maza (2009), who found that unemployment

and economic growth are significantly and negatively cointegrated in Turkey and Spain, respectively.

In a panel study, Anyanwu (2013) ascertained the macroeconomic determinants of youth employment in Africa. The study utilized panel data and panel cointegration methods – ordinary least squares and fixed effects. The empirical results found that real GDP reduces youth employment, whereas the quadratic term of real GDP per capita enhances youth employment. In a follow-up study, Motsatsi (2019) investigated the determinants of unemployment in the Southern African Development Community (SADC) by adopting the ARDL panel estimation method. The finding of the study revealed that economic growth is negatively and significantly related to unemployment, thereby confirming Okun's law hypothesis. Likewise, Huang et al. (2020) ascertained the endogeneity of Okun's law in large panel countries. They concluded that unemployment and economic growth are negatively related. Hence, this verifies the presence of Okun's law hypothesis.

On the contrary, several studies have concluded the absence of Okun's law hypothesis where unemployment and economic growth are not related (Durech, Minea, Mustea, & Slusna, 2014; Folawewo & Adeboje, 2017). In recent years, the nexus between unemployment and economic growth has been evaluated through asymmetric estimation methods. Koutroulis, Panagopoulos, and Tsouma (2016) explored the asymmetric response of unemployment to output in Greece. They found that unemployment responds negatively to shocks in output but not positive shocks. This implies that unemployment is higher during a recessionary period than an expansionary period.

2.2.5 At Ethiopian Level

Argaw (2013) has also examined the impact of external debt on economic growth in Ethiopia using macro econometric model over the period of 2000-2010. She found that external debt service payment and foreign exchange reserve have positive impact on GDP of Ethiopia which implies that external debt in Ethiopia has positive impact on economic growth rather than depress it. In contrast, Ramakrishan (2002) showed the negative as well as nonlinear relation between debt and growth. And the researcher also recommends more and more debt relief to Ethiopia along with fiscal consideration and efficient investment utilization.

Abshoko (2016), using logistic regression educational level, age, access to market information, economic status, gender and electric power were some of the variables that played a big role in influencing unemployment in Ethiopia. Gizaw (2016) assessed the relationship between inflation and economic growth in Ethiopia using co-integration and an Error Correction Model (ECM) for the period from 1991 to 2014. The results indicated the existence of a long run relationship in which the causality runs from economic growth to inflation. The error correction term in the study showed that any disequilibrium in a given period would adjust back to equilibrium by 80.3 percent.

Gizaw (2016), Nandeeswara and Abate (2015) and Asayehgn (2009) focused only on the relationship between inflation and economic growth; unemployment was not included in their work. Nzinga and Tsegay (2012) focused on the youth labour market and their study did not cover the relationship of employment with inflation and economic growth. Contrary to these studies, this study extends the analysis of the association of the variables by bringing in unemployment, one of the significant variables in macroeconomic analysis, and including all the three variables together.

2.3 Conceptual Framework of the Study

We have reviewed different studies about determinants of unemployment. These studies have not considered important macroeconomic variables which may influence unemployment rate in Ethiopia. In the literature reviewed, the following gaps were observed; most studies reviewed did not capture most macroeconomic variables in Ethiopia. In addition, the time period of their studies cannot stand the current period. This study was extended to a more current period to know if the result of their studies can still be relevant in the current period. In addition to these gaps, this study was aimed at finding the relationships between unemployment rate and variables like GDP Growth Rate, Inflation Rate (CPI based), exchange rate and Foreign Direct Investment in Ethiopia.

Based on the theoretical and empirical literature Review the researcher has drafted the conceptual framework shown in the chart below. The graph shows that the unemployment rate is regarded as a dependent variable. The independent variables are the GDP (Gross Domestic Product), inflation, FDI, and exchange rate. Since we anticipate that these elements have an impact on the dependent variable, the unemployment rate, they are referred to as independent variables.

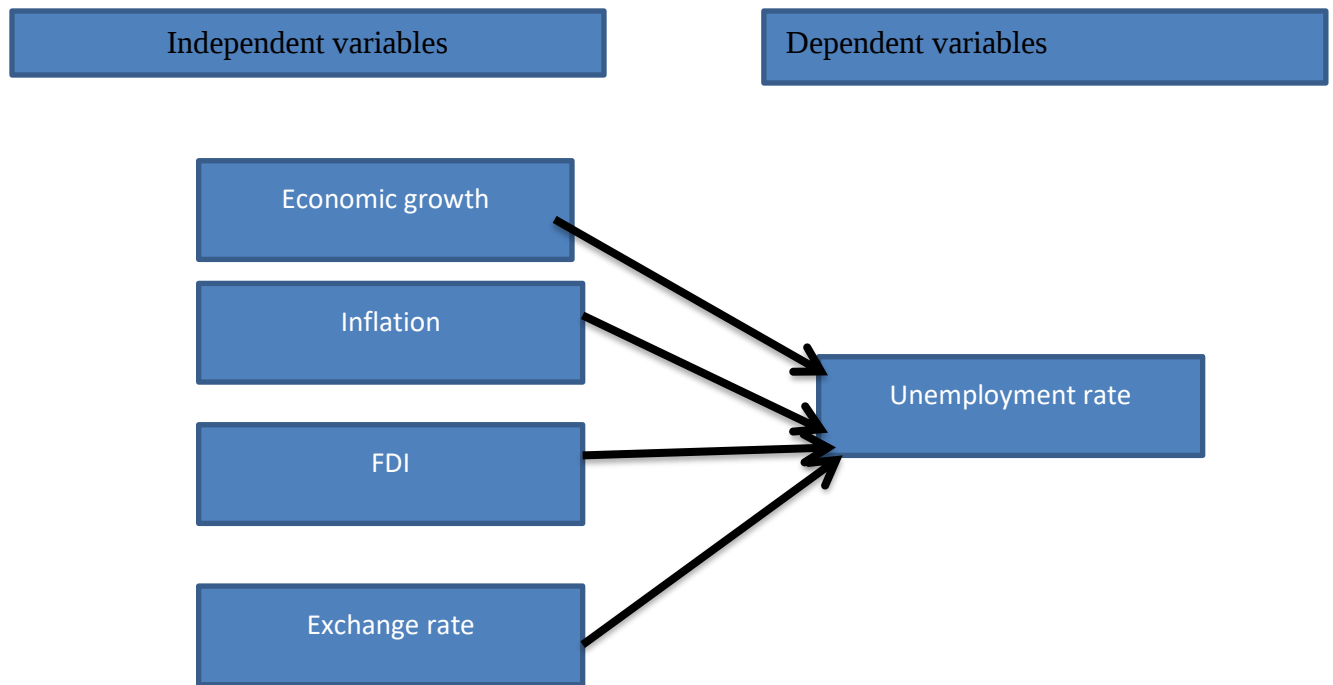


Figure 2. the relationship between the dependent and independent variables.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Research Design

In this study the researcher used descriptive and explanatory research designs. The objective of this study was to scrutinize the determinants of unemployment in Ethiopia. Thus, this examined examine through a descriptive and explanatory research design. The descriptive research design was used to obtain a picture of trends of different factors affecting the unemployment in Ethiopia using charts, tables and graphs. Explanatory research design was used to realize and explain the relationship between unemployment and factors affecting unemployment.

3.2 Research Approach

In this study, a quantitative research approach design was applied. Moreover, it was a co relational research type as it tested relationships between variables. The research used to seek to examine the relationship between unemployment and factors affecting unemployment.

3.3 Data Types, Sources and Methods of Data collection

Secondary data was used in this investigation. On the factors that have been identified, data was gathered. Real gross domestic product, FDI, real effective exchange rate and inflation rate, make up the explanatory variables. NBE, IMF, MoFEC, and the most recent statistics on global development indicators (2022) was all provide information on these factors from 1990 to 2021.

3.4 Method of Data Analysis

Both descriptive and econometric methods of analysis were used in the study. In order to evaluate the short- and long-term relationships between the dependent variable and independent factors, the study used the ARDL model. The short run and long run asymmetric (non-linear) relationship between unemployment and its causes also be examined using the non-linear ARDL (NARDL) model. STATA 13 is the statistical program utilized for economic analysis.

3.4.1 Specification of the Model

By using the most effective econometric strategy, the study tried to determine whether there is any connection between unemployment and its main causes in Ethiopia. The models for unemployment had been constructed using the above description and any relevant theories. Certain variables that are significant in the analysis of unemployment in the instance of Ethiopia are identified via a review of the empirical research on macroeconomic linkages and the theoretical explanations that have already been proposed. These factors include real effective exchange rate, real gross domestic product, foreign direct investment and inflation.

The conventional approach to time-series econometrics is based on the implicit assumption of stationarity of time-series data. A recent development in time-series econometrics has cast serious doubt on the conventional time-series assumptions. There is substantial evidence in the recent literature to suggest that many macroeconomic time series may possess unit roots. That is, they are non-stationary processes. A time-series integrated of order zero $I(0)$, is level stationary, while a time-series integrated of order one, $I(1)$, is stationary in first difference. Most commonly, series are found to be integrated of order one, or $I(1)$. The implication of some systematic movements of integrated variables in the estimation process may yield spurious results. In the case of a small sample study, the risk of spurious regression is extremely high. In the presence of $I(1)$ or higher order integrated variables, the conventional t-test of the regression coefficients generated by conventional OLS procedure is highly misleading, Rhif et al.(2019). Resolving these problems requires transforming an integrated series into a stationary series by successive differencing of the series depending on the order of integration, Box and Jenkins (1970). However, Chatterjee et al. (2021) and Chinedu et al. (2022) have argued that the differencing process loses valuable long run information in data, especially in the specification of dynamic models. If some, or all, of the variables of a model are of the same order of integration, following the Engle Granger theorem, the series are co-integrated and the appropriate procedure to estimate the model will be an error correction specification.

The model specifications of the unemployment models are presented in the following equations.

$$\ln UNM_t = a_0 + a_1 \ln UNM_{t-1} + a_2 \ln REER_t + a_3 \ln RGDP_t + a_4 \ln FDI_t + a_5 \ln CPI_t + u_t \dots \dots \dots (3.1)$$

Where, UNM is unemployment rate in a given period, , REER is the real effective exchange rate for given year for Ethiopia, RGDP is the real gross domestic product of the country, FDI is the foreign direct investment and the last one is the measure of consumption in terms of consumer price index.

3.4.2 Pre-Estimation Tests

Before beginning the main econometric estimation, the preliminary test on the data must be verified. A unit root test will be run to see if each variable in the research is stationary. To determine whether there is a long-term link between the variables, a cointegration test will also be performed.

3.4.2.1 Unit Root Test: Augmented Dickey Fuller (ADF) Test

To prevent inaccurate calculations when unit root series are present, this stage involves evaluating the characteristics of the time series data to establish stationarity. Testing the stationarity of each variable in the economic study that uses time series data is necessary before continuing with any form of econometric estimation (Gujirati, 2004). If a stochastic process' mean and variance remain constant throughout time and only the gap or lag between the two time periods determines the value of the covariance between the two time periods, the process is said to be stationary. The results of the regression model would be incorrect if non-stationary data were used.

The Augmented Dickey Fuller (ADF) test will also be used to see if the series of all variables exhibits stationarity. To do a unit root test, the Augmented Dickey Fuller testing approach is frequently used. The lagged difference terms are used to account for serial correlation (Greene, 2012). ADF accepts the unit root null hypothesis while rejecting the stationarity alternative hypothesis. In conducting the Dickey-Fuller test, the error term is assumed to be uncorrelated. If the error terms are correlated, a 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-Fuller (ADF) test should be employed. Moreover, According to Alrabba (2017), justify for the same research, one

of the most common tests for time series stationary is Augmented Dickey-Fuller test that examines the existence of unit root hypothesis as a null hypothesis.

$H_0: \rho = 0$, Non-stationary time series; so it has unit root problem

$H_1: \rho \neq 0$; Stationary time series; so, it has no unit root problem.

Augmented Dickey Fuller test can be written as:

$$\Delta Y_t = \beta_0 + \beta_1 t + \alpha Y_{t-1} + \sum_{j=1}^p \delta \Delta Y_{t-j} + \varepsilon_t \dots\dots\dots (3.2)$$

Where β , α and δ are estimation coefficients. P is the lag order, Y_{t-1} are lagged values of order one. ΔY_{t-j} are changes in lagged values of the dependent variable, and ε_t is the white noise error term.

3.4.2.2 Cointegration Test: ARDL Bounds Testing Approach

Cointegration tests, in other words, show that non-stationary variables are co-integrated in the sense that they have at least a long-term connection. To determine if there is a long-run cointegrating relationship between the variables, the Pesaran et al. (2001) ARDL bound test for cointegration was used. In contrast to tests like the Engle-Granger and Johansen tests, this cointegration test is preferred because it may be used with variables that are entirely $I(1)$ or variables that have a combination of $I(0)$ and $I(1)$ processes. Additionally, it yields superior results with a small sample size.

Assumption ($i=0$ in equation 3.2) is a null hypothesis that there is no cointegration, and it may be rejected using the ARDL bounds testing approach if the upper limit critical value, $I(1)$, is smaller than the F-statistic. The null hypothesis cannot be rejected if the F statistic is bigger than the crucial value for the lower limit $I(0)$. The stability of the coefficients through time, the absence of autocorrelation, and homoscedasticity are assumptions that are necessary for the ARDL limits test to be valid.

3.4.3 Autoregressive Distributed Lag (ARDL) regression model

Choosing the right econometric method is one of the most crucial components of time series analysis since using the incorrect model might lead to erroneous and biased results. One of the most often used conventional econometric methods is the ARDL regression model. In a single-equation time series scenario, the ARDL model is a dynamic model that uses the Ordinary Least Square (OLS) approach to evaluate the connection between variables. Additionally, it concurrently generates short- and long-term estimates and provides more effective model outcomes for small and finite samples (Nkoro and Uko, 2016).

Additionally, the ARDL model may be used for endogenous and exogenous variables together, unlike the Vector Autoregressive (VAR) model (Bhatta and Shrestha, 2019). The ARDL model was employed to accomplish the study's first two particular goals because of the benefits of the model that were mentioned above. The generalized ARDL (p, q) model is as follows:

$$Y_t = \alpha_0 + \sum_{i=1}^p \delta_i Y_{t-i} + \sum_{i=0}^q \theta_i X_{t-i} + \varepsilon_t \quad \text{--- (3.3)}$$

P and q are the lags of the dependent and independent variables, respectively, where Y_t is the dependent variable and X_t is a collection of independent variables. Independent variable coefficients are denoted by θ_i . However, the ARDL model in equation (3.3) may be re-parameterized as a Vector Error Correction Model (VECM) system to incorporate short-run corrections with long-run interactions in a single equation without losing the long-run information (Shrestha & Bhatta, 2019).

ARDL model can be finally stated as:

$$\Delta Y_t = \alpha_0 - \varphi(Y_{t-1} - \beta_i X_t) + \sum_{i=1}^{p-1} \delta_i \Delta Y_{t-i} + \sum_{i=0}^{q-1} \theta_i \Delta X_{t-i} + \varepsilon_t \quad \text{--- (3.4)}$$

Where $\Delta Y_t = Y_t - Y_{t-1}$, the speed of adjustment coefficient, $\varphi = 1 - \sum_{i=1}^p \delta_i$ and the long run coefficients, $\beta_i = \frac{\sum_{i=1}^p \beta_i}{\varphi}$, The error correction term (rate of adjustment) indicates that how fast

the variables converge or diverge to equilibrium. The existence of stable long-run relationship is confirmed by the presence of significant negative error correction term.

The following will be the ARDL model specification for the hypothesized variables in this study as a consequence of the theoretical framework:

$$\begin{aligned} \Delta \ln UNM_t = & \alpha_0 - \varphi(\ln UNM_t^e - (\beta_1 \ln CPI_t + \beta_2 \ln REER_t + \beta_3 \ln RGDP_t + \beta_4 \ln FDI_t)) + \\ & \sum_{i=1}^{p-1} \delta_i \Delta \ln cpi f_t^e + \sum_{i=0}^{q-1} \theta_1 \Delta \ln CPI_{t-i} + \theta_2 \Delta \ln REER_{t-i} + \theta_3 \Delta \ln RGDP_{t-i} + \\ & \theta_4 \Delta \ln FDI_{t-i} + \varepsilon_t \dots \dots \dots (3.5) \end{aligned}$$

3.4.4 Non-Linear ARDL (NARDL) Regression Model

The autoregressive distributed lag (ARDL) bounds testing approach is applied to gauge long-run cointegration while the nonlinear ARDL (NARDL) model is used to test validity of short and long-run symmetric effects of inflation, exchange rate, FDI, Economic growth on unemployment rate. The conventional ARDL model appears to be a typical regression model, however it is predicated on the linearity (symmetry) assumption that non-linear adjustment processes fail. However, numerous real-world scenarios show that the nature of the link between various macroeconomic factors is not linear. As a result, Shin et al. (2013) created the non-linear ARDL (NARDL) model, which is an asymmetrical extension of the linear ARDL model and takes into consideration the asymmetric impacts of independent variables over both the short- and long-term. They also created the asymmetric cumulative dynamic multipliers to track the asymmetric adjustment process.

To address the asymmetric (non-linearity) dynamics in the traditional ARDL model, the NARDL modelling technique incorporates partial sum decompositions (partial sum processes of positive and negative changes) of regressors. Partial sum processes are specified in a variable X_t as follows:

$$X_t^+ = \sum_{i=1}^t \Delta X_i^+ = \sum_{i=1}^t \max(\Delta X_i, 0) \quad (3.6)$$

$$X_t^- = \sum_{i=1}^t \Delta X_i^- = \sum_{i=1}^t \min(\Delta X_i, 0) \quad (3.7)$$

The partial sum processes of positive and negative changes around zero are denoted by X_t^+ and X_t^- , respectively. They show negative and positive shocks in X_t . The first differenced series (ΔX_t) is expected to have a zero mean normal distribution (Olowofeso, 2017). Accordingly, following Shin *et al.* (2011), the NARDL (p, q) asymmetric long run specification is given by:

$$Y_t = \alpha_0 + \sum_{i=1}^p \delta_i Y_{t-i} + \sum_{i=0}^q (\theta_i^+ X_{t-i}^+ + \theta_i^- X_{t-i}^-) + \varepsilon_t \quad (3.8)$$

Where $X_t = X_t^+ + X_t^-$ is the decomposition of the set of independent variables (X_t); θ_i^+ and θ_i^- are the corresponding asymmetric long run coefficients (parameters).

To show the long run and short run asymmetries the NARDL model can be expressed in the error correction form, as in the case of the traditional ARDL model in the above:

$$\Delta Y_t = \alpha_0 - \varphi' (Y_{t-1} - \beta_i^+ X_{t-1}^+ - \beta_i^- X_{t-1}^-) + \sum_{i=1}^{p-1} \delta_i' \Delta Y_{t-i} + \sum_{i=0}^{q-1} (\theta_i^+ \Delta X_{t-i}^+ + \theta_i^- \Delta X_{t-i}^-) + \varepsilon_t \quad (4.13) \dots (3.9)$$

The possible endogeneity of non-stationary regressors is addressed by the NARDL model in (3.9). φ' is the non-linear error correction term's coefficient.

There are generally three phases involved in the empirical estimate of the NARDL model. When comparing the steps utilized in the linear ARDL approach, the first and second stages are identical. The first step is to use OLS to estimate equation, and the second step is to use F-bounds testing procedures to check for the presence of nonlinear (asymmetric) cointegration between the variables.

Finally, the NARDL model supports in the findings of the asymmetric dynamic multiplier effects of a unit change in X_i^+ and X_i^- on Y_t as follows:

$$m_h^+ = \sum_{i=0}^h \frac{\partial Y_{t+i}}{\partial X_i^+}, \text{ and } m_h^- = \sum_{i=0}^h \frac{\partial Y_{t+i}}{\partial X_i^-}, h = 0, 1, 2 \quad (3.10)$$

As $h \rightarrow \infty$, $m_h^+ \rightarrow \beta_i^+$ and $m_h^- \rightarrow \beta_i^-$. As noted in Shin *et al.* (2013), there is little evidence that the dynamic adjustment patterns (m_h^+ and m_h^-) are symmetric (the asymmetric adjustment

paths are more likely to be observed), which is a key feature of NARDL modelling approach. As Shin et al. (2013) pointed out, there is small the evidence that the dynamic adjustment patterns (m_h^+ and m_h^-) are symmetric (asymmetric adjustment paths are more likely to be found), which is the basic feature of the NARDL modeling technique.

3.4.5 Definition, Measurement and Hypothesis of the variables under Study

Unemployment Rate: : It is the dependent variable which is influenced by real gross domestic product, inflationary pressure, capital inflow and foreign direct investment and occurs when a person is able and willing to work but is currently without work.

General Inflation (CPI): It is the average percentage changes in the overall price movements of a given basket of goods and services in the economy compared with the price in base period. Consumer price index is the commonly used Index to measure inflation. Some researchers argued that inflations have a significant effect on unemployment rate on the other hand others said inflation has not a significant effect on unemployment rate. Researchers like Orji et al. (2015) in Nigeria, Shahid (2014) in Pakistan using autoregressive distributed lag model investigated factors affecting the unemployment rate and finally he found that unemployment and inflation rate has inverse relationship. In addition, Alisa (2015) analyzed that inflation and unemployment rate has an inverse relationship by constructing long run and short run Philips's curve in Russia federation. On the other hand, a noble economist price Friedman (1977) argued that there is a positive relationship between unemployment rate and inflation. King et al. (1995) argued that there is not stable relationship between inflation and unemployment rate. Therefore, based on the above empirical and theoretical arguments the researcher draws the below hypothesis.

H1: Inflation has significantly affected the unemployment rate in Ethiopia

Real GDP (RGDP): it is taken as a measure of economic growth (the performance of economic activities). It may have a **positive** impact of inflation when the expansion of production leads to a rise in demand through a reduction in unemployment and increasing wages. On the other hand, an increase in real GDP as a component of demand for real money balances may reduce excess money supply, which in turn makes prices to decline. Okun's law stated that there is inverse relationship between unemployment and RGDP. For example, Sogner (2001) concluded that there was stable

inverse relationship between unemployment and RGDP in Australia using Markov-Chain Monte Carlo methods. Likewise, Singh & Verma (2016) in India, Michael et al. (2016) in Nigeria also found inverse relationship between unemployment rate and economic growth. Hence, real GDP significantly affect unemployment rate in Ethiopia.

H2: Economic growth has a significant affect unemployment rate in Ethiopia

Foreign Direct Investment (FDI): In a type of cross-border investment known as foreign direct investment (FDI), a stake in and considerable degree of control over a business located in another country are established over time by an investor from one economy. Foreign direct investment may have positive or negative effect on unemployment rate. Classical economist assumes that FDI create job opportunity while others said FDI is destruction of domestic technology and modernized colonialism. Mucuk & Demirsel (2013) using a panel data approach studied the determinants of unemployment in developing countries. Other researcher such as Bayar (3014) in Turkey, Dritsakis & Stamatiou (2018) in European union member countries found that unemployment and FDI had inverse relationship. They found that foreign direct investment has a significant and negative effect on unemployment rate.

H3: Foreign Direct Investment has a significant affect unemployment rate in Ethiopia

Exchange Rate ($\ln REER_{it}$): It is the logarithm of Ethiopia's exchange rate, and it is intended to have a favorable impact on a country's exports. This is because currency depreciation is thought to increase a country's competitiveness. As a result, the exchange rate coefficient is predicted to be positive. Some researcher such as Ali & Aki (2022), Helmy (2022) and Gebremariam & Ying (2022) argued that real effective exchange rate has a significant relationship with unemployment rate. On the other hand, other researcher like He (2013) argued that exchange rate and unemployment rate had not a significant relationship. About Ethiopia's key trading partners, the true effective exchange rate is determined. Exchange rate may have either positive or negative effect on unemployment rate. Therefore, based on the above result researcher draw the below hypothesis.

H4: Real effective Exchange has a significant affect unemployment rate in Ethiopia

3.4.6 Post-Estimation tests: Model Diagnostic Tests for ARDL and NARDL models

Although the ARDL model can provide accurate and objective results, the reliability and validity of ARDL estimates depend on the assumptions of homoscedasticity and the absence of model specification bias. As a consequence, several model diagnostic tests on error terms and model adequacy were examined to ensure that these presumptions are valid and that the outcomes are error-free.

CHAPTER FOUR: RESULTS AND DISCUSSIONS

4.1 Overview of the Unemployment Rate in Ethiopia

Ethiopia has a population that is growing quickly and a burgeoning economy, which requires effective management and use of its labor force. In this regard, it is important to constantly examine the economy's ability to absorb the available labor force, and a suitable employment strategy should be implemented as a result. It is common practice to consider the nation's employment and unemployment rates as general indicators when assessing the state of the economy. One of the most significant data sources for information on the prospective labor force of the nation is the labor force survey. So, it is crucial to reflect on the existing work circumstances and anticipate future changes through the study of job status.

The World Bank (2007), in its two-volume study, notes significant reductions in urban unemployment between 1995 and 2005, even though the labor market environment was unaltered. This study suggests that the rapidly expanding urban labor force puts pressure on the labor market and both opportunities and challenges for the Ethiopian government. The rising literacy rate is another aspect of the Ethiopian urban labor market that this study highlights. From the graph below the unemployment rate has been increasing from the beginning year 1990 and increased till 1999 and then started to decline from the climax stage and reached a minimum during the Ethiopian millennium. Whereas, it is starting to increase the unemployment rate starting from 2011 to the present time and the growth rate becomes higher and higher due to economic rises, drought, and Covid pandemic diseases.

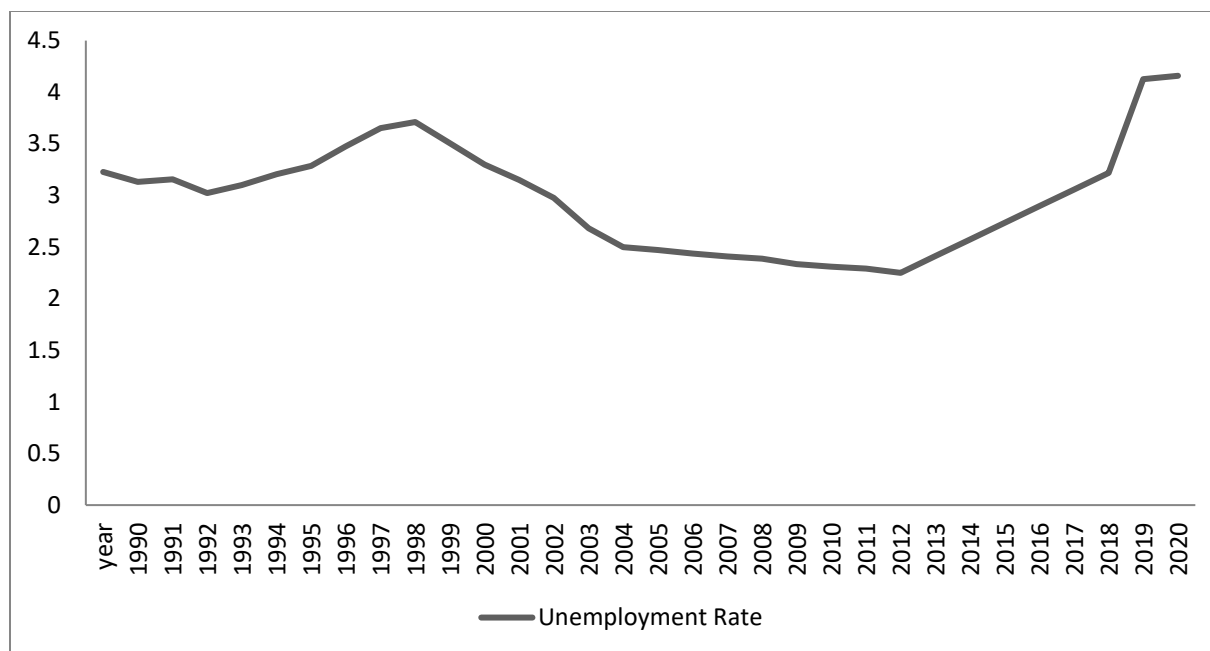


Figure 4.1 Trend of Unemployment Rate in Ethiopia

4.1.1 The Relationship between Unemployment Rate and Economic growth rate

Productivity, income distribution, and unemployment are the three factors that will have the most impact on the total growth of the economy. Okun (1962) made this theoretical connection between output and unemployment. This link, which is one of the most well-known in macroeconomics theory, is true for several nations and areas, mostly in industrialized nations.

The unemployment rate is used to describe the percentage of the population that is jobless compared to the whole labor force. The rate reveals how many people are willing to work in the manufacturing of products and services. The percentage of the population that is jobless over the total number of people who are economically engaged is used to calculate the unemployment rate. From the figure below the economic growth is increasing and then increasing from year to year as in the figure below. It reached the minimum rate during 1992 with an annual growth rate of -8.67 growth rate and tends to increase from 1992 to 1993 with an annual growth rate of double-digit economic growth rate i.e 13 percent per year and then decline to 3 percent economic growth rate during 1994.

The declining growth rate was the war between Ethiopia and Eritrean as well as the drought in the country resulted in the declining of economic growth in the country. From 1994 the growth rate of the economy of the country tends to increase till 1997 which decreased its growth to 3.13 percent and then tends to decline even -3.45. The severe drought in 1998 that led to negative growth of real GDP in Ethiopia resulted in a higher unemployment rate in the country.

Generally, during 1997/98, and 2002/3, there was a rain shortage, and as a result, the economic growth rate of the country was growing at a negative growth rate. And the economic growth rate of the country was a double-digit growth rate from 2004 to 2011 and then tends to single a digit economic growth rate from 2011 till the present. As we see in the figure below, on average the economic growth of the country tends to decline from 2011 to 2021.

The reason for declining the economic growth of the country was declining the agricultural productivity of the country, and the declining interest of the developed country to import agricultural products from developing countries instead of using subsidizing their farmer unions. For example, European countries have their farmer unions that support farmers and producers throughout Europe and the United States as well. The reason was the political instability from time to time in the country has no improvement rather there is the displacement of the people trough out in the country. For example, the political unrest in 2016/17 in Amhara and Oromia region destroyed different projects and infrastructures. During 2020/21-21/22, the political instability in the northern part of the country resulted in decreasing the economic growth rate of the country.

The second reason was the outbreak of Covid19 pandemic diseases during 2019/20 the international community has been affected during this period and it greatly affects the economic growth rate of the country and even resulted in a higher rate of unemployment in the country during that year because as different company closes their offices. From 2002 onwards, when the unemployment rate increases sharply, the economic growth of the country decreases at an increasing rate on the average period. Therefore, the researcher understands that increasing the economic growth of the country ultimately resulted in decreasing the unemployment rate and vise.

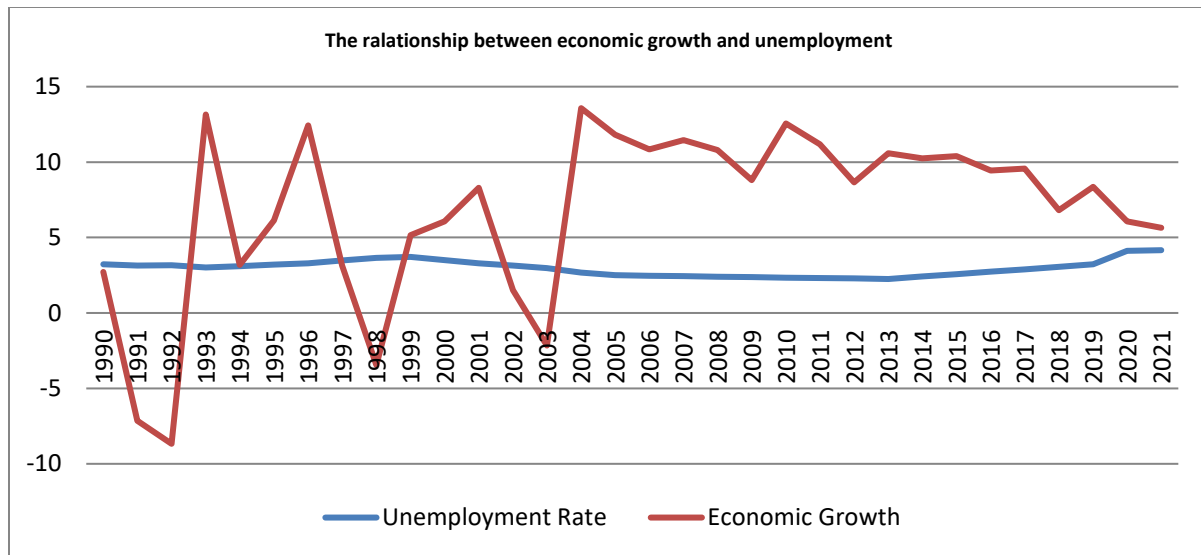


Figure 4.2 Trend and Relationship between Unemployment rate and Economic growth Rate

4.1.2 Unemployment Rate and inflation relationship

The 2010s in Ethiopia were the most well-known era when unemployment and inflation were positively associated. Stagflation, the trifecta of high unemployment, rising inflation, and slow economic development that dogged this decade, resulted from several factors. From the graph below on average from the study period inflation and unemployment rate in the country have been positively associated. From the graph below the inflation rate was increasing from 1990 to 1991 and then declined in 1992 then tends to increase until 1994 and then tends to decline in 1996. And then reached minimum reached the lowest rate and tends to reach the maximum double-digit inflation in 2008. Starting in 2008, it tends to decrease its rate till 2012. Generally, from the graph below on the study period on the average, there is a positive relationship between unemployment rate and inflation in the country.

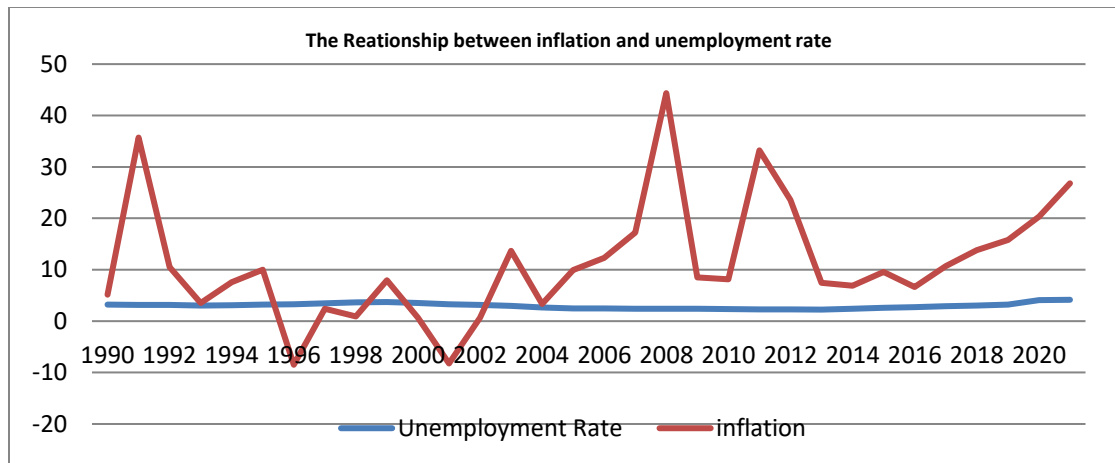


Figure 4.3 Trend and Relationship between the Unemployment Rate and Inflation

4.1.3 The relationship between Unemployment rate and Real effective exchange Rate

The macroeconomic channel claims that there are two distinct methods by which the impact of changes in the exchange rate is transferred to the unemployment rate. One of these strategies affects unemployment positively, while another has an adverse impact. When local currency depreciation boosts competitiveness, which in turn causes a rise in exports and a drop in imports owing to an increase in the price of imported goods, the macroeconomic channel benefits. This results in a rise in the demand for locally produced goods, which prompts businesses to hire more workers to meet the demand, lowering the unemployment rate. On the other hand, when the value of the currency rises, fewer units are needed to buy one dollar, increasing the demand for local goods.

Unlike the prior mechanism, this contends that a decline in the value of the local currency benefits the unemployment rate. A devaluation of the local currency, according to Krugman and Taylor (1978), has a detrimental impact on unemployment. First off, this decline in the value of the local currency causes a rise in exports and a drop in imports, which raises net exports. The prices of local items tend to be higher as domestic and international demand for them increases, which in turn causes a decline in demand for them as well as a reduction in production volume. Second, income redistribution in response to currency devaluation would favor industries with a higher tendency to save, resulting in a decline in investment, consumption, and aggregate demand, which in turn results in a decline in the demand for employment and an increase in unemployment. To put it another way, the impact of currency depreciation transferring to the unemployment rate throughout the whole economy will change over time from a positive to a negative effect.

From the graph below, the real effective exchange rate of the country has been increasing from 1990 to 1992. From 1992 to 2002 period on average, its' growth rate has been declining and then increasing in its growth rate from 2002 to 2008, its growth rate has been improving on average and then started to decline in 2009 and reached a minimum in 2010 and started to increase from 2010 onwards till 2018. From 2018, the real effective exchange rate of the country tends to increase at a decreasing rate. On average in the study period, the relationship between the real effective exchange rate and the unemployment rate is positively correlated as we depicted in the graph below.

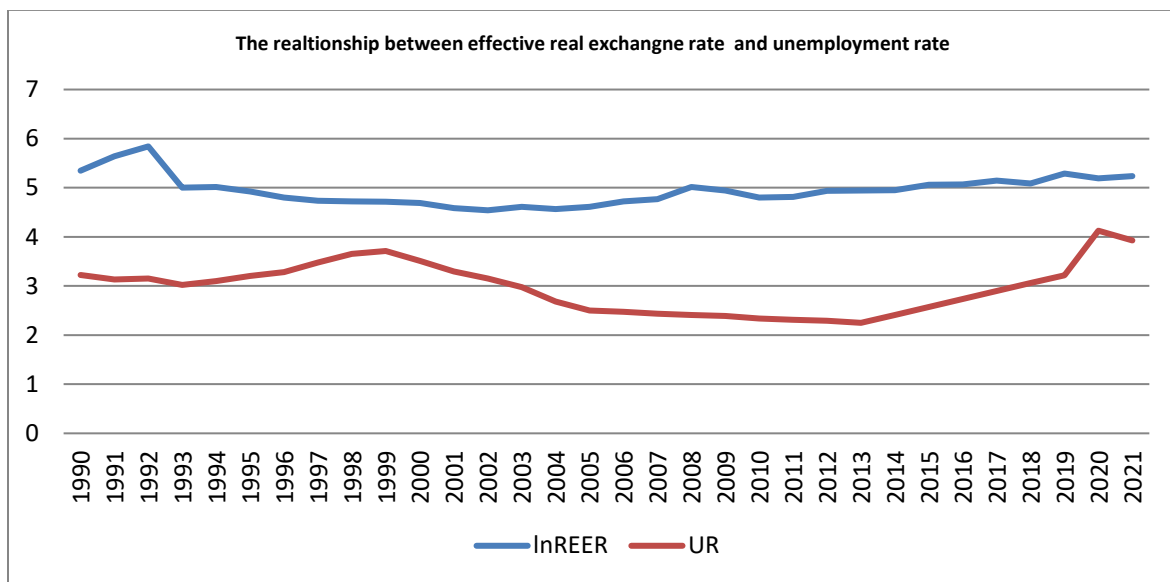


Figure 4.4 Trend and Relationship between Unemployment rate and real effective exchange Rate

4.1.4. The relationship between Unemployment and Foreign direct investment

The importance of both inbound and outbound foreign direct investment (OFDI) is recognized in emerging nations. Work opportunities for both skilled and unskilled laborers increased as a result of projects financed by foreign investors. In recent years, developing nations have viewed FDI as one of the finest options for boosting their economies. According to the research, two of the key factors that foreign investors consider when choosing a potential host nation are the labor market and the macroeconomic stability of that nation. Researchers that offer compelling data in favor of the claim that FDI has significant positive effects on a host nation also note the reverse impact. One measure of economic progress is the influx of foreign direct investment. FDI gives developing nations access to the necessities like technology, finance, business acumen, and professional skills.

These are crucial for increasing employment possibilities, which will reduce unemployment and ease poverty (Athukorala, 2003). We are attempting to assess how FDI has affected Ethiopia's unemployment rate.

As starting from the beginning year 1990 the rate of foreign direct investment increases at an increasing rate till 1992, and then it increases at decreasing rate from 1992 to 1994. Starting from 1994 to 1996, the flow of foreign direct investment increases at an increasing rate and then its rate declined until 1997 and then started to increase its rate in 1999 and then declined its growth rate. In general, from the below figure the rate of foreign direct investment from 1990 to 1995, the rate growth rate of inflow of foreign direct investment increases at an increasing rate, from 1995 to 2016, the growth rate of foreign direct investment increases at decreasing rate and then started to increase its growth rate at increasing rate from 2010 to 2014 and then tends to increases at decreasing rate. When we come to the relationship between the unemployment rate and foreign direct investment under the study period as shown in the figure below, as the time path increases the gap between the graph of FDI and the unemployment rate increases and tends to broaden and have a tendency seems to edge worth curve.

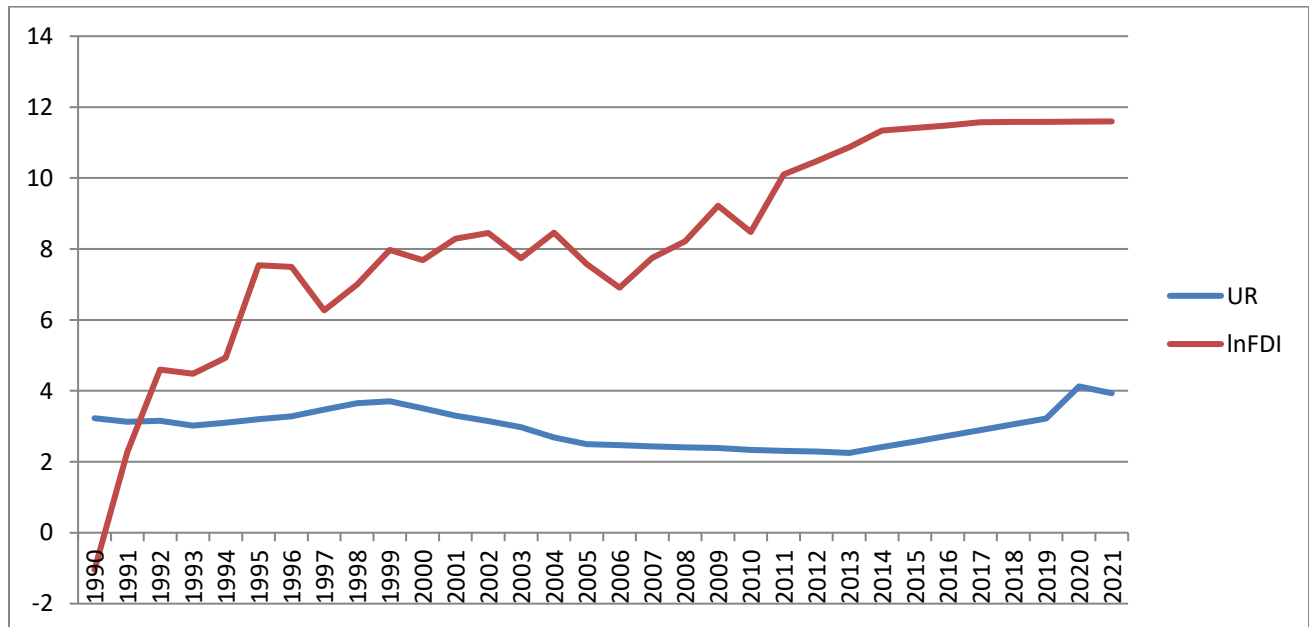


Figure 4.5: Trend and relationship between Unemployment and Foreign direct investment

4.1.5 Descriptive Statistics of the Study Variables

It is necessary to explain the descriptive statistics of the study variables. The result in the table below describes the central tendency and measurement of dispersions. From the result below the first variable natural logarithm of total unemployment has a mean of 2.966 and standard deviation of 0.153. From the result, the maximum value of the unemployment rate was 4.13 in 2020. The researcher understands that during 2020 there is a Covid 19 economic impact and the political instability in the northern part of the country resulted in the maximum unemployment rate in the country.

When we come to the second variable, the natural logarithm of RGDP, it has a mean of 13.11 and a standard deviation of 0.963. The other variable real effective exchange rate has a mean of 4.98 and a standard deviation of 0.302. The other variable natural logarithm of the consumer price index has a mean of 3.40 and a standard deviation of 0.927. The remaining variable natural logarithm of foreign direct investment has a mean of 8.25 and standard deviations of 2.693.

Table 4.1 Summary statistics of the study variables (1990 to 2021)

Variables	Description	N	Mean	Stand. D	Min	Max
lnTU	Natural logarithm of total unemployment	32	2.966	0.153	2.25	4.13
lnRGDP	Natural logarithm of RGDP	32	13.11	0.963	11.739	14.55
lnREER	Natural logarithm of real effective exchange rate	32	4.98	0.302	4.541	5.84
lnCPI	Natural logarithm of consumer price index	32	3.40	0.927	2.13	5.218
lnFDI	Natural logarithm of foreign direct investment	32	8.25	2.693	-1.04	11.59

4.2 Econometrics Analysis

4.2.1 Results of Pre-Estimation Test

The unit root test was initially utilized to establish the stationarity criterion of each variable used in this investigation. A cointegration test was then used to determine if the long-term connection between the variables was stable.

4.2.1.1 Unit Root Test

Unit root tests are critical for identifying the order of integration of variables and avoiding the probability of misleading regressions. Hence, to find the presence of a unit root in each of the time series, the augmented dickey fuller (ADF) was tested. In the ADF unit root tests, the null hypothesis is that the data series are non-stationary (contain unit root), whereas the alternative hypothesis is that the process is stationary.

Table 4.2 Unit Root Test

Variables	ADF Test				Probability within order of integration	Order of integration
	Level		First difference			
	Intercept	Intercept and trend	Intercept	Intercept and trend		
lnTU	-0.426	0.232	-4.051	-4.282	0.0012	I(1)
lnRGDP	-0.098	-3.043	-5.350	-5.238	0.0000	I(1)
lnREERR	-1.921	-1.866	-6.218	-6.587	0.0000	I(1)
lnCPI	1.038	-0.854	-4.828	-5.006	0.0000	I(1)
lnFDI	-4.140	-5.346	-5.755	-5.799	0.0008	I(0)

According to the result above all variables the natural logarithm of foreign direct investment (lnFDI), become stable at their first difference (follow I (1) process), according to the ADF test findings in the above table. The series is statistically significant, and the null hypothesis of non-stationarity can be rejected when the ADF test statistics values are larger than their respective critical values.

4.2.1.2 Test for Cointegration

A cointegration test was done after unit root testing to see whether the variables have a consistent long-term connection. In this study, the alternative hypothesis of cointegration between the variables was utilized as an alternative to the null hypothesis of no cointegration while performing the ARDL bound cointegration test. The null hypothesis can be disregarded if the F-statistic and t-statistic both exceed the upper bound critical values $I(1)$.

Table 4.3 ARDL Bounds cointegration test results

General Inflation	Lower bound, $I(0)$	Upper bound, $I(1)$
F-Bounds test statistic =14.695	3.74 with a 1% significant level 2.86 with a 5% significant level	5.06 with a 1% significant level 4.01 with a 5% significant level
t-bounds test statistic = -4.660	-3.43 with a 1% significant level -2.86 with a 5% significant level	-4.60 with a 1% significant level -3.99 with a 5% significant level

The ARDL bounds cointegration test results show that the variables in all the three model equations are co-integrated, since each F-bound and t-bound test statistic is greater than the corresponding upper bound critical values at the 1% significant level, as shown in the above table. This means that all three models have a stable long-run relationship among variables

4.2.2 Linear ARDL Model Results

As was previously mentioned, the drivers of unemployment in Ethiopia from 1990 to 2021 are studied using the linear Autoregressive Distributed Lag (ARDL) model. These estimate findings are discussed:

4.2.2.1 Long Run Results Discussions

From the result blow, in the long run, the lag of natural logarithm of total unemployment has a positive and significant effect on the current unemployment level. Other things being remain constant; increasing the level of previous year unemployment by 1 percent resulted in increasing the level of current unemployment by 0.443 percent. It is obvious that last year's unemployment

reflects the country's poor economic state, and as a result, it will have a detrimental impact on this year's employment and resulted in increasing the level of unemployment rate. The result is aligned with Hjazeen et al. (2021) who studied the nexus between unemployment and economic growth in Jordan. In His study, the lag of unemployment rate has positive and significant effect at 10 percent level of significance. Maqbool et al (2013) also found positive significant effect of lag of unemployment on unemployment in Pakistan under study period from 1976 to 2002. I concluded that increasing the level of lag of unemployment by 1 percent resulted in increasing the level of unemployment rate by 0.526 percent. Therefore, based on the previous researcher investigation and our study result, we understand that the lag of unemployment has positive and significant effect on unemployment rate in Ethiopia.

The effect of economic growth on the level of unemployment in the long run, economic growth expressed as (natural logarithm of RGDP) has a negative and significant effect on unemployment rate. Other things being remain constant; increasing the economic growth of the country by 1 percent resulted in decreasing the level of unemployment rate by 0.9441 percent. From the result we can understand that there is a strong association between the pace of economic growth and the drop-in unemployment rates. Additionally, slow economic development dynamics will raise the long-term unemployment rate (non-employment growth). On the other hand, prolonged high unemployment may be considered as a deterrent to economic expansion. Lower global demand and human capital investment result from unemployment. The result is aligned with Makaringe & Khobai (2018) in South Africa, Shahid (2014) in Pakistan, Amar et al. (2022) in Western Samatra provision.

Real effective exchange rate in the long run has a negative and significant effect on unemployment rate of Ethiopia. The result indicated that in the long run, increasing the real effective exchange rate by 1 percent resulted in decreasing the total unemployment rate by 1.44 percent, other things being remain constant. Exports might grow as a result of the price of exports dropping since it would attract more customers from outside and make the nation more competitive. While a consequence, the quantity of demand in the nation rises, and while other factors remain stable and supply is attracted, this leads to an increase in domestic output. An increase in exports leads to an increase in output, which raises the need for laborers and, as a result, has a favorable impact on employment and an unfavorable effect on the total unemployment of the country.

In the long run, increasing the inflation rate has a negative and significant effect on the unemployment rate. Increasing the level of the inflation rate by 1 percent resulted in decreasing the level of unemployment rate by 2.5 percent. According to Phillips (1958), the higher aggregate demand is what's causing the high inflation rate; thus, businesses must boost production by investing more in capital, labor, and equipment. As a result, when inflation increased, the unemployment rate declined. As a result of rising fuel and basic commodity costs as well as the fact that the majority of Ethiopian businesses utilize capital-intensive rather than labor-intensive production methods, the country's inflation rate is growing. As a result, employment growth is slower than that of the labor force. Therefore, a high unemployment rate will occur after a high inflation rate in the long run. The result is in line with Abu (2019), Sasongko & Huruta (2019), Dereli (2019), and Sahnoun & Abdennadher (2019). However, Zandi et al. (2022), Sasongko & Huruta (2019), and Gomis-Porqueras et al. (2020) found that inflation and unemployment rate have a negative relationship.

The other variable which has a significant effect on the unemployment rate is foreign direct investment. From the result in the table below, increasing foreign direct investment has positively affected the unemployment rate in the long run. Other things remain constant; increasing the level of foreign direct investment inflow in the country by 1 percent resulted in increasing the level of unemployment rate by 6 percent. According to the dependency theory, Foreign Direct Investment is used as the advanced guard for a new diplomacy of economic imperialism. The dependence theory, according to Aremu (2005), contends those developing countries' poverty results from their routine exploitation by: the introduction of the international division of labor to the disadvantage of developing counties (Ugochukwu et al., 2013).

These academics contend that distortions include the displacement of domestic firms, rising unemployment associated with the adoption of capital-intensive technology, and a significant erosion of political sovereignty. The FDIs are claimed to be imperialist and exploitative in character, making the host nation dependent on the home nation and its wealth. According to the aforementioned, dependence theories hold that the involvement of developed countries in developing countries through their FDIs or by any other methods cannot be anticipated to have a positive impact on the developing economies or the taxation system (Alam et al., 2020; Ziberi & Avdiu, 2020; Tegep et al., 2019).

4.2.2.2 Short Run Results and Discussions

In the short run, the lag of total unemployment has a significant and negative effect on current unemployment. Increasing the level of the previous year's unemployment by 1 percent resulted in decreasing the level of the current unemployment rate by 2 percent, given other things remain constant. Since decreasing and removing unemployment benefits and fringes as for the previous year unemployment resulted in decreasing the level of unemployment in the current year. Since to survive, the labor force is challenged to work different working activities that earn money for their living. During the period in which fringe benefit was given, the level of unemployment resulted in increases as people tried to get income without work and employment because the cost of employment is greater than the benefit of unemployment in the case where the government provides fringe benefits (Raifu et al.,2020; Dmytrów & Bieszk-Stolorz, 2019; C Onuoha & Agbede, 2019).

In the short run Economic growth has a significant and negative effect on the unemployment rate. Increasing the level of economic growth of the country by 1 percent resulted in decreasing the level of unemployment rate by 0.48 percent giving other things remaining constant. As a result of this, we can argue that the Ethiopian government is currently using capital-embodied technological shock triggers which are based on labor-intensive technologies that employed a huge number of labor force.

In the short run, inflation has a positive and significant effect on the total unemployment rate. Increasing the level of total inflation rate as measured by (the natural logarithm of the consumer price index, $\ln\text{CPI}$) resulted in increasing the level of total unemployment by 1.139 percent other things being remain constant. Increasing the level of total foreign direct investment flow by 1 percent resulted in increasing the level of total unemployment rate by 0.096 percent given other things remains constant.

A real effective exchange rate has a positive and significant effect on the unemployment rate in the short run. Increasing the real effective exchange rate by 1 percent resulted in a 1.833 percent increase in total unemployment. The reason for the positive exchange rate with Ethiopia's unemployment rate was higher exchange rate volatility increased unemployment rate the result is in line with Bakhshi & Ebrahimi (2016), He (2013), Khan et al. (2018), and El-Amin et al. (2022).

Whereas other studies like Bošnjak (2021), Chowdhury & Hossain (2014), and Mohd & Siddiqui (2020) found that a real effective exchange rate has a negative and significant effect in the short run.

Table 4.4 ARDL linear Model Result

Selected Model: ARDL (3,2,4,4,1)			
Dependent Variable: D.(lnTU)			
Short run coefficients		Std. error	P-value
D.(L.lnTU)	-2.005***	0.273	0.000
D. (lnRGDP)	-0.4811**	0.169	0.019
D.(lnREER)	1.833***	0.242	0.000
D.(lnCPI)	1.319***	0.290	0.001
D.(lnFDI)	0.096**	0.041	0.044
Error correction term	-0.249	0.025	0.000
Long run coefficients		Std. error	P-value
L.lnTU	0.443***	0.993	0.002
lnRGDP	-0.941**	0.415	0.050
lnREER	-1.445***	0.639	0.050
lnCPI	-2.478***	0.759	0.010
lnFDI	5.979***	0.170	0.007
Model Diagnostic tests			
R ² [adj-R ²]	0.9593 [0.8778]		
Breusch-Godfrey Serial Correlation LM Test [P-Value]	2.906 [0.089]		
Heteroscedasticity Test: White test [P-Value]	31 [0.4410]		
Ramsey RESET Test [P-Value]	3.83 [0.076]		
Normality: Shapiro-W test [p-value]	0.597		
Multicollinearity test [mean VIF]	9.51		

In terms of the model diagnostic tests, as shown in the above table, the coefficient of determination (R^2) shows that the model is sufficient (overall significant) and has a decent fit at the 1% level. The model has no serial correlation or heteroscedasticity concerns, according to the Breusch-Godfrey Serial Correlation LM Test and the autoregressive conditional heteroscedasticity (ARCH) test. The Shapiro-Wilki (SW) test finds normal errors, whereas the Ramsey RESET test determines whether the model is free of omitted variable bias and the VIF test shows there is no multicollinearity. As a result, the model for the unemployment rate passes all model diagnostic tests.

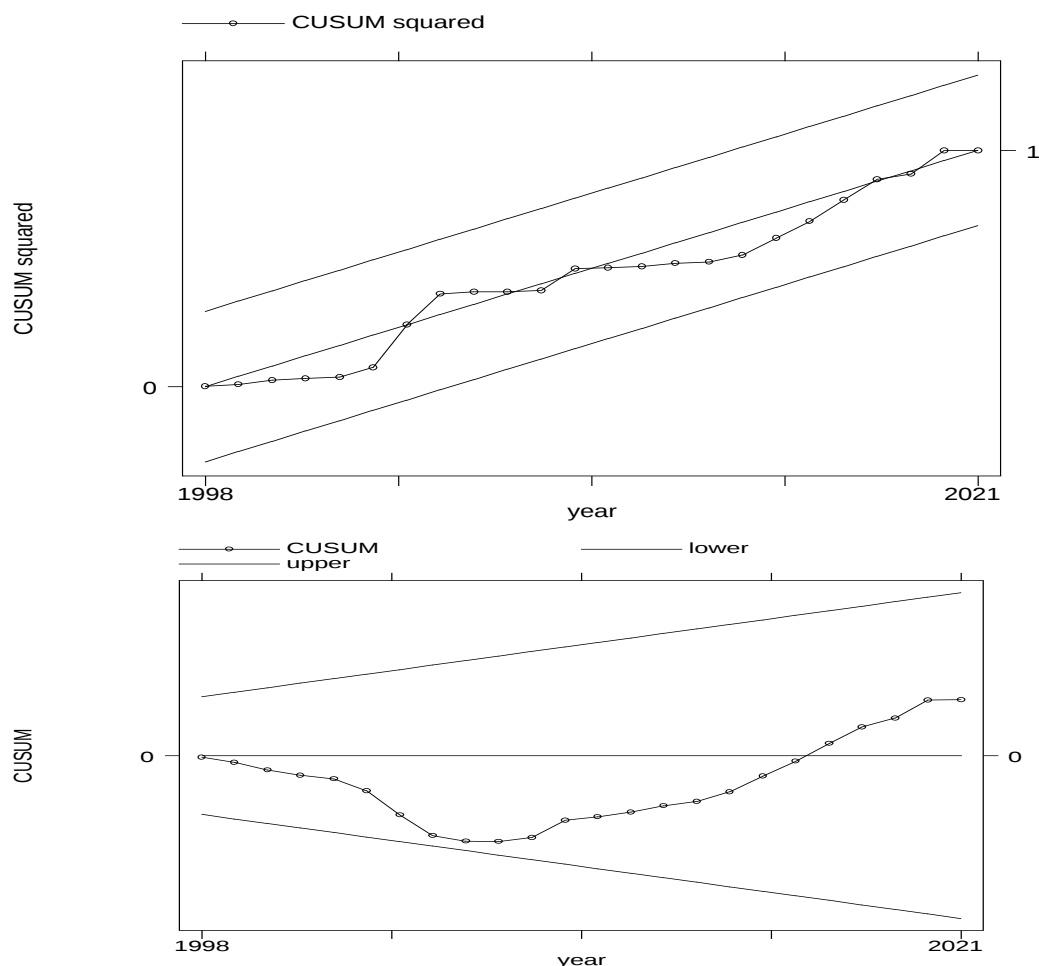


Figure 4. 6 CUSUM and CUSUM square stability tests (Unemployment rate equation)

The CUSUM Test presented in figure above is an indication that the parameters of the model are relatively stable over time as the cumulative sum does not go outside the area between the two

critical lines. As indicated above the CUSUM plot graph is found between the lower and upper boundaries, at 5% level of significance which indicates stable movement of coefficients. Moreover, in the case of CUSUM squares the trend is also moving in between the lower and upper critical bounds of 5%, hence, so it reveals that the model is structurally stable.

4.2.3 Non-Linear ARDL Model Results

As previously stated, the Non-linear ARDL model is a direct extension of the linear ARDL model that is used to investigate potential asymmetric effects (incorporates nonlinearities). The non-linear ARDL model is useful in this context for examining unemployment dynamics and their responses to positive and negative shocks in various demand and supply side components. That is, it is used to examine the asymmetric (nonlinear) connection between total unemployment and its drivers in the short and long run across the research period.

As seen in the lower panel of Table 5.7, the NARDL model has a good fit and passes all model diagnostic tests without exhibiting serial correlation, heteroscedasticity, model misspecification, or error non-normality. The CUSUM and CUSUM square tests additionally reveal the model parameters' stability during the selected time period. Additionally, the robust asymmetric long-run connection of the model is validated by the F and t-bounds testing techniques, which both reject the null hypothesis of no cointegration.

The Wald statistics show that the null hypothesis of no short-run asymmetry is rejected for the consumer price index and real effective exchange rate (at a 5 percent significant level). In the near term, this demonstrates the existence of asymmetric impacts of inflation and real effective exchange rate on the unemployment rate. Whereas the remaining variable RGDP and foreign direct investment index have no short-run asymmetry.

Table 4.5 Non-Linear ARDL result

Selected Model: ARDL (2,4,4,1)			
Dependent Variable: Δ (lnTU)			
Short run coefficients		Long run coefficients	
Δ (lnRGDP_pos)	-0.413*** (0.006)	ln RGDP_pos	-0.527 **(0.024)
Δ (lnRGDP_neg)	-0.326* (0.094)	ln RGDP_neg	0.527 (0.124)
Δ (lnREER_pos)	0.413*** (0.006)	lnREER_pos	4.06 (0.165)
Δ (lnREER_neg)	-0.326* (0.094)	lnREER_neg	-2.629 (0.130)
Δ (lnCPI_pos)	-0.700 (0.398)	lnCPI_pos	1.571** (0.049)
Δ (lnCPI_neg)mo	-6.555(0.339)	lnCPI_neg	-11.582 (0.281)
Δ (lnFDI_pos)	-0.482 (0.135)	lnFDI_pos)	-0.504 (0.154)
Δ (lnFDI_neg)	0.517 (0.383)	lnFDI_neg	0.143 (0.700)
Error correction term	-0.410* (0.000)		
Model Diagnostic tests			
Bounds tests	F-statistic: 19.33, t-statistic = -4.396		
	F-critical values at 1%: lower bound = 2.54; upper bound = 3.86		
	t-critical values at 1%: lower bound = -3.43; upper bound = -5.68		
R ² [adj-R ²]	0.9623 [0.6359]		
F-statistic (p-value)	12.75 (0.0034)		
Breusch-Godfrey Serial Correlation LM Test (P-Value)	19.33 (0.3102)		
Heteroscedasticity Test: Breusch-Pagan-Godfrey test (P-Value)	1.735 (0.6770)		
Ramsey RESET Test (P-Value)	1.33 (0.4095)		
Normality: JB test (p-value)	2.296 (0.3173)		
Long run and Short run asymmetry tests			
	Long run asymmetry	Short run asymmetry	
lnRGDP	.682** (0.015)	.221 (0.630)	
lnREER	1.744 (0.278)	.111 (0.011)	
lnCPI	2.478 (0.045)	.569(0.037)	
lnFDI	4.965 (0.112)	1.689 (0.285)	

When it comes to the impact of Economic growth, the findings show that economic growth (a positive shock in the economy) has significant and negative long-run and short-run effects on the unemployment rate. However, the economic slowdown (negative economic growth) has insignificant short-run effects and long-run effects on the unemployment rate. When it comes to the effect of the real effective exchange rate on the unemployment rate in Ethiopia, an increasing and positive real effective exchange rate has an insignificant and positive effect in the long run while it has a significant and positive effect in the short run. The other variable, the inflation rate is only a significant effect on the unemployment rate in the long run when maintaining a positive inflation rate. Lastly, foreign direct investment has no significant effect on the unemployment rate in Ethiopia.

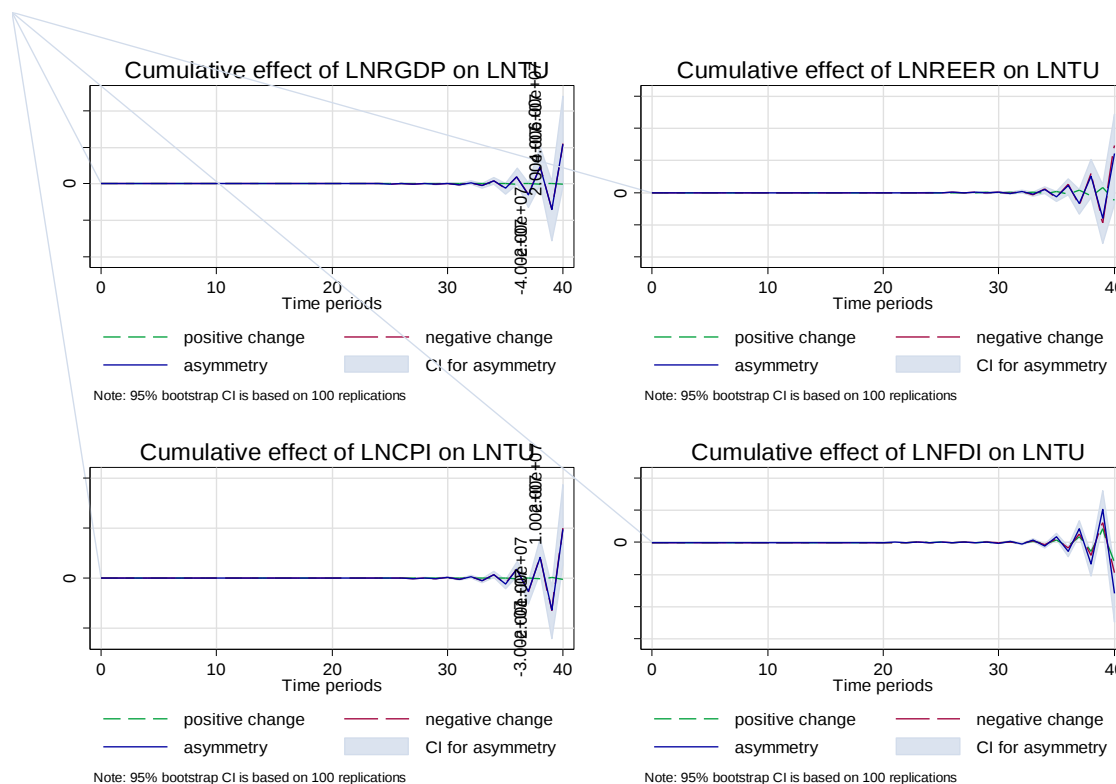


Figure 4.7: CUSUM and CUSUM square stability tests (Non-Linear ARDL model)

Cusum tests assess the stability of coefficients β in a multiple linear regression model of the form $y = X\beta + \epsilon$. Inference is based on a sequence of sums, or sums of squares, of recursive residuals (standardized one-step-ahead forecast errors) computed iteratively from nested subsamples of the data.

CHAPTER FIVE

SUMMARY OF THE FINDING, CONCLUSION AND POLICY RECOMMENDATION

5.1 Summary of the Findings

The unemployment rate has been the most persistent issue in both developed and developing nations. Thus, all the relevant ideas, key factors, and concepts had been discussed at first including the macroeconomic factors that affect the unemployment rate in Ethiopia.

This study is an attempt to investigate the determinants of unemployment in Ethiopia. The yearly data was used from the period 1990 to 2021. Unit root test is used to check the stationarity of the variables and employed Autoregressive Distributed Lag Model (ARDL) regression method.

In Addition, Nonlinear ARDL model has been employed to detect the symmetric impact of different variables on unemployment rate in Ethiopia. When we come to the long run ARDL result all four variables namely (economic growth, real effective exchange rate, inflation and foreign direct investment) were a significant determinant of unemployment rate in Ethiopia.

In the long run, the lag of the natural logarithm of total unemployment has a positive and significant effect on the current unemployment level. The effect of economic growth on the level of unemployment in the long run, economic growth expressed as (natural logarithm of RGDP) has a negative and significant effect on the unemployment rate. Slow economic development dynamics will raise the long-term unemployment rate (non-employment growth). All variables except foreign direct investment affect unemployment rate negatively they decrease Unemployment, while foreign direct investment affect unemployment rate positively.

According to the dependency theory, Foreign Direct Investment is used as the advanced guard for a new diplomacy of economic imperialism. The dependence theory, according to Aremu (2005), contends those developing countries' poverty results from their routine exploitation by: the introduction of the international division of labor to the disadvantage of developing countries (Ugochukwu et al., 2013).

These academics contend that distortions include the displacement of domestic firms, rising unemployment associated with the adoption of capital-intensive technology, and a significant erosion of political sovereignty. The FDIs are claimed to be imperialist and exploitative in

character, making the host nation dependent on the home nation and its wealth. According to the aforementioned, dependence theories hold that the involvement of developed countries in developing countries through their FDIs or by any other methods cannot be anticipated to have a positive impact on the developing economies or the taxation system (Alam et al.,2020; Ziberi & Avdiu, 2020; Tegep et al., 2019).

5.2 Conclusion

When we see the ARDL model, in the long run, the lag of the natural logarithm of total unemployment has a positive and significant effect on the current unemployment level. The effect of economic growth on the level of unemployment in the long run, economic growth expressed as (natural logarithm of RGDP) has a negative and significant effect on the unemployment rate. Slow economic development dynamics will raise the long-term unemployment rate (non-employment growth). On the other hand, prolonged high unemployment may be considered as a deterrent to economic expansion. Lower global demand and human capital investment result from unemployment. A real effective exchange rate in the long run has a negative and significant effect on the unemployment rate of Ethiopia. In the long run, increasing the inflation rate has a negative and significant effect on the unemployment rate. The other variable which has a significant effect on the unemployment rate is foreign direct investment. From the result the researcher concluded that increasing foreign direct investment has positively affected the unemployment rate in the long run.

When it comes to short run results, the researcher concluded that the lag of total unemployment has a significant and negative effect on current unemployment. Economic growth has a significant and negative effect on the unemployment rate. Since when the adaptation cost is below the creation cost, it may lead to a stronger capitalization effect (lower unemployment) and higher employment. In the short run, inflation has a positive and significant effect on the total unemployment rate. In the long run foreign direct investment has a positive and significant effect on the total unemployment level. A real effective exchange rate has a positive and significant effect on unemployment rate in the short run.

When we come to the Nonlinear ARDL results, The Wald statistics show that the null hypothesis of no short run asymmetry is rejected for the consumer price index and real effective exchange rate (at 5 percent significant level). In the near term, this demonstrates the existence of asymmetric

impacts of the inflation and real effective exchange rate on unemployment rate. Whereas the remaining variable RGDP and foreign direct investment index has no short run asymmetry.

5.2 Policy Recommendations

Based on the results, discussions, and conclusions the researcher recommended the following key points.

- The study concluded that Ethiopia's Economic growth has a considerable impact on the country's unemployment rate. Ethiopia's unemployment rate will be lower as its economy grows. As a result, the study suggested that the Ethiopian government (policymakers) should concentrate on restructuring the Ethiopian economy. In general, the government gives due attention to the development of the work culture of citizens by arranging different motivations and training. Provision of incentives for labor-intensive industries such as texel and leather factories. supporting and provision of finance to small and medium enterprises which observe a huge labor force. Moreover, the government authorities should give special attention to the local handicrafts and woodwork.
- The Ethiopian government should focus on its policies and strategies on how to use the abundant labor resource available with the land resource and limited capital. In this regard, I recommend that the Ministry of Education shift from theoretical fields of study to vocational schools thereby improving the practical work capabilities of young students and the self-employment of citizens.
- The findings from the study show that FDI has insignificant effect on the unemployment of citizens in Non ARDLM model, However, this does not imply that the flow of foreign capital is not needed. Rather it means that capital should be combined with efficient labor resources. In doing these the Ethiopian labor office should regulate and create favorable conditions to enable FDI to create more jobs. Lessons and experiences of the Asian tigers should be reviewed and used.
- Real exchange rate has a negative significant effect on the unemployment rate implies that the implementation of an import substitution strategy is crucial in absorbing a huge labor force the Ethiopian government should give attention to limiting imported goods and exert

effort to import only technologies and satisfy the demand for the majority of consumer goods by locally produced goods.

- Last but not least the government should promote the utilization ICT to involve the majority of young graduates unemployed to solve the problems of society.
- The government should work hard to ensure peace and stability in the country. Solve all the possible conflicts among nations and nationalities. Hence intensify economic activities in the country. Create a conducive environment for the safe movement of the people and the goods produced.
- Moreover, the government authorities should efficiently utilize the capital resource generated locally or donations and grants from abroad (like the revolving fund) in job creation.
- Given the asymmetric character of some of the elements, such as the real effective exchange rate and inflation rate as well as economic growth rate, it's important to think about how positive and negative shocks to these variables affect unemployment rate.
- To better comprehend the underlying unemployment and pressures in the economy, policymakers must evaluate the unique behaviors and sources of unemployment rate, as well as the asymmetry effect impact between them. From the result policy makers has to improve and the exchange rate policy regime

REFERENCES

- Abu, N. (2019). Inflation and Unemployment Trade-off: A Re-examination of the Phillips Curve and its Stability in Nigeria. *Contemporary economics*, 13(1), 21-35.
- Achdut, N., & Refaeli, T. (2020). Unemployment and psychological distress among young people during the COVID-19 pandemic: Psychological resources and risk factors. *International journal of environmental research and public health*, 17(19), 7163.
- Afolayan, O. T. (2019). Reducing unemployment malaise in Nigeria: The role of electricity consumption and human capital development. *670216917*.
- Alam, J., Nur Alam, Q., & Hoque, M. (2020). Impact of GDP, Inflation, Population Growth and FDI on Unemployment: A Study on Bangladesh Economy. *African Journal of Economics and Sustainable Development*, 3(3), 67-79.
- Alemu, B. F. (2020). Assessment of Urban unemployment: Is it a challenge in ensuring good urban governance in Dire Dawa Administration? *Asian Journal of Management*, 11(3), 245-253.
- Amar, S., Ariusni, A., & Satrianto, A. (2022, July). Causality Analysis of Economic Growth, Investment, Unemployment and Poverty in West Sumatra Province. In *Eighth Padang International Conference on Economics Education, Economics, Business and Management, Accounting and Entrepreneurship (PICEEBA-8 2021)* (pp. 491-504). Atlantis Press.
- Aniche, E. T. (2020). Migration and sustainable development: Challenges and opportunities. *Migration Conundrums, Regional Integration and Development*, 37-61.
- Bakhshi, Z., & Ebrahimi, M. (2016). The effect of real exchange rate on unemployment. *Marketing and Branding Research*, 3, 4-13.
- Berhe, M. W. (2021). Empirical analysis of urban youth unemployment in Ethiopia. *African Development Review*, 33(1), 104-116.
- Biru, A., Gilbert, D., & Arenius, P. (2021). Unhelpful help: The state of support programmes and the dynamics of entrepreneurship ecosystems in Ethiopia. *Entrepreneurship & Regional Development*, 33(1-2), 108-130.
- Bošnjak, M. (2021). Real effective exchange rate and unemployment across post-transition Europe: Evidence from wavelet coherence analysis. *Ekonomski Vjesnik*, 34(2), 249-264
- Buthelezi, E. M. (2023). Impact of inflation in different states of unemployment: evidence with the Phillips Curve in South Africa from 2008 to 2022. *Economies*, 11(1), 29.
- C Onuoha, F., & Agbede, M. O. (2019). Impact of disaggregated public expenditure on unemployment rate of selected African countries: A panel dynamic analysis. *Journal of Economics, Management and Trade*, 24(5), 1-14.

- Casado, M. G., Glennon, B., Lane, J., McQuown, D., Rich, D., & Weinberg, B. A. (2020). The aggregate effects of fiscal stimulus: Evidence from the Covid-19 unemployment supplement (No. w27576). National Bureau of Economic Research.
- Chatterjee, A., Bhowmick, H., & Sen, J. (2021, October). Stock price prediction using time series, econometric, machine learning, and deep learning models. In *2021 IEEE Mysore Sub Section International Conference (MysuruCon)* (pp. 289-296). IEEE.
- Chinedu, U. A., Ogbonna, N. S., & Nkechi, O. A. (2022). Impact of International Trade on Poverty Reduction in Nigeria: An Approach of Time Series Econometric Model. *Himalayan Journal of Economics and Business Management*, 3(1).
- Chowdhury, M., & Hossain, M. (2014). Determinants of unemployment in Bangladesh: A case study. *Developing Country Studies*, 4(3).
- Cieslik, K., Barford, A., & Vira, B. (2022). Young people not in employment, education or training (NEET) in Sub-Saharan Africa: Sustainable development target 8.6 missed and reset. *Journal of Youth Studies*, 25(8), 1126-1147.
- Debebe, S., & Bessie, S. (2022). Private Sector Development in Ethiopia: Trends, Challenges and Policy Issues.
- Dereli, D. D. (2019). The Relationship Between Inflation and Unemployment in Turkey: An ARDL Bounds Testing Approach. *Kırklareli Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi*, 8(2), 246-257.
- Dinçer, H., Yüksel, S., Adalı, Z., & Aydın, R. (2019). Evaluating the role of research and development and technology investments on economic development of E7 countries. In *Organizational transformation and managing innovation in the fourth industrial revolution* (pp. 245-263). IGI Global.
- Dmytrów, K., & Bieszk-Stolorz, B. (2019). Mutual relationships between the unemployment rate and the unemployment duration in the Visegrad Group countries in years 2001? 2017. *Equilibrium. Quarterly Journal of Economics and Economic Policy*, 14(1), 129-148
- Drosos, N., Theodoroulakis, M., Antoniou, A. S., & Rajter, I. C. (2021). Career services in the post-COVID-19 era: A paradigm for career counseling unemployed individuals. *Journal of employment counseling*, 58(1), 36-48.
- El-Amin, A. A., & Al-Zu'bi, B. K. (2022). Effects of Exchange Rate on Unemployment in Morocco Economy. *Jordan Journal of Economic Sciences*, 9(1), 35-52.
- Fagbemi, F. (2021). COVID-19 and sustainable development goals (SDGs): An appraisal of the emanating effects in Nigeria. *Research in Globalization*, 3, 100047.
- Fakih, A., Haimoun, N., & Kassem, M. (2020). Youth unemployment, gender and institutions during transition: evidence from the Arab Spring. *Social Indicators Research*, 150(1), 311-336.

- Haffert, L., Redeker, N., & Rommel, T. (2021). Misremembering Weimar: Hyperinflation, the Great Depression, and German collective economic memory. *Economics & Politics*, 33(3), 664-686.
- He, X. (2013). *Real effective exchange rate and unemployment rate: The difference between re-exporting and non-re-exporting countries* (Doctoral dissertation, Clemson University).
- Hjazeen, H., Seraj, M., & Ozdeser, H. (2021). The nexus between the economic growth and unemployment in Jordan. *Future Business Journal*, 7(1), 1-8.
- Kassem, M., Ali, A., & Audi, M. (2019). Unemployment rate, population density and crime rate in Punjab (Pakistan): an empirical analysis. *Bulletin of Business and Economics (BBE)*, 8(2), 92-104.
- Kawai, E. (2023). Toward the rebuilding of modern macroeconomic theory: Market failure and Keynes' unemployment equilibrium. *Tokyo Center for Economic Research (TCER) Paper No. E-0186*.
- Khan, I., Ahmad, A., Khan, M. T., & Ilyas, M. (2018). The impact of GDP, inflation, exchange rate, unemployment and tax rate on the non-performing loans of banks: Evidence from Pakistani commercial banks. *Journal of Social Sciences and Humanities*, 26(1), 141-164.
- Kowal, M., Coll-Martín, T., Ikizer, G., Rasmussen, J., Eichel, K., Studzińska, A., ... & Ahmed, O. (2020). Who is the most stressed during the COVID-19 pandemic? Data from 26 countries and areas. *Applied Psychology: Health and Well-Being*, 12(4), 946-966.
- Lala, F. (2020). Africa in the Changing Global Order: Does African Agency Matter in Global Politics? In *The Changing Global Order* (pp. 127-143). Springer, Cham.
- Li, Y., & Lin, Y. (2023). Exploring the Dialectical Relationship between China's Supply-Side Structural Reform and the Western Supply School-----Based on the Macro-Level. *Journal of Education, Humanities and Social Sciences*, 11, 354-360.
- Lindsey, P. A., Anderson, S. H., Dickman, A., Gandiwa, P., Harper, S., Morakinyo, A. B., ... & Tumenta, P. N. (2022). Shepherdng Sub-Saharan Africa's Wildlife Through Peak Anthropogenic Pressure Toward a Green Anthropocene. *Annual Review of Environment and Resources*, 47(1), 91-121.
- Lindstrom, D. P., Randell, H. F., & Belachew, T. (2022). The Migration Response to Food Insecurity and Household Shocks in Southwestern Ethiopia, 2005–2008. *International Migration Review*, 01979183221139115.
- Lischewski, J., Seeber, S., Wuttke, E., & Rosemann, T. (2020). What influences participation in non-formal and informal modes of Continuous Vocational Education and Training? An analysis of individual and institutional influencing factors. *Frontiers in psychology*, 11, 534485.

- Makaringe, S. C., & Khobai, H. (2018). The effect of unemployment on economic growth in South Africa (1994-2016).
- Maqbool, M. S., Mahmood, T., Sattar, A., & Bhalli, M. N. (2013). Determinants of unemployment: Empirical evidences from Pakistan. *Pakistan Economic and Social Review*, 191-208.
- Marti, L., & Puertas, R. (2021). European countries' vulnerability to COVID-19: Multicriteria decision-making techniques. *Economic Research-Ekonomska Istraživanja*, 34(1), 3309-3320.
- Mattei, G., & Pistroesi, B. (2019). Unemployment and suicide in Italy: evidence of a long-run association mitigated by public unemployment spending. *The European Journal of Health Economics*, 20(4), 569-577.
- Mohd, A. S., & Siddiqui, D. A. (2020). Effect of Macroeconomic Factors on Firms' ROA: A Comparative Sectorial Analysis from Pakistan. *Available at SSRN 3681286*
- Mutize, M., & Nkhalamba, M. P. (2021). International credit rating agencies in Africa: perceptions, trends and challenges. *International Journal of Sustainable Economy*, 13(1), 55-71.
- Oluwajodu, F., Greyling, L., Blaauw, D., & Kleynhans, E. P. (2015). Graduate unemployment in South Africa: Perspectives from the banking sector. *SA Journal of Human Resource Management*, 13(1), 1-9.
- Prasetyo, P. E., & Kistanti, N. R. (2020). Human capital, institutional economics and entrepreneurship as a driver for quality & sustainable economic growth. *Entrepreneurship and Sustainability Issues*, 7(4), 2575.
- Raifu, I. A., Aminu, A., & Folawewo, A. O. (2020). Investigating the relationship between changes in oil prices and unemployment rate in Nigeria: linear and nonlinear autoregressive distributed lag approaches. *Future Business Journal*, 6(1), 1-18.
- Rhif, M., Ben Abbes, A., Farah, I. R., Martínez, B., & Sang, Y. (2019). Wavelet transform application for/in non-stationary time-series analysis: A review. *Applied Sciences*, 9(7), 1345.
- Sahnoun, M., & Abdennadher, C. (2019). Causality between inflation, economic growth and unemployment in North African countries. *Economic Alternatives*, 1, 77-92.
- Sasongko, G., & Huruta, A. D. (2019). The causality between inflation and unemployment: the Indonesian evidence. *Business: Theory and Practice*, 20, 1-10.
- Setlhodi, M. (2019). What factors contribute to the unemployment duration of youth: A case study of the Action Volunteers Africas youth labour market programme (Master's thesis, Faculty of Commerce).
- Shahid, M. (2014). Effect of inflation and unemployment on economic growth in Pakistan. *Journal of economics and sustainable development*, 5(15), 103-106.

- Tegep, J., Suratman, E., & Indra, S. (2019). The failure of foreign direct investment to explain unemployment rate and the mediating role of economic growth and minimum wage. *International Journal of Economics and Financial Issues*, 9(2), 154.
- Teka, B. M. (2022). Determinants of the sustainability and growth of micro and small enterprises (MSEs) in Ethiopia: literature review. *Journal of Innovation and Entrepreneurship*, 11(1), 1-16.
- Wallerstein, I. (2019). The present state of the debate on world inequality (pp. 119-132). Routledge.
- Zandi, G., Rehan, R., Hye, Q. M. A., Mubeen, S., & Abbas, S. (2022). Do Corruption, Inflation and Unemployment Influence the Income Inequality of Developing Asian Countries? *International Journal of Applied Economics, Finance and Accounting*, 14(2), 118-128.
- Ziberi, B., & Avdiu, M. (2020). Econometric analysis to examine the relationship between unemployment and macroeconomics aggregates. Evidence from Kosovo. *Academic journal of economic studies*, 6(2), 33-41

APPENDICES

year	RGDP	REER	CPI	population IN MILLION	Unemployment	FDI IN MILLION birr
1990	132336.2	210.5	8.427017	47.89		0.3519
1991	128347.2	281.5	8.848772	49.61		9.8167125
1992	125406.3	344.5	12.8304	51.42		99.377424
1993	139411.5	149	13.09379	53.30		88.38207
1994	139480.2	150.3	13.71107	55.18		138.549354
1995	147454.5	138	14.57397	57.05		1875.386943
1996	162373.1	121.5	16.73607	58.89		1793.852739
1997	169246.9	113.9	15.23004	60.70		525.626778
1998	167917.5	112.2	14.82606	62.51		1096.319664
1999	178512.7	111.9	14.84155	64.34		2909.76826
2000	364984.3	109.1	16.38414	66.22		2178.3375
2001	392058.8	97.8	16.6945	68.16		3990.1185
2002	398464.8	93.8	14.89593	70.14		4698.59847
2003	390102.9	100.9	14.71392	72.13		2293.693194
2004	435859.5	96.4	17.32908	74.24		4733.376904
2005	490970.4	100.7	17.74203	76.35		1952.339639
2006	547625.4	112.2	19.64882	78.85		1003.33191
2007	612217.2	117.7	21.77479	80.67		2307.719568
2008	680706.9	150.5	25.06337	82.82		3716.079959
2009	749058.9	140.7	38.90871	85.23		10097.95579
2010	828212.7	121.2	39.96191	87.64		4806.211508
2011	922512.8	122.8	42.88768	90.14		24451.43453
2012	1002767	139.4	59.20391	92.73		35384.7149
2013	1102468	140.2	71.52554	95.39		52781.49792
2014	1216015	140.8	76.81153	98.09		84190.45139
2015	1342556	157.6	83.31296	100.85		90039.40933

2016	1449398	159.3	92.01618	103.60		97,212.26
2017	1596482	171.9	98.9211	106.39		106,447.42
2018	1719491	161.8	107.1927	109.22		106,979.66
2019	1874689	198.6	144.3	112.083		107,514.56
2020	1989519	179.3808	175.8142	114.963		108,052.13

Lag Length Criteria

```
. varsoc lnTU
```

Selection-order criteria

Sample: 1994 - 2021

Number of obs = 28

lag	LL	LR	df	p	FPE	AIC	HQIC	SBIC
0	-22.2097				.307276	1.65784	1.67238	1.70542
1	2.79413	50.008	1	0.000	.055335	-.056723	-.027633	.038434
2	4.17788	2.7675	1	0.096	.05387	-.084134	-.040498	.058602
3	6.81779	5.2798*	1	0.022	.04797*	-.201271*	-.14309*	-.010956*
4	7.09695	.5583	1	0.455	.050601	-.149782	-.077055	.088112

Endogenous: lnTU

Exogenous: _cons

```
. varsoc lnRGDP
```

Selection-order criteria

Sample: 1994 - 2021

Number of obs = 28

lag	LL	LR	df	p	FPE	AIC	HQIC	SBIC
0	-35.503				.794146	2.60736	2.6219	2.65494
1	18.7552	108.52*	1	0.000	.017696*	-1.1968*	-1.16771*	-1.10164*
2	18.7625	.01454	1	0.904	.019007	-1.12589	-1.08225	-.983153
3	19.393	1.261	1	0.261	.019538	-1.0995	-1.04132	-.909182
4	19.8307	.87558	1	0.349	.020377	-1.05934	-.986613	-.821445

Endogenous: lnRGDP

Exogenous: _cons

```
. varsoc lnCPI
```

Selection-order criteria

Sample: 1994 - 2021

Number of obs = 28

lag	LL	LR	df	p	FPE	AIC	HQIC	SBIC
0	-36.0045				.823106	2.64318	2.65772	2.69076
1	21.9287	115.87*	1	0.000	.014107*	-1.42348*	-1.39439*	-1.32832*
2	21.9787	.10006	1	0.752	.015106	-1.35562	-1.31199	-1.21289
3	22.6124	1.2674	1	0.260	.015524	-1.32946	-1.27128	-1.13914
4	23.3403	1.4558	1	0.228	.015859	-1.31002	-1.2373	-1.07213

Endogenous: lnCPI

Exogenous: _cons

```
. varsoc lnFDI
```

Selection-order criteria

Sample: 1994 - 2021

Number of obs = 28

lag	LL	LR	df	p	FPE	AIC	HQIC	SBIC
0	-58.1675				4.00844	4.22625	4.24079	4.27383
1	-30.7589	54.817*	1	0.000	.607922*	2.33992*	2.36902*	2.43508*
2	-30.5096	.49872	1	0.480	.64178	2.39354	2.43718	2.53628
3	-28.9619	3.0954	1	0.079	.617864	2.35442	2.4126	2.54474
4	-27.8466	2.2306	1	0.135	.613963	2.34619	2.41891	2.58408

Endogenous: lnFDI

Exogenous: _cons

```
. ardl lnTU lnRGDP lnREER lnCPI lnFDI
```

```
ARDL(3,2,4,4,1) regression
```

```
Sample:      1994 -      2021      Number of obs   =      28
                                     F( 18,      9) =      72.49
                                     Prob > F       =      0.0000
                                     R-squared       =      0.9931
                                     Adj R-squared  =      0.9794
Log likelihood = 47.558091      Root MSE      =      0.0781
```

lnTU	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
lnTU						
L1.	-.7568566	.1989443	-3.80	0.004	-1.2069	-.3068132
L2.	2.669305	.4391982	6.08	0.000	1.67577	3.66284
L3.	-.4687194	.321136	-1.46	0.178	-1.195179	.2577406
lnRGDP						
--.	-.2438715	.1607371	-1.52	0.164	-.6074841	.1197412
L1.	-.6552137	.2137393	-3.07	0.013	-1.138726	-.1717017
L2.	.4811165	.1691877	2.84	0.019	.0983873	.8638458
lnREER						
--.	.8438091	.3061463	2.76	0.022	.1512581	1.53636
L1.	1.630454	.3293628	4.95	0.001	.8853832	2.375524
L2.	-1.239633	.2000601	-6.20	0.000	-1.6922	-.7870652
L3.	-.8980749	.2445071	-3.67	0.005	-1.451188	-.3449616
L4.	.3046763	.1454249	2.10	0.066	-.0242976	.6336502
lnCPI						
--.	-.4294046	.2492264	-1.72	0.119	-.9931939	.1343848
L1.	1.213517	.3133697	3.87	0.004	.5046253	1.922408
L2.	1.293237	.2917287	4.43	0.002	.6333003	1.953173
L3.	.3421236	.2902541	1.18	0.269	-.3144767	.998724
L4.	-1.319912	.2907007	-4.54	0.001	-1.977523	-.6623012
lnFDI						
--.	-.1689799	.0381552	-4.43	0.002	-.2552929	-.0826669
L1.	-.0963665	.041288	-2.33	0.044	-.1897665	-.0029666
_cons	-.2496922	2.242692	-0.11	0.914	-5.323015	4.82363

```
.
```

```
. ardl lnTU lnRGDP lnREER lnCPI lnFDI, lags (3 2 4 4 1) ec
```

```
ARDL(3,2,4,4,1) regression
```

```
Sample:      1994 -      2021      Number of obs   =      28
              R-squared      =      0.9593
              Adj R-squared   =      0.8778
Log likelihood = 47.558091      Root MSE      =      0.0781
```

D.lnTU	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
ADJ						
lnTU						
L1.	.4437289	.0993617	4.47	0.002	.2189572	.6685007
LR						
lnRGDP	.941946	.415791	2.27	0.050	.0013614	1.882531
lnREER	-1.445098	.6392904	-2.26	0.050	-2.891273	.0010779
lnCPI	-2.478001	.7593118	-3.26	0.010	-4.195683	-.760318
lnFDI	.5979922	.1700607	3.52	0.007	.2132882	.9826963
SR						
lnTU						
LD.	-2.200585	.2733672	-8.05	0.000	-2.818985	-1.582186
L2D.	.4687194	.321136	1.46	0.178	-.2577406	1.195179
lnRGDP						
D1.	.1740972	.1949754	0.89	0.395	-.2669679	.6151623
LD.	-.4811165	.1691877	-2.84	0.019	-.8638458	-.0983873
lnREER						
D1.	.2025775	.2840851	0.71	0.494	-.4400677	.8452227
LD.	1.833031	.2426835	7.55	0.000	1.284043	2.382019
L2D.	.5933986	.2347333	2.53	0.032	.062395	1.124402
L3D.	-.3046763	.1454249	-2.10	0.066	-.6336502	.0242976
lnCPI						
D1.	-1.528965	.2784858	-5.49	0.000	-2.158944	-.8989864
LD.	-.3154482	.2552416	-1.24	0.248	-.8928447	.2619483
L2D.	.9777883	.287094	3.41	0.008	.3283367	1.62724
L3D.	1.319912	.2907007	4.54	0.001	.6623012	1.977523
lnFDI						
D1.	.0963665	.041288	2.33	0.044	.0029666	.1897665
_cons	-.2496922	2.242692	-0.11	0.914	-5.323015	4.82363

Pesaran/Shin/Smith (2001) ARDL Bounds Test

H0: no levels relationship F = 14.695

t = 4.466

Critical Values (0.1-0.01), **F-statistic**, Case 3

	[I_0]	[I_1]	[I_0]	[I_1]	[I_0]	[I_1]	[I_0]	[I_1]
	L_1	L_1	L_05	L_05	L_025	L_025	L_01	L_01
k_4	2.45	3.52	2.86	4.01	3.25	4.49	3.74	5.06

accept if F < critical value for I(0) regressors

reject if F > critical value for I(1) regressors

Critical Values (0.1-0.01), **t-statistic**, Case 3

	[I_0]	[I_1]	[I_0]	[I_1]	[I_0]	[I_1]	[I_0]	[I_1]
	L_1	L_1	L_05	L_05	L_025	L_025	L_01	L_01
k_4	-2.57	-3.66	-2.86	-3.99	-3.13	-4.26	-3.43	-4.60

accept if t > critical value for I(0) regressors

reject if t < critical value for I(1) regressors

k: # of non-deterministic regressors in long-run relationship

Critical values from Pesaran/Shin/Smith (2001)

```
. nardl lnTU lnRGDP lnREER lnCPI lnFDI
```

Regression results (variables renamed):

Source	SS	df	MS	Number of obs =	30
Model	1.32150268	26	.050827026	F(26, 3) =	2.95
Residual	.051720108	3	.017240036	Prob > F =	0.2029
				R-squared =	0.9623
				Adj R-squared =	0.6359
Total	1.37322278	29	.04735251	Root MSE =	.1313

_dy	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
_y						
L1.	-.5663743	.4718033	-1.20	0.316	-2.067863	.9351143
_x1p						
L1.	-2.359088	1.564141	-1.51	0.229	-7.336883	2.618706
_x1n						
L1.	30.17269	56.41468	0.53	0.630	-149.364	209.7094
_x2p						
L1.	4.066537	2.227167	1.83	0.165	-3.021302	11.15438
_x2n						
L1.	-2.629756	1.271383	-2.07	0.130	-6.675864	1.416351
_x3p						
L1.	1.571843	.8419152	1.87	0.159	-1.107507	4.251193
_x3n						
L1.	-11.58178	8.831712	-1.31	0.281	-39.68823	16.52467
_x4p						
L1.	-.5041335	.2660683	-1.89	0.154	-1.350882	.3426146
_x4n						
L1.	.1431371	.3372723	0.42	0.700	-.930214	1.216488
_dy						
L1.	-1.196033	.5745247	-2.08	0.129	-3.024427	.6323611
_dx1p						
--.	-.7095236	.8536727	-0.83	0.467	-3.426291	2.007244
L1.	1.294065	.8944979	1.45	0.244	-1.552627	4.140757
_dx1n						
--.	-38.3099	89.00455	-0.43	0.696	-321.5621	244.9423
L1.	4.257085	20.83855	0.20	0.851	-62.0605	70.57467
_dx2p						
--.	1.524274	1.140755	1.34	0.274	-2.106118	5.154667
L1.	.2471855	1.905177	0.13	0.905	-5.815938	6.310309
_dx2n						
--.	-1.198625	1.112821	-1.08	0.360	-4.740118	2.342868
L1.	1.924835	.7961742	2.42	0.094	-.608947	4.458617
_dx3p						
--.	-.7004252	.7117512	-0.98	0.398	-2.965535	1.564685
L1.	-1.674888	.72464	-2.31	0.104	-3.981016	.6312396
_dx3n						
--.	-6.555413	5.782147	-1.13	0.339	-24.95679	11.84596
L1.	11.89245	13.40643	0.89	0.440	-30.77278	54.55769
_dx4p						
--.	-.4826399	.2371375	-2.04	0.135	-1.237317	.2720376
L1.	.0401808	.1455455	0.28	0.800	-.4230101	.5033716
_dx4n						
--.	.5170227	.5066357	1.02	0.383	-1.095318	2.129364
L1.	.0105395	.2654425	0.04	0.971	-.8342171	.8552961
_cons						
	3.214896	4.635631	0.69	0.538	-11.53775	17.96754

Asymmetry statistics:

Exog. var.	Long-run effect [+]			Long-run effect [-]		
	coef.	F-stat	P>F	coef.	F-stat	P>F
lnRGDP	-4.165	.8175	0.433	-53.273	.5399	0.516
lnREER	7.180	1.05	0.381	4.643	2.766	0.195
lnCPI	2.775	1.76	0.277	20.449	2.245	0.231
lnFDI	-0.890	2.423	0.217	-0.253	.2204	0.671
	Long-run asymmetry			Short-run asymmetry		
	F-stat		P>F	F-stat		P>F
lnRGDP	.6816		0.470	.2209		0.670
lnREER	1.744		0.278	.1111		0.761
lnCPI	2.478		0.213	.5694		0.505
lnFDI	4.965		0.112	1.689		0.285

Note: Long-run effect [-] refers to a permanent change in exog. var. by -1

Cointegration test statistics: t_BDM = -1.2004
 F_PSS = 5.3608

Model diagnostics	stat.	p-value
Portmanteau test up to lag 13 (chi2)	32.02	0.0024
Breusch/Pagan heteroskedasticity test (chi2)	.1735	0.6770
Ramsey RESET test (F)	.	.
Jarque-Bera test on normality (chi2)	2.296	0.3173