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**ISTANBUL GELISIM UNIVERSITY**  
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Department of Economics and Finance

**THE IMPACT OF UNEMPLOYMENT ON ECONOMIC  
GROWTH IN IRAQ (2003-2022)**

Master Thesis

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Supervisor

Assoc. Prof. Dr. Onur ÖZDEMİR

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## **DECLARATION**

I hereby declare that this thesis has followed ethical standards, where reference has been made to the sources that have been used in accordance with scientific standards, and there is no falsification in the data that has been used, and no section of this thesis has been submitted to this university or any other university as another thesis.

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## SUMMARY

One of the most important objectives of the financial, monetary and commercial economic policies of different countries is to achieve high economic growth rates and reduce unemployment rates. The human capital it possesses, and the failure of the labor market to absorb the stagnant force, which hinders the achievement of a continuous positive increase in the state's production, and thus affects the income and well-being of society members, and many economists, social, security and political effects. The scientific addition to the study is the selection of a relatively long and recent study period, which witnessed changes in the Iraqi economy after the war. A standard model using time series analysis to test the impact of unemployment on economic growth, and this study seeks to explore the impact of unemployment on economic growth in Iraq between 2003 and 2022.

The importance of the study lies in clarifying one of the obstacles facing the Iraqi economy, and this obstacle is the problem of unemployment, which in turn is reflected and affects the economic growth of the Iraqi state. Iraq must overcome this obstacle or reduce it.

The study aims to find out how unemployment can affect economic growth rates in Iraq by building a standard model, and whether the economic reform adopted by the state in the recent period has an impact on these rates, and then trying to propose a set of solutions. This would reduce unemployment in Iraq.

This study will be based on the testing approach associated with the ARDL model proposed by Pesaran, Shin and Smith (2001) with the aim of analyzing the short- and long-run relationship between unemployment and GDP.

The study concluded that there is a negative relationship between economic growth and unemployment, and found a positive relationship between capital, labor and GDP, according to the production function.

**Keywords:** economic growth, unemployment, capital and labor.

## ÖZET

Farklı ülkelerin mali, parasal ve ticari iktisat politikalarının en önemli amaçlarından biri yüksek ekonomik büyüme oranlarına ulaşmak ve işsizlik oranlarını azaltmaktır. Sahip olduğu beşeri sermaye ve işgücü piyasasının, devletin üretiminde sürekli pozitif bir artışın sağlanmasını engelleyen ve dolayısıyla toplum üyelerinin ve birçok iktisatçının gelirini ve refahını etkileyen durgun gücü absorbe edememesi, sosyal, güvenlik ve politik etkiler. Çalışmaya bilimsel olarak eklenen, savaş sonrası Irak ekonomisinde yaşanan değişimlere tanık olan nispeten uzun ve yakın tarihli bir çalışma döneminin seçilmesidir. İşsizliğin ekonomik büyüme üzerindeki etkisini test etmek için zaman serisi analizini kullanan standart bir model ve bu çalışma, 2003 ile 2022 yılları arasında Irak'ta işsizliğin ekonomik büyüme üzerindeki etkisini araştırmayı amaçlıyor.

Çalışmanın önemi, Irak ekonomisinin önündeki engellerden birinin açıklığa kavuşturulmasında yatmaktadır ve bu engel, Irak devletinin ekonomik büyümesine yansayan ve etkileyen işsizlik sorunudur. Irak bu engeli aşmalı veya azaltmalıdır.

Çalışma, standart bir model kurarak Irak'ta işsizliğin ekonomik büyüme oranlarını nasıl etkileyebileceğini ve devletin son dönemde uyguladığı ekonomik reformun bu oranlar üzerinde bir etkisinin olup olmadığını ortaya koymayı ve ardından bir dizi çözüm önermeyi amaçlamaktadır. . Bu, Irak'taki işsizliği azaltacaktır.

Bu çalışma, işsizlik ve GSYİH arasındaki kısa ve uzun dönemli ilişkiyi analiz etmek amacıyla Pesaran, Shin ve Smith (2001) tarafından önerilen ARDL modeliyle ilişkili test yaklaşımına dayanacaktır.

Çalışma, üretim fonksiyonuna göre ekonomik büyüme ile işsizlik arasında negatif, sermaye, emek ve GSYİH arasında pozitif bir ilişki olduğu sonucuna varmıştır.

**Anahtar Kelimeler:** ekonomik büyüme, işsizlik, sermaye ve emek



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## INTRODUCTION

Unemployment is one of the most common problems facing the economies of different countries, and it is considered an important economic and social indicator, as all countries, whether rich, developed or poor, struggle to reduce unemployment rates, especially among young people. While unemployment rates are less than 10 percent in developed countries, it may reach 50 percent in developing countries like Iraq.

On the other hand, it can be said that economic growth in different countries is linked to various financial, political, economic, and human factors, where the unemployment rate is one of the most important human factors that are linked to achieving economic growth. It can also say that one of the most important objectives of the financial, monetary and commercial economic policies of different countries is to achieve high economic growth rates and reduce unemployment rates (Azeng & Yogo, 2015, pp.200-208).

The failure to optimally invest the human capital that states possess, and the failure of the labor market to absorb stagnant power hinders the achievement of a continuous positive increase in the state's production, and thus affects the income and well-being of society members, as many economists have explained the social, security and political effects of unemployment. The scientific addition to this study is to choose a relatively long and recent study period, which witnessed changes in the Iraqi economy after the American invasion of Iraq.

The importance of the study lies in clarifying one of the obstacles facing the Iraqi economy, and this obstacle is the problem of unemployment, which in turn is reflected and affects the economic growth of the Iraqi state. Iraq must overcome this obstacle or reduce it. Therefore, we find that this study is based on clarifying the relationship between unemployment and economic growth in Iraq during the period (2003-2020) to see if unemployment negatively affects economic growth or otherwise. It is also expected that the results of this study will form the basis for subsequent studies in Iraq and a number of Arab countries in order to generalize the results.

The study aims to find out how unemployment can affect economic growth rates in Iraq by building a standard model, and whether the economic reform adopted by the state in the recent period has an impact on these rates. The study also tries to propose a set of solutions. Which would contribute to reducing the unemployment rate in Iraq.

The study structure will be as follows:

In the first chapter, the study will deal with the issue of unemployment, its concept, types, and factors associated with it, as well as highlighting unemployment in Iraq and its economic determinants.

In the second chapter, the study will deal with economic growth, its determinants, theories, dimensions, and economic growth in Iraq and the study will address the relationship between unemployment and economic growth

In the third chapter, the study will deal with the methodology, results, and interpretations of the results that have been reached also the findings of the study and the recommendations associated with it will be reviewed.

# CHAPTER ONE

## UNEMPLOYMENT

### 1.1 The Concept of Unemployment

Unemployment is one of the complex socio-economic terms that still receives a lot of disagreement when trying to define it, and to the extent that it can be said that a comprehensive definition that prevents it is difficult to reach, the disagreement came mainly from the difference of views between thinkers in this field in Many things are originally related to their orientation towards other concepts such as employment, full employment, underemployment, extent of unemployment, types of unemployment, types of unemployment, and other categories that fall into the heart of the problem. Proceeding from this, reaching an agreed definition of Mcleod & Davalos(2008), is difficult and elusive, as the definition of it depends on the conditions existing in the time and place concerned. For example, the survey that was conducted on households in the United States of America in 1974, the unemployed were referred to as all individuals who are fourteen years of age and over, and who do not work for wages outside the family for at least one hour a day at this time when many countries considered it to be a year or more and that if the duration of his work is less than three hours Every day this person can be considered among the unemployed.

Unemployment idiomatically refers to people who are able to work, want it, and search for it, but they do not find it. In sociology Unemployment refers to A state of the worker being idle despite his ability to do so, for a reason beyond his control, such as involuntary idleness that is due to the transfer of work. It is also the necessity of the existence of a situation of non-occupation, as well as the necessity of searching for it, non-occupation as a state condition, but the necessity of searching for it as a moral behavioral condition. The unemployed is everyone who is able to work, is willing to work, searches for it, and accepts it at the prevailing wage level, but to no avail (Bagchi, Aniruddha, Paul & Jomon, 2018, pp.9-20).



## **1.2 Types Of Unemployment**

If the mass of unemployment varies in terms of gender, age, and race, as well as in terms of the period of unemployment suffered by the unemployed groups, then all of this also varies according to the prevailing type of unemployment. There are several types of unemployment known to the capitalist industrial countries, among which we mention the following (Azeng & Yogo ,2015, pp.200-208).

### **1.2.1 Cyclical Unemployment:**

It is well known that economic activity, with all its variables in capitalist economies, does not progress over time at a single, organized pace. The period ranges from three to ten years. The economic cycle consists of two stages and two turning points, and the first stage is the boom or expansion stage in which the volume of income, output, and employment tend to increase, until the expansion reaches its end by reaching the peak point, or the peak of boom, And then the crisis occurs, and then the economic activity with all its components tends towards a cyclical decline, so that the national economy enters the stage of contraction until the decline reaches its end by reaching the bottom point of the contraction, and immediately after that the recovery begins, after which the volume of economic activity tends towards expansion again and so on.

This negatively affects employment in terms of (Mcleod & Davslos, 2008, pp.16-22):

1- A clear decline in consumer goods purchases and an increase in unwanted stocks of permanent consumer goods.

2- A decrease in the demand for labor, as this decrease takes the form of a decrease in working hours at the beginning, followed by layoffs in the second stage, and thus an increase in the unemployment rate.

3- With the decline in the volume of production, the demand for raw and intermediate materials will fall accordingly, and as a result the prices of many commodities will decline, provided that wages and prices of manufacturing products will not fall quickly at the beginning of the recession.

4- Profits rates in the business sector deteriorate rapidly at the beginning of the recession, and share prices in the stock market will fall with it, and pessimism will dominate investors, and the demand for loans from the banking system will also decrease, and interest rates will decrease as a result.

One of the most important features of the recession stage is the high unemployment rate, and one of the most important features of the expansion stage is the low unemployment rate, and this is what is meant by cyclical unemployment.

### **1.2.2 Frictional Unemployment**

Frictional unemployment is unemployment that occurs as a result of the continuous movement of workers between different regions and professions, and arises due to a lack of information between job seekers and business owners who have job opportunities, for example when the worker moves from one geographical area. To another, or to change his profession to another profession, or when the housewife decides to go out to the labor market after she passes the stage of raising and caring for children, obtaining a job opportunity undoubtedly requires time in which the available possibilities are searched for to compare them. The main problem here is that job seekers and business owners who have job opportunities are looking for each other (advertisements, newspapers, direct contacts, recruitment offices), and the job search period may be prolonged due to lack or lack of sufficient information. (Moamen Gouda & Marcus Marktanner ,2019, pp.878-897).

In the light of the foregoing, a number of economists believe that frictional unemployment, although it arises due to the movement of individuals between professions and different regions, the main reason for it is the lack of information, and for this reason they call that the imposition of taxes on income helps unemployment and reduces the period of time in which this is given. The subsidy would reduce this type of unemployment.

### **1.2.3 Structural Unemployment:**

Structural unemployment means that kind of unemployment that affects a part of the labor force, due to structural changes that occur in the national economy, and lead to creating a state of mismatch between available employment opportunities and the qualifications and experiences of unemployed workers who wish and seek work. As for the nature of these structural changes, they are either due to a change in the structure of demand for products, or due to a fundamental change in the technological art used, or to structural changes in the labor market itself, or due to the transfer of industries to new settlement locations (Andersen, 2002, pp.178-190).

This type of unemployment can occur as a result of a decrease in demand for certain types of labor, due to the recession in the industries in which they work and the emergence of a demand for certain types of skills that are required to produce certain commodities for high-quality industries. Here unemployment occurs due to structural changes in demand. In this case, it is difficult for the unemployed workers to easily find an opportunity to work, because the levels of expertise and skill required for the available vacant jobs are not available to them, and at the same time, it is difficult for the businessmen to obtain their needs from the required labor because of the lack of supply of this type of labor, i.e. We are faced with a situation of excess supply in one labor market and excess demand in another labor market (Anderson & Richardson, 2013, pp.318-334).

This imbalance remains until the forces of supply coincide with the forces of demand, an accurate example of the nature of structural unemployment resulting from the change in the structure of demand. An army of unemployed miners at this time, when it was not possible to force them to leave these places and leave for other places in search of work or to learn new skills. Technology can also lead to structural unemployment, and a broad example of this is that the high degree of “automation” of production processes and the emergence of machines or robots in the automotive industry have led to the layoff of a large number of workers who used to work on production lines. This type is structural.

Also, structural unemployment can occur due to tangible changes in the work time, and for example in this case there may be a lack of compatibility between their qualifications and experience on the one hand, and what is required for jobs available in the market on the other hand, and here we mention the entry of adolescents and young people into the labor market In large numbers, as the imported industrialized countries have finally known a new type of structural unemployment resulting from the growing globalization phenomenon of Mondialisation in the last quarter of a century, which resorted to the idea of emphasizing multinational companies (Dieckhoff & Gash, 2015, pp.67-90).

#### **1.2.4 Seasonal Unemployment:**

Seasonal unemployment, or what is also known as temporary unemployment, is that type of unemployment in which individuals work for periods and do not work in other periods, as happens in most of the Arab countryside, where the rotation of the wheel of work intensifies in periods and decreases in others, and may be absent in others. Third, if students work, for example, in the summer only and do not work in the rest of the year, and it is worth noting that this type overlaps with what is known as partial unemployment (Caliendo & Schmidl, 2016, pp.1-30).

#### **1.2.5 Partial Unemployment:**

Despite the overlap between seasonal unemployment and partial unemployment, the latter exists if the available labor force is not fully utilized, i.e. individuals work fewer working hours than normal working hours. In developed countries that guarantee unemployment benefit to the unemployed, the numbers of apparent or registered unemployment are very close, so that registered unemployment numbers are taken as a measure of unemployment in the country or region. In developing countries, as a result of the lack of unemployment benefits, with the weakness of the capabilities and efficiency of the employment offices, and the unemployed themselves do not feel the importance of registration, the registered unemployment numbers are much less than the reality of unemployment, although whoever finds a job and is registered compensates for some of the shortcomings (Ervasti & Venetoklis, 2010, pp.119-138).

On this basis, it is possible to look at the registered unemployment numbers as a mere indicator of changes, not as actual numbers, in addition to being a more accurate picture of the unemployment of the educated, i.e. graduates of high schools and universities. Workers usually do not go to employment offices and may not know anything about it. In sum, dealing with the unemployment numbers registered in the Arab countries (if available) should be taken with extreme caution (Kalousova & Burgard, 2014, pp.28–34).

### **1.2.6 Disguised Unemployment**

It occurs when the number of labor or the volume of work (as a variable factor of production) is constantly increasing while the other factors of production such as capital, land, or organization are constant. Thus, the increasing factor of work interacts with less quantities of the fixed elements, and as a result of a decrease in its share of the fixed elements, the marginal product decreases until it becomes zero or even negative, and in commercial production that aims to achieve maximum profit, it cannot be paid as a wage to the worker, his productivity is zero or negative, but in family production in which the relationships of its members are linked to each other, especially in agricultural production, the son or brother may continue to work and obtain wages or income Although its marginal production is zero, and this sometimes happens in the public sector, especially when the state is committed to employing graduates of high schools, institutes, universities, etc., and the number of recruits exceeds the need for work, so the marginal product decreases very much, and disguised or hidden unemployment occurs in the public sector, which is hidden because the person He receives a wage or salary and works outwardly or seasonally, but he does not produce anything real in reality (Taht, Xanthopoulou, Figgou, Kostouli & Unt, 2020, pp.2355–2375).

### **1.2.7 Voluntary and Compulsory Unemployment:**

Voluntary: It is a situation in which the worker becomes idle by his own choice and will, when he submits his resignation from the job he was working in, either because he is reluctant to work and prefers free time (along with another source of income and subsistence), or because he is looking for another better job that

provides him with higher wages and better conditions. Vacation here is optional, not compulsory. As for compulsory: it is the situation in which the worker is forced to become idle, that is, without his will or choice, and it occurs through layoffs, i.e. forced expulsion from work, even though the worker is willing and able to work and is acceptable to the prevailing wage level, and compulsory unemployment may occur when The new entrants to the labor market do not find opportunities for employment, despite their serious search for it, their ability to find it, and their acceptance of the prevailing wage level. This type of unemployment clearly prevails in the stages of cyclical recession in industrialized countries (Ajufu, 2013, pp.307-321).

### **1.2.8 Full Employment**

It may seem, at first glance, that the term employment, or full employment, means the complete disappearance of unemployment, i.e. reaching an unemployment rate equal to zero, but this is not true, as there is always a rate of unemployment that prevails in the national economy at any given period, and it is the destiny Which results from frictional unemployment and structural unemployment, and these two types of unemployment cannot be eliminated or avoided, because they result from dynamic changes and structural conditions of economic construction. For this reason, economists and experts agree that the state of full employment does not always mean that the employment rate is 100%, but rather less than that, and this amount is determined by the size of frictional and structural unemployment (Dickens & Robert, 2012, pp.41-54).

In other words, it can be said that at the level of full employment, the prevailing unemployment rate is the sum of the frictional and structural unemployment rate, which is sometimes called the natural unemployment rate. It can also be said that full employment is achieved if the cyclical unemployment rate is equal to zero. And when an economy reaches the level of full employment, it achieves at this level, in light of its available resources and their optimal utilization, what is called the possible gross national product (GNP), which represents the best attainable level of national product, commensurate with the size of its available resources through the technology used and the size of the labor force. human productivity, and the normal or natural rate of unemployment, at a certain point in

time, and accordingly we conclude that achieving full employment is a cherished goal sought by various countries of the world after the Second World War (Lindsay, McQuaid & Dutton, 2007, pp.539-560).

### **1.3 Measurement of Unemployment:**

Unemployment is measured by relative or rates, and it has been customary that the national economy is considered in a state of full operation if the unemployment rate is about 3% of the workers, so this unemployment is temporary or non-accidental. The normal changes that occur in the means of production and the labor force must cause a little unemployment, even if the national economy is in a state of prosperity and prosperity, and because the economy, motivated by its own strength, prevents this rate of unemployment from increasing, and that this rate of unemployment may pose a problem from an economic point of view, but even this amount of unemployment group of workers (Lindsay, McQuaid & Dutton, 2007, pp.560-564).

Unemployment is measured as the rate of unemployed workers in relation to the population in a certain country, and in other countries the rate is extracted in relation to the labor force. In the absence of accurate statistics on the population and the labor force, the size of unemployment is measured by absolute numbers, or the increase is attributed to the total unemployment size. The duration of unemployment has developed for several years and in this case, it is called long-term unemployment, and its duration may be shortened and it is called short-term unemployment, because the results that may result from the phenomenon of unemployment and the policies required to treat it depend a lot on the period during which the person remains unemployed, and whether it is a long period or short term (Dickens & Lang, 1995, pp.620-636).

Accordingly, the unemployment rate likes to take note of the size and dimensions of the unemployment problem. It requires calculating the unemployment rate, that is, calculating the ratio of unemployed individuals to the available labor force. The term refers to it from a complex group of individual choices and circumstances specific to each economy, in terms of regulatory and legal frameworks

and institutions and the state of job supply and demand in the various labor markets. If the common definition of the unemployed is that individual who is able to work and is willing and looking for it at the prevailing wage level without success, then the unemployed, however, do not constitute a homogenous group, but rather several groups, which vary among themselves in terms of the extent of the high rate of unemployment and the length of the period Unemployment and the extent of suffering from unemployment itself (Mahadea & Kaseeram, 2018, pp.203–226).

There are many bases on which to divide the unemployed. The unemployment rate may be calculated on the basis of sex ratio, or on the basis of rural and urban areas, or on the basis of age, or on the basis of race, and other bases. Calculating the unemployment rate according to these divisions gives completely different results than the average. total unemployment.

Not that the greater the human, statistical and material capabilities, the more details of the mass of unemployment can be published, but the degree of detail and the nature of the division depend on the purpose of preparing the data. In general, unemployment rates among blue-collar workers are usually higher than among women over men. Unemployment rates among adolescents and youth are higher than among adults. In the United States of America, the unemployment rate among blacks is higher than the unemployment rate among whites. It is also noted that unemployment rates in rural areas differ from those in cities (Ajufo, 2013, pp.324-328).

Likewise, the structure of unemployment varies in terms of the nature of the unemployed groups from one country to another. There are unemployed people who have been laid off from their jobs. The unemployed groups also vary in terms of the length of time for unemployment. There is short-term, medium-term, and long-term unemployment.

It should be noted that the duration of the length of time period usually increases during the recession period, when many individuals lose their jobs, and the opportunity to work or obtain work becomes dear to them, and since the unemployed do not constitute a heterogeneous group, there is an inequality in the distribution of



the burdens of unemployment, so if the total unemployment rate had risen, for example, from 6% to 10%, the impact of unemployment could be tolerated from a social and economic point of view, if all working hours and incomes of all the unemployed had decreased by the same rate as the unemployment rate, but this does not happen in practice. There are labor markets that are clearly affected by more damage than others, which reflects the unequal distribution of unemployment burdens (Moamen Gouda & Marcus Marktanner ,2019, pp.897-902).

#### **1.4 Economic Policies in Combating Unemployment**

The science of economics tries to find the cause-effect relationships between different variables and express them in certain patterns. In doing so, it tries to establish a logical and scientific scheme based on numerous assumptions and hypotheses. It tries to explain the direction and form of events with assumptions, hypotheses and unsystematic observations. Economic policy, on the other hand, investigates which variables should be changed in which direction and degree in line with the determined purpose, more actively in the face of events and relations. The main determining organ of economic policy is the “state”. The bureaucratic organs that make up the state become the decision-making unit in economic policy according to the administrative structure of the state. In addition, local authorized decision-making units, different social unions and sometimes international institutions are effective in these decisions (Bagchi et al., 2018, pp.20-27).

Economic policy has various political tools that can be used within the framework of desired or sought-after goals and determined principles. The type and number of these tools that can be used in certain situations are determined by many factors. The most important of these factors are; The determined objectives are the actual state of the economy and the degree of deviation between the objectives, the principles related to the current economic order and the expected behavior of the economic units against the measures taken. In the economic process, which is shaped according to the goals and instruments of the economic policy, production-consumption and exchange activities develop accordingly. Producers and consumers, who are interconnected through commodity and factor markets, are guided, adapted and influenced by policies that influence this process. In this process of influence,

sizes such as prices, production and consumption amounts, wage and interest rates, loan amounts, taxes, subsidies are used as guiding variables (Azeng & Yogo, 2015, pp.208-217).

It may be possible to examine the economic policies in the fight against unemployment in two main groups as "macroeconomic policies" and "microeconomic policies". Macro economic policies; While creating "monetary, fiscal and incomes policy", it is possible to examine microeconomic policies by dividing them into "active employment policies" and "passive employment policies".

### **1.4.1 Macro Economic Policies**

#### **1.4.1.1 Money Politics**

In a country; The Central Bank is the implementer of monetary policy. While implementing the monetary policy, the Central Bank tries to reach the final targets it has determined by using monetary policy tools. In order to reach the final targets, it sets interim targets and operational targets for itself and tries to reach these targets with monetary policy tools. Policy instruments are the methods the central bank uses to change the volume of money and credit. There are three policy instruments, namely "open market operations", "rediscount policy" and "legal reserve policy". The Central Bank tries to influence the size of the monetary base or money multiplier by using monetary policy tools. Accordingly, while open market operations and rediscount policy are monetary policy tools to affect the size of the monetary base, reserve requirement policy is a monetary policy tool used to control the size of the money multiplier (Anderson & Richardson, 2013, pp.334-339).

However, it is clear that there is a trade-off between these targets. Therefore, the Central Bank has to choose one of these targets as the final target. Today, it is accepted that the main objective of the Monetary Policy is to ensure price stability. Because it is thought that other targets can be achieved if price stability is achieved. However, employment has a different importance than other goals. This means price stability in monetary policies to prevent inflation.

Monetary policy is implemented by choosing "expansive" and

"contractionary" policies, taking into account the conjuncture of the economy. What is meant by expansionary and contractionary monetary policy is money supply control. It will realize the money supply with the monetary policy tools mentioned above. Deposit money is an important part of the money supply. In the financial system, the narrow definition of deposit available by check accounts for more than 75% of M1 and roughly 15% of the widely used M3 (the broadest definition of money). As can be seen, the ability of commercial banks to create deposit money depends on their reserves. The central bank's ability to influence the money supply is closely related to its ability to influence the size and scarcity of these reserves (Taht et al., 2020).

Based on the assumption that there is unemployment in the economy, if the money supply in the economy is increased, that is, if the expansionary monetary policy is applied, the interest rate will decrease. This is the process in which the "transfer mechanism" begins. The transmission mechanism is the mechanism that causes changes in money supply and demand to affect aggregate demand. This mechanism works in three stages. The first is the link between the monetary balance and the interest rate. The second is the link between the interest rate and investment expenditure, and the third is the link between investment spending and aggregate demand.

If the money supply changes or there is a shift in money demand, the interest rate will change. For example, if the money supply increases and the liquidity preference function does not change, there will be an excess money supply at the equilibrium interest rate. An excess of money supply will cause the interest rate to fall. Conversely, if there is a decrease in the money supply, the interest rate will rise. If the money supply remains constant and there is an increase in the demand for money, there will be excess demand for money at the equilibrium interest rate and the interest rate will rise. A decrease in the demand for money will also cause the interest rate to fall (Kalousova & Burgard, 2014, pp.34–39).

Monetary changes caused by changes in money supply or demand change the interest rate. Changes in the interest rate cause a change in total expenditures. This is

the second link of the transmission mechanism. The decrease in interest rates will create new investment expenditures by making borrowing cheaper. This negative relationship between investment and interest rate is called the marginal efficiency function of investment. An increase in the money supply causes the interest rate to fall and investment expenditures to increase. A decrease in the money supply causes an increase in the interest rate and a decrease in investment expenditures. A change in the money supply will change the desired investment expenditure and cause the aggregate expenditure curves to shift, and the aggregate expenditure curve will cause the aggregate demand curve to shift (Mahadea & Kaseeram, 2018, pp.226–234).

An increase in the money supply will increase investment expenditures and hence aggregate demand will increase. In the opposite case, the decrease in the money supply will decrease investment expenditures and therefore aggregate demand will decrease. The transmission mechanism provides the link between monetary forces and actual expenditure flows. It works from a change in the money supply or demand to a change in bond prices and interest rates, to a change in investment expenditures, and from there to a change in aggregate demand (Taht et al., 2020).

#### **1.4.1.2 Fiscal Policy**

Fiscal policy; These are the interventions made by the state in the economy through taxes, borrowing and expenditures in order to achieve its goals. The tools of the fiscal policy that the state uses to achieve its goals are public expenditures, public revenues and borrowing. This classification is the most basic classification and there are sub-items within the items themselves.

Many definitions of fiscal policy can be made. Samuelson stated that “a positive fiscal policy is the determination of taxes and public expenditures in a way that will help reduce business cycle fluctuations and maintain a developing full employment economy free from hyperinflation and deflation”. Musgrave, on the other hand, defined a pure fiscal policy as one in which changes in public spending are compensated by changes in tax revenue. Keynes, on the other hand, defined fiscal policy as “regulations in aggregate demand with the aim of ensuring economic stability (price stability and full employment) related to fund flows between public

and private sector activities”.

The concept of fiscal policy began to enter economic policies with the 1929 World Depression. In order to reduce unemployment caused by the crisis arising from the lack of aggregate demand, the necessity of an accurate demand management has emerged and it has been determined that the most important tools are the fiscal policy tools. The people or citizens, or more accurately, the voters brought the party to power, which promised to reduce tax rates and make more public expenditures. In this period, social security expenditures increased and large-scale unemployment benefits were provided to the unemployed. Fiscal policy remained important until the 1970s. However, due to the fact that Keynesian Economic Policies could not explain the stagflation phenomenon experienced in the 1970s, fiscal policy lost its relative importance. However, in the 1980s, 1990s and 2000s, financial dominance, public economy deficits and the informal economy phenomenon played an important role in the financial and real economic crises experienced in some developing countries (Patel & Choga, 2018, pp.217-229).

In short, Modern Fiscal Policy is a product of the Keynesian economic view. Along with the development of the Keynesian view over time, the suitability of financial instruments to socio-economic conditions has increasingly developed. It has been adopted that the state should intervene in the direction and management of socio-economic life in order to ensure economic development, and make incentives and compulsions with the financial and economic decisions it will take. The state will be able to successfully implement these practices within the democratic legal order, in a reassuring environment, by making the people adopt them (Taht et al., 2020, pp.412-422).

#### **1.4.1.3 Income Policy**

Incomes policy is a policy that is "actuated directly by changes in wages and prices". Incomes policy aims to ensure that this distribution does not cause inflation and unemployment by influencing the distribution process of total income. Incomes policy is also known in practice as price and wage controls or standards. These policies are policies that directly affect the incomes of all factors of production such

as wages, interest, profit and rent, and the prices of goods and services, rather than monetary and fiscal measures. It is used to control nominal income and price increases through direct interventions. In other words, in order to ensure stability in wages and prices, it is envisaged that wages and prices should be controlled without being left directly to market conditions (Ervasti & Venetoklis, 2010, pp.145-156).

Incomes policy is based on the assumption that wage and profit increases under full employment conditions can be a source of inflation. In order to prevent this, wage and price increases are subject to the growth and stability conditions of the system with the incomes policy, and restrictions are imposed on the price and investment strategies of producers that exacerbate the conjuncture. The incomes policy, which seems to be a complement to the monetary and fiscal policies used in the fight against economic instability, is not a tool for monetary and fiscal restrictions, but rather a means of the state.

Incomes policy emerged with the changing economic conditions in developed Western European countries since the first half of the 20th century. The inability of classical macroeconomic theory to find a solution to the economic crises experienced in this period and the insensitivity of its advocates increased the reactions against the model. These reactions were countered by J.M.Keynes' work in 1936, which argued that with expansionary monetary and fiscal policies, the public could end the ongoing economic depression. However, with the simultaneous inflation and unemployment problem experienced in the 1970s, a period of instability started again. With the researches, it has been revealed that only monetary and fiscal policies are not sufficient for economic policy targets and incomes policy has gained importance (Lindsay, 2007, pp.610-622).

According to the incomes policy, indirect control of other incomes will be achieved by controlling wages and prices together. At the beginning, the distribution of income was neglected, with much emphasis on the practices for price stability. However, incomes policy has started to include the aim of ensuring fair income distribution over time. Thus, issues such as personal income distribution, factorial/functional income distribution, income distribution between different types

of the same factor, wealth distribution and poverty began to be evaluated within the scope of this policy. Income policy is determined as short-term (legal) and long-term (voluntary) in practice. Short-term or statutory incomes policy; It is applied in the form of "wage-price freeze" for a certain period of time in extraordinary periods such as war and crisis (Patel & Choga, 2018, pp.230-235).

Incomes policy has some social purposes as well as economic purposes. Especially in the implementation of long-term or voluntary incomes policy, labor-capital cooperation and, accordingly, the establishment of social peace are among the main objectives. Social partners make mutual sacrifices and cooperate in order to achieve the economic targets determined through the incomes policy. This process of cooperation brings peace to economic life. Ensuring cooperation between the parties and realizing a process of harmonization between personal interests and social interests is necessary for the economic purposes of the incomes policy. Thus, a close and voluntary cooperation is formed between the parties and between the parties and the state by aiming at the optimal realization of the conflicting objectives with the income policy. Constructive gathering of social partners and adopting approaches that involve mutual sacrifices in accordance with national goals initiates the social dialogue process (Dieckhoff & Gash, 2015, pp.94-98).

In fact, income distribution is an important area of political debate in all economies. Economic management causes a redistribution of incomes of economic units separately and simultaneously both in fund collection and fund allocation processes. The human and physical resource allocation of the markets in accordance with their own dynamics; can be changed again through taxes, transfer expenditures and other regulatory policies. In this new distribution process, the reflection of public costs, the degree of efficiency of economic units in different income categories in economic decisions and the rate of participation in sacrifice become important (Patel & Choga, 2018, pp.222-234).

The current income distribution or reorganization is generally a result of the market model adopted by the country and the economic policies it implements. In fact, economic law, which directs the economic structure and relations system, is determined as a function of economic morality, social value judgments and political

structure. In the economic atmosphere shaped by such factors, mutual sacrifices of social partners, initiation of social dialogue process at macro or micro level, establishment of democratic platforms where all interest groups can openly express their views will play an important role in ensuring economic and social stability (McLeod & Davalos, 2008, pp.22-28).

#### **1.4.2 Micro Economic Policies**

There are many of the micro economic policies

##### **1.4.2.1 Active Employment Policies**

The Organization for Economic Co-operation and Development (OECD) defines active employment policies as “measures to improve the labor market and the work-related qualifications of workers and to promote a more efficient labor market”. The OECD has been supporting the development of active employment policies since the 1960s. The word “active” in the name is taken from policies in Sweden in the 1950s that were a reaction to policies based on wage restrictions. Although there were many job creation and vocational training programs related to labor markets before the second world war, these policies were not referred to as "active employment policies". In 1948, two Swedish economists Gösta Rehn and Rudolph Meidner defined Active Employment Policies for the first time as “a social democratic strategy that keeps inflation under control while achieving the goal of full employment” (Ervasti & Venetoklis, 2010, pp.146-155).

With the publication of these policies implemented in Sweden in the 1960s by the OECD, active employment policies were accepted as a separate policy. The Labor and Social Issues Committee was established in 1961 to encourage active employment policies among OECD member countries. Although the emphasis on the objectives of active employment policies has changed since then, some objectives of the policies have remained in the foreground. At the beginning of these purposes, "developing human resources" and "facilitating the adaptation of the workforce to structural changes by encouraging economic growth" have come. Active employment policies came into the agenda with the increasing unemployment in the European Union and OECD member countries in the 1970s and 1980s (Caliendo, & Schmidl, 2016, 35-39).



By 1994, it was 7.8% in European Union member countries and 11.2% in OECD145. The European Commission has revealed some determinations as the causes of unemployment. These are shown as not investing enough in vocational education, economic development not creating enough employment, high costs of non-wage labor, ineffectiveness of labor markets and long-term structural unemployment. The Organization for Economic Cooperation and Development (OECD) has gathered the employment policies followed in the fight against unemployment in 7 groups. These (Patel & Choga, 2018, pp.222-234);

1. Twinning and consultancy services of the public
2. Vocational training
3. Wage and employment subsidy for the private sector, used in the sense of subsidized employment, assistance to self-employed and direct employment in the public sector
4. Policies for young people
5. Disabled policies
6. Unemployment insurance
7. Early retirement

For vocational education, skill acquisition and development courses are opened by the public and private sectors for the unemployed or for those who are still working in the business or occupation branches required by the economy. Policy makers generally state that these people will be placed in jobs suitable for the vocational training they have received thanks to the courses. They draw attention to the emerging and accelerating global competition in goods and services, which suggest the implementation of these policies, and as a result, to increase the competitiveness of enterprises. Such globalization and competition demands a better motivated and highly educated workforce. Vocational education services, which find an application area as a supply-side policy, are implemented especially through the “young workforce”. Training the young workforce contributes to “market pressure to lower wages”. Since the young labor force is cheap, this situation encourages employers to increase the employment of young labor force (Caliendo & Schmidl, 2016, pp.33-38).

Wage subsidies are realized by “reducing labor costs” of employers who will employ them. These costs can be reduced in two ways. The first is the direct way of changing the wage structure. Another way is to reduce taxes on wages. In some cases, the government announces to employers that it will cover a certain part of the wage or reduce the taxes paid by these employers in return for hiring workers who are documented/announced to be supported through the program. Within the framework of self-employment assistance, the implementation of training, incentive and advisory services for small businesses and self-employed businesses is a very common practice in recent years. Implemented policies can be listed as educating small business managers, reducing the tax burden on small businesses, simplifying public regulations and bureaucratic procedures.

#### **1.4.2.2 Passive Employment Policies**

Passive employment policies aim to compensate for the negative aspects of unemployment, therefore they include measures to provide a certain economic security to the unemployed. These measures are usually unemployment insurance and unemployment benefits.

In general terms, unemployment insurance is intended to protect workers who pay unemployment insurance premiums for periods specified in the law while working in a job or workplace, and who lose their job despite their willingness and ability to work, while trying to find a new job and get a job, while protecting themselves and their family from getting into a difficult situation during this period. It is an insurance branch established by the state, which covers payment for a certain period and to a certain extent in order to prevent it, operates with the insurance technique, and whose financing is generally contributed by the employee, employer and the state. In the meantime, vocational training should be provided and a job placement system that brings employers and workers face to face more easily should be offered, not support” (Mcleod & Davslos, 2008, pp.23-27).

Another application that is described as passive employment policy is "unemployment benefits". Unemployment benefits, which first came to the fore with the aid funds of labor unions, became legal in the early 1900s, first as voluntary and

then as compulsory insurance. Unemployment benefits are fully funded by the state, usually paid to those who have not yet been placed in a job even though they have expired, and include only a lower payment than unemployment benefits; It can cover a certain period of time, as well as neediness, a type of aid paid as long as the state of poverty continues<sup>156</sup>. The difference between unemployment insurance and unemployment benefits is that unemployment insurance is financed by premiums paid by workers while they work, but unemployment benefits are financed by the state (Patel & Choga, 2018, pp.234-239).

### **1.5 Unemployment In Iraq**

Unemployment is one of the most serious problems facing the Iraqi economy because of its economic, social and political effects, in addition to that it represents a waste of the human element. It warns of a defect in the social and political system, as it indicates that the state is unable to perform its duties towards its citizens in light of its fragile structure and sovereignty. and that unemployment in light of these conditions is the appropriate environment for the growth of terrorism and extremism (Mazhar Muhammad Salih, 2008, pp.4-9).

The state's policy of absorbing workers in the state apparatus, especially the security ones, did not succeed in absorbing the growing labor force. Rather, it had negative results, as disguised unemployment appeared in the public sector, which makes it more difficult to combat it because of the negative returns it generates. Reducing the phenomenon of unemployment and then addressing it requires exceptional efforts and a package of integrated policies aimed first at reforming the labor market and reforming the sectors that absorb labor, especially the productive sectors, industry and agriculture, along with reforming the private sector (Kamal Al-Basri, 2007, pp.10-15).

The destruction that befell the Iraqi economy through its entry into three wars and the war and terrorist acts that befell it after the change in April 2003, as well as the undisciplined policy of openness that led to a significant increase in imports, a shortage of local supply, an almost complete halt in production, and a decline in exports (except Oil) and with the growth in oil exports, symptoms of the so-called

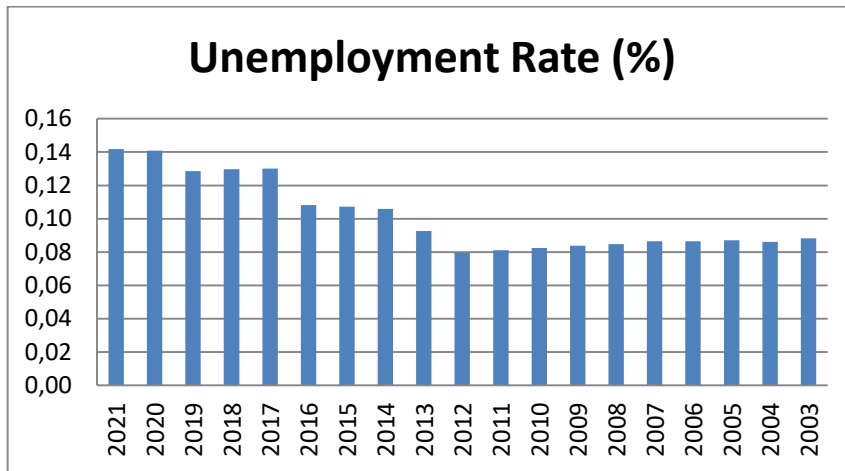
Dutch disease appeared, where agricultural commodities lost their competitiveness with imported commodities, and the country became completely dependent on the outside, and the combination of these economic reasons helped spread the phenomenon of unemployment, in addition to the deterioration in the security file and the heavy legacy left by the regimes The high rates of population growth and the deterioration of the educational system(Muhammad Abd Salih, 2010, pp.23-49). By looking to the table and figure 1 it can be noticed that the unemployment rates in Iraq from 2003 to 2022 ranged between 7 and 14%, with the largest increase in the unemployment rate in 2017 at a rate of 2.2.

**Table 1.** Iraq Unemployment Rate

Year	Unemployment Rate (%)	Annual Change
2021	14.19%	0.10%
2020	14.09%	1.23%
2019	12.86%	-0.10%
2018	12.97%	-0.05%
2017	13.02%	2.20%
2016	10.82%	0.10%
2015	10.73%	0.14%
2014	10.59%	1.33%
2013	9.26%	1.30%
2012	7.96%	-0.16%
2011	8.12%	-0.13%
2010	8.25%	-0.14%
2009	8.39%	-0.09%
2008	8.48%	-0.17%
2007	8.65%	0.00%
2006	8.65%	-0.05%
2005	8.71%	0.10%
2004	8.61%	-0.21%
2003	8.82%	-0.03%

Source : world bank data

**Figure 1.** Iraq Unemployment Rate



### **1.5.1 The General Features Of The Iraqi Economy**

Looking at the economic history of Iraq shows us that this economy is no different from the rest of the economies of developing countries with its abundant financial, material and human resources. It suffers from structural imbalances, not only because of weak economic policies, but also because of the confiscation of the economic decision, so that the decisions that are taken have become of a more political nature than it. Economic, which led to the deepening of those imbalances. Iraq is an oil country, the proven reserves of which reached 115 billion barrels, and it constitutes 11% of the global reserves, which caused nations to fight over it, in addition to its people who destroyed it more than what was destroyed by the greedy invaders. Even its written civilization more than six thousand years ago, but whenever it is destroyed, it is rebuilt again (Kamal Al-Basri, Bassem Abdel Hadi, 2009, pp.68-69).

The destruction during the past thirty years was intentional, and it was not limited to aspects of the economy, but included all aspects of life because of the wars waged against Iran that destroyed everything, then the invasion of Kuwait and the accompanying economic sanctions imposed by the Security Council and the destruction of infrastructure in both Iraq and Kuwait, which were estimated With 448 billion dollars, but the destruction was greater after the invasion of Iraq, as the

damage was not limited to the infrastructure, but rather produced a new economy that was not familiar before. It happened that a security chaos occurred that was unprecedented before, so the life of the citizen was violated, and acts of killing and terrorism spread throughout the country. These conditions imposed on the occupation forces and successive governments to change the order of priorities, as attention focused on combating terrorism and rebuilding the Iraqi army. The absence of The existence of a clear-cut economic policy that exacerbated the deterioration in unemployment and poverty indicators, the deterioration of human security, and the decline in economic growth.

The intervention does not allow us to detail the characteristics of the Iraqi economy, but its requirements require mentioning(Kamal Al-Basri, 2007, pp.10-15):

Disruption of the production structure

Disruption of the structure of exports

The imbalance of the budget structure

External indebtedness

The deterioration of GDP growth rates (other than oil)

The deterioration of human development indicators

High rates of inflation and unemployment coincided

The spread of corruption in all its administrative, financial and political forms

Waste of resources

High population growth rates

Uncontrolled economic openness

### **1.5.2 Causes Of Unemployment in Iraq**

Unemployment in Iraq is the result of the interaction of several factors, including those related to the nature of the Iraqi economy, and others related to the labor market, which was greatly affected by the security situation and the conditions

of war and siege, as well as the dependence of this market on the public sector in generating job opportunities. The exacerbation of unemployment is due to economic, social and political factors. However, there are mechanisms that help generate unemployment, which are:

#### 1. The rentier nature of the Iraqi economy

The Iraqi economy is a rentier economy. Oil accounts for more than half of its gross domestic product and more than 90% of its exports. It is the main source of financing the budget. Despite this importance, it absorbs only 2% of the labor force, in addition to the growth in the sector. Oil does not affect development in the country, which is supposed to grow other sectors three times the growth in the oil sector in order to absorb the workforce. (Mazhar Muhammad Salih, 2008, pp.14-15).

#### 2. High population growth

The population of Iraq reached 6.299 million people according to the 1965 census. It rose to 22 million people according to the last census conducted in Iraq in 1997. However, it was estimated at 29 million people in 2007, at a compound annual growth rate of 2.2%, and 44.5 million people in 2022 at a compound annual growth rate of 2.4% which is one of the highest rates in the world . The growth of the labor force is 5.5%. The most important characteristic of the population is the predominance of the age group under 15 years, which amounted to 43.1% of the total population, and the decrease in the age group over 65 years, which amounts to 2.8%. This indicates a high age dependency rate, which reached 45.9%, which generates pressure on The labor market and to pressures on the state in providing health and educational services.

**Table 2.** Iraq Population Growth Rate From 2003 To 2022.

<b>Year</b>	<b>Population</b>	<b>Growth Rate</b>
<b>2022</b>	44,496,122	2.21%
<b>2021</b>	43,533,592	2.29%
<b>2020</b>	42,556,984	2.39%
<b>2019</b>	41,563,520	2.40%
<b>2018</b>	40,590,700	2.45%
<b>2017</b>	39,621,162	2.39%
<b>2016</b>	38,697,943	2.49%

<b>2015</b>	37,757,813	2.75%
<b>2014</b>	36,746,488	3.56%
<b>2013</b>	35,481,800	4.78%
<b>2012</b>	33,864,447	4.59%
<b>2011</b>	32,378,061	3.56%
<b>2010</b>	31,264,875	3.22%
<b>2009</b>	30,289,040	3.66%
<b>2008</b>	29,218,381	1.95%
<b>2007</b>	28,660,887	-0.85%
<b>2006</b>	28,905,607	0.72%
<b>2005</b>	28,698,684	3.01%
<b>2004</b>	27,858,948	2.92%
<b>2003</b>	27,068,823	3.10%

Source: World Bank Data

### 3. The security situation

The security situation affected the economic and social situation greatly, so that some of them divided the country's regions into hot areas and safe areas, and the security deterioration had an impact on all economic sectors, but the most affected sector is the electricity sector, which is the backbone of life, and most projects have stopped with it, and then The security deterioration has become a constraint on the local and foreign private sector and an obstacle to foreign direct investment, despite the government's attempts to create an investment-attractive environment through issuing the necessary legislation for this environment. Opinions differed on the relationship between security and unemployment, as some believe that unemployment is the cause of the security deterioration While others think otherwise, as the deteriorating security situation produces high rates of unemployment, as is the case in hot areas (Nineveh, Anbar, and Diyala), and this opinion can be rejected because there are safe governorates, but unemployment rates are high, as in Dhi Qar and Muthanna, and there are A third opinion is the most likely, as it believes that the relationship between them is a mutual one, because the lack of security leads to the cessation of reconstruction operations, which leads to the lack of jobs, and then the lack of security in a solution A vicious and tight corner (Muhammad Abd Salih, 2010, pp.29-59).



#### 4 . Corruption

Corruption is considered one of the most serious problems that haunt politicians before economic decision makers, after it has grown in size, its effects have ramified, and its matter has worsened in most of the joints of public institutions. It refers to the moral, social and political aspects, and its danger increases as it leads to distortion of the social fabric and class structures in society. According to the classification of Transparency International, Iraq ranked 178 out of a total of 180 countries based on the Corruption Perceptions Index, preceded only by Somalia and Myanmar. Despite the widespread effects of corruption, its effects on unemployment come from restricting economic growth, as it affects the volume of domestic and foreign investments, because investment avoids an environment in which corruption is rampant, and this is what leads to poverty and unemployment, as it results in a shortage of revenues directed to address poverty. and creating new job opportunities in the economy (Muhammad Abd Salih, 2010, pp.52-59).

#### 5.Trade openness

The imbalance in the foreign trade structure is one of the characteristics of the Iraqi economy, because the export structure is characterized by inflexibility and is focused on oil, as well as the nature of the Iraqi society that consumes and invests more than it produces and saves, and this is what made the Iraqis' demand for foreign products much higher than the foreigners' demand for Iraqi products. Before the change in 2003, the weak market efficiency and the resulting misallocation of resources became the main justification for following a trade protection policy that was built on the pattern of import substitution policy, relying on the state in managing the commercial sector, marginalizing the private sector, and not allowing the foreign sector to work in the commercial field. This development trend is such that economic growth is not sustainable, but the situation has changed after the change, as it has become impossible to accept Iraq's commercial past as evidence of its future because conditions have changed (Kamal Al-Basri, Bassem Abdel Hadi, 2009, pp.76-79).

## CHAPTER TWO

### ECONOMIC GROWTH

#### 2.1 The Concept of The Economic Growth

The term "growth" or "economic growth" is commonly used to describe GDP growth. A country's total worth of goods and services generated during a certain time period is its gross domestic product, or GDP. Both nominal and real terms can be used to measure it. Real GDP calculation entails taking inflation into account and adjusting for inflation. In order to account for inflation's distorting effect on the pricing of produced goods, growth is frequently stated in real terms (Caleb, Mazanai, & Dhoro, 2014, pp.612-622).

Economics typically models growth as a function of the labor force, technology, human capital, and physical capital. Higher economic output is the outcome of improving the quantity or quality of the working-age population, the resources available to them, and the methods available to them for fusing labor, capital, and raw materials. Economic growth has been one of the most important areas of macroeconomics and has been the subject of many studies. For this reason, there are many sources on the definition of economic growth. Roughly speaking, it is the increase in a country's production capacity and the amount of goods and services produced over a period of time, which is usually assumed to be one year (Dritsaki, & Stiakakis, 2014, pp.181-191).

Another definition of economic growth, which varies, is real increases in Gross Domestic Product (GDP), and therefore real increases in GDP per capita, which is obtained by dividing Gross Domestic Product by the country's population. These real increases show that economic growth is a phenomenon that can be measured numerically. It is important to measure the growth in a healthy way whether the growth is real or not, that is, whether the increases in GDP are free from changes in price. Because, when the growth is calculated in nominal terms, the growth compared to the previous year can actually come from price increases, not from an increase in the amount of production. This means a growth that is not reflected in real life (Jayachandran, & Seilan, 2010).

Economic growth generally occurs in two ways. The numerical increases in the production factors of the country are in the form of the expansion of the production capacity or the improvement in the productivity of the production factors. Economic growth is a long-term dynamic variable as the number and productivity of production factors increase but can be observed in the long run. Economic growth can be represented by a rightward shift of the production possibilities curve, which is the combination of all the quantities of goods and services a country can produce (Lucas, 2013, pp.22-31).

Similarly, all the factors that affect the rightward shift of the aggregate supply curve are among the indicators of economic growth. The Gross Domestic Product indicator is used as an important determinant in measuring economic growth. The main thing in Gross Domestic Product is that it takes place within the borders of the country and covers a certain period. Gross Domestic Product is measured in two ways, nominal and real. Nominal Gross Domestic Product (NGDP) is the monetary value of goods and services produced in a country in a given period of time, calculated at market prices, ie current prices. Real Gross Domestic Product (GDP) expresses the value of goods and services produced in a country in a certain time, calculated with the prices of a certain year, that is, at a fixed price (Nguyen, 2017, p.519).

Real Gross Domestic Product is the elimination of annual price changes in Nominal Gross Domestic Product. In other words, Real Gross Domestic Product is Nominal Gross Domestic Product adjusted for inflation. Nominal Gross Domestic Product is not an accurate measure of economic growth. Because some of the increase in Nominal Gross Domestic Product is the increase in the amount of goods and services produced; the other part may be an increase due to the annual price increase, namely inflation. This may also be misleading about the real effects of the calculated growth (Saaed, & Hussain, 2015).

While the GDP of the economy is growing, it is of great importance from which determinant item this occurs. The important point here is to determine the source of the growth. Sustainable growth will be possible in an environment led by the increase in investment expenditures. Thus, the economy will be able to enter the

future with a larger production capacity and this will be the dynamic of a sustainable growth rate. An important point to be considered when dealing with economic growth is the concepts of growth and development, which can be used interchangeably from time to time in colloquial language. Economic growth refers to the numerical increase in the population of the country, the labor force and the functions involved in production (Shihab, Soufan, & Abdul-Khaliq, 2014).

However, economic development refers to the transformation of a country's production structure in such a way that it can produce high added values and to raise the living standards, namely the level of welfare, by equitably distributing the resulting product among the income groups that make up that society. Although economic growth and development are intertwined concepts, economic growth alone is not sufficient for development. However, economic growth is a prerequisite for development to occur. Development in a country's economy; while expressing a positive change in many fields such as education, health, rights, law and freedoms; There is no transformation for economic growth. Although these two concepts are different from each other, they are actually combined in the same event; It is not possible to examine one separately from the other (Surya Bahadur & Khatri Chhetri, 2017).

## **2.2 Types of Economic Growth**

We can briefly explain the types of economic growth under nine headings (Tapşın, 2016).;

**Open Growth:** In this type of growth, production factors such as capital and labor can be obtained from the international platform. In free market economies, this type of growth takes place.

**Closed Growth:** Closed growth occurs in economies where the state intervenes in all kinds of problems of the economy, trade with foreign countries is quite low, and production is based on the state's own resources.

**Planned Growth:** It is the type of growth that is realized by deciding on the issues such as using the resources in the economy as effectively as possible and

obtaining more efficiency from these resources, by deciding how much production will be produced with which resources within a certain plan.

**Spontaneous Growth:** The realization of a certain growth by acting independently of the state intervention of the factors of production is called spontaneous growth.

**Balanced Growth:** It is the growth that aims to have a market, that is, demand, for the output of goods and services obtained with the resources participating in production. Supply creators must find markets for their produce so that there is no waste of resources. In other words, sectors act in an interdependent manner (Winiński, 2003, pp.22-37).

**Unbalanced Growth:** It has emerged with the thought that all sectors in the economy act in a balanced way with each other, which does not correspond to reality.

It is aimed to realize growth by investing in one or several selected sectors.

**Biological Growth:** In this type of growth, economic growth is likened to growth in living things. It is envisaged that the growth will be rapid at first, then a slow growth will take place and that the growth will gradually stop or even regress.

**Stagnant Growth:** It is the type of growth in which the rate of increase in Gross Domestic Product, which is the scale of growth, is equal to the rate of population growth. In other words, in this case, the per capita income growth rate becomes zero (Sothan, 2018, pp.168-183).

**Exponential Growth:** It is the type of growth that defines growth in economies where the rate of growth is increasing.

In the Human Development Report published by the United Nations in 1996, it was mentioned about the bad growth types that are dangerous for the economies and which economies should stay away from. We can explain these growth types as follows:

**Brutal Growth:** While there is an increase in production and income in such a growth, there are problems in the distribution of this income. In other words, as

growth increases, inequalities in income distribution are observed. Most of the growth and income generated is collected in a certain part of the society.

**Unemployment Growth:** Employment is expected to increase in economies where growth takes place. However, despite the increase in growth in some economies, it does not have a reducing effect on unemployment. Such growth is defined by the UN as growth to be avoided.

**Rootless Growth:** When growth occurs in some countries, changes and deteriorations in the social and cultural values of the society may occur. In such cases, even if the economy develops, there is a loss of value in the society. It is among the unwanted growth types in such a growth.

**Silent Growth:** With this growth, individuals in countries experience difficulties in terms of their rights and freedoms, and democratization worsens while growth improves. It is an undesirable growth especially for the society.

**Growth Without Future:** The fact that most of the natural resources used in production for the realization of growth are resources that cannot be converted to nature, a form of growth that threatens the future of both economies and humanity. In economies where this growth is experienced, environmental pollution, the destruction of some plant and animal species, and the destruction of nature are in question. (Sothan, 2018, pp.183-184).

### **2.3 Dynamics of Economic Growth**

Explanation of growth and its sources for policy makers has been very important in determining economic policies and it still maintains its popularity among countries today. Ensuring economic growth and making this economic growth permanent are issues that need to be investigated recently for countries. There are many variables that determine any variable in an economy. Therefore, the sources of economic growth vary. Since we express economic growth as increases in the amount of production, we can show all the factors involved in the production process as the source of growth. We can list these factors as follows (Owusu-Nantwi, & Erickson, 2016, pp.120-124).;

- Capital accumulation
- Population and workforce
- Natural resources
- Technological developments

The function of the factors of production involved in the production process is expressed as follows.

$$Y = f(L, K, N, T)$$

In this function, L is the population, that is, the amount of labor involved in production; K is the capital; N stands for natural resources and T stands for technological progress in production. Let's explain the effects of production factors on growth one by one (Nelson, 2005, pp.109-113):

### **2.3.1 Accumulation of capital**

Capital accumulation is one of the most important factors of production. Capital accumulation includes elements such as various machinery, equipment, buildings, transportation vehicles, industrial equipment and facilities that are necessary for the production of goods and services and facilitate production. In other words, capital is all the tools used for production and made by human hands.

Capital is the most basic and most important resource for economies acting for growth. Because workers can be productive only if they have the tools and physical capital materials they use and are sufficient. It is not possible for workers to replace insufficient capital. Therefore, it is meaningless to talk about the existence of production activity without capital accumulation (Durlauf, 2005, pp.150-157).

If a country has enough income to invest and save, it means that the country can accumulate enough capital. Countries with capital accumulation can produce more by expanding their production capacities. Therefore, countries that can earn high income and accumulate capital gain more income by providing economic growth. If there is a country with insufficient capital accumulation, this country

should strengthen investment in order to increase its capital accumulation and use some of its resources for investment. Allocating some of the resources to investment requires reducing consumption (Dell'Anno, & Villa ,2013, pp.8-13).

### **2.3.2 Population and Labor force growth**

The factor that creates all kinds of muscle and brain power that contributes to production is called labor force. The workforce contributes to production based on both physical and mental strength. Since the increase in population will increase the labor in production, it is the determinant of economic growth. The part of the increase in population that affects production is the part in the working age range. However, not all of this working-age part may be actively working. Therefore, the total workforce is obtained by subtracting the part that cannot work due to military service, education and health reasons from the part in this working age range (Belloumi, 2008).

In addition to providing solidity to the supply side of the economy, that is, to the production process, the population is also actively involved in the consumption and distribution process, which is the demand side of the economy. In other words, the population, which is the subject of economic activities that affect economic growth, on the one hand, is affected by these economic activities on the other. Human capital is involved in production and creates a domestic market for the economy (Akbar, Fatima, 2003).

In addition to the quantitative contribution of the population to economic growth, the qualitative contribution is also important. Having a large active working population increases production and contributes to economic growth. But it is important that the population is also developed in terms of quality. The ability of the population to be healthy, educated and keep up with technological developments positively affects the productivity of the workforce. This is explained by the concept of human capital in the literature. Human capital is related to the knowledge, skills, accumulation and dynamism of the workforce, which is included in the production process and enables the other production factors to be used more effectively and efficiently. In the literature, human capital, which has a very important place



especially in modern growth theories, has been taken into account in conjunction with technological developments. Economists emphasize the necessity of a human capital that assimilates technological development in order to realize and sustain economic growth (Steedman, 2003, pp.73-82).

Population growth will cause an increase in production until the law of diminishing returns of labor comes into effect for the workforce, which represents the population's place in production. That is, it will cause an increase in economic growth. When the marginal productivity of labor ceases to increase faster than its average productivity, each amount of labor added to production will not contribute to the increase in production. In other words, it will cause a negative effect on economic growth. The effect of population growth on production is determined by the employment level in the country. In addition to its positive effect on growth, an important macroeconomic factor used in determining the level of development of countries is the employment rate. Therefore, labor force is a determinant in development as well as its effect on growth (Temple, 1999, pp.112-119).

### **2.3.3 Technological Development**

Technological development affects economic growth in the form of increased productivity and producing more products in a shorter time. Therefore, technological development ensures that the production increase required for economic growth is achieved and that growth is sustainable. In the production process, technology increases our production capacity by enabling us to produce better quality goods at a lower cost with knowledge, technique and organization. Therefore, increases in production capacity translate into an increase in output, which in turn translates into economic growth. Technology can increase the quality of the product produced, as well as providing more output with less input (Tessema, 2016).

In addition, technological development increases capital accumulation and has a positive effect on competitiveness in foreign trade by increasing exports. Today, the level of development and economic power of countries are directly related to technology. Countries with technology have gained production power by processing inputs appropriately, providing efficiency in output and following

appropriate policies and have been among the developed countries (Adel ,2019, pp.84-90),.

In terms of the effects of technological development on distribution, it is possible to divide it into three classes as capital-intensive, labor-intensive and neutral technological development. The same rate of increase in productivity in all production factors is defined as neutral technological development. In other words, it is getting more output with the same amount of inputs of the same quality. Since there is a shift to capital or labor in capital-intensive and labor-intensive technological developments, these technological developments are also called biased technological developments. While labor is saved by using more capital in capital-intensive technological development, capital is saved in labor-intensive technological development (Sothan, 2018, pp.183-184).

#### **2.3.4 Natural resources**

Natural Resources, in short, are all kinds of factors that are not included in the human being used in production. These are natural wealth such as rivers, lakes, seas, soil, mines and underground resources, forests and animals. It is important to effectively incorporate natural resources into production as they are scarce. Natural resources, which differ for each country, are shaped according to the geographical location and structure of the countries, climatic conditions and vegetation. Although the distribution of natural resources on the world is not homogeneous, the effect on the development level of countries is not the same. Natural resources are not indispensable for economic growth because countries that do not already have natural resources can add to their production by trading from countries with natural resources. Having a lot of natural resources in a country can provide an advantage for that country and contribute to economic growth. However, the important thing is not to have a natural resource, but to use that natural resource effectively by processing it with appropriate technology and adding it to production in an organized way (Blecker, 2009, pp.3-17).

## 2.4 The Models of Economic Growth

In economics, the concept of economic development was measured in terms of the precious metals with which the land was occupied in mercantilism. The main strategy to achieve this expansion was to increase the value of selected metals such as gold and silver, to introduce industrial and commercial mandates, to introduce positive practices such as the importance of payments, and most importantly. In international relations, national interest should be taken into account. According to this, the wealth of the state, copper and the state was established at that time. But the Physiocrats fought against mercantilism, claiming that growth could come not only from the industrial sector but also from agriculture (Anwer, & Sampath, 2000, pp.70-83).

They also showed that economic activity is natural and should not be hindered by the state. Physiocrats praised agriculture as a branch of economy that produced “pure” products and based economic liberalism, represented by Adam Smith, David Ricardo, Thomas Malthus, and Karl Marx, under the concept of “let them do it, let them pass” spoken at the meetings of the physiocrats. General ideas about economic growth are found in the classics. For example; Smith and Ricardo described economic growth through the production of Say's Law author and verified Say's law. Smith stated that the expansion will affect the size of the manufacturing market (Winiecki, 2003, pp.37-40).

These views on the role of supply in economic evolution were expressed by Marx, who acknowledged that supply had an important role in the economy, but disagreed with Say's law like Smith and Ricardo. Because, according to Marx, there is no reason to demand supply if the capitalist economy always overcomes the risks of production. In other words, they assumed diminishing returns from factors involved in the production process. Marx expressed this view, which sees the reason for decreasing income in the process of increasing the organic composition of capital

Smith points out the division of labor and specialization as an important element of economic growth. According to Smith, the division of labor develops through the accumulation of capital and the gradual expansion of the market. Among

these views, one of the analysts and an important representative of the economic growth theory, Joseph Schumpeter; It emphasizes important concepts such as rent and innovation, which emphasize the importance of these concepts in the context of economic development. According to Schumpeter, the existence of entrepreneurs in the economy, productivity, innovation and creativity are the main determinants of economic development (Surya Bahadur and Khatri Chhetri, 2017, p.67).

While the classical economic approach reflects the importance of supply in the economic growth process; Keynes viewed demand as a vital factor for economic growth. The experience of the Great Depression of 1929 confirmed the existence of an independent state that stabilized the economy. The Great Depression of 1929 dragged the world into a serious economic recession. During the crisis, industrial production decreased by 44.7% and GDP by 28%. Austria, Germany, Italy, Czechoslovakia and Poland were the countries that suffered the most from the deep recession. The Netherlands, Romania, England and Scandinavia were less affected by the economic crisis than other countries (Snowdon et al., 1998: p.16). Influenced by the Great Depression experience, Keynes insisted on the idea that capitalism was inherently unstable and openly criticized classical economics in his work.

Keynes did not support Say's law and stated that the economy was not stable for a long time. According to Keynes, the economic mechanism is naturally subject to inequality and unemployment. Unlike the classics, Keynes believes in the instability of economic growth and is known for investing in the short term as an important growth factor. The Keynesian model does not take into account the passage of time, and in this context, Harrod and Domar models tried to examine the Keynesian model on a long-term scale (Piatek, 2014: p.49).

Rostow has proposed solving the problem by raising capital, but believes that if it is not possible to raise local taxes, foreign aid will be needed. In addition, Rostow said that the creation of the economy extends from agriculture to industry and the economic development of the whole country. In 1971 Rostow added a sixth step to economic growth, which he called "quality", the continuous improvement in the quality of goods and services. Keynesian growth model developed in a dynamic framework and the concept of growth are discussed in two frameworks. These appear

as Extrinsic and Intrinsic Growth Models after the 1950s (Owusu-Nantwi, & Erickson, 2016, pp.125-130).

Economic growth theories are divided into two main parts. These; exogenous economic growth theory and endogenous economic growth theory. The neoclassical model assumes that technological progress is measured by participation in production growth that cannot be explained by factors of production. In this context, technological progress is perceived as an external factor. In other words, technological progress is the internal process of the economic system and is one of the leading factors of the world economy (Seyidoğlu, 2006: pp.844-845).

#### **2.4.1 Extrinsic Economic Growth Theories**

External economic growth theories are discussed under two headings. These are the Harrod-Domar model and the Solow-Swan economic growth model. Necessary explanations for these models are presented below.

##### **2.4.1.1 Harrod-Domar (Post Keynesian) growth model**

In the production of models called modern development theory based on classical thought, 1929 and the World Great Depression were discussed above. This approach, which takes into account the conditions of balanced economic growth, is based on the assumption of fixed employment of capital at employment scale and fixed returns to scale. In other words, after the 1929 global economic crisis, Keynes came forward to take advantage of fiscal policy to reverse the recession and encourage economic growth, and then, theoretical studies were continued with the participation of Harrod and Domar (Blecker, 2009, pp.20-24).

The Harrod-Domar model is based on two different studies by R. F. Harrod (1939) and D. Domar (1946). The similarities between the studies, much more than their differences. The model is built around a single product, two manufacturer market economy. According to this model, the economy produces a good that can be used for both consumption and financing, and since there is no money in the economy, there is no price. In the model, the state is not involved in economic activity. All economic decisions are made by private sector initiatives and the

economy is closed to the outside world. In other words, the economy lacks commercial and economic openness ( Nelson, 2005, pp.122-125).

The total volume of production is a function of capital accumulation. The change in total output ( $\Delta Y$ ) is equal to the change in fixed capital ( $\Delta K$ ) times the marginal rate of capital output, ie the rate of capital output ( $v$ );

$$Y = (1/v) \Delta K \text{ and } v = K/\Delta Y$$

- Capital accumulation depends on total income and savings rate:  $N=S.Y$

S is total savings and Y is total income, s is the savings rate. The first assumption is that an increase in capital in the economy increases the efficiency of capital. The ratio of capital intensity is measured by the efficiency of using capital. Thus, in countries with low capital intensity, higher output may occur with lower capital inflation. It is believed that capital increase per worker will lead to higher productivity growth. Since this model does not take into account the employment effect, it is seen that the only growth in economic growth is capital gains. The second assumption, in capital's view, is the accumulation of domestic savings. In a closed economy, total domestic savings (S) is equal to total domestic investment (I), which is equal to total capital exchange ( $\Delta K$ ). In this case, the author of the first equation follows this equation (Saaed, & Hussain, 2015, pp.55-64):

$$\Delta Y = (v) S. Y$$

According to the last equation, economic growth ( $\Delta Y/Y$ ) depends on the savings rate (s) and the capital ratio (V). In an article published in 1939, Harrod examined the conditions for transitioning from part-time to full-time. According to Harrod, the desired growth (Gw) should equal the annual growth of the natural population (n). Annual growth, capital savings.

In the example given by Harrod, they show that the growth and human capital variables are independent of each other and they have difficulty in achieving the desired growth. Net investment in the economy generates demand for products while increasing the economy's ability to produce products. For example: the opening of new factories increases the demand for goods such as bricks, steel and hardware. On

the other hand, when the construction of the facility is completed, the production capacity of the economy increases. If these modes of production do not change, a certain amount of capital is required to complete certain production. If  $K$  is a constant load and  $Y$  is the generation equation, the average fixed output load can be represented as  $K/Y$  (Sothan, 2018, pp.190-199).

The marginal capital output ratio ( $\Delta K/Y$ ) shows how much additional capital is required to achieve an increase in output. For example, if the net investment is 60 units and the increase in output is 20 units, the marginal rate of capital exports is three. The reversal of the average return on the good ( $Y/H$ ) shows the average return on the good. If 1 unit of output requires 3 units of capital, the average productivity of capital is  $1/3$ .  $Y/\Delta K$  shows the rate of increasing production capacity to increase the determined capital. In the Harrod-Domar model, it is necessary to either increase the savings rate or use capital efficiency to accelerate economic growth. The purpose of the plan is to ensure continued growth and economic growth. Also, according to this model, adjustment becomes more difficult when the economy falls on the inflation trajectory. As a result, it is difficult to maintain height in a model and the "backrest" comes into play (Caleb, et al, 2014, pp.612-622).

The Harrod-Domar model is insufficient to explain economic growth in countries other than developed countries and exhibits unique attitudes. Especially in the 1950s, various efforts were made to correct the Harrod-Domar pattern deficits. Parts of production are determined by marginal factors of production. It is macro and labor capital. The production of marginal products is reduced and external technologies are produced. That same year, the American economist T. Swan presented a similar model, in which the model in question was called the Solow-Swan model. The Neoclassicals, like the Classics, argue that spontaneous growth and development are natural phenomena and there is no significant difference between them. Classical and neoclassical economic systems view temporal differences in evolution between countries as inequalities (Tessema, 2016, pp.22-31).

The neo-class growth model is a long-term approach that adds to the Harrod-Domar earnings-to-earnings model. Although the Solow study is based on the Harrod-Domar model rather than the reliable method. The Solow growth model

analyzes the relationship between savings, capital accumulation and economic growth. It also discusses the relationship between health, investment and economic growth, which are considered as exogenous variables of human growth and technological development. Comparing the three separate functions, Solow concludes that the Cobb-Douglas production function is more realistic. In a simple Solow growth model, total output is a function of capital and labor (Shihab, Soufan, & Abdul-Khaliq, 2014, pp.24-28);

$$Y = F(K, L) \text{ ve } Q = A \cdot K^\alpha \cdot L^\beta$$

Population growth and technological progress are becoming the main determinants of economic growth as there is a stable precedent for the law of income reduction. A relatively safe country is more capital-intensive than a less-saving country in a stable state. However, the growth rate is stable except for economic growth. While the Solow model alone cannot provide a significant GDP change in the process of technological change, it focuses on two main phenomena. These two main facts are (Adel, 2019, pp.55-60);

- Changing technology increases productivity.
- Labor causes changes in production due to population growth.

The inclusion of continuous technological changes in the Solow model results in a stable, positive situation with no change in GDP per capita and therefore an increase in GDP per capita. The reason for this is that studies on technological progress are evaluated more comprehensively than previous studies. The Solow model helps to understand the large differences in national wealth. Countries that invest most of their resources in physics, art and the efficient use of resources are rich. Countries that cannot combine one or more of these parameters have lower incomes (Jayachandran, & Seilan, 2010).

#### **2.4.2 Intrinsic Growth Theories**

The endogenous growth model is largely based on the work of Romer (1986) and Lucas (1988). Research in this area is significantly different from the neoclassical growth theorem, which assumes that economic growth occurs as a result



of the interaction of some factors in the internal functioning of the economic system in a region. Examples of ingrowth are based on these five main phenomena (Stensnes, 2006);

- The development of military exports is increasing due to various economic developments.
- Technology is exported from industrialized countries to developing countries through foreign direct investment (FDI).
- Head of external development can be made through an external orientation.
- An open economy supports economic growth and the positive effects of technological progress on an economy scale.

He argues that being ready for trade will lead to economic growth sooner. While this issue of endogenous growth models is an important consideration in trade relations, it can lead to slower growth, such as market forces, and specialization in sectors that lack economic dynamics and other social benefits. Proponents of endogenous growth theories argue that economic growth can lead to rapid growth by increasing human capital. In other words, production knowledge can be increased by increasing human capital, technological design and technological infrastructure through technology transfer of better health and education. This is the endogenous growth theory; It explains how nations can advance in the world market by finding complementary goods and services (such as education) within their own economic and political boundaries (Dritsaki, & Stiakakis, 2014, pp.140-147).

#### **2.4.2.1 AK model**

The simplest model to learn from endogenous growth models is the AK model. This model developed by Rebelo simply shows that per capita growth can be sustained in the long run even in the absence of external technological progress, removing the assumption that marginal capital income will decrease (Temple, 1999).

$$Y = AK$$

$$A = Y / K$$

The main feature of the above production function is that income does not reduce capital. K stands for capital and elements of human capital (knowledge, expertise, experience, etc.). Rebelo objects that the variables also explain the growth gap. For example, he predicts that countries with high property taxes and lower property rights will grow more slowly than other nations (Rebelo, 1991: p.509).

#### **2.4.2.2 R&D model**

Arrow builds on the work of Romer (1962) based on an inherent sense of technological progress in the process of economic growth. Romer argues that the liberalization of foreign trade and economic integration with more productive countries with human capital will also have a positive effect on economic growth. According to Romer, per capita income levels between countries do not require convergence. Growth in raw countries may or may not be slow. These events are independent of technological changes or differences between countries. Preferences, technologies, and even the number of people can be the same or fixed. In order to achieve all these results, yield reduction should be avoided (Temple, 1999).

Romer used the current capital stock in a country as an indicator of the knowledge gained in the economic process. In other words, the initial investment is more decisive in that region and therefore the larger the capital stock, the more economical it will be. By changing the production function in this way, capital gains efficiency can be achieved under certain assumptions. In other words, each new investment is more money and more income than the previous one (Tapşın, 2016, pp.27-37).

#### **2.4.2.3 The human capital model**

Perhaps the most famous of the endogenous growth theories, considered the variable human capital model, was developed by Robert Lucas in 1988. Increasing human capital through education greatly contributes to economic growth and thus increases productivity. Lucas put forward the thesis that human capital is greater than physical capital, which describes a long growth process. He argues that creating positive external financing in education is necessary, leading to increased returns on the ladder. The opposite is true in countries that are relatively poor in human capital.

Lucas argues that increasing a person's human capital not only increases his productivity, but also contributes to the production of other products (Shihab, et al., 2014, p.224).

#### **2.4.2.4 Public policy model**

Barro points to government spending as a factor accelerating the growth process. According to Barro (1991), the private sector is sufficient to produce public goods that increase resource efficiency throughout the economy. The positive impact of government spending on inflation and economic growth stems from policies that maximize the benefits of employment and household representation. This policy has a positive impact on economic growth and financial well-being. The negative effect of public expenditures on economic inflation is explained by the depreciation of private savings accounts (Lucas, 2013).

### **2.5 New Trends in Economic Growth**

The concept of industrialization has also brought about the change in the economic welfare of countries with technological change and transformation. The future of the economy depends on its ability to benefit from new technologies. In this context, related technologies such as Blockchain and Internet of Things (IoT) and Artificial Intelligence are revolutionary developments in many areas of economic activities (Caleb, et al., 2014).

#### **2.5.1 Industry 4.0**

Industry 4.0 emerged as a proposal for the development of a new German economic policy based on advanced technology strategies. The basis of the industry 4.0 process is the establishment of machinery and production systems that can work without the need for labor factor.

The Internet of Things (IoT), known as Industry 4.0 technologies, aims at sustainable development with its economic, social and environmental dimensions. By enabling fast, flexible and low-cost production; It provides competitive advantage in many areas such as the allocation of resources, the efficient use of resources in areas such as new products, materials, energy and water efficiency gains. The introduction

of technologies such as the internet of things and services, cyber-physical systems into the production process and the establishment of smart factories is expressed as the Fourth Industrial Revolution, which is the process we are in. With the active use of Industry 4.0, its economic effects have started to be seen (Abdelbary, & Benhin, 2018).

In Klaus Schwab's book on the Fourth Industrial Revolution, there are different views on Industry 4.0. The first view is that the developing technologies will lead to more increases in productivity and economic growth, while the other view is that it affects productivity. With Industry 4.0, it is expected that the demand for products and services will increase by integrating the people whose needs are not met in the world with the world economy (Dritsaki, & Stiakakis, 2014).

### **2.5.2 Artificial intelligence**

The concept of artificial intelligence was first introduced in 1956. Each discipline defines the concept of artificial intelligence in a different way in its own focus. He defined artificial intelligence as a set of calculations that can reason, perceive rationally, and have the ability to act, which evaluates artificial intelligence in four different categories (thinking/acting like a human; rational thinking/acting). In another definition, artificial intelligence is expressed as “a machine-based system that can make predictions, recommendations or decisions that affect real or virtual environments for machines that perform human-like cognitive functions and a set of defined targets” (OECD 2019, p.6).

In the European Union Parliament report published on the economic effects of artificial intelligence, it is thought that artificial intelligence will guide economic growth in three ways (Nguyen, 2017, p.24);

- Thanks to innovative technologies that provide more efficient time management related to the workforce, it will provide a great increase in workforce productivity by up to 40%.

- A new virtual workforce will emerge, capable of self-learning and solving problems defined as intelligent automation.

- New income sources will be created in different sectors with the innovations that artificial intelligence will bring.

### **2.5.3 Blockchain Technology**

Blockchain technology is an electronic payment system that was invented to solve security vulnerabilities and the problem of double spending in digital currencies. In the simplest terms, Blockchain; It is a distributed database that can manage encrypted data on a security-protected and easily accessible network. Blockchain. The difference of technology from today's networks is that it has security systems such as peer-to-peer network, distributed ledger, consensus mechanism and cryptography technologies (Sothan, 2018, pp.13-18).

All countries, which are at the crossroads of global and regional trade in road, rail, air and sea transportation, energy transportation, strive to be the junction and storage center of digital data and economic asset transfer with Blockchain technologies for the sake of economic harmony. Realizing the potential gains of blockchain technology, many states are making serious studies and investments in this regard. Considering that the blockchain technology has just emerged and the changes it brings, it is thought that it will be an opportunity for a country to become a developed country from a developing country. It has been stated that blockchain technology has a structure that can change the traditional economic system in certain areas (Tessema, 2016, pp.48-53).

### **2.6 Economic Growth In Iraq**

Iraq's economy is based on oil. The economy of Iraq, which has eight percent of the world's proven crude oil reserves, entered the process of restructuring after the occupation and civil war. The country's main source of income is oil and natural gas production. The most important strength of the Iraqi economy is its oil resources, and therefore its economy is based on oil revenues (95% of Iraq's foreign exchange revenues were from oil before the Gulf War). The oil possibilities of Iraq caused it to lead its economic development based on oil, neglecting other resources. When we look at its existence apart from oil, we see the industry and then the agriculture

sector, which we cannot think of completely independent from oil (Ada, & Acaroglu, 2014, pp.25-31).

The production factors of a nation are the elements that show that nation's economic strength. As a result, a growth in a country's production factors is a necessary condition for its economic strength to grow.

### 2.6.1 Iraq Economic Outlook

As Iraq benefited from higher OPEC+ quotas, the country's economy is predicted to have grown at the second-fastest rate in MENA last year. Crude output increased by 9.6% yearly in January through December, and oil exports as a whole reached a four-year high in 2022. The absence of a 2022 budget, however, most certainly had an impact on public spending. This institutional deadlock, the threat of rocket strikes, and tensions between security personnel and opposing political factions all probably discouraged investment. Due to the Supreme Court's decision that budget transfers from the federal government to the Kurdish regional government were unlawful, the approval of the 2023 budget was halted just before the new year in January. Although while oil plays a significant role in the Iraqi economy, there is also a sizable amount of activity in other economic sectors. The inadequate data that may be employed in the evaluation is one of the major issues. One major source for the ratings is research on the Iraqi economy conducted by the Iraqi-American Chamber of Commerce.

**Table 3.** Distribution of Iraqi Economy by Main Sectors (%)

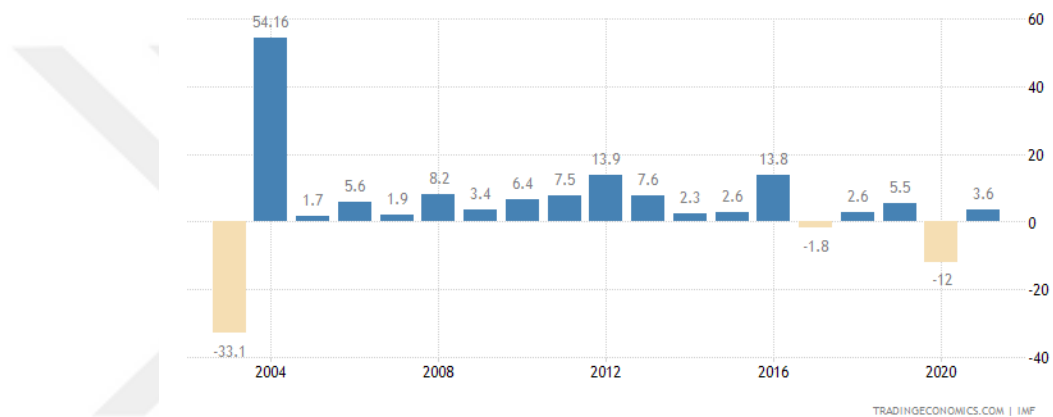
	2003	2008	2013	2018	2022
Agriculture	15,0	12,2	13,4	12,5	12,2
Industry	54,4	59,0	58,5	58,6	59,0
Services	28,0	25,0	27,9	26,0	25,0

Source: Researcher Depending On World Bank Data

When Table 3 regarding the sectoral structure of the Iraqi economy is examined, it can be seen that the industrial sector has a large share in the Iraqi economy. The Industry sector is followed by the Services and Agriculture sector.

Although the data on private sector activities during the occupation period are limited, according to a study conducted by the Iraqi-American Chamber of Commerce, while the number of private companies in Iraq was 16 on average before the occupation, this number decreased to an average of 12 after the occupation.

**Figure 2.** Iraq GDP Annual Growth Rate (2003-2022)



Source: Researcher Depending On World Bank Data

Iraq's economy expanded by 3.6 percent year-on-year in 2021, bouncing back from a decline of 12 percent in 2020. In 2003, when Iraq was invaded by the United States, its gross domestic product (GDP) was down nearly 33 percent below the level of Zero returned to grow until 2017, when the growth rate reached -1.8, then in a year it increased in 2018 and 2019, and decreased in 2020 due to the Corona pandemic by -12%, and in 2021 the gross domestic product of Iraq reached 3.6%.

In Iraq, oil extraction is the most important sector of the economy and accounts for 55 percent of the GDP. The service sector makes up 33% of output. Within services, the largest segments are: community, social and personal services (13 percent of GDP); Finance, insurance and real estate services (9%), wholesale and retail trade, restaurants and hotels (7%). Manufacturing, construction, and the

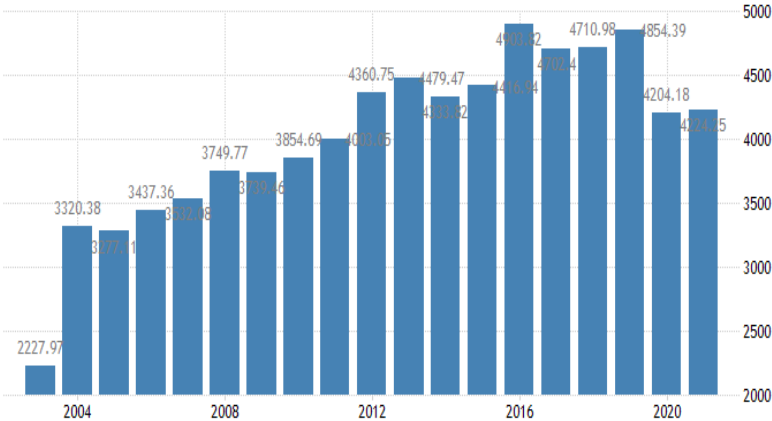
production and distribution of water and electricity account for 8 percent of wealth, agriculture, forestry, and hunting and fishing account for the remaining 4 percent.

### 2.6.2 Iraq GDP per capita

The GDP per capita is obtained by dividing the country’s gross domestic product, adjusted by inflation, by the total population.

From the figure 3, we note an increase in per capita GDP in Iraq from 2003, when it was \$2,227 to \$4,852 in 2019, then it decreased to about 4,200 in 2020 and 2021.

**Figure 3.** Iraq GDP per capita (2003-2022)



Source: Researcher Depending On World Bank Data



## **CHAPTER THREE**

### **METHODOLOGY AND MODELLING**

In this part of the study, the researcher discussed the data to test the relationship between unemployment and economic growth in Iraq between 2003 and 2022, and the methods used in the analysis, analyzes, and results that were reached were also discussed.

#### **3.1 Data and Analyses**

The variables used in the study thesis to analyze the relationship between unemployment and economic growth in Iraq are unemployment, labor and capital as independent variables and economic growth as a dependent variable. The relevant period range covers the period from 2003 to 2022. These variables, which were generated for the purpose of the study, were first tested for stability and their degree of integration was determined. Next, an ARDL association test analysis was performed between the variables.

The relationship between unemployment, economic growth, and inflation in Iraq was tested through ARDL cointegration analysis. The data is taken from the World Bank database and the Statistical Center in Iraq.

Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) unit root tests were taken into account for this stationarity in the thesis study. After the stationarity test, ARDL cointegration analysis test was applied for the relationship between the variables in the model and evaluation was made.

##### **3.1.1 Time Series Unit Root Tests**

Unit root testing should be performed to determine whether variables are static or not. This is very important because as long as the variables are not constant, the logarithmic form of the functional relationship will not be robust. Several unit root tests such as Augmented Dickey-Fuller Test (ADF), Phillips-Perron (PP) test will be used to test the constant nature of GDP, UN, LA, and CA.

## 1- Augmented Dickey-Fuller Test (ADF)

In econometrics and measurements review, an expanded Dickey-Fuller test (ADF) tests the invalid theory that a unit root is available in a period series test. The elective theory is different relying upon which adaptation of the test is utilized, yet is generally stationarity or pattern stationarity. It is an increased rendition of the Dickey-Fuller test for a bigger and more muddled set of time series models.

ADF measurement which utilized in the test, is a negative number. The more regrettable it is, the more grounded the dismissal of the theory that there is a unit root at some degree of confidence.

The premise of the unit root test is as follows:

H0: unit root (non-stationary)

H1: no unit root (stationary)

## 2- Phillips-Perron (PP) test

Phillips-Perron test is a unit root test. This test is utilized in time series investigation to test the invalid hypothesis that a time series is coordinated of order 1. It expands on the Dickey-Fuller test of the null hypothesis  $\rho=1$  in  $\Delta y_t = (\rho - 1) y_{t-1} + u_t$ , where  $\Delta$  is the first difference administrator. Like the Augmented Dickey-Fuller test, the Phillips-Perron test resolves the issue that the interaction creating information for  $y_t$  could have a higher request of autocorrelation than is conceded in the test condition making  $y_{t-1}$  endogenous and in this way negating the Dickey-Fuller test. While the increased Dickey-Fuller test resolves this issue by presenting slacks of  $\Delta y_t$  as regressors in the test condition, the Phillips-Perron test makes a non-parametric rectification to the t-test measurement. The test is hearty regarding unknown autocorrelation and heteroscedasticity in the aggravation cycle of the test equation.

The null hypothesis of the Phillips-Perron (PP) test is that there is a unit root, with the alternative being that there is no unit root. If the p value is above the critical size, then zero cannot be rejected there and the string looks like a unit root.

Hypothesis of unit root test is as follows:

H0: unit root (non-stationary)

H1: no unit root (stationary)

### **3.1.2 Optimum Lag Selection**

The goal of selecting the best lag is to eliminate residual correlation. Literature provides several options, including the Akaike, Hannan-Quinn, and Schwarz information criterion, as well as Sim's The likelihood test To avoid losing degrees of freedom, the number of delays is normally kept to a minimum of one or two.

The lag length selection is affected by the maximum delays assigned as well as the selection criteria, such as AIC and SIC, among others. If there is no specification problem, it is acceptable to use a limited number of delays. More delays, on the other hand, might be beneficial when there is a specification problem.

### **3.1.3 ARDL Test**

The ARDL model is a dynamic model that uses bounds testing as an alternative approach to cointegration (in the presence of one integrator - one dependent variable). One of its benefits is that it interprets the dependent variable based on its previous values and the previous values of the independent variables.

This model works by testing limits to detect the co-integration between the different variables in degrees of integration (zero and one or only one), provided that the dependent variable is stable in the first degree. It is a good model in the case of small samples and enables us to estimate the short and long-term relationship in the same model. This does not mean that it is free from some defects.

Hypothesis of ARDL test is as follows:

H0: There is no cointegration relationship between the variables used.

H1: There is cointegration relationship between the variables used.

### 3.2 Model Specification

The purpose of this thesis is to consider the impact of unemployment on economic growth in Iraq, and the variables of production, which are capital and labor, will be added to unemployment because it is closely related to unemployment and economic growth. Moreover, this study will attempt to determine which of these variables has the greatest impact on economic growth in the Iraq region.

The annual statistics for the period from 2003 to 2022 were collected from the indicators of the statistics of the International Data Bank and the Statistical Center of Iraq. Economic growth (GDP) is the dependent variable for the study, and GDP will be used as an indicator of economic growth denominated in US dollars. The independent variables for the study include unemployment (UN), labour (LA), and capital (CA).

Economic growth or Gross Domestic Product is the main factor for measuring the standard of living as we mentioned earlier. Unemployment, labor force, and capital are factors that directly affect economic growth. The main formula that studies the relationship between these factors is as follows:

$$\text{GDP} = f(\text{UN}_t, \text{LA}_t, \text{CA}_t) \quad (1)$$

To study the impact of the unemployment, labor force, and capital on the economic growth, the previous formula has been situated in algorithm formula:

$$\ln \text{GDP}_t = \beta_0 + \beta_1 \ln \text{UN}_t + \beta_2 \ln \text{LA}_t + \beta_3 \ln \text{CA}_t + \varepsilon_t \quad (2)$$

Where  $\varepsilon_t$  is one period delayed error correction term (ECT) calculated from a functional relationship in logarithmic form, and this is the second equation for the short run equation. The error correction term indicates how quickly imbalance between short-run and long-run GDP will be removed. As a result, the error correction term is projected to be statistically significant and negative. Furthermore, it reflects a change in GDP, UN, LA, and CA.

Equation (1) will be used to detect co-integration. In the following step, level coefficients will be detected in equation (2). And finally, error correction model will

be estimated by equation (3) in order to determine long-term path of dependent variables and short-term coefficients. The equation for determining the long-term impact will be in the following form.

$$\Delta \ln \text{GDP} = \beta_0 + \beta_1 \sum \Delta \ln \text{IUN}_{t-1} + \beta_2 \sum \Delta \ln \text{LA}_{t-2} + \beta_3 \sum \Delta \ln \text{CAI}_{t-3} + \phi \text{ECT}_{t-i} + \varepsilon_t \quad (3)$$

### 3.3 Findings

#### Unit Root Tests

Findings and ratings regarding the results of the application are shared in the tables below. The unit root test process is evaluated for the variables used to analyze the relationship between unemployment, economic growth, and inflation in Iraq.

**Table 4.** ADF test Results

Variables	Fixed		Fixed Fixed and trending	
	t-statistics	P value	t-statistics	P value
Growth	-7.423643	0.0000	-7.255724	0.0000
Unemployment	-1.646672	0.4634	-2.247462	0.2456
F Unemployment	-3.557548	0.0000	-3.188624	0.0000
Capital	1.401864	0.2417	1.585724	0.3732
F capital	3.297843	0.0000	2.576528	0.0000
Labour	1.107441	0.2363	1.310772	0.3645
F labour	4.363623	0.0000	4.042577	0.0000

The results of the ADF test are given in Table 4 above. The table shows the t-statistics and probability values calculated considering both the static model, the static model, and the trend model. When the models of the constant and variable trend of the unemployment, labor and capital variables are taken into account, it is seen that the level is rooted in unity and becomes constant when the first divergence

is taken into account. On the other hand, the growth variable was found to be constant at the level. In the model, static, stationary, and vector models were evaluated by considering a 1% significance level for both variables. In short, unemployment and capital and labor, which are two variables in the ADF, are complementary of the first degree, and growth is stable at the level.

**Table 5.** PP Test Results

Variables	Fixed		Fixed and trending	
	t-statistics	P value	t-statistics	P value
Growth	-6.342531	0.0000	-5.645647	0.0000
Unemployment	-1.634243	0.5663	-2.635256	0.3143
F Unemployment	-4.647568	0.0000	-3.565454	0.0000
Capital	1.535356	0.2362	1.664536	0.4535
F capital	3.072354	0.0000	2.115476	0.0000
Labour	1.227621	0.2663	1.432286	0.3645
F labour	5.488623	0.0000	4.522986	0.0000

In Table 5 above, according to the PP test results, the t statistics and probability values are given considering both the static model and the static and vector model. unemployment and when the constant and constant trend models are taken into account, it is seen that the inflation variables have a unit root in the level and become constant when the first variation is taken. On the other hand, the growth variable was found to be constant at the level.

In the model, static, stationary, and vector models were evaluated by considering a 1% significance level for both variables. In short, in the PP test, unemployment and inflation were first-order integrated variables, while growth remained stable at the level. As shown by stability tests, in the model, it is seen that economic growth is constant at the level, while unemployment, capital and labor are constant at the first difference. For this reason, the ARDL limit test was applied.

## Lag Selection Test

**Table 6.** Lag Selection Test Result

Selection-order criteria  
Sample: 2003 = 2022  
Number of obs = 20

lag	LL	LR	df	p	FPE	AIC	HQIC	SBIC
0	-243.602				1.6e+08*	24.5602*	24.5797*	24.6598*
1	-241.298	4.6091	4	0.330	1.9e+08	24.7298	24.7881	25.0285
2	-240.953	.6904	4	0.953	2.8e+08	25.0953	25.1924	25.5931
3	-239.401	3.1038	4	0.541	3.7e+08	25.3401	25.4761	26.0371
4	-234.091	10.619*	4	0.031	3.5e+08	25.2091	25.384	26.1053

Note: \* indicates lag order selected by the criterion, LR: sequential modified LR test statistic (each test at 5% level) FPE: Final prediction error, AIC: Akaike information criterion, SC: Schwarz information criterion, HQ: Hannan-Quinn information criterion

In the second step, the researcher conducted a test to choose an appropriate delay value to verify the long-term and short-term correlations using the ARDL model. . The results shown in the above table show that lag 1 is the best delay number for testing long and short-run relationships in our ARDL model.

## ARDL TEST

If the variables are not stationary at the same level, the ARDL model can be used. This model is a test for the cointegration relationship between variables that are stationary at different levels or have different levels of unit root. In the analysis, first, the appropriate lag length is checked in order to determine whether there is cointegration or not. Appropriate lag lengths are Akaike and Swartz. criteria and the model are estimated by the Least Squares method (Least Squares).

In testing the hypotheses, the calculated F test values are compared by determining the lower and upper limits. If the lower limit is greater than the F test values, it is seen that there is no cointegration relationship, that is, the H0 hypothesis is accepted. In this case, there is no cointegration relationship between the variables used.

On the other hand, if the F test value is greater than the upper limit, it is seen that there is a cointegration relationship, that is, the H1 hypothesis is accepted. In this case, there is a cointegration relationship between the variables used. If the calculated F test value falls between the lower and upper limits, then no definite inference can be made about the existence of a cointegration relationship. After the analysis, the long-term relationship is determined.

**Table 7.** ARDL Model (1,0,0,0) Results

Significance level Lower limit Upper limit	Lower limit	Upper limit
<b>%10</b>	2.24	3.18
<b>%5</b>	3.14	3.92
<b>%1</b>	4.34	5.86
<b>Calculated F stat value</b>	8.42572	

It is seen that the F statistical value calculated according to the ARDL limit test results is greater than the upper critical value of the table. In other words, since the calculated F statistical value is 8.42572 and is greater than the upper critical values of the table, there is a cointegration relationship between the variables.

Estimated short- and long-term statistical values and results for the cointegration relationship are given in table 8 and table 9.

**Table 8.** Long-run ARDL (1,0,0,0) Results

Variable	coefficient	Standard error	t-statistics
Growth (GDP)	-0.53634	0.2632	-1.26*
Unemployment (UN)	-0.51635	0.2597	-1.17*
LA	0.66746	0.17445	0.82*
CA	-0.74563	0.57441	1.56**
C	-4.53746	0.25217	-2.33

Source: researcher design

Notes: Dependent variable = GDP. \*\*\*, \*\*, and \* represent significance at 1%, 5%, and 10%, respectively.



After performing analyzes of the VAR Lag Order Selection Criteria and setting the optimal lag to 1, we will use the ARDL model to construct whether there is a relationship in the long run between unemployment, employment, capital and economic growth. Table 9 shows the estimated results of the ARDL equation over the time period of the study. The results of the long-term equation show that unemployment has negative effects with statistical significance on economic growth in Iraq in the long run, but capital and labor are positively related to the Gross Domestic Product (GDP), which is statistically significant in the long run.

### Short-run equation results

The ARDL short-run equation results are reported in Table below.

**Table 9.** Short -run ARDL (1,0,0,0) Results

Variable	coefficient	Standard error	t-statistics
$\Delta GDP(-1)$	-0.3455	0.1163	1.44***
$\Delta UN$	-0.234	0.1432	-0.54**
$\Delta LA$	0.1544	0.6554	2.24**
$\Delta CA$	0.1245	0.7543	0.34**
C	1.265	0.2215	-1.54
$ECT(-1)$	-0.365	0.0573	-3.451***
Dependent variable = $\Delta GDP$			
R-square		0.8643	
Breusch-Godfrey LM test		1.1067343	
Statistical value ARCH test		5.354661	
Jarque Bera Stat value		1.046356	
Heteroskedasticity Test statistical value			

Source: researcher design

Over the course of a year, 36.5% of the disequilibrium is corrected. The findings show that capital stock and labor have little effect on economic growth in the near run. The findings also suggest that unemployment has a detrimental impact on economic growth in the short term. According to the results in Table above, it is seen that there is no autocorrelation for the Breusch-Godfrey LM Test, there is no normal distribution problem in the model for the Jarque Bera value, and there is no problem of varying variance in the model for Heteroskedasticity. In short, while economic growth is constant in the model, so are unemployment, capital and labour. It is fixed

at the first difference. After determining stability, the model was created and the dependent variable was economic growth, and the independent variables were unemployment, capital and labor.



## CONCLUSION

Unemployment can be viewed as a negative issue with a devastating impact on the social and economic life in the country, as all countries seek to get rid of this problem, first and foremost, in order for people to survive and continue to practice their activities and lives and secure an income that enables them to survive from by providing for their basic needs. Therefore, measures must be taken to eliminate the negative effects of this phenomenon on the economy first, and active employment policies and practices that will increase job opportunities should be implemented, especially in Iraq, since the country has suffered from wars and terrorism during the past years.

The main objective of this study is to study the impact of unemployment on economic growth through the gross domestic product. Based on the assumption that unemployment has negative social, economic, political, cultural and psychological effects, this study aims to develop ideas through which to reduce the problem of unemployment, which is one of the most important problems of today's societies, and increase economic growth.

In the study, a negative relationship was found between economic growth and unemployment, and a positive relationship was found between capital and labor investments and GDP according to the production function. In this context, every policy that increases capital investment and utilization of the labor force reduces unemployment and increases the economic growth of the state, and every policy that reduces that increases unemployment and reduces the state's gross domestic product, i.e. economic growth. Where it is noted that there is a statistically significant result between growth and unemployment during the short and long-term period, and this is consistent with the results of the studies reached by each of the (Abdelbary, & Benhin, 2018; Surya Bahadur & Khatri Chhetri, 2017 and Ada, & Acaroglu, 2014).

Access to employment and benefiting from human capital depends mainly on ensuring a sustainable economic growth environment and increasing Iraq's economic competitiveness. As one of the reasons for the increase in unemployment in the labor force in addition to political factors and terrorism is the increase in migration from

the village to the city as a result of the decrease in agricultural employment, and the fact that women, as a result of cultural and religious factors, do not participate effectively in work, and the weak practical application of engineering studies and others, in addition to political and administrative corruption and immigration .

It can also be said that economic growth must create a labor force, as this leads to unemployment and, in the long run, to weak growth. The structural features of the labor market that restrict employment and growth must be identified, and economic policies must be put in place to support overcoming these restrictions. In order to ensure a sustainable and high growth rate, social dialogue and national competitiveness policies must be defined and implemented.



## RECOMMENDATIONS

The study reached a set of important recommendations:

First, many researches must be conducted during different periods of time and by taking into account other variables such as foreign direct investment, foreign trade, etc. to reach results that can be generalized, in addition to taking the case of Arab countries similar to Iraq.

Employment strategies and policies should be developed at the level of the Iraqi state and implemented. The international competitiveness of the Iraqi economy must be taken into account and administrative corruption must be fought.

When the strategic objectives of the state are set and decisions are taken, the needs of the labor market and the amount of capital that must be employed must be studied in a way that contributes to the development of the economy based on the production equation.

Work must be done to develop other non-oil sectors such as agriculture, industry and trade in order to employ a larger number of workers, especially in the agricultural sector, which attracts large numbers of workers, and not to rely solely on the revenues of the oil sector.

There is an urgent need to develop joint social work in Iraq and to overcome the inherited culture that urges the non-participation of women in the labor market, and to improve social concepts, in addition to raising the educational level of Iraqi women, as well as for workers in the agricultural sector and professions.

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