

**THE RELATIONSHIP BETWEEN UNEMPLOYMENT AND
ECONOMIC GROWTH: THE CASE OF AFGHANISTAN**

Master Thesis

Mohammad MORADI

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Mohammad MORADI

Master Thesis

Economics Department

Supervisor: Prof. Dr. Ethem ESEN

Eskişehir

Anadolu University

Graduate School of Social Science

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FINAL APPROVAL FOR THESIS

This thesis titled “The relationship between unemployment and economic growth: the case of Afghanistan” has been prepared and submitted by Mohammad MORADI in partial fulfillment of the requirements in “Anadolu University Directive on Graduate Education and Examination” for the Degree of Master of Arts in Economics Department has been examined and approved on 20 /07/2023.

Committee Members:

Signature

Member (Supervisor) : Prof. Dr. Ethem ESEN	
Member : Doç. Dr. Nazım ÇATALBAŞ	
Member : Doç. Dr. Mehmet ŞENGÖR	
Member : Prof. Dr. Levent ERDOĞAN	
Member : Doç. Dr. Taner SEKMEN	

.....
Director
Graduate School of Social
Science

ABSTRACT

THE RELATIONSHIP BETWEEN UNEMPLOYMENT AND ECONOMIC GROWTH: THE CASE OF AFGHANISTAN

Mohammad MORADI

Department of Economics

Anadolu University, Graduate School of Social Science, June 2023

Supervisor: Prof. Dr. Ethem ESEN

This thesis examines the relationship between unemployment and economic growth in Afghanistan and investigates the validity of Okun's Law in the context of the country. The main research driving this study is whether there exists a significant relationship between unemployment and economic growth in Afghanistan. The research methodology employed includes descriptive analysis and the implementation of the Auto-regressive Distributed Lag (ARDL) model. The findings from this research provide valuable insights into the dynamic between unemployment and economic growth in Afghanistan. The results reveal that there is a long-run relationship between unemployment and economic growth in Afghanistan. Furthermore, the estimation of the Okun's coefficient yields a value of -4.23, indicating that a 1% increase in unemployment is associated with a 4.23% decrease in economic growth. The findings contribute to the understanding of the economic conditions in Afghanistan and highlight the importance of addressing unemployment for sustained economic development.

Keywords: Unemployment, Economic Growth, Okun's Law, Afghanistan, ARDL model, VAR Granger causality/Block exogeneity Wald test.

ÖZET

İŞSİZLİK İLE EKONOMİK BÜYÜME ARASINDAKİ İLİŞKİ: AFGANİSTAN ÖRNEĞİ

Mohammad MORADI

İktisat Anabilim Dalı

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Danışman: Prof. Dr. Ethem ESEN

Bu tez, Afganistan'da işsizlik ve ekonomik büyüme arasındaki ilişkiyi incelemekte ve Okun Kanununun ülke bağlamında geçerliliğini araştırmaktadır. Bu çalışmayı yönlendiren temel araştırma, Afganistan'da işsizlik ile ekonomik büyüme arasında anlamlı bir ilişki olup olmadığıdır. Kullanılan araştırma metodolojisi, tanımlayıcı analizi ve otoregresif dağıtılmış gecikme modelinin (ARDL) uygulanmasını içerir. Bu çalışmadan elde edilen bulgular, Afganistan'daki işsizlik ve ekonomik büyüme arasındaki dinamiğe ilişkin değerli bilgiler sağlamaktadır. Sonuçlar, Afganistan'da işsizlik ile ekonomik büyüme arasında uzun dönemli bir ilişki olduğunu ortaya koymaktadır. Ayrıca Okun katsayısının tahmini -4,23 değerini vererek, işsizlikteki %1'lik artışın ekonomik büyümedeki %4,23'lük düşüşle ilişkili olduğunu göstermektedir. Bulgular, Afganistan'daki ekonomik koşulların anlaşılmasına katkıda bulunmakta ve sürdürülebilir ekonomik kalkınma için işsizliğin ele alınmasının önemini vurgulamaktadır.

Anahtar Sözcükler: İşsizlik, Ekonomik Büyüme, Okun Kanunu, Afganistan, ARDL modeli, VAR Granger nedensellik/Blok dışsallık Wald testi.

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I hereby truthfully declare that this thesis is an original work prepared by me; that I have behaved in accordance with the scientific ethical principles and rules throughout the stages of preparation, data collection, analysis and presentation of my work; that I have cited the sources of all the data and information that could be obtained within the scope of this study, and included these sources in the references section; and that this study has been scanned for plagiarism with “scientific plagiarism detection program” used by Anadolu University, and that “it does not have any plagiarism” whatsoever. I also declare that, if a case contrary to my declaration is detected in my work at any time, I hereby express my consent to all the ethical and legal consequences that are involved.

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Mohammad MORADI

TABLE OF CONTENTS

THE RELATIONSHIP BETWEEN UNEMPLOYMENT AND ECONOMIC GROWTH: THE CASE OF AFGHANISTAN	i
FINAL APPROVAL FOR THESIS	ii
ABSTRACT.....	iii
ÖZET	iv
STATEMENT OF COMPLIANCE WITH ETHICAL PRINCIPLES AND RULES	v
TABLE OF CONTENTS	vi
LIST OF TABLES	viii
LIST OF FIGURES	ix
LIST OF ABBREVIATIONS	x
1. INTRODUCTION	1
2. ECONOMIC GROWTH AND UNEMPLOYMENT: CONCEPTS AND THEORIES.....	3
2.1. The Concept of Economic Growth	3
2.1.1. Definition and calculation of economic growth	3
2.1.2. The resources of economic growth.....	5
2.2. Economic Growth Theories.....	8
2.2.1. Mercantilism	9
2.2.2. Physiocrats theories of growth	10
2.2.3. Classical theory of economic growth	10
2.2.4. Keynesian theory of growth.....	14
2.2.5. Harrod-Domar theory of growth	15
2.2.6. Neoclassical theory of growth.....	16
2.2.7. Endogenous theory of growth.....	18
2.3. Unemployment Concept	24
2.3.1. Definition of unemployment	25
2.3.2. Measurement of unemployment.....	25
2.3.3. Types of unemployment	28
2.4. Cost of Unemployment	33
2.5. Unemployment Approaches in Economic Literature	34
2.5.1. Classical unemployment approach	34

2.5.2. Keynesian unemployment approach.....	35
2.5.3. New classical unemployment approach.....	36
2.5.4. Real business cycle theory and unemployment approach	38
2.5.5. New Keynesian unemployment approach	39
2.6. The Relationship between Unemployment and Economic Growth.....	42
3. ECONOMIC GROWTH AND UNEMPLOYMENT IN AFGHANISTAN	
ECONOMY	44
3.1. Afghanistan's Current Economic State	44
3.2 Afghanistan's Economy Through Sectors	50
3.2.1. Agriculture sector	50
3.2.2. Industry sector	52
3.2.3. Services sector	54
3.3. Unemployment in Afghanistan	55
3.3.1. Unemployment according to the level of education.....	59
3.3.2. Unemployment according to the age groups.....	60
3.3.3. Unemployment according to the gender.....	60
4. THE RELATIONSHIP BETWEEN UNEMPLOYMENT AND ECONOMIC	
GROWTH IN AFGHANISTAN.....	62
4.1. Literature Review.....	62
4.2 Descriptive Analysis of Data Set	66
4.3. Econometric Approach	69
4.3.1. Stationarity and the unit root test:.....	70
4.3.2. Auto-Regressive distributed lag model (ARDL):	73
4.4. Empirical Research.....	76
4.4.1. Unit root tests	76
4.4.2. ARDL approach Results	78
4.5. Conclusion.....	83
REFERENCES.....	88

LIST OF TABLES

Table 3. 1. Agriculture contribution as % of GDP.....	51
Table 3. 2. Agriculture Contribution in GDP (Constant Price of 2016 in Millions Afghanis)	52
Table 3. 3. Real GDP based on 2016 & GDP growth rate (in millions AFs)	53
Table 3. 4. Sectoral distribution of employment and value added (2010-19).....	56
Table 3. 5. Unemployment by region (+15, in 1000).....	58
Table 4. 1. The GDP, Unr and LGR's ADF and PP unit root test results	77
Table 4. 2. Afghanistan's ARDL (1,6,5) Model Results	78
Table 4. 3. Afghanistan's ARDL (1,6,5) Model Results (Continue)	79
Table 4. 4. ARDL Bound Test Result	80
Table 4. 5. Cointegration and long-term relationship	80
Table 4. 6. The Serial Correlation LM Test (Breusch-Godfrey).....	81
Table 4. 7. Heteroskedasticity Test	81

LIST OF FIGURES

Figure 2. 1. Economic growth resources	5
Figure 2. 2. Adam Smith's economic growth path.....	12
Figure 2. 3. Dynamics of the labor market	26
Figure 2. 4. The Beveridge curves	27
Figure 3. 1. Afghanistan's GDP (current US dollars in billion) (2002-2019).....	45
Figure 3. 2. Afghanistan's trade and trade deficit from 2018-2020 (Quarterly in million US dollars)	47
Figure 3. 3. GDP sectoral contribution (2019)	51
Figure 3. 4. Distribution of Afghanistan's GDP by Sectors (in percent)(2002-21)	55
Figure 3. 5. Unemployment rate in Afghanistan (2010-2020).....	57
Figure 3. 6. Unemployment by level of education (in 1000).....	59
Figure 3. 7. Unemployment by age groups (in 1000 persons) (2014,2017 and 2020) ..	60
Figure 3. 8. Unemployment by gender (in 1000) (2014, 2017 and 2020)	61
Figure 4. 1. Afghanistan's LGDP, Unemployment rate and LGR (1991-2020).....	68
Figure 4. 2. Top 20 ARDL Model	79
Figure 4. 3. CUSUM Test	82
Figure 4. 4. CUSUM of Squares	82
Figure 4. 5. VAR Granger Causality/Block Exogeneity Wald Tests	83

LIST OF ABBREVIATIONS

ACCI	: Afghanistan Chamber of Commerce and Investment
ADF	: Augmented Dickey-Fuller
AFN	: Afghani currency
ALCS	: Afghanistan living condition survey
ANSF	: Afghan National Security Force
ARDL	: Auto-Regressive Distributed Lag Model
CPI	: Consumer Price Index
DAB	: Da Afghanistan Bank
ECM	: Error Correction Model
FLFP	: Female Labor Force Participation
GDP	: Gross Domestic Product
HIES	: Households Living Conditions Survey
ILO	: International Labour Organization
ISAF	: International Security Assistance Force
ISIC	: International Standard Industrial Classification
LFS	: Labor Force Survey
NSIA	: National Statistics and Information Authority
OECD	: Organization for Economic Co-operation and Development
PP	: Phillips-Perron
PPF	: Production Possibility Frontier
R&D	: Research and Development
UK	: United Kingdom
UNAMA	: United Nations Assistance Mission in Afghanistan
UNODC	: United Nations Office on Drugs and Crime
UNR	: Unemployment Rate
USA	: United States of America
USDOS	: United States Department of State
USSR	: Union of Soviet Socialist Republic
VECM	: Vector Error Correction Mode

1. INTRODUCTION

Global economic growth is a key indicator of a nation's overall economic performance and is measured changes in Gross Domestic Product (GDP) over a specific period. The world has witnessed varying levels of economic growth across different regions and countries, influenced by factors such as technological advancements, trade policies, and macroeconomic stability. However, alongside economic growth, the issue of unemployment persists as a pressing concern of societies worldwide. Unemployment refers to the state of individuals who are willing and able to work but are unable to find suitable employment opportunities. It is influenced by factors such as labor market conditions, skills mismatch, and structural changes within the economy. The relationship between unemployment and economic growth has been a subject of extensive research. The prevailing understanding suggests that economic growth can contribute to job creation and reduce unemployment rates. As economies expand, businesses tend to increase their workforce to meet growing demands, thereby absorbing more individuals into employment. However, the relationship is complex and multifaceted, as various factors, including labor market flexibility, education and training systems, and the nature of economic growth, can influence the extent to which employment opportunities are generated. Understanding the dynamics of this relationship is crucial for policymakers, as it informs the formulation of effective strategies to promote sustainable economic development and tackle unemployment challenges.

Over the past decade, Afghanistan has experienced a challenging economic landscape marked by a complex interplay of political instability, security concerns, and the process of post-conflict reconstruction. Despite these obstacles, Afghanistan has shown some signs of economic growth and resilience. The country has witnessed an expansion of economic activities, particularly in sectors such as agriculture, mining, construction, and services. Efforts to promote private sector development and attract foreign investment have played a crucial role in fostering economic growth. Additionally, international aid and assistance have provided much-needed support for infrastructure development and capacity building. However, it is important to note that Afghanistan's economic growth remains fragile and susceptible to various internal and external factors. Persistent security challenges, weak institutional framework, corruption, and limited access to finance pose significant hurdles to sustained and inclusive economic development.

Unemployment in Afghanistan remains a pressing socioeconomic challenge, intricately linked to the country's complex history of conflict, political instability, and underdevelopment. High levels of unemployment persist across various regions, with significant variations between urban and rural areas. The Afghan labor market faces several structural issues, including a rapidly growing population, limited job opportunities, and a lack of skills alignment between the available workforce and market demands. The country's transition from a predominantly agrarian economy to a more diversified one has been accompanied by challenges in creating sufficient employment opportunities in non-agricultural sectors. Furthermore, the participation of woman in the labor force remains considerably low, primarily due to cultural and societal barriers. Unemployment in Afghanistan is also influenced by ongoing security concerns, as the volatile environment hampers business investments and job creation.

In this study, the relationship between unemployment and economic growth during the period 1991-2020 in Afghanistan is analyzed. This thesis is consisted of three parts. In the first part, the concepts and theories of economic growth and unemployment are described. In the second part, the current economic situation and the three important sectors of agriculture, industry and services, and on the other hand, the problem of unemployment with regard to the level of education, age groups and gender, have been discussed. And the third part consist of the empirical analyzation of the relationship between unemployment and economic growth in Afghanistan. For this purpose, first the data used were analyzed graphically, and then the Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) unit root tests are used for the data stationarity determination. In the following, first an ARDL model is used to obtain the relationship between the variables. Secondly, the Toda-Yamamoto approach was used for the Granger causality test.

2. ECONOMIC GROWTH AND UNEMPLOYMENT: CONCEPTS AND THEORIES

In this chapter the concepts of economic growth and unemployment were explained and the meaning of them tried to be revealed. Firstly, the concept of economic growth was defined and various ways of economic growth measurements were explained, then the GDP was considered as a measurement tool for economic growth. In the following, four resources of economic growth and the various economic growth theories from Mercantilism through more new economic growth theories were described in details. Secondly, the concept of unemployment and different types of unemployment were reviewed. Afterwards, the relationship between unemployment and economic growth variables with respect to economic growth theories were tried to be exposed. At the end, the inverse relationship between unemployment and economic growth “Okun’s law” which proposed by Okun in 1962 was presented.

2.1. The Concept of Economic Growth

Economic growth, which had a central importance in Classical Economics, gained more reputation with the appearance of Keynesian Economics and led to the appearance of modern economic growth after World War II. Especially in recent years, the prominence of growth as a research area among economists shows the importance of economic growth.

2.1.1. Definition and calculation of economic growth

One of the most important topics in macroeconomics is economic growth. The economic growth of a country shows the country’s ability to increase the amount of goods and services. During the last 50 years many countries have been suffered from poverty and low living standards, because of having too slow economic growth rate. Thus, in order to have higher level of living standards, countries need to have higher rate of economic growth (Hubbard, 2015:290).

Economic growth has been defined differently by economists. In instance, the increase in production possibilities can be defined as economic growth. In other words,

the production possibility frontier (PPF) of a nation shifts up and the new aggregate production will be on a new PPF with more goods and services (Parkin, 2016, p. 170). This positive change in production can be met through improvement in technology, labor productivity, or by discovering new sources of natural resources (Sexton, 2015, p. 84).

Another definition of economic growth can be as an increase in the rate of real gross domestic product per person in an economy in a particular time. Here, the “real” term means that the increase in GDP should not be due to rises in prices and “per capita” term considers the economy’s population and shows the fact that if the real GDP growth rate be higher than the population growth rate, the growth benefits the whole population and so on rises living standards (Sayre and Morris, 2014, p. 99).

GDP growth can be measured as in nominal and real forms. While nominal GDP growth can be obtained by subtracting previous nominal GDP from current nominal GDP divided by previous nominal GDP which includes price changes over time, the real GDP growth eliminates inflation effects on GDP by taking prices constant set to base year. The calculation will be understood better with the following formula (Sayre and Morris, 2014, p. 101-102);

$$NGDPr = \frac{GDP_c - GDP_p}{GDP_p} \times 100 \quad (2.1)$$

$$RGDPr = \frac{RGDP_c - RGDP_p}{RGDP_p} \times 100 \quad (2.2)$$

While:

NGDPr; denotes nominal gross domestic product rate,

RGDPr; denotes real gross domestic product rate,

c & p, denote current and previous terms respectively.

In addition, regardless of GDP to be calculated in nominal or real forms, GDP can be measured by calculating through total incomes or total expenditure approaches. In an economy the sum of total incomes is equal to total expenditures (Mankiw, 2009, p. 20).

2.1.2. The resources of economic growth

Although that the economic growth resources identified differently in many sources but, it is classified in four major categories here. First, the importance of labor forces in economic growth process; second, capital accumulation which includes both physical capital accumulation and human capital accumulation; third, the importance of natural resources in economic growth; and finally, the change in economic growth made by advancement in technology.

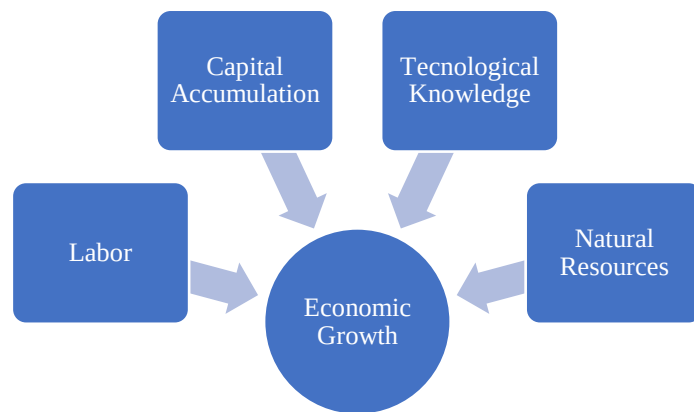


Figure 2. 1. Economic growth resources

2.1.2.1. Labor force

The labor force is known as the most important factor in production process. The labor force or human resource are among the most effective factors of the economic development process and economic growth. Labor force includes the sum of all human and physical-mental efforts used in the production of goods and services in a firm or a country and is known as the main factor of production. Without the labor force, other factors of production cannot contribute to the production function alone. However, it is the human being that gathers other production factors. If we compare developing countries with developed countries, some developed countries despite of lack of natural resources in their country their well-educated labor forces had great impact in their countries' economic growth trend. In contrast, developing and underdeveloped countries with abundant natural resources couldn't effectively grow due to lack of trained and educated labor forces. Hence, labor force is known as an important factor in the economic growth process (Farahmand, 2019, p. 13-14).

2.1.2.2. Capital accumulation

Capital is the second important determinant of economic growth. Economists divided the capital into physical and human capitals.

Physical capital includes all the physical tools which enables human to do their work or produce more. There are many types of machines in factories each has been designated for a specific production process, there are buildings where businesses are taking place in it, different kind of transportation systems and vehicles for carrying raw materials and products, even the usage of a computer by a professor for preparing a textbook are all examples of physical capitals which enable workers to produce something. Moreover, those labors who have more capital or better one can produce more than the others (Weil, 2012, p. 68).

One of the income measurement tools between countries can be considering their physical capital (Weil, 2012, p. 68). Because capital accumulation has been one of the most fundamental elements of the economic growth of developed and developing countries. Capital accumulation, which is one of the main indicators of the ability to produce goods and services in a certain period, increases the welfare of countries as it increases employment and productivity.

The concept of human capital was first introduced in economics literature by Adam Smith (1776); John S. Mill (1868) and Alfred Marshall (1890). Later, economists such as Denison (1962), Becker (1964) and Schultz (1968) developed the concept of human capital. After the Second World War, the human capital concept gained more importance with acceptance of the human as an element of capital. With the emergence of endogenous growth models based on human capital at the end of the 1980s, human capital began to be accepted as the engine of economic growth. Human capital; It increases the productivity of physical capital and increases employment in qualified workforce. It also affects the economy by spreading technological development (Çakmak ve Gümüş, 2005, p. 60-61).

The concept of human capital includes the knowledge, skills and other qualities of individuals related to economic activities by getting educated, attend in trainings, and experience. The process of knowledge collection in human starts from the beginning of his life. The programs before, during, and after school and so upper educational levels

play an important role in accumulating human capital. These programs provide opportunities for mankind to learn fundamentals and by attending in practical training programs get ready to involve in labor market. In comparison of human capital with physical capital, it can be understood that they are similar in many ways. One of characteristics of physical capital is to increase the human's ability in goods and services production. Similarly, human capital raises this ability the same as physical capital. In another way, human capital like physical capital is produced by workers to produce other products. The education, training, and experience periods are required time to produce human capital or the inputs of this product are like teachers, teaching infrastructures, and time (Mankiw, 2017, p. 238). Finally, the human capital depreciates during the time just like physical capital (Weil, 2012, p. 170).

2.1.2.3. Natural resources

Natural resources are the third determinant of economic growth, playing an important role as a production factor. Natural resources are resources in which humankind has not any role in their existence, they are created by nature. Land, water, air, wind, forests, and underground sources are all examples of natural resources. Natural resources are divided into two categories of renewable and nonrenewable natural resources. Renewable resources are those which can be renewed during the time and the usage of them does not have much effect on their future value, such as land, water, air, sun, forests, and fish stocks. For instance, there are a lot of things in our life made by wood and for this reason, forest areas are decreasing but, this problem can be eliminated by planting seedling again. On the other hand, underground resources like oil, natural gas, and different mines are examples of nonrenewable natural resources. These kinds of resources for regenerating need a very long time or never can be regenerated again. For instance, the oil needs millions of years to be restored. Thus, once nonrenewable natural resources are depleted, there is no chance to produce more. The studies that evaluated the effect of natural resources on living standards in the world have shown us that natural resources increased the level of living standards in most cases. The USA, Kuwait, and Saudi Arabia are three examples of using natural resources to increase their living standards. The USA used its land which is suited for agriculture while Kuwait and Saudi Arabia are located on large pools of oil.

In contrast, Japan is a rich country with few natural resources. Instead of using these natural gifts, Japan started to import natural resources from other countries and after processing export goods to other rich countries. Thus, although having natural resources are important for countries and can increase their economic growth but they are not the only key to have a productive economy (Hess, 2013, p. 14).

2.1.2.4. Technological knowledge

Technological knowledge is the fourth determinant of economic growth. Finding best ways for production is always important especially for firms and countries. Technological knowledge means how to produce goods and services better than before with less input contribution. For instance, a hundred years ago, a significant portion of American workforce was engaged to agriculture because, the agricultural tools and technics was not developed and required more inputs such as labor. Changes in technology resulted more output with less inputs in agricultural products in America and provided opportunities for the entire workforce to participate in other sectors and increased production of goods and services.

Technological knowledge is categorized in many forms. Some technologies will be common for all after the first use; like assembly line production, some other technologies are proprietary and never will be common for other users; like coca cola recipe, and other technologies needs a short time to be common; like pharmaceutical drugs.

Two concepts of technological knowledge and human capital might come similar for people but, it is better to distinguish between them. While technological knowledge is understanding of how this world works for societies, human capital is the resources that the workforce used to learn this understanding. An example might make clear the subject; the quality of textbooks counts as technological knowledge while the time which is allocated by people to read those textbooks counts as human capital (Mankiw, 2017, p. 239-240).

2.2. Economic Growth Theories

Economic growth was one the main concept in macroeconomics and each nation have tried to reach to the power politically and economically. In following sections, some thoughts of economical schools will be discussed and it will be started by reviewing the Mercantilism thoughts and their rules for growth. After Mercantilism, Physiocrats, Classics, Keynesians, Neoclassical, and Endogenous growth theories will be under review.

2.2.1. Mercantilism

Mercantilism or bullionism is the title given to the first ideas and economic policies approximately between 1500-1700 AD, before the Industrial Revolution. According to the Mercantilism thoughts, the only wealth sources are gold, silver, and other valuable metals. Thus, increasing these precious metals were meaning more wealth and economic growth to Mercantilists. The Mercantilists, used to design and implement such policies for increasing the number of precious metals in the country and in contrast, preventing them to exit from the country. In their opinion, more gold and silver bring them more power economically and politically; in one hand, it increases the defense power against enemies and in the other hand expands the empire by acquiring more colonies. Therefore, they built powerful military forces and navies for founding external gold and silver resources by invading other regions and colonizing. Moreover, they designed trade policies and trade restrictions to have always surplus in balance of trade because they thought that trade is a zero-sum game. Consequently, they accumulated more gold in trade with other countries specially their colonies by exporting more goods and services than imported. While the government encouraged exports and discouraged imports of final goods and services, this situation was in opposite about the raw materials and intermediate goods. As a result, they gained more gold by exporting final goods and services and loss less gold for raw materials and intermediate goods.

In addition, for Mercantilists population growth was another important factor of growth for several reasons. Except that larger population mean larger army, but more population mean more labor force which keep wages down enough and enhance the country to compete in international trade. In this respect, Mercantilists gave the greatest

importance to labor among the other production factors and encouraged population growth (Hess, 2013, p. 57-58).

2.2.2. Physiocrats theories of growth

Physiocrats were the first economic school with their own press organization to introduce, distribute and defend their ideas and policies. François Quesnay (1694–1774) and Victor Riqueti (1715–1789) were two famous Physiocrats. Although that the Physiocrats period was not very long; maybe half a century, but this short time had significantly great impact on the expansion of political economy. The Physiocrat term is a Greek term consists of two parts of *physis* = ‘nature’, and *cratēin* = ‘to dominate’.

In their opinions, the soil had great importance and agriculture was the only sector that could bring economic surplus for a nation which is a gift from nature. Quesnay stressed that economic development of a country is achievable by reforming the agriculture system with engaging higher capital-intensive technology. They were against mercantilism and believed that manufactures only change the shape of the products and are not productive but agriculture sector is productive and can generate economic surplus. In contrast with mercantilists, which they proposed policies for facilitating the imports of raw materials and intermediate goods and supporting the businesses and productions, the Physiocrats especially Quesnay argued that government should consider ‘bon prix’ or subsidies for agriculture sector (Roncaglia, 2017, p. 48-49).

2.2.3. Classical theory of economic growth

The classical theories of Economic growth mainly started with the publication of ‘*inquiry into the nature and causes of the wealth of nations*’ by Adam Smith in 1776 and developed by two other classic outstanding figures, Thomas Malthus and David Ricardo. The classical thought nearly remained for a century (Hess, 2013, p. 58). They built their theories by using Physiocrats analytical foundations and stressed on capital accumulation and capitalist economic institution. The theoretical foundation of the classics is Adam Smith's theory of division of labor. The owner of production tools (such as factories, mines, transport) organize the labor productivity by hiring them on wage basis contracts.

As there is a difference between the product price in the market and wages in average, capitalists or the owner of production tools gain appropriate profits. The profit causes competition among capitalists to achieve a bigger portion of it, thus, they consider a large amount of their profit to expand production, which raise employment, division of labor, and labor productivity. On the other hand, capitalists tend to decrease the production costs by researching new ways and strategies of production, and interested in investment on cost-reducing technical innovations. The cost-reduction technological innovations enable them to reach to a higher profit than other competitors.

According to Classical theory, economic growth results growth in population till the capital accumulation leave behind labor-saving innovations. In this situation the demand for labor increases as the capitalists tend to increase production. As a result, wage increases due to increased labor demand led to an increase in population and migration of people from other less productive areas (Setterfield, 2010, p. 50).

2.2.3.1. Adam Smith

In Adam Smith's theory, the division of labor and trade are the sources of economic growth but it depends on the extent of market. Larger markets which mean more demand for goods and services provide more opportunities for division of labor and trade specialization. Thus, in contrast with small markets which there are less demand for products and individuals have to be more self-sufficient, greater market enable manufacturers to use from economy of scale opportunities and decrease their cost of production (Hess, 2013, p. 59).

Geographical and political boundaries are two kinds of problems for emerging markets. Based on liberalism, Adam Smith argues that the government should not be involved in economic activities, but should provide economic infrastructure such as roads, bridges, education, justice and defense. In conclusion, foreign trade and the growth of the market both increase the division of labor and ensure economic growth (Ünsal, 2007, p. 47-48).

Smith emphasized the role of international trade on economic growth in contrast with the Mercantilism theory which said that the international trade is a zero-sum game.

According to Smith's theory the international trade can influence the economic growth as follows (Hess, 2013, p 60):



Figure 2. 2. *Adam Smith's economic growth path*

2.2.3.2. Thomas Robert Malthus

After writing the “The Wealth of Nations” by Adam Smith, Classical economists were divided into two groups as optimistic and pessimistic. According to optimistic economists, population growth does not pose any threat to humanity and society. However, Malthus, a pessimistic economist, in his work titled "An Essay on the Principles of Population" in 1798, stated growth theory developed contrary to the optimistic economists, the continuous increase of the population would pose a serious threat to humanity and society. According to Malthus, when the population growth not be checked or when it is left alone, the population increases geometrically. On the other hand, Malthus noticed that the growth rate of food increases arithmetically because of diminishing returns of fixed input factor, the land. He predicted that the population growth rate will outstrip the growth rate of food and will result vice and misery (Hess, 2013, p. 60).

The Malthus economic growth is based on two important concepts of land and population. The first one, the cultivatable land which has an important place among the factors of production which is constant and limited. The second concept, the population growth which directly relates with labor and grows geometrically means lesser land for each individual to work on it and participate in the process of food production. Thus, as a result of diminishing returns law the aggregate output per person will start to decline and will spread poverty in societies with more population. Malthus suggested that for

preventing from this condition the only way is “moral restraint” which people have to engage in and have to decrease their number of children (Todaro and Smith, 2014, p. 296-297).

2.2.3.3. *David Ricardo*

David Ricardo (1772-1823), is another famous figure of the classic school and the biggest contribution to the formation of the classical growth model belongs to Ricardo. According to classical economists, economic growth occurs with an increase in capital accumulation. The source of capital accumulation is savings. While other conditions are constant, economic growth occurs as a result of increasing savings into investment. According to Ricardo, for the capitalists whose main purpose is to make a profit, the only way is to continuously increase production. In order to increase production, labor demand will increase and this will cause higher wages. Since an increase in wages causes an increase in the population, the demand for agricultural products will increase. Like Smith, Ricardo thinks that growth will not follow a continuous path and will stagnate after a certain point. It is an inevitable result that after a certain point economic growth will stop because the cost of agricultural production would increase due to an increase in wages and as a result profit margin would be reduced (Acar, 2002, p. 11).

On the other hand, the cost of food production will be rising due to lack of appropriate land for cultivation and landowners takes higher economic rents for. There is two ways for producing more agricultural products that either employing more labors than before at the same amount of land or using lesser appropriate land for cultivation which both means higher cost than before as we know it as the diminishing returns per labor law. While the share of economic rents eventually increases, the share of wages and profits in total income decreases to the subsistence level and enough to replace the depreciated capital respectively. At this point, capital accumulation, capital-labor ratio, per capita income, and labor productivity will remain constant and the economy will experience nor economic growth, or population growth with subsistence wages and zero economic profits (Hess, 2013, p. 70-71).

In summary, since the classical growth model is based on many more rigid assumptions such as full employment and perfect competition conditions, this model is unlikely to work in today's economies. Although the classical growth model cannot fully

explain the development process of today's economies, it is very important because it is the first systematic model on growth.

2.2.4. Keynesian theory of growth

John Maynard Keynes (1883-1946) a British economist in 1991 clarified the unemployment problem which was risen after World War II in the free market framework. His great work “General Theory of Employment, Interest, and Money” was written in contrary to free market mechanism, classical economist and Say’s law by developing new theories based on aggregated expenditures model and emphasizing the government role in economy (McConnell, Brue and Flynn, 2018, p. 237).

After WWII, during the Great Depression, the time when most of the world were suffering from high rates of unemployment, the Adam Smith’s invisible hand law could not answer the unemployment problem with flexible market prices. Keynes first proposition is about the existence of deficient demand in the market. Keynes explained that the prices and wages are not willing to adjust rapidly in the market unlike the classical school followers which they argued that the prices and wages adjust the supply and demand quantities quickly in the market. Then he contended that the unemployment can occur since the market cannot equalize prices and wages quickly, the number of persons that firms want to hire and the number of persons who want to work remain unequal (Abel, Bernanke and Croushore, 2017, p. 45).

In contrast with Say’s law, he stressed the importance of demand consists of consumption and savings in economic growth. He said that lack of investment is dependent to lack of income and this will influence people’s consumption and savings.

Thus, in order to decrease the unemployment problem and increase the people’s income the government have to interfere in economic affairs. The government by applying two kinds of policies can influence the unemployment. First, by increasing the government spending through buying the products or lowering the taxes and second, participating in markets by public investment which both strategies will lead to an increase in income and demand for goods (Vaggi and Groenewegen, 2006, p. 186).

In fact, Keynes did not envision a model directly related to economic growth. He was concerned more with how to solve the unemployment problem in the economy after the Great Depression. In later sections, other economists developed new models based on Keynes's thought.

2.2.5. Harrod-Domar theory of growth

After Keynes' theory of growth, the first macroeconomic model which analyzed the growth formally is known as Harrod-Domar's growth theory. Roy F. Harrod (1939) with "An Essay in dynamic Theory" and Evsey Domar (1948) with "Capital Expansion, Rate of Growth, and Employment" valuable works independently started all modern economic growth theories. Although that both theories are different from numbers of respects but due to many similarities in basic structure they are known as a single Harrod-Domar model of economic growth. In this theory, they stressed the role of consumption and saving behaviors of households and in contrast the entrepreneurs' investment decisions (Salvadori, 2003, p. 30).

In this simple economic growth model, there are two factors of production; the labor and capital, which assumed that they produce only one type of good for consumption or saving and in the production of the same good as an input. Also, it is assumed that the saving-consumption behavior is a constant fraction of aggregate output and will never change during the time unless by applying fiscal policies. Furthermore, in the Harrod-Domar model, it is assumed a constant rate of growth for labor force and defined it as an exogenous parameter because it was assumed that labor is abundant and can be hired in any time (Ramanathan, 1982, p. 18). In addition, in the Harrod-Domar model the technological progress is defined as a reduction in capital-output ratio (Todaro and Smith, 2014, p. 122).

In the Harrod-Domar model, the effect of the investments on economy's production capacity, that Keynes neglected was included in the analysis, and the basis of the model was determined as the investment rises the production capacity in an economy. Every investment has two effects on the economy. First, investment raises the income in a greater value as it was addressed in the Keynesian model by multiplier effect. Second, investment provides an increase in production capacity in an economy. Harrod-Domar

growth theory explains the relationships between aggregate demand, production, and employment. In addition, it connects the growth rate of the economy to the marginal saving rate and the capital-output ratio (Özsağır, 2008, p. 340). The Harrod-Domar growth model emphasizes that investments create a demand for production on the one hand and on the other hand, increase the capacity of the economy for output production.

A simple form of the Harrod-Domar theory of economic growth is defined as $(\Delta Y/Y) = (s/c)$. The $(\Delta Y/Y)$ or G_w denotes the warranted rate of economic growth, s denotes the aggregate saving ratio, and c denotes the capital-output ratio. More precisely, the economic growth of a country directly or positively depends on its aggregate saving ratio and inversely or negatively depends on its capital-output ratio in the absence of government. With other words, while the more saving and investment ratio leads more output, the more capital-output ratio leads to less output in the economy (Todaro and Smith, 2014, p. 121-122).

2.2.6. Neoclassical theory of growth

The period after the Second World War has been a period of emphasis on growth and development. The countries that participated in the Second World War suffered greatly in political and economic terms. After the war periods, the main purpose of the countries has been economic growth and development. Especially rich countries have considered different methods and policies in order to reach the level of growth and development more rapidly. Therefore, growth and development have become an important issue. In general, countries have studied how they can grow faster. At this period, Neo-classical growth theory started to attract attention (Farahmand, 2019, p. 25).

After Harrod-Domar growth model which played a significant role in modern growth theories, Robert Solow (1956) tried to overcome the full-employment steady state problem by bringing changes in production techniques and allow the substitution between capital and labor. Hence, production growth is adjusted by the labor force growth rate and economy can grow fully employed (Hunt and Lautzenheiser, 2011, p. 450).

The assumptions of Neoclassical theory are as follows (Jones, 1998, p. 20-23):

- Product: the economy can produce one type of product or homogenous product as output and counted in Gross Domestic Product.
- Factors of production: in this model there are only two types of production factors, physical capital and labor and can be substituted to each other. Moreover, the wages and rents for labors and capitals are set equal to their marginal productivities.
- International trade: in this model there is no international trade due to considering one type of product as output.
- Labor force growth: in this model the population growth rate is exogenous, thus labor force participation rate considered constant and grows in a constant rate.
- Technology development: in the neoclassical growth model the technology progress considered as an exogenous parameter. It means that the technology is available for every country without any cost and boundaries.
- Constant returns to scale: in this model the production function follows from constant returns to scale law. Thus, by doubling inputs, output will exactly double.
- Production distribution: in this model assumed that production can be distributed either for consumption or savings.
- Type of market: a perfect competition market assumed for this model and firms are price-takers due to existence of a large number of firms in the market.
- Diminishing returns to capital per worker: it is assumed that by giving an extra physical capital to a worker, it will raise the aggregate output but less than before.

In this context, according to the neoclassical growth theory, the per capita income levels of countries converge in the long run. Thus, the development differences of countries with the same savings rate, the same population growth rate, and the same technological development rate begin to disappear and a convergence occurs between developed and undeveloped countries. Solow called these explanations "convergence hypothesis". According to Solow, economies will provide stability by finding a stable and balanced growth process in the long term. While population growth, labor force growth and technological development factors affect economic growth, economic growth does not affect these factors. There is a one-way causality relationship between growth and population growth and technological development. In other words, technological

development and population growth are considered as exogenous variables in the model (Berber, 2011, p. 115).

In Solow's economic growth theory, he tried to answer the question of why some countries are rich and some countries are poor. According to the Solow model, the main reason for the rich and the poor country is due to the increase in investment and population rates and the differences in technological developments. Because rich countries are countries that invest more, have less population growth rate and their labor productivity increases due to faster technological development (Berber, 2006, p. 163-164). Therefore, new models called endogenous growth models were developed by investigating the factors affecting growth in the neoclassical growth theory in a more systematic and technical framework in the mid-1980s.

2.2.7. Endogenous theory of growth

Between the 1980-90 period the standard neoclassical growth theory started to become less remarkable as a tool to discover the factors of long run growth because of its theoretical fundamentals. In the neoclassical growth theory, it was assumed that technological progress is an exogenous object and the economy without technological change will finally converge to a steady state and the per capita income growth will turn to zero. The problem in the model is the existence of diminishing returns to capital assumption. In order to eliminate this problem, an approach is that the capital can be explained not only as physical capital but also as human capital. By considering both physical and human capitals in the model, the problem of diminishing return would be solved. Another approach that can solve the diminishing return problem in the long run is to endogenize the technological progress in the model (Barro and Martin, 2003, p. 61).

Before 1980's, economic growth theories particularly Solow model were called exogenous economic growth theories because of counting the technology as an exogenous object in the model and firms profit or other market incentives could not affect the technology. The endogenous growth theory does not agree with the idea that the physical capital is the main economic growth factor. This theory was built on the basis of Solow model with adding human capital and technology to the model as endogenous parameters. In this theory the production function can generate increasing returns to scale

and rises the income per capita which was not possible in the Solow model (Sengupta, 2011, p. 21-22).

The assumptions of the endogenous growth theory against the Neo-classical growth theory are as follows (Han and Kaya, 2009, p. 296):

Increasing Returns to scale: Neoclassical growth theory is based on the assumption of diminishing returns. The inclusion of human capital as well as the physical capital accumulation in the model may bring an increase in income per capita. The increasing returns assumption strengthens the economic growth theories. In the Neoclassical growth theory, the consideration of diminishing returns for capital and that capital is considered as a factor separated from technology are two factors that make investments insignificant. Investments have an important place in endogenous growth theory. Investment in physical capital, human and knowledge will increase economic growth.

Positive Externality: Externality is an important factor of growth and development. The knowledge capital of individuals (a person or firm) not only makes profit for itself but also creates profit for the entire society. Therefore, the endogenous variable prevents the decline of marginal productivity by creating a positive externality in the model. In other words, endogenous variables cause productivity to increase by creating externality.

Imperfect competition markets: While the existence of perfect competition markets is assumed in the neoclassical growth theory, the existence of imperfect competition markets is assumed in the endogenous growth theory. Because in reality none of the markets can fulfill the perfect competition market conditions. Therefore, it is important to model be settled on the perfect competition market basis. One reason for this is that monopolistic markets are necessary in occurrence of innovation and new ideas. The monopoly profit provided by innovation will motivate companies to invest more on research and development programs and therefore innovate more products.

Technological progress: The fundamental difference between knowledge and human capital endogenous growth and Neo-classical growth theories emerges from the initial definition of the concepts of capital and investment. The main sources of endogenous growth theories are technological progress, knowledge and human capital. In this approach, it is known that every investment provides innovations and knowledge, and every new investment on physical capital causes an increase in human capital as well as

an increase in production. Therefore, the labor working with excess capital increases knowledge and skills. In this context, the increase of both physical and human capital will prevent the emergence of decreasing labor capital ratio.

Since the mercantilism period, the views on economic growth have been discussed by economists until today. Looking at the historical development of economic growth theories, each of the factors contributing to growth, capital, labor, land, natural resources, technological developments and human capital, has been an important topic of discussion by economists in different periods. Nowadays, the contribution of technological progress to the economic growth of developed and developing countries is increasing quickly. In addition, technological progress affects economic growth, as well as social and cultural behavior of human.

2.2.7.1. AK model

The basic assumption of exogenous models of economic growth, especially the Solow's model of growth, is that the technology is an exogenous parameter in growth and cannot be affected by the market forces and once the economy reached to steady-state equilibrium will never change. In contrast to exogenous economic growth models, endogenous growth models assume that technology is an endogenous parameter in model and has an important role which can be affected by market powers and profits. Therefore, it can continuously increase the level of output. In addition, the physical and human capital accumulation are determined the dominant factors of production in economic growth not only in the short-run periods but also in long-run periods and they are not obeying the diminishing returns to scale rule obeying from increasing return to scale rule (Sengupta, 2011, p. 21-22). Agenor (2000, p. 462) stressed that these changes in production functionality can be risen because of three main reasons. First of all, by reaching output to a sufficient high level, the production function takes the internal economies of scale feature and economy can grow internally. Second, because of positive externalities created during capital accumulation in learning by doing process. And third, external economies of scale might be generated by production technology. In instance for the last reason, a firm by doubling its inputs may increase its output as the same ratio but in total all firms may gain more than that ratio if they act together.

Roble in 1991 introduced a simple form of endogenous economic growth model by taking both physical and human capital accumulation in a model based on a constant return to scale context. Unlike the neoclassic framework which took only the physical capital into the model, in the AK model, human capital is also emphasized beside the physical capital Agenor (2000, p. 462).

This model has a linear form as follow (Sengupta, 2011, p. 22):

$$Y_t = A(K) K(t) \quad (2.3)$$

In the above function the Y_t denotes the output and $K(t)$ denotes a combination of physical, human and knowledge capital. $Y(t)$ depends on the $K(t)$ and has a linear function form. The $A(k)$ is the endogenous technological changes in the economy and it will be different in each country depending on how their production function reacts to the nominated new knowledge and the speed of spreading new knowledge within the country. This speed can be different in each country due to some reasons such as the labor forces' level of education, types of R&D investments, the ability of labor forces' adaptation in using better technology imported from abroad by foreign direct investment, and the capabilities of institutions in the form of productive efficiency, flexibility and transparency.

$$Y = Ak^\alpha L^{1-\alpha}, 0 < \alpha < 1 \quad (2.4)$$

In this function, the Y exhibits the output value, K exhibits the capital stocks value, L exhibits the workforces, and A exhibits the level of technology. Because of constant return to scale feature of the capital then α value is equal to one (Kaynak, 2009, p. 122). Therefore, the economic growth depends on the rate of physical capital accumulation and technology.

Arrow in 1962 emphasized the concept of “learning by doing” in his study and made another way of modeling endogenous growth. By considering this assumption, investment in different types of capital creates positive externalities on future investments. In other words, investment not only increases the capital stock but also changes the production process. For instance, employees in a company learn how to use

new machines, improve their skills and increase their productivity. This firm cannot completely exclude other firms from accessing and using this new knowledge obtained as a result of learning by doing. Thus, further technical progress will be made through spreading this knowledge to other firms. After Arrow, other two economist stressed the other factors of production. Romer (1986) stressed the importance of the knowledge and knew it as a driving force of economic growth while Lucas (1988) propose that it is the human capital that increase the productivity of other inputs such as physical capital. In the Lucas' model, it is the human capital that provides long-term growth is the efficiency of human capital. The following function exhibits the Lucas model and shows the role of human capital in production function (Kaynak, 2009, p. 128):

$$Y(t) = AK(t)^\alpha [u(t) h(t) L(t)]^{1-\alpha} h(t)^y \quad (2.5)$$

In here, t shows the time, Y denotes output, K denotes physical capital stock, A exhibits technology level, $u(t)$ shows the labor time spent in production, $h(t)$ shows human capital, and $L(t)$ stands for workforce level. The combination of $u(t) h(t) L(t)$ symbolizes the effective workforce. Here, α , $\alpha-1$, and y are the elasticity coefficients of output relative to capital, effective labor force, and human capital, respectively. In this model, the production function is the function of technology, effective labor force, and human capital. The $h(t)$ in effective labor force term shows the endogenous effect of the human capital while the $h(t)^y$ shows the exogenous effect of the human capital in Lucas' model. In case when the exogenous effect, be larger than zero ($y>0$), firm will produce with an increasing return to scale production.

According to Lucas, the main source of growth is human capital accumulation, and the differences between countries' living standards arise from differences in human capital accumulation. In countries with higher human capital accumulation, the workforce is more productive and the wages paid to this skilled workforce are higher. Therefore, skilled labor migration is experienced from poor countries to rich countries. While the migration of the labor force with high productivity and skill level causes the poor countries to decline further, on the other hand, it has a positive effect on preventing the economies of the rich countries they migrated to from going into recession (Lucas, 1988: 40).

Another form of endogenous growth model is to considering the effects public policies on economic growth. According to Robert Barro (1999), the main determinants of growth are high education level, health condition, low fertility rate, low rate of government transfers, and advantageous terms of trade. In Barro's model, capital consists of capital goods, education, experience and health levels. Therefore, it consists of both physical and human capital (Gürak, 2006: 123).

2.2.7.2. R&D model

In the late 1980s, more intention was paid to endogenous economic growth models and the role of technology and investment on research and development (R&D) got more under the focus of economists. Romer (1986) was the first person who stressed the role of technological innovation and he argued that the human capital by using existing knowledge stock in the R&D sectors can create technological innovations. Then the new technology will be used in production and will increase the level of output permanently. In this model, it is assumed that the human capital has a constant return to scale and by employing more human capital a sustainable economic growth is achievable. With other words, he said that the R&D is a key determinant for long run economic growth and will increases the factors productivity (Samimi and Alerasoul, 2009, p. 3464). Grossman and Helpman (1989-1990) and Aghion and Howitt (1992) were other economists who follow the Romer and developed his endogenous growth model (Tari and Alabas, 2017, p. 4).

In Solow (1956) model, technology was only considered as an exogenous factor in production function. He believed that technology affects the savings, capital, and factors productivity and increases them. His model was based on Neo-classical assumption and the production function had decreasing return to scale feature in his model. The main lack of his model is that his model does not explain technological developments. In contrast to Solow (1956), after three decades Romer (1986) and after him Lucas (1988) define technological developments and R&D to their model separately but similarly as an endogenous factor. The factor that able to increase the productivity of other factors and output. He mentioned that, R&D generates new Knowledge and new goods and services. The newly generated knowledge and information spreads to other firms therefore significant impact will be seen in firms and production (Tari and Alabas, 2017, p. 4).

Grossman and Helpman (1989, 1990), explore the relationship between technological development and economic growth. They nominated technological development as an endogenous factor to their economic growth model. At this model, technological development increases productivity and therefore leads to economic growth in long run. In Grossman and Helpman endogenous growth model, product diversity and public information effects which assumed to be the consequences of technological developments were paid more attention in long run economic growth. They argued that generate positive externalities from knowledge base on R&D positively increase economic growth (Tari and Alabas, 2017, p. 4).

Phillipe Aghion and Peter Howitt (1992) are other two economists who have great contribution on endogenous growth models. Their model is based on Schumpeter's idea of creative destruction. They believed that innovations are outcomes of investment on R&D. Schumpeter's idea briefly says that patent law gives firms to act as a monopoly firm in the market and motivates them to always introduce new or better-quality goods to the market, otherwise, they will be left out of the market by other firms that had more efforts on producing new goods. In the Aghion and Howitt's model the economic growth has direct relationship with the speed of innovation (Samimi and Alerasoul, 2009, p. 3465).

2.3. Unemployment Concept

Unemployment is one of the three most considerable economical issue for economist. For two reasons economists and policy makers are interested in unemployment issue. First, they are interested in unemployment and care about it because unemployment affects directly the unemployed person's welfare. Second, it is a kind of alarm for economists and policy makers that may some resources in the economy are not used. It means, by raising unemployment rate the economy cannot use some of it resources efficiently. Like a high rate of unemployment situation in an economy, with low level of unemployment rate, the resources in the economy maybe overused. (Blanchard, 2017, p. 29-30).

In this section, we will explain the concept of unemployment, the way how it is measured, and the types of unemployment. Then, the causes and types of unemployment

in the economy will be reviewed. In next subsections, the unemployment concept will be examined in the context of economic growth theories. Finally, the relationship between economic growth and unemployment which presented by Okun in 1962, known as “Okun’s law” will be reviewed.

2.3.1. Definition of unemployment

The unemployment concept can be defined in two broad and narrow scales. The broad meaning of unemployment includes all the three factors (labor, land, and capital) of production and if the economy’s production is not at full capacity, then there is a possibility that some of the production factors have not been employed. However, economists by using the unemployment concept focus on the labor market. In the labor market context unemployment defined as the number of persons equal or older than fifteen years old, who are trying actively to find a job but are unsuccessful to gain (Sayre and Morris, 2014, p. 117).

Although that some levels of unemployment in pleasant for economy but every country aims to lower the unemployment rate as much as possible. Having low unemployment rate for country means higher aggregate output level or higher GDP than leaving some portion of labor force be unemployed because those who cannot find job then cannot participate in production process in order to increase the aggregate output (Mankiw, 2017, p. 294).

ILO, the International Labour Organization, defines unemployed persons as those persons who are between 15 to 74 years of age, actively looked for job during the previous one month and not worked in the reference week but were available for job (ILO, 2020, p3).

2.3.2. Measurement of unemployment

The population is divided into two major groups of working-age population and unable to work population. Those people who are 16 years old or above and they are not at prison, pensions, hospital or any other kind of institutional care are counted in working-age population. Two groups of people have been included in the working-age population

regarding the United States' Census Bureau division: those people who are in the labor force and not in the labor force groups. Also, the labor force group again is divided into two employed and unemployed groups. Therefore, by the summation of the last two groups the amount of labor force will be obtained. Those persons who have a full-time job or working in part-time jobs are counted as employed and the other persons in labor force group is counted as unemployed if he/she is available for work and in one of the three following categories (Parkin, 2016, p. 147):

- He/she tried to get a job within the previous month or for four weeks but currently is still without job.
- He/she was waited for the job he/she was fired from.
- He/she was waited for a new job within thirty days.

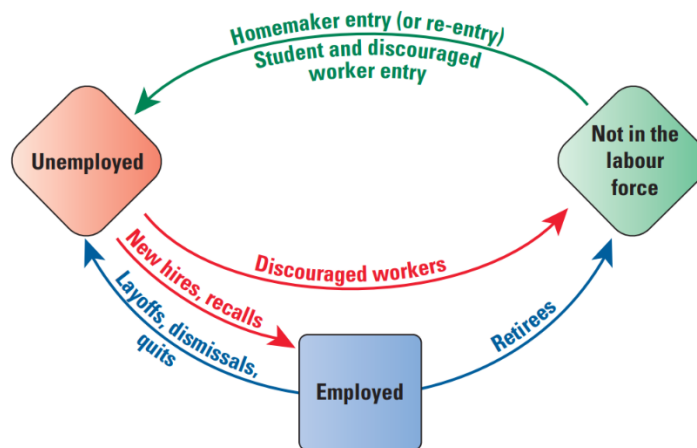


Figure 2. 3. Dynamics of the labor market

Source: (Sayre and Morris, 2014, p. 123)

Regarding the unemployment measurement which explained above, the following formula may be helpful for understanding better the measurement process (Case, Fair and Oster, 2017, p. 158):

$$\text{Working-age population} = \text{Labor Force} + \text{not in labor force}$$

Working-age population is equal to the number of people who are in labor force group plus the number of people who are not in the labor force group.

$$\text{Labor Force} = \text{Employed} + \text{Unemployed}$$

The labor force is equal to the number of people who are employed and either working in full-time or part-time jobs plus number of people who are not employed but actively looking for job.

The unemployment rate is another important concept that must be explained under this section. The unemployment rate represents the percentage of unemployed people in society in terms of total labor force. How higher this rate is means that the unemployed people need more effort to get a job. The following formula shows the measurement of unemployment rate:

$$\text{unemployment rate} = \left(\frac{\text{unemployed}}{\text{employed} + \text{unemployed}} \right) \times 100$$

It is very difficult to distinguish between types of unemployment. The Beveridge Curve developed by British Economist William Beveridge is one of the main objectives developed for this purpose.

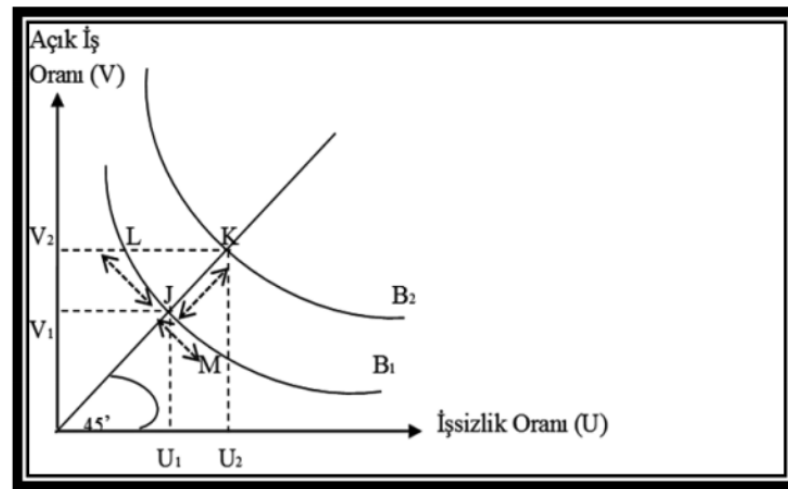


Figure 2. 4. The Beveridge curves

Source: (Biçerli, 2009, p.466)

The Beveridge Curve shows the relationship between the job vacancy rate and unemployment rate in an economy. In the above figure, the job vacancy rate is on the vertical axis denoted by (V) and the unemployment rate is on the horizontal axis denoted by (U). As can be seen in the figure, there is a negative relationship between the job vacancy rate and the unemployment rate. Positions K and J show that the number of job vacancy is equal to the rate of unemployment, showing full employment situations. The

area above the 45-degree line, in here the L point, indicated that there is an excess in labor demand. In contrast, the area below the 45-degree line, in here the M point, indicates excess in labor supply. At J point the unemployment rate is U_1 amount on the horizontal axis. Although that points J and K both show the full employment situations but the economy has some rate of unemployment every time as we know it as natural rate of unemployment. In fact, J and K points indicate the natural rate of unemployment. By comparing those two J and K points to each other, it is clear that K point is with more unemployment rate than J point.

B1 and B2 curves show the growth rate of the workforce. The workforce may grow due to migration or the participation of women in the workforce and this will shift the curve from B1 to B2. Consequently, the vacancy rate and the unemployment rate increase equally.

An increase in cyclical unemployment will increase unemployment and decrease vacancies. An example is the movement from J point to M point on B1 curve. On the other hand, if there is an increase in temporary or structural unemployment, then both job vacancies and unemployment will increase simultaneously. The shift from J point on the B1 curve to K point on B2 curve is an example of this situation.

An increase in unemployment can result from both cyclical and structural unemployment. This situation is shown in a horizontal movement from J to M. Such a situation may be due to the large-scale workplace closures in one line of business and the lack of new jobs in other sectors of the economy. An increase in aggregate demand can partially eliminate such unemployment and recall some of the workers that firms have fired (Biçerli, 2011, p. 466).

2.3.3. Types of unemployment

Understanding the different types of unemployment helps the government to design policies against it. Three main types of unemployment are known as frictional, structural, and cyclical unemployment (Tucker, 2017, p. 171).

2.3.3.1. Frictional unemployment

The labor market consists of two major groups and is the place where both workers and firms are actively dealing regarding finding each their desired jobs and suitable workers respectively. It is clear that jobs are not identical the same as labors are not identical to each other in the labor market. Otherwise, it was very easy and needed a short time for workers to be occupied in their interested positions and on the other hand firms would immediately hire employees for their available vacancies. But unfortunately, nor jobs and labors are identical and they are different in many respects. Because of these difference in jobs criteria and labors specifications, it always takes time for labors to search desired positions and be employed or for employers to search appropriate labors to hire for their free vacancies. The unemployment that rises in this condition generally called frictional unemployment (Abel, Bernanke and Croushore, 2017, p. 122).

Also, the frictional unemployment sometimes is known with transitional unemployment or with search unemployment terms because of transition time which is needed for a new job or the problem of lack of information existed in the market which avoid from matching a job candidate immediately with a job position. Since the information in jobs market spreads slowly, the market operates always with “friction” results frictional unemployment (Tucker, 2017, p. 172).

Frictional unemployment classification can be described as follows (Tucker, 2017, p. 171):

- **Newcomers:** there are always some new job seekers who either leave the school or newly graduated from the school.
- **Voluntarily unemployment:** the second group of frictional unemployment is consisted of those people who voluntarily leave their jobs in order to find their desired ones due to many reasons.
- **Discharged ones:** the third group of frictional unemployment is consisted of those people who are fired form the job despite of having marketable skills.
- **Seasonal unemployment:** the fourth group of frictional unemployment is consisted of those people who are working in seasonal jobs. Some jobs are seasonal in nature like harvesting time in agriculture, winter sports, tourism sector during the holiday season in summer, firefighters during the summer, or in many other categories which the number of vacancies raises during a particular time in a year.

The length of time for labors to find new jobs and leave the unemployment pool is different. Some labors may leave the unemployment pool in a short time while for some other labors it takes a long time to find a job. In fact, as workers have marketable skills, the economy's condition determines the length of this kind of unemployment. If the economy works well then labors would find job in a shorter piece of time (Heijdra, 2017, p. 737).

2.3.3.2. Structural unemployment

Structural unemployment occurs because of a mismatch between the skills of employees who are jobless and the skills needed for the related job opportunities. In this kind of unemployment, the problems for those workers who are structurally unemployed are not lack of job information and changing jobs. In fact, structurally unemployed workers need more education or training to meet the criteria in contrary to the frictionally unemployed workforces who have required skills for the job. The other difference between frictional and structural unemployment is their period length which frictional unemployment occurs in the short-run period while structural unemployment occurs in the long-run period and possibly permanent (Tucker, 2017, p. 172). Lack of education, changes in consumer demand, technological advances, and globalization are four main causes of structural unemployment.

Lack of education: Structural unemployment occurs because they cannot fulfill the skills for the related job due to lack in education or other training programs. Although that this kind of unemployment may have effects on all workforce groups but mainly teenagers who have not get finished their education nor have enough experience and minority groups are two target groups for this kind of unemployment (Tucker, 2017, p. 172).

Changes in consumer demand: this kind of unemployment arises because of a change in consumer's demand. The changes in demand affect some industries to be closed or change the production line which leads to unemployment of those workers who were working at these industries because of mismatch between current labor's skills with required skills in new positions. This period takes some time because labors' current talents may not be needed in any other position anymore, so they are structurally

unemployed until the time that they are prepared themselves with new skills for employers (McConnell, Bure and Flynn, 2018, p. 184).

Technological advances: Firms are always interested in latest technologies available in the market for lowering their cost of production to gain more competitive power against local and international firms that produces identical or similar commodities. Implementation of new technology in production line may increase the structural unemployment in a particular industry. The introduced technology which often is capital-intensive rather than to be labor-intensive, thus some portion of labors will lose their jobs (Tucker, 2017, p. 172). Although that technological advancement will increase the structural unemployment pool but it would be temporary. In contrast, if technological advancement raises the structurally unemployment but it will decrease the cost of production, raise the profit, and also wages will be increased. In addition, it will provide other opportunities for new born industries which will absorb some amount of unemployed workforce (Sexton, 2015, p. 277).

Globalization: there is a possibility for some industries to use sources outside (in here focused more on labor market) of the country or region where those firms are manufacturing by producing some part of production in abroad. This kind of activities which called outsourcing enable firms to reach to outside sources with lower cost than the firms origin sources. Therefore, it results lower cost of production, raises the profitability, and empowers firms' competitiveness in local and international markets. Cost of this profit belongs to those workers who lose their jobs and they have to change their job with retraining themselves. Although that this decision of firms will cause structural unemployment but it is better than to lose all jobs in that industry. In fact, those companies with more competitive power will remain in the market and other firms will exit from the market. Another possibility for the firms is to hire employee from other countries with lower wages which again reduces their cost of production and the employee which is fired have to look for another job (Tucker, 2017, p. 173).

The both frictional and structural unemployment are similar to each other but they can be distinguished regarding the employees' skills and duration of the unemployment. Those workers who lost thier positions and are counted in frictional unemployment pool, they have demand on their current skills, education level and are able to move to other regions for working. In contrast, skills and education level of those workers who lost thier jobs

and are counted in structural unemployment pool do not have any more demand and they have to participate in educational program for filling their gaps. The other difference between these two kinds of unemployment is on their duration. While frictional unemployment ends in short-time period the structural unemployment needs longer time to be finished and thus it's more important for economists (McConnell, Bure and Flynn, 2018, p. 184).

In conclusion, structural unemployment can occur due to a lot of different reasons in economy. Accordingly, economists consider a certain level of structural unemployment inevitable.

2.3.3.3. Cyclical unemployment

Before we start to discuss about the cyclical unemployment concept, it is better to be familiar with the meaning of business cycles in a country. Business cycles consist of contractions and expansions of business activities and shows upswings and downswings in the real output level. While an up-warding movement in business cycles shows the expansion in economy, a downward movement in business cycle or a very slow growth rate in real output exhibits recession (Abel, Bernanke and Croushore, 2017, p. 32). Generally, recession periods seem to be last for two following quarters or six months which the aggregate real output declines during these periods. In addition, beside a decline in real output, business profits fall, the unemployment rate rises, and economic resources are not used sufficiently. Referring this situation by the help of production possibility frontier, the economy is functioning inside the PPF line which shows that some resources are not used in production function (Tucker, 2017, p160).

The sequence of an expansion following with a contraction is always repeating in the economy and as it is discussed in the first paragraph under this section, it is regular and shows the fluctuations in business activities of a country. The unemployment that occurs because of fluctuations in aggregate output is called cyclical unemployment. An economy experiences a full employment situation when the business cycle is at its expansionary peak. Cyclical unemployment only occurs during the recession period. Moreover, in an expansionary peak of a business cycle the available unemployment is due to frictional and structural types of unemployment. Thus, we can realize that when there is no cyclical

unemployment the economy is at full employment state and the rate of unemployment which is at this state is called natural rate of unemployment. Therefore, during the recession the cyclical unemployment raises the total unemployment rate and total unemployment would be more than natural rate of unemployment (Sayre and Morris, 2014, p. 122).

The following formula expresses the cyclical unemployment (Abel, Bernanke and Croushore, 2017, p. 123):

$$\text{Cyclical unemployment} = U_a - U_n$$

While U_a denotes the actual unemployment rate, U_n denotes natural rate of unemployment. It can be seen that, by fluctuating output around its full employment level, actual unemployment rate fluctuates around the natural rate of unemployment. The above formula shows that cyclical unemployment is the difference between actual and natural rates of unemployment. If the output and employment be less than the full employment level, the cyclical unemployment would be positive and vice versa would be negative.

The Great Depression is one of the best examples of cyclical unemployment. During this period consumption, investment, government expenditures, and net exports faced a sudden decline and unemployment rate raised dramatically. In 2007, another great example of cyclical unemployment is The Great Recession. In this period, business investments declined due to a simultaneous decline in home and stock prices and caused shortage in demand. The unemployment rate was at 9.7 percent at the end of this recession in 2009 (Tucker, 2017, p. 173). These series exhibit that decline in total expenditure would result cyclical unemployment which typically happens during recession period of the business cycles. With other words, insufficient demand for goods and services are the reasons or cyclical unemployment (Abel, Bernanke and Croushore, 2017, p. 184).

2.4. Cost of Unemployment

Generally, the costs of unemployment are categorized into two groups of economic and non-economic costs. Economically, unemployment reduces the aggregate output as some labors cannot participate in the production process. This loss of output will affect

directly the unemployed individuals in terms of income they have lost during their unemployment spells. However, unemployment facilities such like tax exemptions and unemployment insurance payments which have been concerned by governments for unemployed persons would affect indirectly the rest of the society. For the first time the output loss was estimated by Okun in 1972 and later known as Okun's law. The Okun's law will be discussed in detail in later section and briefly under this section. Okun estimated that each percentage of cyclical unemployment leads to two percent loss in full employment output. In this prediction beside the effect of unemployment rate on output level the other effects like the shorter work-time and workweeks, decline in labor force participation, and labor productivity were all concerned in his prediction.

The output loss cost is not the only cost of unemployment. The other cost of unemployment is non-economic and targets again the unemployed individuals and their families. In addition to losing job and living without income, unemployment attacks psychologically not only the employed but also whole the family members may suffer from it. Psychologically effect of unemployment has more suffers for those who are unemployed for long time. Unemployed individuals lose their self-confidence and job skills. Unemployment not only affect them during the unemployment spell but will also affect them with lower wages or even longer unemployment spells in the future. Moreover, unemployment cost may be different regarding demographic groups. During the 2007 recession, those who were less educated, younger, men, and black suffered more than other demographic groups (Abel, Bernanke and Croushore, 2017, p. 489).

2.5. Unemployment Approaches in Economic Literature

In this section, three basic approaches of unemployment in the context of Classical, Keynesian and Neoclassical frameworks are discussed. The views of these three approaches about the labor market have been tried to be put forward. Apart from these basic approaches, some new approaches emerging in recent years regarding the unemployment problem are also mentioned.

2.5.1. Classical unemployment approach

The key determinant of Classical school is the price flexibility in the market. They believed that in a free capitalist market mechanism all markets will be in equilibrium include goods markets and factors of production markets. In their idea not only labor market will be at equilibrium but also other factors of production such as capital, land and other production factors. Therefore, according to Classical school the economy will always be at full employment level or near to it because of flexibility in the labor market in context of free capitalist market mechanism. However, they had a long run perspective of the case and did not consider temporary unemployment that happens in short run period. Their all theories were based on a long run view and they ignored all short run problems no matter how serious they are. In the long run, price flexibility will adjust the demand and supply of goods and the flexibility of wages will adjust the demand and supply of the labor in the labor market and any maladjustment will be corrected by a suitable wage cut. Thus, Classical economists' idea about the unemployment was like a passing phase towards the development and it will be full unemployment in the long run (Dutta, 2014, p. 23-24).

2.5.2. Keynesian unemployment approach

Like it is discussed in previous subsection, the classical model was based on perfect competition market mechanism, and price and wages were considered to be perfect flexible at this market system. Therefore, employment was always at full employment level while there was not any unemployed labor. In contrast, Keynes rejected the classical idea about the market clearing and full employment level. He argued that involuntary unemployment would be a consequence of rigidity of money wages and prices in labor market. In addition, he argued that flexibility of money or nominal wages have not the enough power to bring the economy especially labor market back to equilibrium state (Snowdon & Vane, 2005, p. 65).

According to Keynes, when the effective demand in the economy is not at a sufficient level, the economy comes to an unbalanced level with unemployment. In this case, involuntary unemployment occurs and individuals may become unemployed despite their willingness to work. In an economy with underemployment, the effective demand level needs to be increased to reduce unemployment. The increase in effective demand leads

to an increase in the production level and, accordingly, the employment level. Therefore, for an underemployed economy with sticky monetary wages to move towards the full employment equilibrium, the government must intervene in the economy by applying expansionary fiscal policies. It should not be considered that Keynes's approach to employment and unemployment is based on his recommendation of sticky wage rates. Because Keynes stated that the level of employment will be determined by effective demand, not by the negotiation process between employees and employers. According to Keynes, the producers will make their production regarding the effective demand and they will demand that much workers to realize this production. Therefore, in the short-term labor market, while labor demand is effective in determining the level of employment, labor supply does not play an important role because of sticky wages and determination of employment level by firms (Esen, 2020, p. 40-41).

2.5.3. New classical unemployment approach

Although the origins of the new classical school are based on monetarism, it continued its development as a separate school of thought in the 1970s. Early on, the new classic economists such as Robert Lucas, Robert Barro and Thomas Sargent argued that the economy would spontaneously return to full employment because wages and prices were perfectly flexible. New classics (especially Lucas) have used the "Rational Expectations Hypothesis" put forward by John Fraser Muth in macroeconomic analysis. According to the rational expectations hypothesis, economic units use all the information they have while forming their expectations for the future. Expectations formed using all the available information will be equal to the values realized on average (Esen, 2020, p. 44).

In the Keynes' General Theory (1936), one of the exogenous variables which might has a role in macroeconomic instability was the individuals' expectations about the future and he suggested that the animal spirits drive these expectations. The rational expectations hypothesis incorporated into the model instead of the adaptive expectations hypothesis. The other models of expectations hypothesis have systematic error but, the rational expectations hypothesis is out of systematic error.

The rational expectation hypothesis has been used in various forms, it is better to distinguish two kinds of weak and strong forms of rational expectation hypotheses. The weak form of the hypothesis is that the individuals in order to foresee a variable's future value they will use all available information about the other variables which might have influence in determining the desired variable's future value and it is assumed that economical individuals' expectations are based on their utility maximizing behaviors. On the other hand, the strong form of the hypothesis is based on true mathematical expectation of those influential variables. In addition, the strong version of the hypothesis does not mean that economical individuals have the exact foreseen of the variable's future value. They will make mistake due to lack of information they have used in their prediction. But, instead of being every time correct in prediction individuals learn from their mistakes. With other words, the prediction made by rational expectation hypothesis will be correct on average (Snowdon and Vane, 2005, p. 226).

Under the rational expectation hypothesis, the labors and firms maximize their utilities and profits respectively. In the labor market, Firms will increase the demand for hiring labors while they consider an increase in their goods and services relative prices and this will result more employment. But, if the rise in prices were due to rise in general price level, then the firms will not tend to hire more labors and the level of output will not be changed. In this condition the economy is producing at the natural level of unemployment.

The central banks have the ability to increase the employment level in short term by raising an unexpected increase in money supply. With a constant supply, while the demand will shift to the right or above, the prices will also rise. Since firms can not realize the origins of the increase in prices due to the lack of information, they will perceive this increase in general price level as their goods and services' relative price. Therefore, for more production firms will increase their labor demand. in this condition the economy is producing more than its potential output level and the unemployment level is below than the natural level of unemployment. This method only works only in short term and as the firms understand about the real history, they will decline the level of production and labor demand level (Esen, 2020, p. 44-45).

On the other hand, the supply side of the labor market make decision about their time allocation between work and leisure. They decide to work more or rest more based on the

difference between the current real wages and the expected real wages. If the current real wages be above the expected real wages, then labors prefer to allocate their time more on working now and rest more in the future. Conversely, if the current real wages be lower than the expected real wages then labors prefer to allocate their time more on leisure and work more in the future. Thus, the changes in employment based on the time allocation for current leisure and future leisure are voluntary choice made by labors (Snowdon and Vane, 2005, p. 233).

According to the new classics assumptions of market clearing and rational expectation hypothesis, the unemployment is totally a voluntary phenomenon. The supply and demand forces in the labor market determine the level of real wage but, these are workforces that take decide to work at the equilibrium real wage or not. They argued that unemployment does not exist under the market circumstances and those who are unemployed they do not willing to be employed.

2.5.4. Real business cycle theory and unemployment approach

Finn Kydland and Edward Prescott introduced the real business cycle theory in early 1980s. They built their model on the basis of the shocks made by random productivity or with other words by technology development. They argued that the productivity shocks are the main reason of the fluctuations of the business cycles in contrary to monetary shocks. Also, they said that the fluctuations in macroeconomics are being made by supply shocks not by consumption demand shocks (Williamson, 2018, p. 500).

The real business cycle model mathematically is a complex one but, Snowdon and Vane (2005) made the model simple. This model is based on two representative market actors; the households and firms. It is assumed that all the households are similar in behavior and rationally acting in the market for maximizing their utility, also the firms are similar in behavior too and acting for maximizing their profit. The perfect competitive market is the layout of the market system and prices are completely flexible. therefore, market is always in equilibrium with flexibility of prices in this model. Changes in technology is the cause of output fluctuations and the level of employment and unemployment. In this model the unemployment is voluntary as the workers consider the current and future real incomes and take rationally decide to whether work or not. Also,

work and leisure are perfectly substitutable to each other in this model. The other feature of this model is that the money is out of the model and the model is based on real terms (McDonald, 2015, p. 76).

The change in total productivity, raises the labor productivity and under this situation firms now are able to produce more than before. In one hand this leads to an increase in labor demand and will shift the labor demand to the right and on the other hand the current real income of labors will be increased. The workforce also expects more increase in their future real income but not as much as change in their current real income. Therefore, the workforces take decide to work more in current time and save more instead of consuming at current time. As total productivity rises, the marginal product of capital will also be increased. Then the demand for capital will be increased and the capital rents will rise. Increase in investment by firms needs more capital provided by more saving from households with higher real interest rates (Chugh, 2015, p. 206-212).

The intertemporal substitution of workforce proposes two things. First, if the technological shock is temporary, the imitation of the current real wage, which is above the normal wage, is temporary. In this case, employees will prefer to work now rather than spare time to take advantage of this high real wage level. Permanent technology shocks that raise the expected real wages in the future will stimulate the wealth effect that causes the current labor supply to decrease. Second, as Barro (1981) said, some theorists have emphasized the effect of real interest rate on labor supply. As the real interest rate rises, households will prefer to work in the current period, as the value of income from working now rises relative to the value of income from working in the future. Because the work in the current period has been encouraged due to the high interest rate (Esen, 2020, p. 47).

2.5.5. New Keynesian unemployment approach

The new Keynesian school of thought raised among a period suffered from unemployment and inflation problems during the 1970s. The New Keynesian came to rebuild the old version of Keynesian approach by considering a strict microeconomic foundation and general equilibrium framework for their theories. They were against the new classical economists and the real business cycle theory that its assumptions were

unrealistic to the real world like the existence of perfect competition market, perfect flexible prices and wages in the market, and considering the availability of full information for market actors without any cost. The new Keynesian emerged to take real world imperfections into a new macroeconomic model. One of the problems that new Keynesian and old Keynesian determined in old and new classics thought is the continuous market clearing assumption which under this assumption the economy is functioning at full capacity and never suffer from the effective demand which then proposed by Keynesians. In this regard, the new Keynesian aimed to build a theory of aggregate supply with rigidities in prices and wages as they believed that the prices and wages are not tend to change immediately and are not flexible (Snowdon & Vane, 2005, p. 361-365).

Although that old and new Keynesian are both advocate that rigidity of prices and wages in the market but in their defending side is different regarding the nominal and real values. The new Keynesian views about the prices and wages rigidity are based in real terms. The resources of these rigidities in prices and wages are determined a lot such as efficiency wages, implicit contracts, insider and outsider relationships (Ball, Mankiw and Romer, 1998, p. 5). In here some new Keynesian theories will be discussed.

2.5.5.1. *Efficiency wages*

According to the wage efficiency model, wages that are above the wage level that provides the balance in the market cause involuntary unemployment. However, despite the presence of these reluctant unemployed people in the market, surplus labor supply does not cause a fall in wages. Because wages are stricter towards falling in the wage efficiency theory, which establishes a linear relationship between productivity and wage, the nature of labor leads to an increase in wages. Therefore, if there is a decrease in wages, the productivity of labor will decrease and the cost of labor will increase (Yellen, 1984, p. 200-205). Regarding this model, due to various reasons higher real wages will increase the productivity of labors. In order to increase the labor productivity, the firms are willing to pay higher wages than the other firms for employees and this action will increases the firms cost of wages. However, firms compare the cost of the increased wages and the profitability of the increased labor productivity (Esen, 2020, p. 58). Thus, in this model

firms will pay higher wages if the profitability of increased labor productivity would be bigger than cost of increased wages.

2.5.5.2. *Menu cost theory*

the simplest model of the new Keynesian about the stickiness feature of prices and wages is the menu cost theory. There are always fluctuations in cost of inputs for firms but firms prefer to not change their goods prices in short term. According to the menu cost theory, costs of changing price list of goods and services in firms prevent prices from rising in the short term. For instance, it would be profitable for a restaurant to raise its foods prices and earn more, but in order to earn more the restaurant has to change its menu. Therefore, the restaurant compares the cost of changing the menu and expected revenue by changing menu (Chugh, 2015, p. 202). The new Keynesian menu cost theory regarding the labor market mechanism explains that the employees are not willing to negotiate for higher wages due to the cost of wage negotiations with employers and signing new contracts. Due to this reason the wages are sticky in short term (Esen, 2020, p. 54).

2.5.5.3. *Unemployment insurance theory*

The unemployment insurance is one the reasons of frictional unemployment. The unemployment insurance is set to avoid a decrease in living standards of those people who are laid off because of their unnecessary skills that they have. This amount is different regarding each country's policy but generally it is nearly to 50 percent of his or her former wage and will be paid by government for 6 months to 1 year. This policy has benefits for those who are receive it during their unemployment spell but also has an effect on the duration of their unemployment spells. Because the unemployed person may try less to find a new job by receiving it. Therefore, the unemployment insurance increases the unemployment (Mankiw, 2017, p. 303). However, the unemployment insurance is another reason for wages to be stickiness in short time periods. In those countries where this policy has been applied the employed persons have power to not accept lower wages than before as unemployment insurance covers minimum wages (Esen, 2020, p. 54).

2.5.5.4. Insider-outsider theory

According to the insider-outsider theory, the concept of insider describes the employee who is currently working for the firm and the concept of the outsider defines person who is looking for a job. Firms prefer to negotiate wages with employees and suggest them higher wages instead of hiring new employees from outside of the firms since hiring new employees has huge costs. On the one hand, the process of firing previous employee and hiring new employee takes time and has cost and on the other hand, the loss of the work experience of the laid off workers will decrease the productivity in production. For this reason, firms will choose to negotiate wages with insiders rather than looking for new workers from outside. This preference causes further increase in wages. According to this approach, it is possible to say that the insiders significantly affect the average income and financial performance of the firms (Ataman, 1998, p. 69).

2.6. The Relationship between Unemployment and Economic Growth

The unemployment problem has been an important issue for most countries, especially for developing countries. The higher unemployment rate in a country gives information that some production function resources of labor forces are not occupied in the production process therefore the economy is not working at full employment level. Hence, one of the government's economic aims is to keep the unemployment rate at the natural rate of unemployment to maximize the economy's aggregate output (Noor et al., 2007, p.337).

Both theoretical and empirical literature studies have conducted for many years on whether changes in the growth rate of an economy affect the level of unemployment and whether the change in the unemployment level also affects the growth performance of the economy. According to economic theory, an increase in production leads to an increase in aggregate demand. In order to meet this demand, firms increase employment, thus reduces the rate of unemployment. This is the relationship between unemployment and economic growth in many countries. In other words, high growth performance is expected to bring less unemployment, while the growth rate falling to low or negative values brings high unemployment, and a reverse relationship is expected.

The relationship between the unemployment and economic growth was first recognized by Arthur Okun in 1962 known as Okun's law. Okun found an inverse relationship between these two important economic variables by using the United States' quarterly unemployment rate and real output data. In his work he estimated that a for every 1% increase in actual unemployment rate from its natural level the actual output rate will be declined by nearly 2% from its potential rate. (McConnell, Brue and Flynn, 2018, p.186). It clearly shows the negative relationship between unemployment and economic growth during the expansions and recessions as unemployment rate falls during expansions and increases during recessions. With other words the economy should has a certain growth rate to keep unemployment rate constant due to two reasons; firstly, population is growing continuously and increases labor force. Secondly, the output growth per worker increases during the time and infers that the growth rate of output is higher than the growth rate of employment (Blanchard, 2017, p. 34).

3. ECONOMIC GROWTH AND UNEMPLOYMENT IN AFGHANISTAN ECONOMY

Mohammad Zahir Shah was the last king of Afghanistan from 1933 until 1973. During his kingdom period, the Soviet Union began to be involved in domestic political developments in Afghanistan from the 1960s. After the coups in 1973, 1978, and 1979, the Union of Soviet Socialist Republics (USSR) invaded Afghanistan, using internal turmoil as an excuse. Since 1984, the Mujahideen started to achieve success against the invaders by receiving important foreign aid. Following the agreements signed by Pakistan, Afghanistan, and the USSR in 1988, the USSR completed its withdrawal from Afghanistan in 1989. Between 1989 and 1992, Najibullah managed to stay in power despite the lack of support from the public or the international community. The Islamic Government of Afghanistan was established in 1992. However, since 1992, civil war has intensified between the groups in Afghanistan and the Taliban seized power by seizing Kabul in 1996 and Mazar-i Sharif in 1997 and 2001 finally war ended with the fall of the Taliban (Dış Ekonomik İlişkiler Kurulu, 2012, p. 2).

3.1. Afghanistan's Current Economic State

According to the world bank report of Afghanistan's development updates in July 2020, Afghanistan's real gross domestic product due to Covid-19 was estimated to be contracted between 5.5 -7.7 percent while it was predicted that real GDP will face a positive 3.3 percent growth before Covid-19. Covid-19 had had great negative influences on two sectors of industries and services in Afghanistan and significant declines in relevant outputs will be the shreds of evidence of the story. It is estimated 13-14 percent and 8-10 percent declines for the growth rate of services and industries sectors respectively as a result of lockdowns and other restrictions during the pandemic period (World Bank Group, 2020a, p.25). Afghanistan's GDP with regards to the World Bank data was 19,101 billion US dollars in 2019 and shows a decline since 2017 as it was 19,484 billion dollars and 20,192 billion dollars in 2018 and 2017, respectively. World Bank data shows a sharp decline in the Gross National Income per capita since 2013 (was 660 US dollars) which is 530 US dollars in 2019 (European Asylum Support Office, 2020, p.23). Afghanistan's economy experienced sustainable growth after the Taliban regime between 2003-2013. However, after this golden period the economy stuck into a

stagnation state as the growth rate was 1.5, 2.3, and 2.7 percent in 2015, 2016, and 2017 (World Bank Group, 2019, p.2).

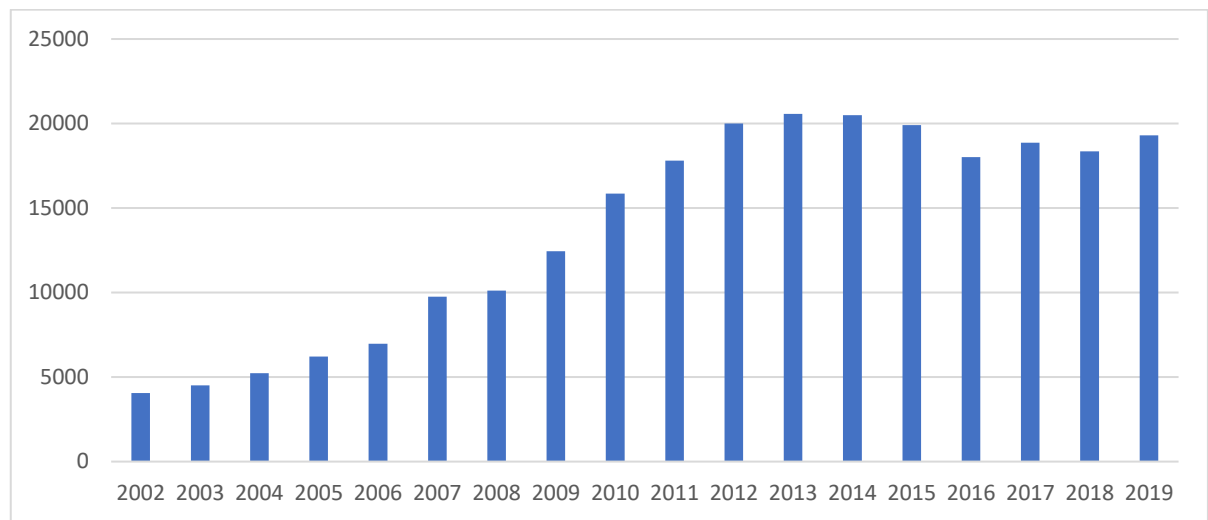


Figure 3. 1. Afghanistan's GDP (current US dollars in billion) (2002-2019)

Source: World Bank Database

Figure 3.1 shows the Gross Domestic Product of Afghanistan from 2002 up to 2019. Afghanistan's output started to grow from 2002 after the Taliban period and it has a great and stable performance till 2013 with a 9.2 percent average growth rate at this period. However, Afghanistan's GDP fall from 20561 billion dollars in 2013 to 18017 billion dollars in 2016. The reduction of Afghanistan's GDP between this period is due to reductions in foreign aids, foreign direct investment, and increasing the insecurity problems by ISAF (International Security Assistance Force) withdrawal in 2014 and the transition of the country's security to ANSF (Afghan National Security Force).

Afghanistan's budget for the year 1399 (2019-2020) was 428 billion AFN (5544076600 USD, 1\$=77.20 AFN) and increased approximately four billion AFN than the previous fiscal year. Afghanistan's revenue is not sufficient to fulfill its budget and it has been dependent on international aids since the establishment of the new government. Total revenue is estimated as 416 billion AFN which consists of 208 billion AFN from domestic sources and 207 billion AFN from international sources. Therefore, still, a 48 percent budget deficit is financed by international aids and shows Afghanistan's dependence on foreign sources. The operational budget took 67 percent of the total budget while the development budget took only 33 percent of the total budget this year. The operation budget had shown a three percent decrease in comparison with its previous

year's value due to some reductions in consumption in other codes except salaries. In contrast, the development budget was planned 11 percent more than 1398 (2018-2019) fiscal year and this increase has been revealed in the involuntary codes. A considerable amount of the development budget was devoted to accomplishing the ongoing projects. Hence, the increase in the development budget can be a sign that the Afghan government paid attention to the development issue despite financial pressures (Afghanistan's Ministry of Finance, p.23,28).

Consumer Price Index (CPI) in Afghanistan shows rising prices from 2018 to 2019. The average inflation in the 2019 period was 2.1 percent (as of Nov. 2019 report) while it was around 1.2 percent in the previous period. In May 2019, inflation reached its maximum point of 4.9 percent. The main reason of increase in inflation was the increase in cereal prices not only in Afghanistan but in its world price. Also, price of vegetables faced a sharp decline in 2019 than 2018 which might be a result of a change in Pakistan imports strategy by reducing the amount of vegetable imports and caused price to fall in this period. In addition, Non-food inflation had a similar performance during May 2019 and reached to its peak. It is estimated that non-food inflation was averagely 1.7 percent from January 2019 till November 2019. The price of clothing was also increasing during this period and was 5 percent in average. While the price of communication and housing in average was 4.1 percent the price of electricity and gas in average was 2.5 percent which was lower than its international energy prices in this period (World Bank Group, 2020b, p.3).

Afghanistan is a country which its imports has been exceeded form exports since 2002. Table 3.2 exhibits the amounts of exports, imports and trade deficit of Afghanistan from the first quarter of 2018 towards third quarter of 2021. As it can be seen, the exports and imports fluctuate in this period but a sharp decline in trade deficit which started from beginning of 2018 (1764 million dollars) and ended to second quarter of 2020 (1061 million dollars) is mutual with a decline in value of exports at 2020. An increase in the agriculture production within the country and decrease in domestic demand caused a drop of 8.2 percent in country's import during 2019. At the same time, worsening economic conditions of Afghanistan's major partners in trade and increased tension with Pakistan were main reasons of export reduction of Afghanistan (World Bank Group, 2020b, p.7).

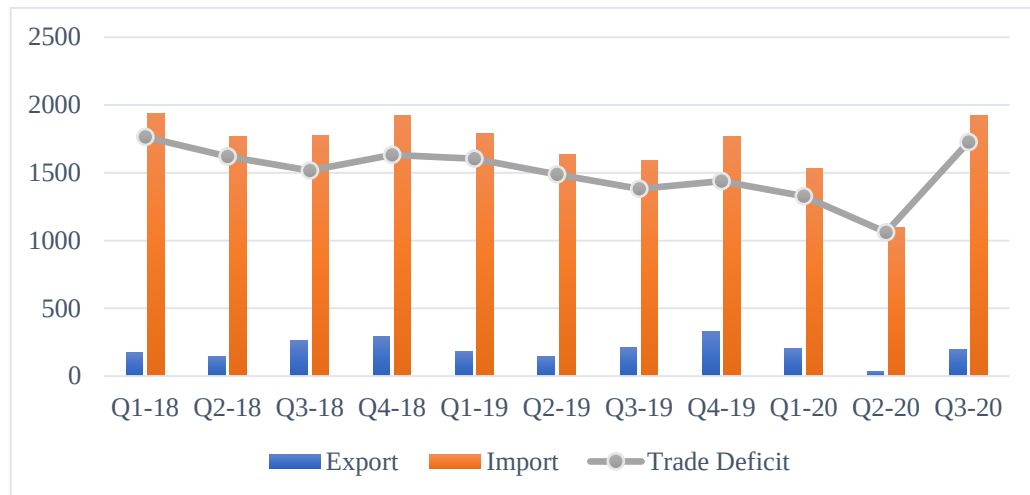


Figure 3. 2. Afghanistan's trade and trade deficit from 2018-2020 (Quarterly in million US dollars)

Source: National Statistic and Information Authority (NSIA)

Afghanistan is one of the main countries for cultivation of opium. The 2017-2018 drought influenced this production negatively by reducing its cultivation area (20 percent of total 263000 hectares). However, it was different in parts of Afghanistan, for instance, in the north part of Afghanistan where most of lands are rain-fed, this decrease even reach to 50 percent. It is estimated that 29 percent of opium production had decreased during drought from 9000 tons to 6400 tons. The United Nations Office on Drugs and Crime (UNODC) reported that produced amount of opium in 2018 was at second place since 1994 the starting date of monitoring.

The drought of 2017 and 2018 had negatively decreased the area of opium cultivation in this country and economically the opium revenue dropped 20 to 50 percent from 4.1-6.6 billion dollars to 1.2-2.2 billion dollars between this period. The opiates and other related productions like production of heroin and their transportation to the borders have a total share of 6-11 percent of GDP. This value of production has a considerable size in compare with the licit economy of Afghanistan. It exceeds the export value of goods and services of the country in 2017 and it is almost half of the value of the licit agricultural sector at the same time (UNODC, 2019, p. 23).

Among 180 countries, Afghanistan was ranked by World Bank the 173th country in the sense of Doing Business Index in 2020 (World Bank Group, 2020c, p. 4). According to a World Bank report on the investment situation in Afghanistan, private investors have lost confidence in investing in Afghanistan in 2019 due to a lack of relative

political stability, but according to the report, the possibility of an increase in private investment in 2020 is also mentioned (World Bank Group, 2020b, p.15). As reported in the case of private businesses, corruption in Afghanistan is one of the major problems in the sector, and on the other hand, this class faces restrictions on access to financial instruments (OECD, 2019, p.13).

According to another 2108 UNAMA report on the Afghanistan's fight against corruption, reported that Afghans are often have to pay bribes to advance their goals and activities and 'widespread nepotism and patronage' has strongly suffered their life (UNAMA, 2018, p.5). The extend of corruption in Afghanistan affects not only Afghan private businesses but also foreign private businesses, and let to numerous complaints from both domestic and international private businesses about various forms of corruption in government offices. Among the various types of corruption for businesses, corruption in obtaining licenses and permits, corruption in the process of government procurement, corruption in the process of supervision and monitoring, and corruption in taxes can be observed (USDOS, 2019, p.8). The informal economy dominates the Afghan market. The informal sector has either a small positive effect on economic growth or a destructive and negative effect on the formal sector (OECD, 2019, p.13).

OECD stressed that existing barriers to accessing financial resources, heavy regulation, widespread corruption in Afghanistan, weak communications both domestically and internationally specially with neighboring countries, and the high risk of insecurity have led to small and medium-sized companies that are very interested in investing in Afghanistan, just give up their decision. Two major problems that start-ups and SMEs have faced in financing were reported as the higher rate of interest which sometimes reach to 25 percent and the short-term bank loans. Evidences shows that only 5 percent of private businesses have used bank loans and the rest other instruments expect Hawala (DAB, 2019, p.17). In addition, the lack of financial literacy of citizens has also played a significant role in the lack of expansion and underdevelopment of financial instruments in this country (OECD, 2019, p.13-14).

The regulations for starting a startup in this country vary in provinces. For instance, a report from the World Bank in 2017 states that in order to start a start-up in Balkh or Herat Provinces, there different institutions should be referred and in compare with capital, the setup procedures are almost twice as more (World Bank, 2017, p.25).

Based on telephone interviews between ACCI (Afghanistan Chamber of Commerce and Investments) and those companies which located in one of Kabul, Herat, Kandahar, Balkh, and Nangahar provinces, the ACCI reported that 83 percent of interviewed companies had said the lack of electricity as the first and the most important among other infrastructures. Other major problems presented by companies include tax and customs problems (ACCI, 2019, p.2). The lack of cheap and permanent electricity in this country caused the production activities into trouble and has been had a huge impact on increasing the cost of the production and the products' prices, as a result has lost their competitive advantages against neighboring good. For instance, this is one the reasons for the underdevelopment of Herat industrial park. Although that Herat is one of the provinces where has a better security than other parts of the country and has a suitable business environment, it couldn't experience a significant growth and development and were dependent to Iran in the sense of electricity (Foschini, 2018, p.25).

After the fall of the Taliban government in 2001, Afghanistan needed to witness a fundamental transformation after a long period of war and destruction. This transformation and integration of Afghanistan's economy with other economies in the region and the world required extensive financial support. Therefore, in 2002, the Afghan government, with the cooperation of 34 other donors, sought to rebuild Afghanistan's backward economy through the creation of a financial fund under the name of the Afghanistan Reconstruction Trust Fund. The flow of financial funds in the reconstruction process of Afghanistan, which took place in the two main branches of security and official development assistance, shows the efforts and significant presence of international institutions in order to create and support an efficient market. The \$10 billion development aid package that was included in this reconstruction exceeded the amount of financial support allocated to post-war Europe and made Afghanistan one of the top ten recipients of official development aid since 2001 (OECD, 2019, p.15).

Afghanistan's economy experienced rapid growth after 2001, but economic growth was relatively unstable. Several reasons have affected the speed of economic growth in Afghanistan. Among the most important ones, the strong dependence of growth on foreign aid funds and the increase in internal disturbances and the gaining of power by rebels in most parts of Afghanistan can be mentioned as the main factors of this. Since the official development aid had almost halved until 2009 and on the other hand, there

were no more internal financial resources to solve this problem, it caused us to witness a shaky economic growth trend in Afghanistan. (OECD, 2019, p.13)

3.2. Afghanistan's Economy Through Sectors

In this section, the recent state of Afghanistan's economy will be examined in terms of three important economic sectors: agriculture, industry and services.

3.2.1. Agriculture sector

Afghanistan is an agricultural country and a significant part of the country's population is engaged in the production of agricultural products. The capacity of arable land (irrigated and non-irrigated) is estimated at 7.8 million hectares. However, taking into account the amount of rainfall and weather conditions, 3.3 million hectares (2.3 million hectares of irrigated land and 1 million hectares of rainfed land) are cultivated annually. (NSIA, 2020, p.1)

An important part of agricultural production consists of cereals produced for domestic consumption, mainly wheat. Agricultural production in Afghanistan is almost entirely based on melting snow waters and spring rains, which provide the water needed by the crop. On the other hand, even in years with good climate, Afghanistan is not a self-sufficient country in agriculture and has to import food or receive food aid to meet its domestic needs. (Kabil Ticaret Müşaverliği, 2017, p.7)

Since the agriculture sector has a significant share in the GDP and constitutes almost a quarter of it, and after the service sector, it has the largest impact on production, the agriculture sector is one of the most important sectors with development capacity in Afghanistan. The importance of the agriculture sector can be seen in its role in the living standards of the population of this country because almost 90% of the total population of this country and on the other hand 80% of the people who live below the poverty line live in rural areas. About 40% of the total workforce in this country fully or partially support their living expenses through activities in the agriculture sector. Currently, foreign aid plays a significant role in financing government and development expenses, and with the passage of time, the level of this aid has always been decreasing, but the agriculture sector

has the ability and capacity to replace the flow of foreign aid in the future. Using the macroeconomic model and considering the growth rate of Afghanistan's population, it is predicted that if the rate of agricultural production increases by 6%, the rural income can be increased. However, this rate has moved almost half of the target growth rate in the last decade. (Word Bank, 2014, p.9).

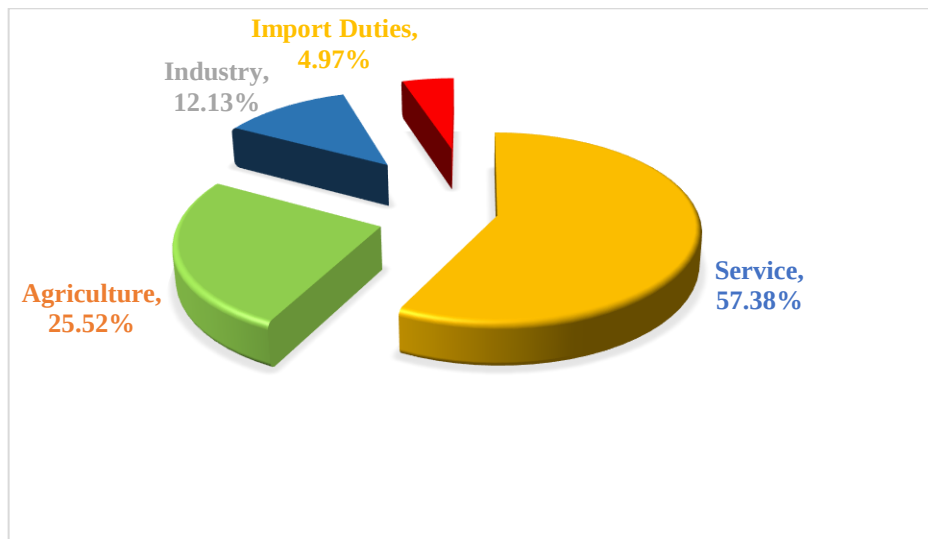


Figure 3. 3. GDP sectoral contribution (2019)

Source: Afghanistan Statistic Organization Yearbook, 2019.

As mentioned earlier and according to Figure 3.3, the production of agricultural products has played a prominent role in this country and has taken the second place with 25.52% share in the GDP after service sector.

Table 3. 1. Agriculture contribution as % of GDP

Sector	2017	2018	2019
Agriculture	25.57	22.44	25.52
1. Cereals	9.95	8.11	8.77
2. Fruits	4.85	4.10	4.61
3. Livestock	3.66	3.38	2.68
4. Others	7.11	6.86	9.45

Source: Afghanistan Statistic Organization Yearbooks, 2019.

Table 3.1, shows the individual share of each of the subcategories related to the agriculture sector. Among the agricultural products, cereals, fruits, and livestock products have the largest share and the rest of the products that have smaller share are included

under Another sub-category. Table 3.2, also shows the contribution of agricultural products in the GDP with constant price of 2016 in national currency. Although, the data range only covers 2017-19 years but it clearly shows fluctuations in the production level. In 2019, Agricultural products in general were worth almost 401910 million Afghanis, which shows a growth rate of 20.8% after a decrease of 5.8% in the previous year. The reason for the increase in the growth rate has been identified in the increase in the amount of rainfall, since agriculture in Afghanistan is highly dependent on the amount of rainfall.

Table 3. 2. *Agriculture Contribution in GDP (Constant Price of 2016 in Millions Afghanis)*

Sector	2017	2018	2019
Agriculture	353439.80	332732.86	401910.25
1. Cereals	137439.93	120204.24	138174.67
2. Fruits	67069.50	60744.42	72679.95
3. Livestock	50641.64	50090.30	42269.99
4. Others	98288.72	101693.90	148785.64

Source: Afghanistan Statistic Organization Yearbooks, 2019

3.2.2. Industry sector

According to the International Standard Industrial Classification (ISIC), the industry sector encompasses the following: mining and quarrying, manufacturing, electricity, gas, water, and construction. In 2019, this sector contributed a value of Afs 168.6 billion to the total GDP, representing 12.13 percent (Figure1 under previous sub-section). Despite a negative growth rate of 4.39 percent, the industry sector continued to be driven by its key subsectors, including manufacturing (-9.55 percent growth) and construction (-1.35 percent growth) (NSIA, 2020, p.154).

The industrial sector of Afghanistan was based on the processing of certain agricultural raw materials before it went into a period of economic collapse with internal conflicts and turmoil. Among them; cotton, wool textile products, sugar production facilities. In addition, chemical fertilizer production and cement production were other important production areas. However, lack of raw materials and safety problems caused disruptions in production. As of the current situation, the leading sectors in the manufacturing industry are; textile industry and leather production, dried fruit production

and processing, some construction materials, semi-precious metal production and marble production. (Kabil Ticaret Müşaverliği, 2017, p.10)

There are 8 industrial zones (industrial park) in the country and approximately 1,250 factories serve in these zones. It is estimated that there are approximately 2,500 factories outside the Industrial Zones. The Pul-e Charkhi Industrial Zone in Kabul is one of the most important industrial zones, employing approximately 42,000 people (Kabil Ticaret Müşaverliği 2017, p.10).

Table 3. 3. Real GDP based on 2016 & GDP growth rate (in millions AFs)

Sector	2017		2018		2019	
	Value	G. rate	Value	G. rate	Value	G. rate
Industry	134023.13	8.05	161478.51	19.44	168632.36	-4.39
Mining and Quarrying	24957.04	40.86	27218.74	1.58	27837.00	1.63
Manufacturing	39370.78	-3.37	67172.94	68.48	66197.37	-9.55
Food and Beverages	34190.24	19.15	58015.39	84.25	72736.62	1.02
Non-food Manufacturing	5180.54	-29.2	9157.55	38.05	6539.25	-36.77
Electricity, Gas and Water	27127.08	17.73	22697.08	-20.13	29534.90	0.90
Construction	42568.22	2.08	44389.75	1.99	45063.09	-1.35

Source: *Afghanistan Statistic Organization Yearbooks, 2019.*

Afghanistan boasts a rich abundance of natural resources, including significant reserves of natural gas, petroleum, coal, marble, gold, copper, chromite, talc, barites, sulfur, lead, iron, salt, precious and semi-precious stones, construction stone, and various rare earth elements.

According to the Table 3.3, in 2019, the value added by this sector was Afs 27.84 billion (nominal price). Despite the presence of numerous mines in the country, most of them remain untapped. While some attempts have been made to extract minerals such as copper, iron, gold, and others, no actual extraction has taken place thus far. (NSIA, 2020, p.154).

The value added by the electricity, water, and gas sector was Afs 29.53 billion in 2019. The sector recorded a growth rate of 0.9 percent during that year. Electricity in Afghanistan is generated from hydro, diesel, and thermal power stations, and production increased by 31.3 percent from 2018 to 2019. (NSIA, 2020, p.154&195).

Construction value added showed a decrease of 1.35% in 2019, with a total of Afs 45.06 billion. In 2019, there was a 18.1% drop in the number of construction projects compared to the previous year. Additionally, road construction saw a substantial decrease of 44.5% in 2019 as compared to 2018. (NSIA, 2020, p.155&190).

3.2.3. Services sector

The prolonged civil war had a detrimental impact on the service sector. In 1970, only a handful of companies were operational in the country, but as the conflict persisted, these companies ceased their operations (Obayd, 2017, p. 136). Since 2002, the service sector has advanced considerably compared to the agriculture and industry sectors, in an effort to resolve conflicts and eradicate insecurity in the country. Notably, the fields of finance, logistics services, and communication have experienced positive growth in recent years. Over the last decade, the telecommunications sector has expanded at an annual average rate of 60%, while banking activities gained momentum in the country after 2001. Presently, there are more than 16 commercial banks operating within the country (T.C. Kabil Büyükelçiliğ Ticaret, 2017, s. 11). Following the establishment of a new government, significant progress has been observed in both the economic and political spheres of the country. Furthermore, the agriculture, industry, and service sectors have witnessed an increase in their share and contribution to the overall economic growth of the country.

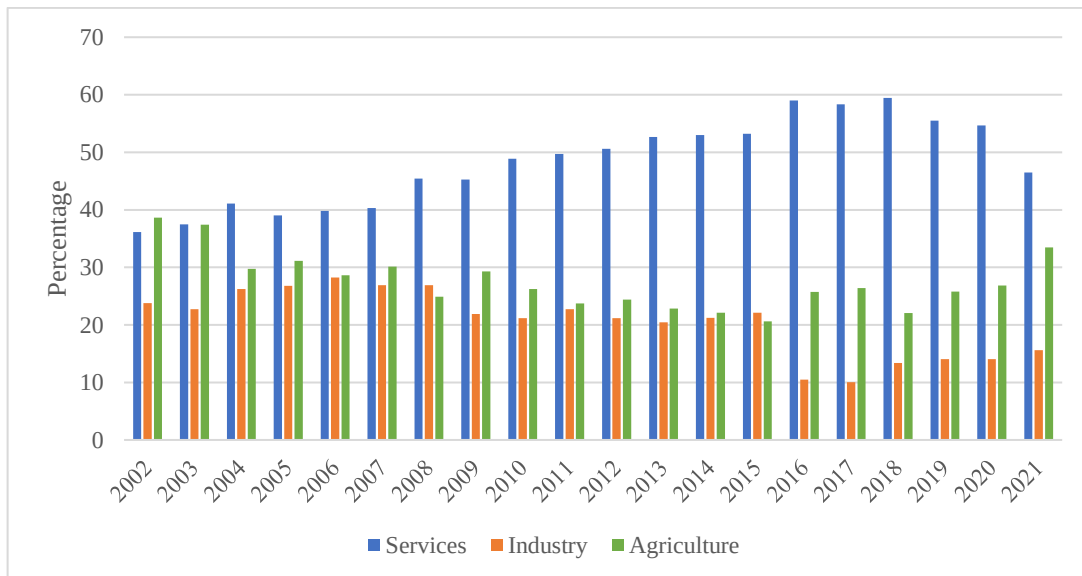


Figure 3. 4. *Distribution of Afghanistan's GDP by Sectors (in percent) (2002-21)*

Source: World Bank Database

By looking at Figure 3.4, it can be seen that, after the formation of the new government in 2001, all three sectors do not differ much from each other in their share in the gross domestic product. During the course of 20 years, three distinct trends have emerged. The agriculture sector has experienced a continuous downward trend, resulting in a loss of its share in the GDP. Conversely, the service sector has exhibited a consistent upward trend with minimal fluctuations, underscoring its dominance in the country's economy. However, the industry sector has shown more variability during this period. It witnessed an upward trend from 2002 to 2007 and continued on a linear path until 2014, but suffered a steep decline in 2015 and is currently in a weak upward trend.

3.3. Unemployment in Afghanistan

The global concern of unemployment has become increasingly prevalent, affecting both developed and developing nations. The severity of unemployment varies according to a country's level of development. The ramifications of unemployment are far-reaching and undeniable, as gainfully employed population is a crucial pillar for both social and economic progress (Aziz, 2021, p.1). Millions of Afghans sought education and training after the Taliban's fall in 2001, hoping to secure well-paying jobs. The Guardian reported that 400000 people join the labor force annually, but the economy cannot accommodate this sizable influx of workers. A significant portion of Afghans, about 35% of those

willing and able to work, struggle to find decent employment, leaving many graduates facing unemployment. Despite the \$65 billion in aid from international community over the past 14 years, job seekers continue to face difficulty finding desirable work. In a post-conflict country like Afghanistan, high unemployment rates can have catastrophic consequences (Chandra & Apartment, 2019, p. 11).

Upon examining the arrangement of employment and output in the nation, it becomes evident that despite the swift expansion of the Afghan economy in the decade after international takeover, there has been minimal progress in terms of structural alteration (Dasgupta, Anhal, & Bhatnagar, 2019, p.6). Table 3.4, predicts the sectoral distribution of employment and value added of employment and GDP respectively in last decade in per cent. It is quite clear that despite the influx of a large amount of foreign aid and the passage of two decades, most of the labor force (42 percent) is still engaged in the agriculture sector, although the role of that sector in the GDP is 25 percent. However, by observing the data related to the labor force participation level in the industrial and service sector, we are facing a relatively upward trend and in the agriculture sector with a downward trend, which will indicate the country's move towards industrialization in the long term.

Table 3. 4. Sectoral distribution of employment and value added (2010-19)

Employment	Year									
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Employment in agriculture (% of total employment)	54.6	53.6	51.4	49.8	48.4	47.1	45.8	44.0	43.1	42.5
Employment in industry (% of total employment)	14.7	14.8	15.8	16.3	16.8	17.2	17.3	18.0	18.5	18.5
Employment in services (% of total employment)	30.8	31.7	32.8	33.8	34.8	35.8	36.9	38.0	38.4	39.0
Agriculture, forestry, and fishing, value added (% of GDP)	26.2	23.7	24.4	22.8	22.1	20.6	25.7	26.4	22.0	25.8
Industry (including construction), value added (% of GDP)	21.2	22.7	21.2	20.4	21.2	22.1	10.5	10.1	13.4	14.1
Services, value added (% of GDP)	48.9	49.7	50.6	52.7	53.0	53.2	59.0	58.3	59.5	55.5

Source: World Bank Database

Afghan refugees are being deterred from returning home due to high unemployment rates, with many opting to leave the country altogether to seek work in Iran and Pakistan. Despite ongoing insecurity, unemployment is actually the second most significant factor driving migration among Afghans. This trend is not limited to unskilled laborers, as even educated and skilled individuals are living in search of better opportunities and quality of life. Unfortunately, this exodus is unlikely to reverse, as there is little hope of employment for economic stability in Afghanistan. Moreover, the problem of unemployment is also fueling insurgency in the country. Many job-seekers, particularly youth, are joining the Taliban as means of obtaining employment. Others are sending their children to extremist Madrassas in Pakistan's tribal areas, simply because they cannot afford to provide for them. In some areas, people are turning to poppy cultivation as a way to earn a living. This not only perpetuates the drug trade but also provides financial support to the Taliban. As a result, Afghanistan is experiencing a brain drain, drug trafficking, insurgency, and a large population in neighboring countries (Chandra & Apartment, 2019, p. 11).

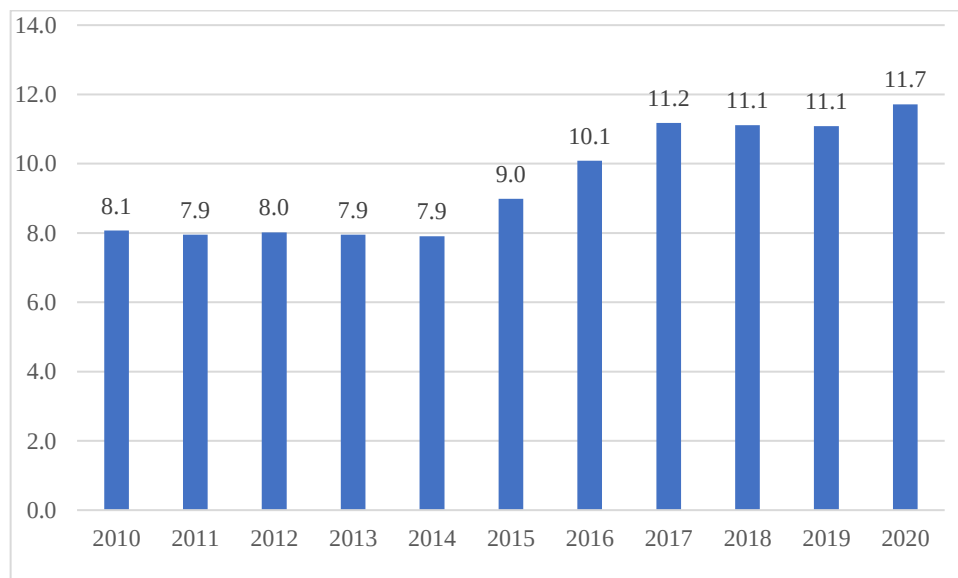


Figure 3. 5. *Unemployment rate in Afghanistan (2010-2020)*

Source: World Bank Dataset

Table 3.5, shows the unemployment rate of Afghanistan from 2010 till 2020 based on World Bank dataset. In average the unemployment rate was 8.60 in 1991-2020 period with the lowest rate of 7.91 in 2014 and highest 11.7 in 2020. The unemployment rate from 2010 to 2014 has been almost uniform with a slight decrease in 2014. But with the

beginning of the reduction of foreign support in 2014, it faces an increase in the unemployment rate. However, the unemployment rate in the country has been mentioned way more than the Word Bank. ALCS; Afghanistan living condition survey, in 2016-17 found the unemployment rate 35% which is very harmful for any nation (Aziz, 2021, p.4).

In order to investigate and analyze the situation of workforce and unemployment in Afghanistan, the survey of LFS – Labor Force Survey 2020, HIES – Households Living Conditions Survey 2017 and 2014 which are presented on ILOSTAT have been used in this part of the study. The definition of the employment and unemployment are based as international definitions and might be different from national statistics.

Table 3.5, presents a general overview of labor force from Afghanistan in 2014, 2017, and 2020. Workforce divided into two main categories of rural and urban. Although there is another category of Kuchi(nomadic tribes), but this category was not included by the related surveys. Average rate of unemployment for these three years is approximately 67 percent in rural areas. It should be emphasized that in impoverished nations, the rural unemployment rate is generally low due to the abundance of surplus labor in family-owned farms and other non-agricultural enterprises. Consequently, Afghanistan is no exception to this pattern. However, the fact that the country has n exceptionally high rate of rural (open) unemployment, despite the availability of unpaid or poor compensated family labor, is another worrisome sign of the grim employment situation in the country (Dasgupta, Anhal, & Bhatnagar, 2019, p.17).

Table 3. 5. *Unemployment by region (+15, in 1000) (2014, 2017 and 2020)*

Year	Region	Unemployed	Employed	Labor Force
2020	National	806.2	6078.5	6884.7
2020	Rural	543.5	4426.4	4969.9
2020	Urban	244.7	1312.5	1557.2
2017	National	805.4	6396.5	7201.9
2017	Rural	517.4	4966	5483.4
2017	Urban	288	1430.5	1718.5
2014	National	601.9	7003	7604.9
2014	Rural	420.6	5500.4	5921
2014	Urban	181.3	1502.7	1684

Source: ILOSTAT Explorer

The averages of rural labor force approximately are 77, 76, 72 percents in 2014, 2017, and 2020 respectively might showing a movement from rural area to the cities. The

averages of urban labor force approximately are 22, 23, and 22 percents in 2014, 17, and 2020 respectively, indicate fluctuations in urban labor force market. The question that arises here is what happened to the labor force that was in rural areas and decreased over time? Perhaps one of the answers can be the migration of professional and non-professional labor to neighboring countries. In the following subsections the unemployment in Afghanistan is going to be studied according to the education, age groups, and gender.

3.3.1. Unemployment according to the level of education

The role of education level in employment can never be ignored. It is expected that people with higher level of education are less likely to face the problem of unemployment. Figure 3.6, illustrates the unemployed people regarding their level of education in year 2014, 2017, and 2020 and the numbers are in thousands. They have been categorized into four level of workers with advanced, intermediate, basic, and less than basic educations. As the level of education increases, the unemployment amount decreases. By studying the level of unemployment dispersion, most of unemployed in all studied years belong to the category of people with less than basic education by 68, 48, and 57 percents in 2014, 2017, and 2020 respectively. On the other hand, the unemployed population which categorized as advanced unemployed has the lowest rate of unemployment by approximately 2, 11, and 8 percents in 2014, 2017, and 2020 respectively.

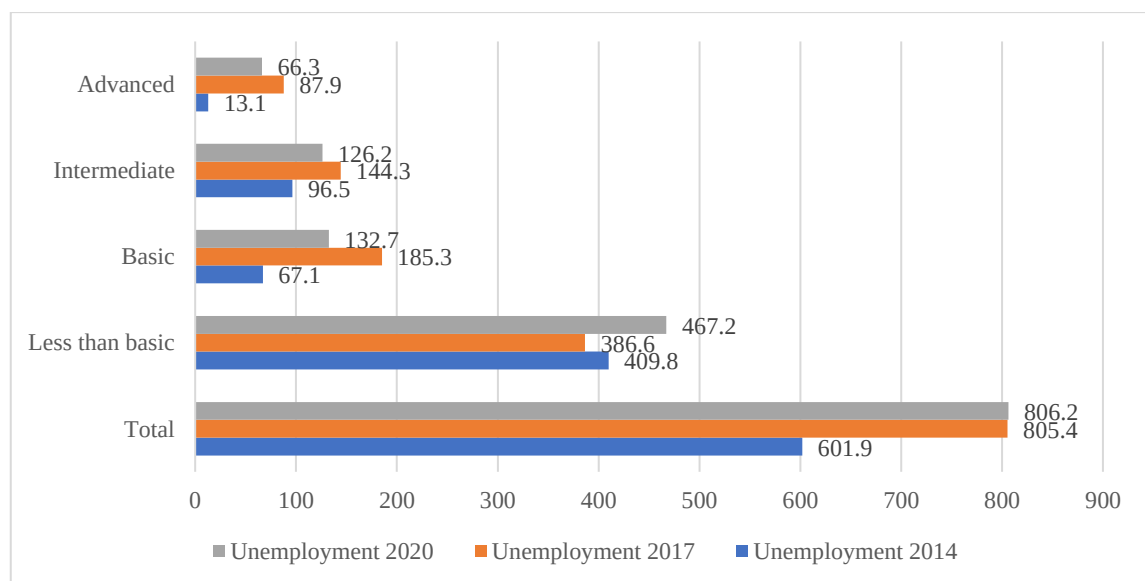


Figure 3. 6. Unemployment by level of education (in 1000) (2014, 2017 and 2020)

Source: ILOSTAT Explorer

3.3.2. Unemployment according to the age groups

The age structure of the workforce is another indicator of the labor market. Afghanistan is known as a country where young labor is abundant. The problem of unemployment is usually observed among the young workforce than the other age groups, and the Afghanistan is no exception. Figure 3.7, indicates the unemployment by age groups in 2014, 2017, and 2020. Youth group aged between 15 and 24 years of old has the highest amount of unemployment among other age groups with the highest rate of 48 percent in 2017. Second highest unemployment rate among the categories belong to the 25-34 years of old unemployed persons with the highest unemployment rate of 27 percent in 2020.

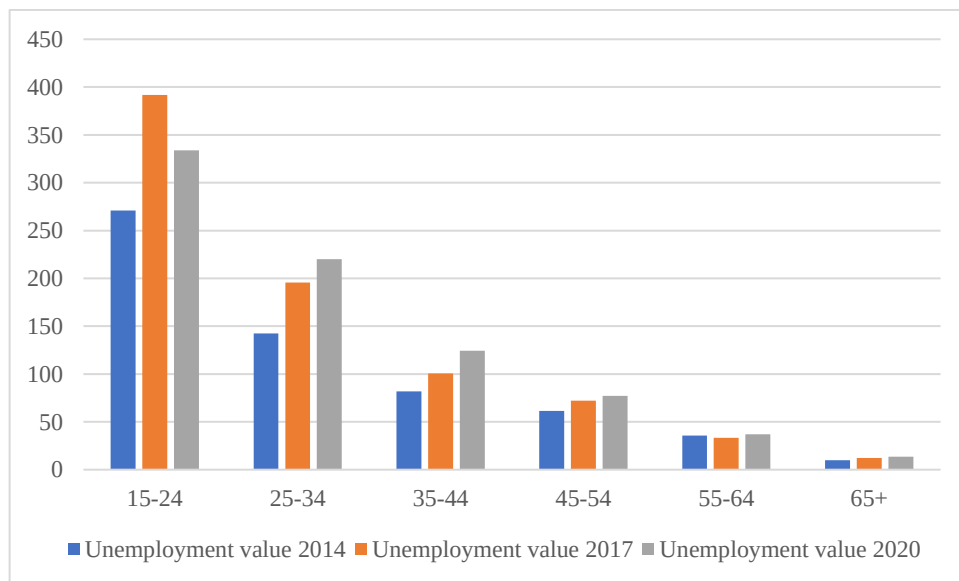


Figure 3. 7. Unemployment by age groups (in 1000 persons) (2014,2017 and 2020)

Source: ILOSTAT Explorer

3.3.3. Unemployment according to the gender

Afghanistan's low female labor force participation (FLFP) rate, which stands at approximately 26 percent, is a significant contributor to the country's unemployment. Women in Afghanistan own only 5% of businesses, according to UN Women's 2015 projections, highlighting the severe consequences of these dismal figures for socioeconomic inclusion, poverty reduction, growth, and productivity. Female

participation in economic activity is critical to economic development and long-term progress. However, a low FLFP rate in Afghanistan indicates that several underlying obstacles prevent women from working, including mobility issues, legalized gender discrimination, lack of economic opportunities, and limited family bargaining power. Due to cultural restrictions, women's movement outside the house is restricted, leading them to engage in home-based income-generating activities such as carpet weaving, sewing, tailoring, agricultural work, animal care, and selling dairy products. The low female labor market engagement hampers the overall labor force participation rate in Afghanistan, emphasizing that women still hold significant untapped economic potential (Aziz, 2021, p.9).

Figure 3.8, shows the unemployment by gender (in 1000s) in Afghanistan in years 2014, 2017, and 2020. Women have a lower unemployment rate compared to men. Averagely, women unemployment rate was between 28-31 percents, with the highest rate of 31 percents in 2014.

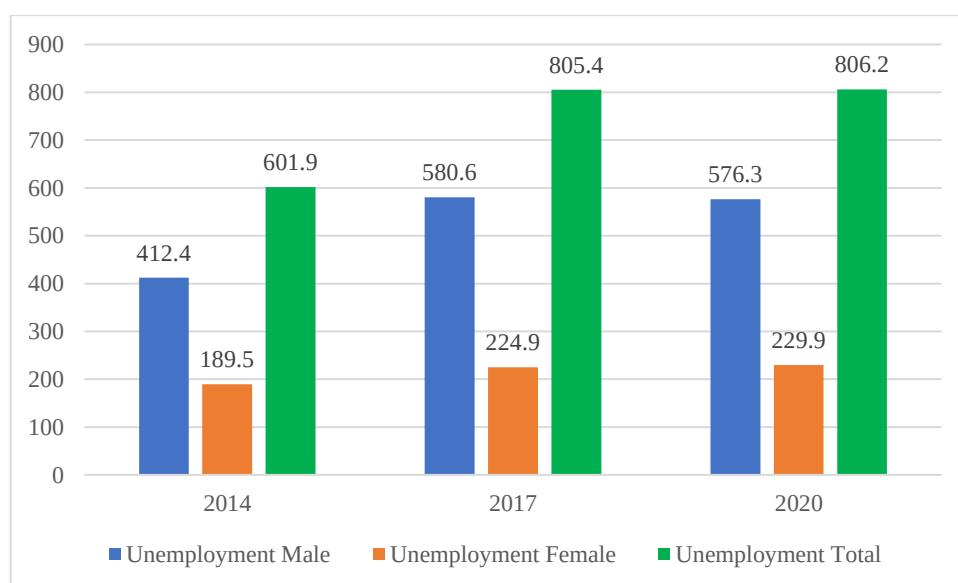


Figure 3. 8. Unemployment by gender (in 1000) (2014, 2017 and 2020)

Source: ILOSTAT Explorer

4. THE RELATIONSHIP BETWEEN UNEMPLOYMENT AND ECONOMIC GROWTH IN AFGHANISTAN

This section explores the correlation between unemployment and economic growth in Afghanistan. The research history is reviewed initially, followed by a descriptive analysis of the data. Subsequently, ADF and PP unit root tests are conducted on the research data. Considering the unit root tests results, an appropriate econometric model is proposed to address the research question. Finally, the results obtained from implementing the econometric model using E-views Software are analyzed and interpreted.

4.1. Literature Review

Lee (2000) investigated the robustness of Okun's law for 16 OECD countries. The data which were used for examining to find the relationship between unemployment and economic growth are postwar annual data from 1955 to 1996. In this research, both approaches; the difference approach and the Gap approach, which often have been used in various researches applied to uncover the relationship. Moreover, to increase the level of robustness for Okun's law, he applied several data decomposition filters such as Hodrick-Prescott (HP-1997), Beveridge-Nelson (BN,1981), and Kalman methods. The shreds of evidence strongly support the validity of Okun's law in general but show that the Okun coefficient is different not only for each country but also differs regarding the types of models and data decomposition procedures.

Sögner and Stiassny (2002), also considered a case of 15 OECD countries for estimating the Okun coefficient, testing its structural stability, and whether this stability is caused by supply side or demand side. Like the previous mentioned study, the Okun coefficient varied widely for each considered country. The structural stability investigated by using Bayesian and Kalman filters. By applying first method they recognized instability in all countries and in second approach they found 10 countries¹ instable but 5 counties² with a stable Okun coefficient. In addition, they recognized that the relationship

¹ Switzerland, Germany, Denmark, Finland, France, Great Britain, Japan, Netherlands, Norway, and Sweden.

² Austria, Belgium, Canada, Italy, and the USA.

between unemployment and economic growth caused from demand side in most cases except France, Switzerland, and Germany.

In another similar study conducted by Apergis and Rezitis (2003), seven regional areas of Greece has been considered as a case of Okun's law examination for the 1960-1997 time period. In order to find the real gross domestic product and unemployment gap they used HP and band-pass data detrending techniques. In contrast with (Sögner & Stiassny, 2002) and (Lee, 2000) , they found a stable Okun coefficient for most of the regions except Epirus and North Aegean Island which the coefficient were much larger than the others.

Noor et al. (2007) tested the existence of Okun's relationship for Malaysia. For revealing the relationship, they used time series data from 1970 to 2004. The result based on gap method also confirms the existence of an inverse relationship between the unemployment and economic growth in Malaysia. The Okun coefficient is -1.75 which is much lower than the coefficient that Okun found for USA in 1967 and supports that this key relationship in the macroeconomic framework can be different regarding the selected county and the method. The also tested Granger Causality test which found a two-way relationship between two concepts.

Dritsaki and Dritsakis (2009) considered four European countries; Italy, Spain, Portugal and Greece, for examining the Okun's law. The Okun coefficients were -0.024, -0.017, -0.016, and -.007 respectively.

Andrei, Vasile and Adrian (2009) examined Romania for the unemployment and economic growth relationship between 2000 and 2008 by using quarterly time series data. Results indicated that a negative relationship exist and its around -0.5.

Hussain et al. (2009) by applying a VAR model tried to investigate the relationship between unemployment and economic growth of Pakistan. They used annual time series data from 1972 to 2006. They found a long run and short run relationship between unemployment and economic growth by Johansen co-integration test and Vector Error Correction model.

Lang and de Peretti (2009) examined a hysteretic form of Okun's law in seven countries and compared it with a simple linear regression model by using quarterly data starting mostly from 1960 to 2007. They argued that important shocks in growth rate play

an important role on current unemployment fluctuations. In order to study a hysteretic form of Okun's law they chose individual firms' reactions to these economic growth shocks regarding to continue production with the same, less or more employees. They found that hysteretic form, specifies better the Okun's law for France and in contrast non-hysteretic form, specifies better for United States and Sweden.

The robustness of Okun relationship analyzed by (Villaverde and Maza, 2009) in 17 regions of Spain between 1980-2004 time period. They considered the "Gap approach" and used QT, HP and BK detrending filters for increasing the robustness of Okun's law. Their study confirms Okun's law in general and for most of the regions, but the coefficient varies regarding the regions and used detrending filters.

In another study (Moazzami & Dadgostar, 2009) examined Okun's law by applying an Error Correction Model for 13 OECD countries in order to reveal long run relationship between unemployment and economic growth. Evidences showed that Okun coefficient varies from 2.6% to 4.7%.

Lal et al. (2010) observed the existence of Okun's law in some Asian countries³ by applying Engle Granger causality test for long run relationship and Error Correction Model for short-run relationship between unemployment and economic growth over the period of 1980-2006. The evidences did not support the existence of Okun's law for most of the countries.

The relationship between unemployment and economic growth in European countries was investigated by (Doğru, 2013). They used a panel dataset covering 2000-2012 time period and recognized the long-run and short-run relationships between the two concepts by applying panel co-integration and panel error correction methods respectively. Their findings support the Okun's law but the investigated coefficients were less than Okun coefficient and varied for each country.

Elshamy (2013), in another country case considered the Egypt for testing the validity of Okun's law over 1970-2010 time period. He used co-integration analysis and error correction mechanism for revealing the long-run and short-run relationship between

³ Pakistan, India, Bangladesh, Sri Lanka, and China

unemployment and economic growth respectively. His analysis results exhibit the validity of Okun's law in Egypt with desired sign even in short-run and long-run periods.

The impact of fluctuations in economic growth rate on unemployment rate has been investigated by (Alamro and Al-dalaïen, 2014) by taking Jordan under consideration for the 1980-2011 time period. The authors used HP filter for detrending the gross domestic product gap and estimating the Okun coefficient by employing autoregressive distributed lag model (ARDL) and ECM. They found a week significance impacts of economic growth on unemployment even in short and long run period. This Study was reexamined by (Abdul-Khaliq, Soufan and Shihab, 2014) with identical methods in Jordan and supports the existence of a negative relationship between unemployment and economic growth.

In the paper that was published by (Akram et al., 2014), the Okun's law in Pakistan has been investigated between 1972 to 2012. The authors used three different version of Okun's law models (Gap, Difference, and Dynamic models) by analyzing with Ordinary Least Square method. The shreds of evidence do not support the Okun's law in the case of Pakistan.

Ferhat Pehlivanoglu and Tanga (2016) have used fully modified OLS model in order to study the relationship between unemployment and economic growth in several countries⁴. The authors, detrended the data by helping HP filter to find the gaps between actual GDP and potential GDP. The evidences concluded that the Okun's law exists in China, India, and Russia but not in Turkey, Brazil, and South Africa.

Dritsakis and Stamatiou (2016) by employing an ARDL bounds testing approach and Vector Error Correction Model (VECM) tried to reveal the relationship between unemployment and economic growth in Greece between 1995-2015 time period. They have found a unidirectional relationship from unemployment to economic growth even in short or long run period.

Makaringe and Khobai (2018) investigated the Okun's law in South Africa by employing ARDL bounds testing approach within 1994Q1 to 2016Q4 time period. The results show the negative relationship between variables in both short-run and long-run.

⁴ Brazil, China, India, Russia, South Africa, and Turkey.

Seth et al. (2018) in order to find the effects of unemployment on economic growth of Nigeria have used an ARDL approach and Error Correction Model. In this regard, annual dataset has been considered between 1986-2015 time period. The results of their analysis show that there is not any long-run relationship between variables and ECM result shows a growth enhancing path which means an increase in unemployment is associated with economic growth in Nigeria.

Chuttoo (2020) by helping from an ARDL bounds testing approach and ARDL-ECM examined the existence of Okun's law in Mauritius economy. The author, used 1983-2017 annual time series dataset in order to disclose the relationship. The shreds of evidences support the existence of Okun's law, but the Okun coefficient is not significant in Mauritius.

4.2. Descriptive Analysis of Data Set

The purpose of this research is to study the effect of unemployment on the economic growth of Afghanistan during the period of 1991-2020. For this purpose, the variables used in the research from Afghanistan are introduced at this section and later will be analyzed graphically.

It should be noted that Afghanistan is severely lacking in time-series data. However, in this research three variables are used; The variables are real gross domestic product (GDP), unemployment rate (UNR) and Grants excluding technical cooperation (GR). All variables are sourced from the World Bank datasets. The variables are annual data and the GDP and GR variable is logarithmically calculated.

At this section, the logarithmic form of GDP and the unemployment rate of Afghanistan will be analyzed. The natural logarithm of GDP will be shown as LGDP, the unemployment rate will be show as UNR and the grants will be show as LGR.

Afghanistan is a country that has seen many changes since the late 1970s, and these changes, which have always been accompanied by war, have had a great impact on the country's economy. In fact, this country has not been able to achieve a stable system for about half a century. On the other hand, crises and periods of global recession have also had an impact.

After the Mujahideen war with the Soviet Union and the withdrawal of the Soviet Union from Afghanistan in 1989, the Taliban always had parts of Afghanistan under their control, but in 2001, their government was weakened and the government of the Islamic Republic of Afghanistan came into being. Of course, the new government was once again under The Taliban took control on August 15, 2021.

Figure 4.1, shows the time series data on logarithm of real GDP (LGDP) and unemployment rate (UNR) in the period 1991-2020. In the figure, the upper panel represents the logarithm of GDP and the lower panel represents the unemployment rate. As the figure shows, an upward trend has formed in both panels after the year with some fluctuations over years. Just before the formation of the government of the Islamic Republic of Afghanistan in 2001, the gross domestic product graph shows a downward trend with severe fluctuations, and the unemployment rate graph shows an increase in the unemployment rate with severe fluctuations. After the defeat of the Taliban in 2021, Afghanistan's economy has started to grow at a remarkable speed, and even in the international financial crisis of 2007-2008, it witnessed a slight decline and continued its upward trend again. As can be seen in the figure, after 2014, the economic growth rate of Afghanistan has decreased and the unemployment rate has also increased. It should be noted that Afghanistan's economic growth during this period has been heavily dependent on foreign aid and since 2014 was the beginning of the reduction of foreign financial aid to this country, it has affected the GDP and the unemployment rate.

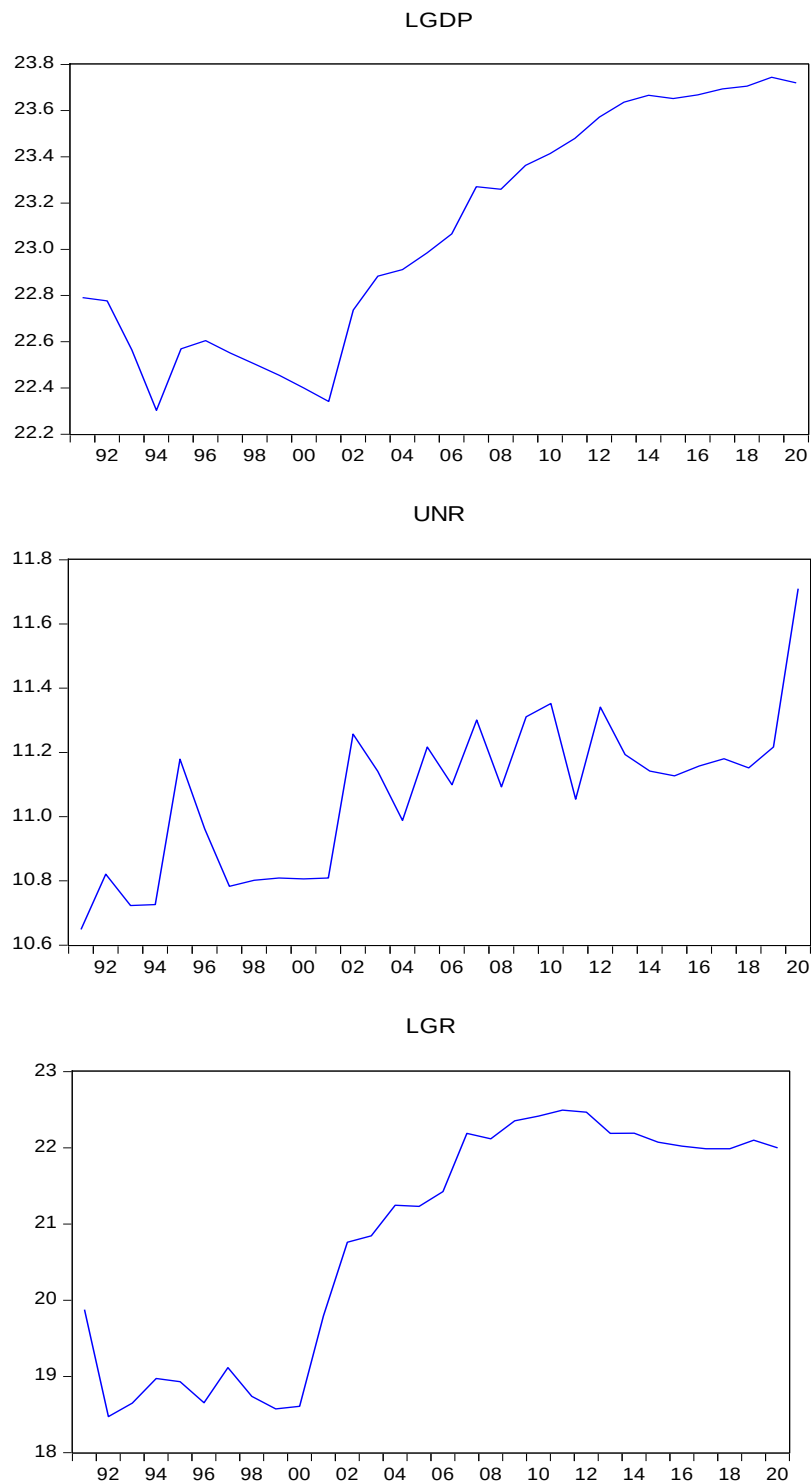


Figure 4. 1. *Afghanistan's LGDP, Unemployment rate and LGR (1991-2020)*

4.3. Econometric Approach

Okun's Law is a theory that can be utilized to elucidate the correlation between unemployment and growth. It is based on empirical evidence that establishes a connection between the rate of economic growth and the unemployment rate.

In 1962, Okun made a forecast that a rise of 1 percent in unemployment would result in a decrease of 3 percent in GDP. The regression analysis produced a coefficient of -0.3 to support this prediction. Consequently, this connection suggests that in order to maintain a steady unemployment rate, the pace of GDP growth needs to equal its potential growth rate. To reduce unemployment, the rate of GDP growth needs to surpass the growth rate of potential output (Chuttoo, 2020, p.247). As per Okun's (1970) suggestion, there are two typical model specification for Okun's Law: the "First difference model" and the "Gap model". The first difference model describes the relationship between the natural logarithm of real output (Y_t) and the natural logarithm of unemployment rate (U_t) in the following manner:

$$Y_t - Y_{t-1} = \alpha + \beta(U_t - U_{t-1}) + \varepsilon_t \quad (4.1)$$

Here, Y_t stands for real gross domestic product and Y_{t-1} stands for the lag of real output. Similarly, U_t stands for unemployment rate and U_{t-1} stands for the lag of unemployment rate. α is the intercept and β is the Okun's coefficient, which shows the variation of unemployment regarding the changes in output, and ε is the random error.

The second equation of Okun's Law is as follows:

$$Y_t - Y_t^* = \alpha + \beta(U_t - U_t^*) + \varepsilon_t \quad (4.2)$$

This equation which is known as the "Gap Model" of Okun's Law, computes the Okun's coefficient by the help of the gap between real output and unemployment with their potential trends. Here, the left-hand side shows the output gap; simply displays the existed fluctuations in real GDP from its potential value, and the right-hand side is the unemployment gap; likewise shows the fluctuations of unemployment rate from natural rate of unemployment. As the values of Y_t^* and U_t^* are not observable and should be estimated, the first model of Okun's law is used for further analyzation.

4.3.1. Stationarity and the unit root test:

Stationarity refers to a property of a time series where it exhibits a constant mean and variance, and the covariance between two values of the series depends on the time interval. This research utilized commonly employed ADF (Augmented Dickey-Fuller) and PP (Phillips-Perron) unit root tests to assess the stationarity characteristics of the variables' series. The ADF test incorporated lagged dependent variables to address autocorrelation issues within the error terms. Conversely, the PP test employed non-parametric methods. Both tests aimed to evaluate the alternative hypothesis, suggesting stationarity of the series, against the null hypothesis, which posits the presence of a unit root within the series.

When working with time series data, ensuring the stationarity of the series is crucial. If non-stationary series are used in time series analysis, the resulting regression outcomes may lack realism. Non-stationary series can lead to misleading relationships between the variables being analyzed, resulting in findings that lack economic significance. Therefore, it is essential to first examine the stationarity levels of the time series as a preliminary step to obtain accurate and meaningful results.

A variable is considered to be stationary at its level value if it exhibits a property denoted as $I(0)$. However, if the series is not stationary at the level, it can be transformed into a stationary series by taking the first-degree difference. In this case, the series becomes stationary in the first difference and is denoted as $I(1)$. If the series still fails to achieve stationarity after the first difference, the second difference is taken, and the stationary property is expressed as $I(2)$. This process continues until the series reaches stationarity. Therefore, if it is necessary to take the difference d times for the series to become stationary, it is denoted as $I(d)$.

The ADF and PP unit root tests employed in this study follow the following hypothesis and decision framework:

Null Hypothesis (H_0): The series possesses a unit root, indicating non-stationarity.

Alternative Hypothesis (H_1). The series does not have a unit root, indicating stationarity.

If the H_0 hypothesis is accepted, it implies that the series contains a unit root, signifying non-stationarity. Conversely, if the H_0 hypothesis is rejected, the H_1 hypothesis

is accepted, indicating that the series is stationary. In this study, ADF and PP unit root tests were utilized to analyze the stationarity properties of the LGDP, UNR and LGR variables.

4.3.1.1. Augmented Dicky-Fuller unit root test (ADF):

To address the issue of autocorrelation in the Dickey-Fuller (1979) test, a lagged value of the dependent variable is incorporated into the Dickey-Fuller equation. This addition aims to mitigate the autocorrelation problem. Consequently, the Dickey-Fuller regression equation is transformed into the Augmented Dickey-Fuller (ADF) equation. In this study, both constant and constant trend ADF regression equations were employed. The equations are as follows (Enders, 2004, p.222):

$$\Delta Y_t = \beta_0 + \beta_1 Y_{t-1} + \sum_{i=1}^n \delta_i \Delta_{t-1} + \varepsilon_t \quad (4.3)$$

$$\Delta Y_t = \beta_0 + \beta_1 Y_{t-1} + \sum_{i=1}^n \delta_i \Delta_{t-1} + \gamma_1 Trend + \varepsilon_t \quad (4.4)$$

In the given equations, the Y variable undergoes a stationarity test. The β_0 represents the constant term, while β_1 , δ , and γ_1 represent the coefficients of their respective variables. The operator Δ denotes the difference, Σ signifies the lag length in the summation, and ε_t denotes the error term. The first equation corresponds to the constant (intercept) model, while the second equation represents the constant plus trend model, incorporating a trend component. To determine the optimal lag length t , this study considered the Schwarz lag information criterion. The hypothesis tests associated with the aforementioned test are as follow:

$$H_0: \beta_1 = 0$$

$$H_1: \beta_1 < 0$$

In this analysis, the ADF test statistic is compared to the critical values form MacKinnon (1991) in order to test the null hypothesis ($H_0: \beta_1=0$) against the alternative hypothesis ($H_1: \beta_1<0$). The null hypothesis suggests that the series is non-stationary.

Meaning it possesses a unit root, while the alternative hypothesis indicates stationarity of the series. If the calculated t statistic is lower than the corresponding value from the MacKinnon (1991) table, the null hypothesis is not rejected. In this case, it is concluded that the series contains a unit root test. On the other hand, if the calculated t statistic is greater than the critical value from the MacKinnon (1991) table, the null hypothesis is rejected. This leads to accepting the alternative hypothesis, including that the series does not possess a unit root and is considered stationary.

4.3.1.2. Phillips-Perron unit root test (PP):

The PP (Phillips-Perron) unit root test is an alternative method employed to examine the presence of a unit root in time series. In the PP test, the underlying assumption of the Dickey-Fuller (1979) test regarding error terms has been expanded. While the ADF (Augmented Dickey-Fuller) test assumes that the error terms are independent and possess constant variance, the PP unit root test relaxes these assumptions. It allows for the error terms to exhibit weak dependence and heterogeneity, thus accommodating a broader range of error structures compared to the ADF unit root test.

Phillips and Perron (1988) highlight a potential issue with the Dickey-Fuller test, which is the presence of autocorrelated error terms that can lead to erroneous results. To address this concern, the DF test proposes a correction factor that is added to the test statistics to account for autocorrelation. The critical values for these corrected test statistics remain the same as those used in the DF test. Despite the difference values of the test statistics, the same critical values are employed in unit root tests. However, this approach may result in a reduction in the degree of freedom and potential deviations. In order to overcome this limitation and maintain higher statistical power, the PP (Phillips-Perron) test is utilized. The PP test is considered more robust and prevents the loss of degrees of freedom (Akdi, 2012, p.280). Hence, in this study, both the ADF and PP tests were employed to minimize errors and ensure more accurate analyses.

For models with a constant and constant trend, the PP regression equations with non-parametric corrections can be represented as follows (Çağlayan and Saçaklı, 2006, p.124):

$$\Delta Y_t = \alpha Y_{t-1} + x_t' \delta + \varepsilon_t \quad (4.5)$$

In the PP test, α represents the coefficient $\rho-1$, and x'_i denotes the deterministic component indicating either a constant or a constant trend. Non-parametric correction is applied in the PP test to compute the test statistics. As a result, the presence of autocorrelation does not impact the asymptotic distribution of the test statistic. The correction method used is based on the spectrum estimation of the error terms ε_t at the zero frequency, which yields consistent estimates. The calculation of the PP test statistic is as follow:

$$\hat{t}_a = t_a \left(\frac{\gamma_0}{f_0} \right)^{\left(-\frac{1}{2}\right)} - \frac{T(f_0 - \gamma_0)(s_e(\hat{a}))}{\propto f_0^{-\frac{1}{2}} s} \quad (4.6)$$

In the PP test, several parameters are involved in the hypothesis test. The key variables are defined as follows: $s_e(\hat{a})$ represents the standard error of the relevant coefficient, s denotes the standard error of the equation, T indicates the number of observations, γ_0 represents the consistent estimate of the error variance, and f_0 is the estimator of the residual spectrum at the zero frequency.

The hypothesis tests conducted in the PP test are as follows:

$$H_0: \alpha = 0$$

$$H_1: \alpha < 0$$

The asymptotic values for the PP test statistic are identical to those used in the ADF test. As a result, the decision is determined by comparing the ADF test's MacKinnon (1991) table value.

4.3.2. Auto-Regressive distributed lag model (ARDL):

As it is known, Engle & Granger (1987) and Johansen & Juselius (1990) cointegration tests require the variables being investigated for their relationship to be stationary both at the first difference and at the same level. In such cases, the cointegration relationship can be analyzed by utilizing these specified tests with the series of the variables' level values. In contrast to these methods, the ARDL (Autoregressive Distributed Lag) bounds tests approach, developed by Pesaran, Shin & Smith (2001),

enables the examination of the cointegration relationship between variables that are stationary at different levels. The noteworthy advantage of the ARDL bounds test approach is its applicability regardless of whether the variables under examination are integrated of order zero (I(0)) or integrated of order one I(1) (Pesaran and others, 2001, p.289-290). Hence, in the ARDL bounds test, there is no requirement to determine the integration orders of the variables being tested. However, to avoid situations where, for example, I(2) is stationary in the second difference of the variables, it is crucial to conduct unit root tests prior to applying the ARDL bounds test (Narayan and Narayan, 2005, p.429). The ARDL approach enables the examination of the co-integration relationship between variables and facilitates the estimation of long-term coefficients. Additionally, it provides insights into the short-term dynamics of the variables under investigation.

The ARDL bounds testing approach comprises two main stages. In the first stage, the existence of a long-term relationship between the variables under analysis is tested. If a cointegration relationship is detected, the second stage involves estimating the long equation and determining the corresponding elasticity coefficients. Afterward, the estimation of short-run coefficients becomes possible (Narayan and Smyth, 2006, p.103). The model was created as follows to determine the cointegration relationship with the ARDL bounds test approach.

$$DLGDP_t = \beta_0 + \sum_{i=1}^m \gamma_{1i} \Delta LGDP_t + \sum_{i=1}^n \gamma_{2i} \Delta UNR_{t-i} + \sum_{i=1}^p \gamma_{3i} \Delta LGR_{t-i} + \theta_1 \Delta LGDP_{t-1} + \theta_2 UNR_{t-1} + \theta_3 LGR_{t-1} + \varepsilon_t \quad (4.7)$$

In the bounds test approach, the significance of the one-term lagged values of the dependent and independent variables is examined by testing the following null hypothesis using the F statistical value. The null hypothesis and alternative hypothesis are defined as follows:

$$H_0: \theta_i = 0, i = 1, 2, 3$$

$$H_1: \theta_i \neq 0, i = 1, 2, 3$$

The distribution of the F statistic used to test the hypothesis is not standardized. Its distribution varies based on factors such as the inclusion of I(0) or I(1) variables in the

ARDL model, the number of variables, the presence of a constant term or trend, and the sample size. Hence, it is necessary to utilize the critical values determined by Pesaran et al. (2001). If the F statistical value exceeds the upper limit, the null hypothesis will be rejected, indicating the presence of cointegration between the variables. Conversely, if the F statistical value is below the lower limit, the null hypothesis will not be rejected, implying no cointegration between variables. When the F statistical value falls between the limits, the relationship between the variables is uncertain, and there is no conclusive evidence to either accept or reject the hypothesis.

Once the ARDL bounds test establishes the presence of a cointegration relationship between the variables, it allows for the examination of both long-term and short-term relationships. To explore the long-term relationship, the ARDL(m,n,p) model is constructed by adapting our variables, as shown below:

$$DLGDP_t = \beta_0 + \sum_{i=1}^m \gamma_{1i} \Delta LGDP_t + \sum_{i=1}^n \gamma_{2i} \Delta UNR_{t-i} + \sum_{i=1}^p \gamma_{3i} \Delta LGR_{t-i} + \varepsilon_t \quad (4.8)$$

Following the identification, the long-term relationship, the ARDL error correction model is formulated to analyze the short-term relationship. The model is constructed as follow:

$$DLGDP_t = \beta_0 + \sum_{i=1}^m \gamma_{1i} \Delta LGDP_t + \sum_{i=1}^n \gamma_{2i} \Delta UNR_{t-i} + \sum_{i=1}^p \gamma_{3i} \Delta LGR_{t-i} + \beta_1 ECT_{t-1} + \varepsilon_t \quad (4.9)$$

Within the error correction model, the term ECT_{t-1} corresponds to the one-lagged values of the error terms derived from the long-term relationship equation. The coefficient assigned to this term, denoted as β_1 is anticipated to exhibit a negative value and possess statistical significance. The β_1 coefficient signifies the extent to which deviation from equilibrium will be rectified in the long run.

To analyze the directional relationships between variables, researchers often employ the Toda-Yamamoto approach and the Granger causality test. Granger (1988) proposed deriving dynamic Granger causality from the vector error correction model,

which is based on the long-run cointegration relationship. However, using causality tests without incorporating the error correction term can lead to issues like detection errors and spurious regression, despite the cointegration relationship suggested by Granger (1969). Engle and Granger (1987) emphasized that if the linear combinations of two non-stationary series are stationary, indicating a cointegration relationship, the standard Granger causality test results may not be reliable.

To address these challenges, Toda and Yamamoto (1995) and Dolado and Lutkepohl (1996) introduced a modified Wald test statistic (MWALD) based on the VAR model. This method allows for causality testing without prior assessments of stationarity and cointegration. In the Toda-Yamamoto approach, the maximum integration degree (d_{max}) of the variables in the model are determined. For instance, if one variable has an integration order of $I(0)$, and two variables have an order of $I(1)$, the maximum integration degree would be 1. Subsequently, an unconstrained VAR model is estimated using the level values of the series, and the appropriate lag length is determined using model selection criteria. Assuming the suitable model is $VAR(P)$, the next step involves conducting the VAR Granger causality/Block externality test. This test is performed by estimating the $VAR(P+d_{max})$ model. From this estimated model, the MWALD test statistic is calculated, which follows an asymptotic chi-square distribution. By comparing the calculated test statistic with the critical value from the table, researchers can determine whether to reject the null hypothesis, which suggests the absence of causality (ESEN & Özata, 2017, p.49-50).

4.4. Empirical Research

In this section, the time series data undergoes ADF and PP unit root tests. Subsequently, ARDL model is employed to examine the relationship between the research variables. Finally, the research results are analyzed and interpreted.

4.4.1. Unit root tests

As mentioned before, prior to investigation the correlation between the unemployment rate and production, we conduct tests to determine the stationarity of the

variables involved using the ADF and PP unit root tests. Stationarity refers to the time series having a consistent mean, constant variance, and covariance between values within a given time interval. As previously explained, the null hypothesis in both tests assumes that the series possesses a unit root, indication non-stationarity. Conversely, the alternative hypothesis suggests that the series is stationary.

Table 4. 1. *The GDP, Unr and LGR's ADF and PP unit root test results*

Variables		ADF Test Statistics		PP Test Statistics	
		Level	1st Difference	Level	1st Difference
LGDP	Constant & Trend	[-3.450483]	[-4.462651]	[-2.800689]	[-4.404401]
		0.0703*	0.0073***	0.2082	0.0083***
		(7)	(0)	(0)	(3)
UNR	Constant & Trend	[-4.174605]		[-4.182508]	
		0.0136**		0.0134**	
		(0)		(1)	
LGR	Constant & Trend	[-1.864181]	[-5.803041]	[-2.181782]	[-5.762368]
		0.6469	0.0003***	0.4814	0.0003***
		(0)	(0)	(3)	(2)

a: (*) Significant at the 10%; (**) Significant at the 5%; (***) Significant at the 1% and (no) Not Significant.

b: The numbers inside the parenthesis are the lag length based on Schwarz Info Criteria for ADF tests and the bandwidth based on Newey-West automatic for Philips Perron unit root test.

c: The numbers inside the brackets are the t-statistics values.

Table 4.1, displays the results of ADF and PP unit root tests for GDP, Unemployment rate and LGR variables. Both tests shows identically that two variables of LGDP and LGR with trend and intercept are not stationary at level as the H_0 cannot be rejected while the T-statistic values are lower than the Mackinnon critical values and the probability values are greater than 0.05. But after first difference the null hypothesis is rejected and both variables became stationary. On the other hand, both ADF and PP unit root tests shows that the UNR variable is statistically stationary at level, while test statistic values are greater than Mackinnon critical values and probabilities are less than 0.05 significance level.

Taking these findings into account, Pesaran et al. (2001) conducted a study to evaluate Okun's law using the ARDL bounds test approach. This approach enables the investigation of the cointegrated relationship between two variables, irrespective of their

stationarity levels. Since the result of the ADF and PP unit root tests indicate stationarity at the first difference or at level, it is appropriate to apply the ARDL bound test.

4.4.2. ARDL approach Results

Based on the outcomes of the unit root tests, an investigation into the application of Okun's law to the Afghan economy was conducted using the ARDL approach. The analysis commenced by examining the cointegration relationship between the unemployment rate and real GDP and log of grants variables by the help of ARDL bounds tests. Subsequently, the estimation results of the extended ARDL model were provided. This was followed by presenting the estimates of the regression equation that represents the long-term relationship. Additionally, the estimation results of the error correction model, which captures the short-term relationship, were presented. Finally, the graphical representation of the CUSUM and CUSUM of Squares tests was used to assess the stability of the ARDL model coefficients.

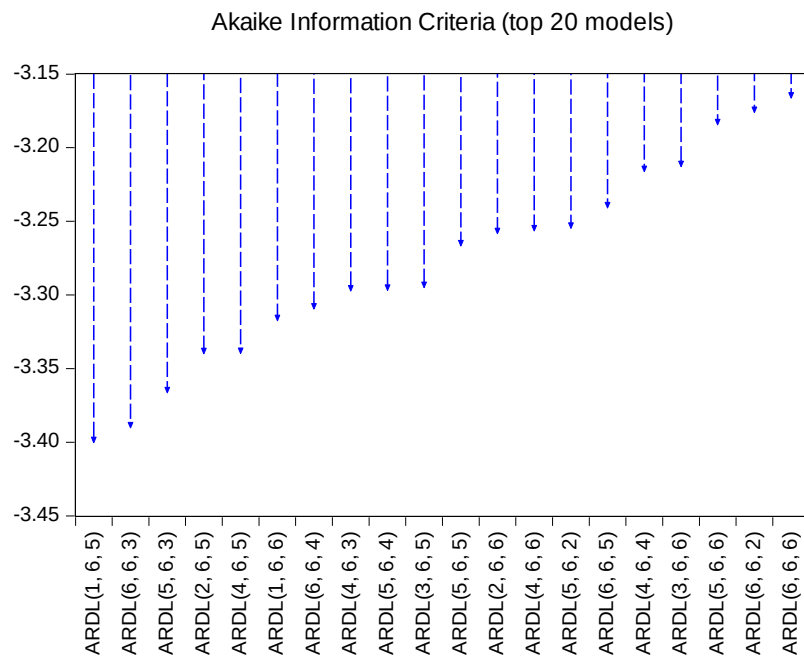
Table 4.2, displays the Afghanistan's ARDL (1,6,5) model results. It can be seen that the model has used first lag of LGDP, 6th lag of UNR and 5th lag of LGR variables. Additionally, Figure 4.2, shows the top 20 ARDL models based on Schwarz Criteria which the selected model has the lowest value among other models.

Table 4. 2. *Afghanistan's ARDL (1,6,5) Model Results*

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
LGDP(-1)	0.525699	0.18461	2.847623	0.0192
UNR	-0.036016	0.083232	-0.432716	0.6754
UNR(-1)	-0.237105	0.132189	-1.793677	0.1065
UNR(-2)	-0.264475	0.151156	-1.749686	0.1141
UNR(-3)	-0.476265	0.22027	-2.16219	0.0589
UNR(-4)	-0.236183	0.229483	-1.029195	0.3303
UNR(-5)	-0.45567	0.12932	-3.523571	0.0065
UNR(-6)	-0.300762	0.09568	-3.143404	0.0119
LGR	0.04195	0.060101	0.697993	0.5028
LGR(-1)	0.168912	0.063749	2.649649	0.0265
LGR(-2)	-0.103971	0.080703	-1.288326	0.2298
LGR(-3)	0.127849	0.061043	2.094419	0.0657
LGR(-4)	0.006441	0.067682	0.095172	0.9263
LGR(-5)	0.133163	0.042286	3.149149	0.0118

Table 4. 3. *Afghanistan's ARDL (1,6,5) Model Results (Continue)*

C	25.39739	9.01699	2.816615	0.0202
R-squared	0.997551	Mean dependent var		23.19507
Adjusted R-squared	0.993743	S.D. dependent var		0.488886
S.E. of regression	0.038673	Akaike info criterion		-3.398196
Sum squared resid	0.01346	Schwarz criterion		-2.661912
Log likelihood	55.77835	Hannan-Quinn criter.		-3.202859
F-statistic	261.9037	Durbin-Watson stat		2.567247
Prob(F-statistic)	0			

**Figure 4. 2.** *Top 20 ARDL Model*

The bound test, test the null hypothesis that there is no long-term relationship for the determined ARDL model. There are two critical bounds of $I(0)$ and $I(1)$ at this test. If the test statistic value is less than the critical lower bound $I(0)$, then the null hypothesis is accepted. If the test statistic value is more than the critical upper bound $I(1)$, then the null hypothesis is rejected or there is a long-term relationship in the determined ARDL model and if the test statistic value is between critical bounds 'values, then it is uncertain whether there is a long-term relationship or not. Table 4.3, is the result of bound test for Afghanistan's ARDL (1,6,5) model. Here, test statistic value is 8.20 which is greater than critical upper bound $I(1)$ and it is at 0.1 significance level. Hence the null hypothesis is rejected and bound test results, determine a long-term relationship between variables.

Table 4. 4. *ARDL Bound Test Result*

F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Significance	I(0)	I(1)
Asymptotic: n=1000				
F-statistic	8.199137	10%	2.63	3.35
k	2	5%	3.1	3.87
		2.50%	3.55	4.38
		1%	4.13	5

Table 4.4, displays the cointegration and long-term relationship between the variables. At the table, In the equation in cointegrated form, the coefficient of the first lag of the ECM is negative and statistically significant. This finding is reliable with the findings of a long-term relationship in the model presented in Table 4.3. Moreover, at lower part of table 4.4, the long-term relationship between variables is presented. Both UNR and LGR variables are statistically significance at 0.05 and 0.01 significance level respectively. The long-term coefficient of UNR is (-4.23), indicating that that there is a negative long-term relationship between unemployment rate and economic growth in Afghanistan and one percent increase in unemployment rate will decrease the real GDP by 4.23 percent in long-term. Also, the coefficient of LGR is (0.78), signifying a positive long-run relationship between grant amounts and real GDP of Afghanistan.

Table 4. 5. *Cointegration and long-term relationship*

Variables	Coefficient	Std. Error	t-Statistic	Prob.
D(UNR)	-0.036016	0.056989	-0.631979	0.5431
D(UNR(-1))	1.733354	0.296281	5.850376	0.0002
D(UNR(-2))	1.468879	0.253369	5.797396	0.0003
D(UNR(-3))	0.992614	0.215569	4.604623	0.0013
D(UNR(-4))	0.756432	0.128163	5.902089	0.0002
D(UNR(-5))	0.300762	0.070815	4.247147	0.0022
D(LGR)	0.04195	0.02758	1.521043	0.1626
D(LGR(-1))	-0.163482	0.067435	-2.42429	0.0383
D(LGR(-2))	-0.267454	0.050245	-5.323036	0.0005
D(LGR(-3))	-0.139605	0.043066	-3.241682	0.0101
D(LGR(-4))	-0.133163	0.033108	-4.022072	0.003
ECM(-1)*	-0.474301	0.071725	-6.61277	0.0001
ECM = LGDP - (-4.2304*UNR + 0.7893*LGR + 53.5469)				
Long-Term Coefficients				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
UNR	-4.23038	1.33258	-3.174578	0.0113
LGR	0.789254	0.150495	5.244401	0.0005
C	53.54694	11.68944	4.580795	0.0013

In order to ensure the reliability of ARDL model presented in tables 4.2 and 4.4, the presence of heteroskedasticity and serial correlation is examined. Table 4.5, shows the serial correlation LM test (Breusch-Godfrey test). The LM test resulted in a non-significant p-value of 0.38, indicating no evidence of serial correlation in our regression model. Here, the H_0 is that there is no serial correlation.

Table 4. 6. *The Serial Correlation LM Test (Breusch-Godfrey)*

F-statistic	0.872834	Prob. F(1,8)	0.3775
Obs*R-squared	2.360917	Prob. Chi-Square(1)	0.1244

Furthermore, Table 4.6, shows the heteroskedasticity test result based on Breusch-Pagan-Godfrey test. The performed Breusch-Pagan test for heteroskedasticity, yielded a non-significant p-value of 0.26. This result further confirms the absence of heteroskedasticity in our model. The absence of heteroskedasticity and serial correlation strengthens the reliability of our regression results. It supports the assumption of constant variance and independent error terms, allowing for efficient coefficient estimates and valid statistical inferences.

Table 4. 7. *Heteroskedasticity Test*

F-statistic	1.534204	Prob. F(14,9)	0.2625
Obs*R-squared	16.91312	Prob. Chi-Square(14)	0.2608
Scaled explained SS	1.907332	Prob. Chi-Square(14)	0.9999

In this analysis, the CUSUM test and CUSUM of squares test is conducted to examine the stability of the ARDL model over time. These tests help determine whether there are any significant changes or deviations from stability in the coefficients of our model. The CUSUM test involves assessing the cumulative sum of the recursive residuals. After performing the test, we found that the CUSUM test statistic remained within the critical bounds, see Figure 4.3, indicating no evidence of structural instability or significant changes in the coefficients over time. This suggests that the relationships between the independent variables and the dependent variable remain stable throughout the analyzed period.

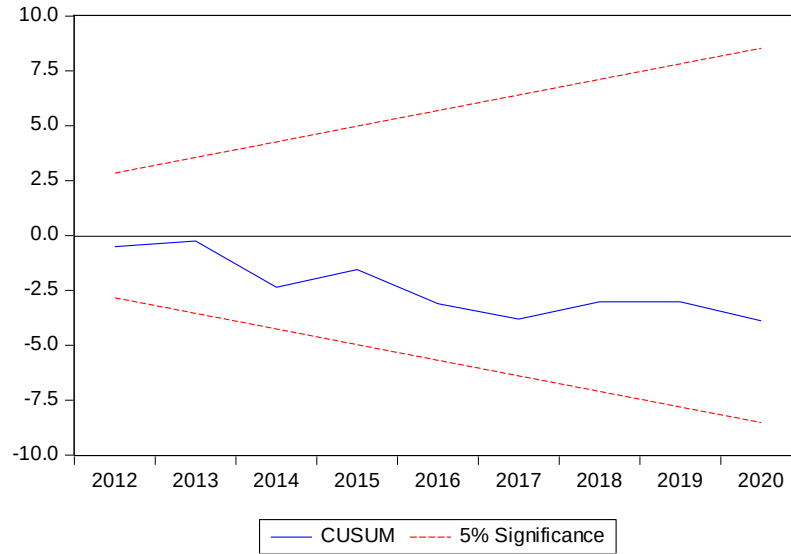


Figure 4. 3. CUSUM Test

Additionally, we conducted the CUSUM of squares test, which examines the cumulative sum of squared recursive residuals. Our results revealed that the CUSUM of squares test statistic also fell within the critical bounds, see Figure 4.4, further confirming the stability of our regression model.

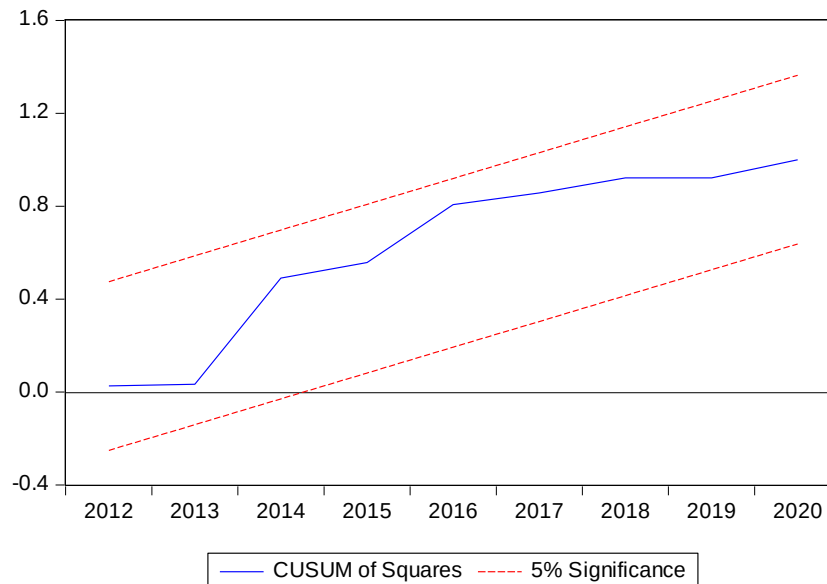


Figure 4. 4. CUSUM of Squares

Finally, the Granger causality test was applied with the Toda Yamamoto approach in order to determine the direction of the causal relationships between the variables. First of all, the maximum degree of integration (dmax) must be determined. As a result of ADF and PP unit root tests; the LGDP and LGR series are determined at I(1) and the UNR

series is determined at $I(0)$, thus the maximum integration degree is determined as 1. Then, an unconstrained VAR model was estimated with the level of the variables and the appropriate lag was determined to be 5 based on AIC with the help of model selection criteria. After this stage, VAR(P+dmax) is VAR(5+1) model was estimated and VAR Granger causality/Block exogeneity Wald test was applied. The result of the test is presented in Table 4.5.

Figure 4. 5. VAR Granger Causality/Block Exogeneity Wald Tests

VAR Granger Causality/Block Exogeneity Wald Tests			
Dependent variable: LGDP			
Excluded	Chi-square	Degree of Freedom	Prob.
UNR	14.13382	6	0.0282
LGR	64.73284	6	0.0000
All	84.68343	12	0.0000
Dependent variable: UNR			
Excluded	Chi-sq	Degree of Freedom	Prob.
LGDP	1.17761	6	0.978
LGR	5.435534	6	0.4893
All	10.02757	12	0.6135

According to the results of the VAR Granger causality test, the null hypothesis stating that there is no causality from unemployment rate to the LGDP is rejected at 5% significance level (Prob.=0.0282). On the other hand, the null hypothesis stating that there is no causality from LGDP to unemployment rate could not be rejected at 5% significance level (Prob.=0.978). In this case, we can say, that there is unidirectional causality from unemployment rate to real gross domestic product. The results also support the long-term relationship between variables carried out by ARDL model.

4.5. Conclusion

Afghanistan faces a significant unemployment problem, which poses multifaceted challenges to the country's economic and social development. High levels of unemployment hinder economic growth, exacerbate poverty, and contribute to social instability. The issue is rooted in a complex web of interrelated factors, including the protracted armed conflict, limited access to education and skills training, and the lack of diverse and sustainable employment opportunities. The ongoing conflict has destroyed

infrastructure, disrupted trade, and led to the displacement of millions of people, resulting in a weakened labor market. Furthermore, the inadequate education system and limited vocational training programs have resulted in a mismatch between the skills possessed by job seekers and the demands of the labor market. Consequently, many individuals, particularly youth, find themselves trapped in a cycle of joblessness and despair, fueling social discontent and potential recruitment into illegal activities or extremist groups. Addressing the unemployment problem in Afghanistan requires comprehensive strategies that prioritize the reconstruction of infrastructure, investment in education and vocational training, and the promotion of entrepreneurship and private sector growth. Moreover, efforts should be made to foster regional and international collaborations to enhance employment opportunities and attract foreign direct investment, thereby creating a conducive environment for sustainable economic development and job creation.

The relationship between unemployment rate and economic growth has been a longstanding and pivotal topic of debate within the field of economics. Originating from an influential article by Arthur M. Okun 1962, known as Okun's Law, this concept introduced the notion of an inverse relationship between the rate of real output growth and the unemployment rate. Okun's Law postulates that high growth rates lead to a decrease in unemployment, while low or negative growth rates result in an increase in unemployment (Ceylan and Şahin, 2010, p.158). The introduction of Okun's Law sparked a significant scholarly discourse, with researchers examining the empirical validity and nuances of this relationship across different countries and time periods. Some scholars argue that Okun's Law holds true consistently, illustrating a strong connection between economic growth and unemployment. However, others contend that the relationship is more complex, influenced by various factors such as labor market flexibility, technological advancements, and industrial differences. The ongoing debate surrounding Okun's Law highlights the need for continues research to gain a comprehensive understanding of the intricacies involved in the unemployment-growth relationship and to inform effective policy-making aimed at achieving sustained economic development and reduced unemployment rates.

For this purpose, the relationship between unemployment rate and GDP during the period of 1991-2020 was investigated. The main variables used in this research are GDP, unemployment rate and Grants variable as a control variable. Logarithmic values

of GDP and Grants were used in the model. After the graphical analysis, it was observed that the variables have trend. ADF and PP unit root tests were used to study the stationarity of the series. The results of the both unit root tests showed that the variables of GDP and Grants with the trend are stationary at first difference and the unemployment rate is stationary at level. As a result, the variables are a combination of stationarity at the level and $I(1)$.

Based on the results of the stationarity analysis, the cointegration analysis was carried out within the framework of the ARDL bounds test approach, which allows the cointegration relationship between variables to be examined regardless of the level of stationarity of the series. The results obtained here show that the unemployment rate and real GDP variables are co-integrated, meaning that there is a long-term relationship between them. The extended ARDL model was then estimated. Also, in the equation in cointegrated form, the coefficient of the first lag of the ECM is negative and statistically significant. This finding is reliable with the findings of a long-term relationship in the model and supports it. Moreover, in long-term relationship, both UNR and LGR variables are statistically significant at 0.05 and 0.01 significance level respectively. The long-term coefficient of UNR is (-4.23), indicating that that there is a negative long-term relationship between unemployment rate and economic growth in Afghanistan and one percent increase in unemployment rate will decrease the real GDP by 4.23 percent in long-term. Also, the coefficient of LGR is (0.78), signifying a positive long-run relationship between grant amounts and real GDP of Afghanistan. In order to ensure the reliability of ARDL model, the presence of heteroskedasticity and serial correlation is examined. The serial correlation LM test (Breusch-Godfrey test) resulted in a non-significant p-value of 0.38, indicating no evidence of serial correlation in our regression model. The performed Breusch-Pagan test for heteroskedasticity, yielded a non-significant p-value of 0.26. This result further confirms the absence of heteroskedasticity in the model. The CUSUM and CUSUM of squares tests are conducted to examine the stability of the ARDL model over time. Both tests show stability of the model. Finally, the Granger causality test was applied with the Toda Yamamoto approach in order to determine the direction of the causal relationships between the variables. According to the results, there is a unidirectional causality from unemployment rate to logarithmic gross domestic product of Afghanistan at 5% significance level. The results also support long-term relationship between variables carried out by ARDL model.

Reducing the unemployment rate in Afghanistan requires a comprehensive and multifaceted approach that addresses the unique challenges facing this country. Here are some strategies that can help reduce unemployment:

Encouraging investment and entrepreneurship: by improving business regulations, simplifying bureaucratic processes and providing incentives to attract domestic and foreign investors, it creates a suitable environment for investment. Aspiring entrepreneurs should be supported through training programs, guidance and access to financial resources to stimulate the growth of small and medium enterprises.

Infrastructure Development: Investing in infrastructure development, including transportation networks, energy systems, and telecommunications. This not only creates immediate employment opportunities in construction, but also attracts industries and facilitates trade, leading to sustainable employment growth.

Focus on agriculture and rural development: Agricultural productivity should be increased by providing farmers with improved seeds, modern techniques and access to markets. Investing in rural infrastructure such as irrigation systems, storage facilities and rural electrification to support the growth of the agricultural sector and create employment opportunities in agriculture and agribusiness.

Strengthening vocational education and training: expanding vocational training programs that match market demands and provide practical skills for employment. Collaborate with industries to develop training and education programs that meet their specific needs. In addition, to improve the literacy rate and equip people with the knowledge and skills necessary for a competitive labor market, investment in education should be made.

Strengthening public-private partnerships: encouraging cooperation between the government, the private sector, and civil society organizations to jointly address unemployment challenges. Public-private partnerships can facilitate investment, knowledge sharing and the implementation of job creation initiatives.

Support microfinance and access to credit: Microfinance institutions should be established and promoted to provide affordable credit to aspiring entrepreneurs and small businesses. This enables them to start or expand their own companies, creating job opportunities and stimulating economic growth.

Strengthening labor market information systems: Strong labor market information systems should be developed to identify skill gaps, emerging industries, and management trends. These data can inform policy decisions, help align training programs with market needs, and facilitate job matching between employers and job seekers.

Promoting gender equality and empowering women: creating targeted programs and policies to promote women's participation in the labor market. This could include initiatives that address cultural barriers, provide access to financial resources, and provide training and mentoring opportunities for women entrepreneurs.

Investing in conflict resolution and peace-building efforts: Political stability and security are critical to economic growth and job creation. Focusing on conflict resolution, promoting peace building initiatives, and improving security conditions to attract investment and create and create an environment conducive to job creation.

Involving the international community: Support and cooperation should be requested from international organizations, donor countries, and development partners. Their expertise, resources and technical assistance can complement domestic efforts and help reduce unemployment in Afghanistan.

The successful implementation of these measures requires the coordinated and continuous efforts of the government, private sector, civil society and international partners to promote economic growth, create jobs and improve the livelihood of the Afghan people.

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