REPUBLIC OF TURKEY
ISTANBUL GELISIM UNIVERSITY
INSTITUTE OF GRADUATE STUDIES

Department of Economics and Finance

MEASURING AND ANALYSING THE IMPACT OF THE WORKING- AGE MALE POPULATION GROWTH ON THE UNEMPLOYMENT RATE IN IRAQ FROM (1992 TO 2023)

Master Thesis

Mustafa Jaafar Hussein SULTANI

Supervisor

Asst. Prof. Dr. Iryna SKAVRONSKA

Istanbul – 2025

THESIS INTRODUCTION FORM

Name and Surname	**:**	Mustafa Jaafar Hussein SULTANI
Language of the Thesis	**:**	English
Name of the Thesis	**:**	Measuring and analysing the impact of the working-age male population growth on the unemployment rate in Iraq from (1992 to 2023)
Institute	**:**	Istanbul Gelisim University Institute of Graduate Studies
Department	**:**	Economics and Finance
Thesis Type	**:**	Master
Date of the Thesis	**:**	12.05.2025
Page Number	**:**	80
Thesis Supervisors	**:**	Asst. Prof. Dr. Iryna SKAVRONSKA
Index Terms	**:**	Key words (Iraq, population growth, working-age males, unemployment rates, economic indicators)
Turkish Anstract	**:**	Bu çalışmanın amacı Irak'ta çalışma çağındaki erkek nüfus artışının işsizlik oranına olan etkisini ölçmek ve analiz etmektir.
Distribution List	**:**	1. To the Institute of Graduate Studies of Istanbul Gelisim University 2. To the National Thesis Center of YÖK (Higher Education Council)

Signature

Mustafa Jaafar Hussein SULTANI

REPUBLIC OF TURKEY
ISTANBUL GELISIM UNIVERSITY
INSTITUTE OF GRADUATE STUDIES

Department of Economics and Finance

MEASURING AND ANALYSING THE IMPACT OF THE WORKING- AGE MALE POPULATION GROWTH ON THE UNEMPLOYMENT RATE IN IRAQ FROM (1992 TO 2023)

Master Thesis

Mustafa Jaafar Hussein SULTANI

Supervisor

Asst. Prof. Dr. Iryna SKAVRONSKA

Istanbul – 2025

DECLARATION

I hereby declare that in the preparation of this thesis, scientific ethical rules have been followed, the works of other persons have been referenced in accordance with the scientific norms if used, there is no falsification in the used data, any part of the thesis has not been submitted to this university or any other university as another thesis.

Mustafa Jaafar Hussein SULTANI

/ /2025

TO ISTANBUL GELISIM UNIVERSITY

THE DIRECTORATE OF GRADUATE EDUCATION INSTITUTE

The thesis study of Mustafa Jaafar Hussein SULTANI titled as Measuring and analyzing the impact of the working-age male population growth on the unemployment rate in Iraq from (1994 to 2023) has been accepted as MASTER in the department of Economics and Finance by out jury.

Director _____

Assoc. Prof. Dr. Deniz Dilara DERELI

Member _____

Asst. Prof. Dr. Iryna SKAVRONSKA

(Supervisor)

Member _____

Asst. Prof. Dr. Onur CELIK

APPROVAL

I approve that the signatures above signatures belong to the aforementioned faculty members.

... / ... / 20..

Prof. Dr. Izzet GUMUS

Director of the Institute

SUMMARY

Iraq faces many challenges related to its growing population, especially among working-age males. This is accompanied by a rise or fall in economic indicators. Statistics show a significant increase for this specific group, although some of these indicators have a negative and some a positive impact on economic growth. Therefore, studying unemployment rates is an important topic that changes periodically and appears annually and affects specific groups that represent the most important segment of society: working-age males. The unemployment rate is used to measure the percentage of those who do not work actively seeking work compared to the total labour force. This indicator reflects Economic potential to provide sufficient job opportunities for the population and is therefore an important tool for assessing a country's economic situation. This study the impact of the increasing number of males in the Republic of Iraq within the age group (15-64) on the unemployment rate and its percentage for the years between 1994 and 2023 using data analysis, measurement, and testing through statistical programs by measuring the correlation between variables and the positivity and negativity of that relationship. The data of the World Bank Group was used, as well as part of the data of the Central Statistical Organisation in Iraq. This data represents the growth rate over (30) years for the targeted study so that a clear picture of the population and growth rates appears, ensuring that they are tested and analysed, their relationship with unemployment rates is found, and solutions and future predictions for that relationship are found. The theoretical aspect included a set of theories and ideas that present the subject of the study and the vision of scientists regarding the increase in population numbers and its impact on economic growth, as some explained that it is an economic problem resulting from the increase in population numbers without controls, while others see it as an economic wealth that requires sound management of these resources, and some see it as a problem related to class and capitalism. These opinions were included in the research, and the theoretical aspects that support the practical aspect were taken into consideration, meaning that the problems of the theoretical aspect apply to the subject of the study and the target society in Iraq. The practical aspect included the use of the quantitative approach in the study and focusing on collecting and analysing numerical and statistical data. The aim of this is to test hypotheses and determine the relationships between variables using statistical tools and methods, as well as analyse annual

changes in growth rates and unemployment rates by studying the tables provided and extracting the average growth rate and comparing the results with other years and predicting the annual increase in population and unemployment rates in the future. The Excel program was used to find the average annual growth rate and apply mathematical calculations, as well as the SPSS program to find measures of central tendency, as well as the regression equation and Pearson's correlation. A coefficient used to determine the strength and direction of the linear relationship between two variables, where the relationship is directly proportional between the two variables, i.e., when the number of males of working age increases, the unemployment rate increases.

Key Words: Iraq, population growth, working-age males, unemployment rates, economic indicators.

.

ÖZET

Irak, özellikle çalışma çağındaki erkeklerde artan nüfusla ilgili pek çok zorlukla karşı karşıyadır. Buna ekonomik göstergelerde artış veya azalışlar eşlik ediyor. İstatistikler bu özel grupta önemli bir artış olduğunu gösteriyor, ancak bu göstergelerin bir kısmının ekonomik büyüme üzerinde olumsuz, bir kısmının da olumlu etkisi var. Dolayısıyla işsizlik oranlarını incelemek dönemsel olarak değişen ve her yıl ortaya çıkan, toplumun en önemli kesimini oluşturan çalışma çağındaki erkekleri ilgilendiren önemli bir konudur. İşsizlik oranı, toplam iş gücüne kıyasla aktif olarak iş arayan işsizlerin yüzdesini ölçmek için kullanılır. Bu gösterge, ekonominin nüfusa yeterli iş imkânı sağlama yeteneğini yansıtır ve bu nedenle bir ülkenin ekonomik durumunu değerlendirmek için önemli bir araçtır. Bu çalışma, Irak Cumhuriyeti'nde yaş grubu (15-64) içindeki erkek nüfusunun artmasının etkisine ışık tutmaktadır.erkek nüfusun sayısındaki artışın (1994-2023) yılları arasındaki işsizlik oranı ve yüzdesi üzerindeki etkisini açıklamaktadır. Veri analizi, istatistiksel programlar aracılığıyla ölçüm ve test edilerek, değişkenler arasındaki ilişki ve bu ilişkinin pozitifliği veya negatifliği yüzde olarak ölçülmektedir. Dünya Bankası Grubu'nun verileri ve Irak'taki Merkezi İstatistik Örgütü'nün verilerinin bir kısmı kullanıldı. Bu veriler, hedeflenen çalışma için (30) yıllık büyüme oranını temsil eder, böylece nüfus ve büyüme oranlarının net bir resmi ortaya çıkar, test edilmelerini, analiz edilmelerini ve işsizlik oranlarıyla ilişkilerinin bulunmasını ve bunun için çözümler ve gelecek tahminlerinin bulunmasını sağlamak. İlişki.Teorik yön, çalışmanın konusunu ve bilim insanlarının nüfus sayısındaki artış ve bunun ekonomik büyüme üzerindeki etkisine ilişkin vizyonunu sunan bir dizi teori ve fikir içeriyordu. Bazıları bunun nüfus sayısındaki artıştan kaynaklanan bir ekonomik sorun olduğunu açıkladı; kontroller olmadan, bazıları bunu bu kaynakların sağlam bir şekilde yönetilmesini gerektiren ekonomik bir zenginlik olarak görürken, bazıları da bunu sınıf ile ilgili bir sorun olarak görüyor. KCapitalism. U görüşler araştırmaya dahil edildi ve pratik yönü destekleyen teorik yönler dikkate alınmıştır. Yani teorik yönün sorunları çalışmanın konusu ve Irak'taki hedef toplum için geçerlidir.Pratik yön, çalışmada nicel yaklaşımın kullanılmasını ve sayısal ve istatistiksel verilerin toplanması ve analiz edilmesine odaklanmayı içeriyordu. Bunun amacı, istatistiksel araçlar ve yöntemler kullanarak hipotezleri test etmek ve değişkenler arasındaki ilişkileri belirlemek ve yıllık değişiklikleri analiz etmektir. sağlanan tabloları

inceleyerek ve ortalama büyüme oranını çıkararak ve sonuçları yıllarla karşılaştırarak büyüme oranlarında ve işsizlik oranlarında. Diğer ve gelecekteki nüfus ve işsizlik oranlarındaki yıllık artışı tahmin edin. Yıllık ortalama büyüme oranını bulmak ve matematiksel hesaplamalar yapmak için Excel programı, merkezi eğilim ölçülerini İlişkiyi bulmak için SPSS programı kullanılmış, doğrusal ilişkinin gücü ve yönü belirlemek için regresyon denklemi ve Pearson korelasyon katsayısı kullanılmıştır. İki değişken arasındaki ilişki doğru orantılıdır, yani çalışma çağındaki erkekler arasında nüfus artmaktadır. yüksek işsizlik oranına yol açar.

Anahtar Kelimeler: Irak, nüfus artışı, çalışma çağındaki erkekler, işsizlik oranları, ekonomik göstergeler.

TABLE OF CONTENTS

SUMMARY ..... **i**
ÖZET ..... **iii**
TABLE OF CONTENTS ..... **v**
ABBREDIVATIONS ..... **vi**
LIST OF TABLES ..... **vii**
LIST OF GRAPHICS ..... **viii**
INTRODUCTION **1**

CHAPTER ONE
THEORETICAL FOUNDATIONS OF POPULATION AND UNEMPLOYMENT

1.1. Population Concept and Population Growth 4
1.2. Population Census and Demography 6
1.3. Working Age Reasons for Determining the Working Age and Child Labor ... 14
1.4. Unemployment 16

CHAPTER TWO
MEASUREMENT AND ANALYSIS OF POPULATION AND UNEMPLOYMENT IN IRAQ

2.1. Iraq Population Growth Total and The Working Age Group of Males 21
2.2. The Labour Force In Iraq and Unemployment 34
2.3. Comparison of Working Age, Labor Force and Unemployment Rates For Males 44

CHAPTER THREE
THE IMPACT OF THE NUMBER OF MALES OF WORKING AGE ON UNEMPLOYMENT IN IRAQ

3.1. The Relationship Between the Number of Iraqi Males of Working Age and the Total Number of Unemployed 47

CONCLUSION AND RECOMMENDATIONS **64**
REFERENCES **68**
APPENDIXES **73**

ABBREVIATIONS

GR	:	Growth rate
LFT	:	Total Labour Force
IPM WA LF	:	Male population of working age in the labour force
IPM WA	:	Population variable for age groups of males of working age
IPMT	:	Iraq population male groups total
IPT	:	Total population of Iraq
IUMPM	:	Male unemployment
IUMT	:	The unemployment total

LIST OF TABLES

Table 1. Iraq Population Growth Rate Between 1994-2003 22
Table 2. Iraq Population Growth Rate Between 2004-2013 23
Table .3 Iraq Population Growth Rate Between 2014-2023 24
Table 4. Percentage of Male Population in Iraq in the Age Group 15-64 (Working Age) of the Total Population 25
Table 5. Iraq Male Population Growth in the Age Group 15-64 (1994-2023)..... 27
Table 6. Percentage of Male to Female Labour Force and Annual Growth Rate 34
Table 7. Percentage of Unemployed in the Labour Force in Iraq with Annual Growth Rate..... 38
Table 8. Comparison of the Percentage of Unemployed People (Males and Females) Out of the Total Labour Force Years (1994-2023)..... 40
Table 9. Comparison of the Percentage Number of IPM WA (Out of) Number of Labour Force and the Percentage of the Unemployed as a Percentage of the IPM WA (1994-2023) 44
Table 10. The Percentage of the Working-Age Male Population in the Total Population Compared to the Percentage of Unemployed in the Labor Force (1994-2023) 47
Table 11. Value of X and Y That Represent the Independent and Dependent Variables (1994-2023) 48
Table 12. Number of Male Populations of Working Age Compared to the Number of Unemployed Between (1994-2023)..... 54
Table 13. Value of X and Y That Represent the Independent and Dependent Variables:(1994-2023)..... 56

LIST OF GRAPHICS

Graphic 1. The Difference Between the Total Population Growth Rate Divided into Three Stages in Iraq from 1994 to 2023 24
Graphic 2. Iraq's Population Growth Rate of Working-Age Males in Iraq from 1994 to 2023 29
Graphic 3. The Pyramid Chart Illustrates the Distribution of Iraq's Population by Age Groups and Gender Year (2003,2013,2023) 31
Graphic 4. Number of Males in the Labour Force Compared to Females in Iraq Years (1994-2023) 36
Graphic 5. Unemployment, Total (% of Total Labour Force) (1994-2023) 39
Graphic 6. Hierarchical Chart to Compare the Number of Unemployed Males with Females (1994-2023) 41
Graphic 7. Number of Unemployed Men and Women of The Total Number 42
Graphic 8. Simple Linear Regression Equation as well as the R2 50
Graphic 9. Scatter Plot of the Residuals and Predicted Values 54
Graphic 10. simple linear regression equation as well as the R2 58
Graphic 11. Represents the Scatter Plot of the Residuals and Predicted Values 62

INTRODUCTION

One of the most important economic indicators that Iraq is facing during this period is the high unemployment rate and the increase in population numbers and the entry of specific groups into the working age – males. This has created an increase in the supply of labour, and consequently, many workers get involved in the Iraqi market, which has caused competition. Hence, the economic impact and challenges are facing Iraq in providing sufficient job opportunities to absorb the new workforce. Here, it is possible to illustrate the relationship between the increase and growth of the working-age male population in Iraq and its impact on economic indicators, particularly the unemployment rate. This relationship is directly proportional. This means that an increase in the number of working-age male job seekers, coupled with a lack of sufficient opportunities, leads to an increase in the number of unemployed, particularly in this age group, and this impacts economic development. However, government economic policies can seek to achieve a balance between the increase in the working-age male population and the increase in labour market supply by directing this increase to maximise the use of these capacities. This means that as the supply for labour increases, the state creates jobs that are filled by the unemployed. It is concluded from this that population growth is a double-edged sword. Either the energies of young people will drive the country's economic development and contribute to stimulating its economy by providing job opportunities that include and accommodate young people, which in turn contributes to stimulating the economic recession and raising per capita income from the gross domestic product, or the opposite. That is, if the labour supply is greater than labour demand, the number of job seekers will increase, given that the male category of working age in Iraq is the largest compared to other categories, and thus the unemployment rate among this category will rise. These uncontrolled increases also lead to pressure on the infrastructure, social services, and the state's limited resources and capabilities, which negatively impacts the country's economic and social development and economic stability. In other words, unemployment rates are affected by population growth, and thus unemployment is affected by supply and demand. When a balance between supply and demand is not achieved, this leads to an increase in the percentage of unemployed and a failure to absorb the energies of young people. Many young people are forced to resort to illicit trade or other means of generating quick and easy income as a way out of this crisis. Many also resort to

migration to fulfil a dream that has long been the antithesis of reality. Although Iraq seeks to adopt economic policies to address these challenges, successful solutions require comprehensive strategies based on supporting small and medium-sized enterprises, developing educational and training policies aligned with labour market needs, and promoting investments in productive and technological sectors that generate new job opportunities. Considering that there are other factors that lead to an increase in the unemployment rate, such as political, security and economic influences.

The purpose of this research is to reveal the relationship between the number of male workers within the working age groups between 15 and 64 and analyse its impact on unemployment rates in Iraq.

The importance of the research comes from understanding and analysing the relationship between the population growth of the male working-age group and unemployment rates, considering that the population in this age group is one of the factors affecting the unemployment rate in Iraq, as well as the importance and impact of economic policies on unemployment rates on the one hand and controlling the numbers of these population groups on the other hand, and finding solutions that contribute to recovering these increases and directing them to the labour market in a way that ensures the provision of sufficient job opportunities to occupy them from job seekers.

To achieve the study purpose, the following hypotheses were verified in this study according to the study variables: population growth of the working-age male category and the unemployment rate: When examining the relationship between two research variables, the focus is on the extent to which they are related.

Assuming high unemployment rates, is the growth in the working-age male population in Iraq the cause? Is there a relationship or correlation between these two variables, and how strong is this relationship? According to World Bank statistics, unemployment rates in Iraq have been rising significantly over the past years. Also, given the rapid growth in the number of working-age males in Iraq, the hypothesis is: what will this relationship look like? Will unemployment rates rise as the number of working-age males in Iraq increases? Is the relationship statistically significant, and does it serve the purpose of the research? The increase in the number of working-age males in Iraq is expected to lead to higher unemployment rates due to the increased demand for jobs resulting from the increased labour force. However, the extent of this effect may vary across age groups in society, with higher unemployment rates

expected to be more pronounced in younger age groups within the working-age category.

CHAPTER ONE

THEORETICAL FOUNDATIONS OF POPULATION AND UNEMPLOYMENT

The theoretical aspect of the research in the first chapter includes a study that provides a clear understanding of the research variables and scientific opinions that addressed this topic and the importance of linking the theoretical aspect to the practical or applied aspect.

1.1. Population Concept and Population Growth

According to Teitelbaum (2024), population is the number of people living within a certain area. The numbers and proportions of the population change because of demographic influences such as births, deaths, and migration. The population is usually concentrated in areas where food is available. The population is affected by social norms and technological developments, especially medical and health factors, which have affected the decline in the death rate and led to an increase in the average lifespan.

Population growth is an important topic that enters economics by measuring the economic indicators of the population on the one hand and statistics on the other hand by measuring, analysing, and predicting population growth data on the other hand, where population growth can be defined as It is the amount of increase that occurs in population ratios during the year, such as the death rate, birth rate, and migration rate. The population growth rate is calculated by dividing the number of deaths by the number of births in the same year. Population growth occurs due to an increase in the number of births compared to the number of deaths, as well as an increase in the number of migrations to that area (Foflonker, 2024).

Population growth and development: Some scholars view population growth according to socialist or capitalist thought; some adopt the capitalist system and believe that underdeveloped countries remain in poverty and misery unless they control population growth, while others believe that under the socialist system the cause of poverty in underdeveloped countries is the economic and capitalist occupation and control by developed countries.

The economy is not just capitalism or socialism. Modern economies can be a hybrid of capitalism and socialism, with a market-orientated or planned economy and a private or social ownership approach. Sweden is classified as a capitalist country due to its reliance on market exchange and the dominance of private property and also a socialist country due to the welfare of citizens and the provision of health and social care. When compared to a country like China, which is considered socialist with Chinese characteristics due to the expansion of the market sector and government control over the economy in general, the United States is considered an example of market capitalism (Boston University, 2021, p.15).

Scientists have sought for population growth to be balanced and development by finding theories that prove this effect and its percentage. The difference between scientists in this regard comes from the differences in societies. There are some economic and social theories that apply to one region and do not apply to another. This is due to the environment, lifestyles, customs, and traditions followed by the people of that city. In some countries in rural areas, the people of those areas believe that having many children is a strength for that group or tribe. On the other hand, the civilised people of the city believe that having many children threatens their economic future and competes for resources and livelihood. Therefore, following any scientific theory.

The impact of population growth on some economic aspects (Al Bayati, 2011. p. 157-158):

1. The Impact of Population Growth on the Labour Market: Population growth increases the supply of labour, thus increasing the percentage of job seekers. Also, consider the demand for labour in the market. Is there a relationship between high supply and high demand? When the supply rate increases and the demand for labour decreases, this leads to a high unemployment rate, i.e., an increase in the surplus of labour in society, thus negatively impacting the labour market through a decrease in demand for goods and services, which leads to a slowdown in the economy and then leads to a decrease in wages and increased competitiveness in the labour market. It has long-term cumulative effects. The increase in population, in turn, increases unemployment rates, causing an economic problem and a major impact on the labour market.

2. The Impact of Population Growth on Savings and Investment: The increase in population has a double effect (negative and positive); it negatively affects savings and investment and affects economic growth. The increase in population causes a decrease in the per capita share of the gross domestic product, increases family expenses, and reduces savings. If the number of family members is large, the annual income of that family is distributed among more individuals, and their consumption of goods and services increases; thus, the demand for money increases, and that family is forced to spend all the savings to meet the requirements of living and prevent them from saving, and their ability to invest will weaken, thus slowing down the process of economic development. As for the positive effect, the increase in population means an increase in demand for goods and services, thus investment in infrastructure and industries, and this balance depends directly on the economic policies of the governments of countries.
3. The Effect of Population Growth on Consumption: The increase in population leads to an increase in demand for goods and services, thus increasing productivity and organising the effectiveness of production, as well as reducing the burdens on society thanks to the division of labour and its distribution over a larger number of people. Some other scholars believe that the increase in population increases the demand for only necessary goods and services due to limited income compared to the large population, thus weakening consumption because of weak income.

1.2. Population Census and Demography

A population census is the process of planning, collecting, classifying, evaluating, publishing, and analysing demographic, economic, and social data for the smallest geographic area at a specific time, covering either all people or a precise portion .This process is carried out every 10 years or 5 years (United Nations, 2017, p. 2).

There are two methods used for population censuses:

1. De Facto Method: counting people where they are located regardless of their usual place of residence.

2. De Jure Method: counting people where they usually live regardless of where they are on census day (Britannica, 2017; United Nations, 2006, p. 1).

Population censuses are conducted in most countries periodically. A series of successive recommendations have been issued regarding the population and housing census, which includes Title of the principles and recommendations used in the population census also housing in conducting population censuses, which have large countries and are adopted by many global population censuses, as well as population census offices, departments, and institutions. These recommendations provide a set of guidelines and are also considered a roadmap for how to conduct population censuses and the processes that facilitate conducting the census and the results in a good, more detailed, and accurate manner. It is also necessary to consider changes in curriculum and technological developments, thus ensuring a fair distribution of resources and wealth. It also regulates administrative divisions, thus providing health and educational services. This function is of great importance in the private sector, such as companies, as well as in the educational and academic sectors. The primary task of the census is to generate error-free statistical data on remote and small areas and residential complexes. As for the population census, these results are used for research and analysis purposes, which include population forecasts, which are considered essential for all private and public sectors and fields; (Principles and Recommendations for Population and Housing Censuses, Revision 3, 2017)

Individual census refers to the process of counting everyone and each group separately and recording their characteristics independently. You can meet the requirements of an individual census by collecting information in the field; it is done using administrative records.

The census in this type covers a precisely defined area (for example, an entire country or part of it). The population census should include all individuals present and residing within its scope, depending on the type of population census required. It should include all areas, regardless of their type.

The counting of each person and each group of living places should occur at a single, well-defined point in time, and the collected data should correspond to a clearly defined reference period.

Conducting censuses at regular intervals ensures the availability of comparable information in a fixed sequence. A series of population censuses makes it possible to assess and compile the past accurately.

Likewise, the ability to create statistics that include areas with small populations or areas of small size makes it necessary for the census to include all characteristics of the population as well as the housing units; the information must be kept strictly confidential, protecting the privacy of individuals. (United Nations, 2017, pp. 3-4).

The population census provides urban planning with the most important needs of the areas subject to the census in terms of educational services, infrastructure, medical services, and other services. The population census provides the necessary data for economic planning, as it gives a clear understanding of the workers and the unemployed, which helps in the fair distribution of wealth and economic growth. It also contributes to social planning by studying the structure of the population and their areas of spread, which facilitates the process of providing the necessary services to them. The population census provides a database on individuals that facilitates the government in setting public policies. Researchers also use population data to study demographic, economic, and social phenomena. One of the benefits provided by population censuses is the subject of housing planning, which gives a picture of the population's need for housing units or urban development of areas.

Demography is a statistical study which includes distribution, size and density, and vital statistics such as births, deaths, and marriage, as well as the study of population explosion, economic development, urban congestion, and illegal immigration, as well as labour force statistics. (Britannica, 2024)

Demography has great effects on the economic aspect, as many scientists have been interested in this aspect to explain the impact of births and deaths in a city or a specific region on the economy of that region and the country in general.

The study of human resources is included within economics by studying human resources and their impact on economic aspects and knowing the relationship between them. The speed of population growth has positive or negative returns. Knowing whether the population increase puts pressure on the resources of that city or region and whether this increase increases the rates of poverty and misery, it is necessary to compare the individual's income with the gross domestic product or the production

provided by the individual compared to the individual income. Among the important things that the study of demography provides to the economy are future prediction, strategic and economic planning, and economic development.

Studying population history is considered one of the important matters for studying population growth, as history is the path to the future. The population has witnessed a rapid and significant development, as this growth can be controlled by studying and understanding the history of that region by studying the nature of people, their orientations, their daily lives, and their lifestyles in previous years, which gives a clear understanding of the reason for the rise (Omira, 2014, p. 23).

When studying the developments of society and how people spread in the regions and what the mechanism was that led to their gathering in those regions rather than others, this population growth can be controlled and directed.

Demography depends on statistics very heavily, as statistics is considered the mathematical aspect of calculating the numbers used in population censuses and analyzing demographic data, as it is about collecting and analyzing data related to the population, such as growth rate, age distribution, migration, deaths, and using statistical tools to analyze the data and find the results that are relied upon in the future, as statistical methods are used in measurement, such as central tendency, dispersion, correlation measurement, and linear regression using statistical methods, the most famous of which is the SPSS program, which made a qualitative leap in data analysis (Omira, 2014, p. 25).

The relationship between demography and population growth: As mentioned earlier, demography studies a place in terms of its characteristics, such as size, distribution, composition, and changes that occur to the population over time, such as births, deaths, and migration. Population growth is one of the aspects studied by demography, and it studies the change that occurs to the population over a specific period, such as studying the natural increases that occur in birth, death, and migration rates. Population growth is considered one of the demographic sciences.

Statistics is the process of collecting data, tabulating and displaying it, and then analysing the results. It also includes economic and health data. Currently, statistics has entered all fields due to the need to predict the future, as well as study and analyse test results in an accurate manner that guarantees results that can also be future.

Statistics can also be used in applied fields, where data has been classified based on its type. There is the qualitative type that separates similarity and the quantitative type that gives an image of quantities and their measurement. (Anderson, 2024).

The benefit of statistics in calculating population censuses and growth rates is very great, as data is collected and analysed by collecting comprehensive data on the population of a specific region or country by classifying data by age, gender, education, or standard of living; thus, the composition of the population and the changes that occur to them can be understood. Also, population growth rates are measured over the years in general and include demographic changes for the entire population without specifying or detailing, for example, the number of the male or female population separately or the number of children under 14 years of age or the elderly over 65 years of age.

Calculating these population censuses separately allows for calculating the number of young people in a country and comparing it to the number of elderly people to know the proportion or strength of the youth in that country. Also, through statistics, future population projections and future population growth projections can be made in the coming years. Future population estimates are important matters through which the need for housing, services, and infrastructure in that region or country is expected, in addition to the amount of water and other government services to control those increases. Therefore, statistics are very important in collecting and analysing data, and they are also a tool for understanding, evaluating, and forecasting population growth and future rates of increase.

Economics is the study of resources, individuals, goods, and services. Economics provides a clear understanding of the choices individuals make, as well as how resources are used and the administrative process of goods and services, such as the productivity of goods and services and how they are produced and distributed among individuals (Britannica, 2021).

The relationship between the economy and population growth is represented by measuring the rate of increase or decrease in the population in addition to that on economic indicators. The view of economists, demographers, and specialists in this field on this topic can be summarised as follows:

1. Robert Malthus's Theory (Malthus, 1798): Malthus is best known for his theories on population growth, where he observed that population tends to grow at a geometric rate, while food production increases at an arithmetic rate, leading to a shortage of food resources over time. This concept became known as the Malthusian catastrophe or Malthusian trap. His most famous work is the book An Essay on the Principle of Population, first published in 1798, in which he presented his theories on the relationship between population and resources. Robert Malthus offered solutions to address the problem of population growth, showing that humanity would experience a large increase in population, which would create a state of imbalance, famine, epidemics, and diseases, or what he called the Malthusian catastrophe. He called for achieving a balance between different sectors and economic activities. One of his most important suggestions was to postpone the age of marriage and observe chastity before marriage, as he asserts that poverty is the result of the mistakes of the poor in procreation and failure to adhere to moral restrictions. He also does not recommend increasing workers' wages, which in turn encourages marriage and procreation and thus increases the population to a degree that exceeds the availability of food. (Malthus, 2022; Al-Awidi, 2022; Gelişim, 2023).
2. Herbert Spencer's Theory (Spencer, 1884/1992; Acton, 2024): Spencer is famous for developing the concept of survival of the fittest. Spencer was one of the first thinkers to apply the theory of evolution to social and philosophical studies, which led to the development of what is known as social Darwinism. He wrote a book entitled Principles of Technology, which he published in 1901. Spencer was interested in the biological and social evolution of natural forces, and thus his interest in the issue of population came. He believed that increasing the ability to reproduce is good nutrition, and that the main thing that controls this process is nature. The more creatures advance, and their forms develop, they are exposed to extinction because they care more about themselves and their development than about reproduction and procreation. Thus, creatures of lower forms are not exposed to extinction because they work according to the law of reproduction for the sake of survival, meaning that social

development leads to the development of individuals and then makes them neglect reproduction and care about self-development. (Spencer, 1884/1992; Acton, 2024; Al-Halayqa, 2021).

3. Alexander Carsonders (Britannica, 2024): Sir Alexander Maurice Carsonders. He was a prominent English researcher in the field of population studies. He was born on January 14, 1886. He was interested in studying population phenomena and presented his theoretical issues in his book entitled World Population that man's need to reproduce is subject to his need to interact with his environment, meaning that man is the one who controls reproduction. Carsonders showed that the subject of population increase is relative, meaning it varies from one society to another according to circumstances and influences. He also divided population density into three sections (statistical, economic, and physical). An example of this theory is that there are countries with very high populations but low resource ratios, and the opposite is also true. There are some countries with very large resources and wealth compared to their small population. (Britannica, 2024; Abdul Jawad, 2009, p. 27-28).
4. Kingsley Davis (Britannica, 2024): Kingsley Davis was a prominent American sociologist and demographer. he is known for his work in the field of population and demography, and he contributed significantly to the development of theories about population growth and migration. One of his most famous works is the concept of the demographic transition. The scientist Kingsley rejects the explanation (total population change) based on economic, cultural, or biological factors but rather tends to social equilibrium, as the population always tends to adapt to the conditions of visitation or decrease. (Britannica, 2024; Abdul Jawad, 2009, p. 28).
5. Karl Marx is known for developing the Marxist theory, which criticises capitalism and calls for socialism. His most famous works include The Communist Manifesto, which he wrote with Friedrich Engels, and Capital (1867), which is considered one of the most important studies in political economy. Marx's theory had an opinion not only about population, population growth, and economic and social effects. He

believed that the socialist system was the only solution to all these problems, and population density could be addressed by reorganising society. The accumulation of private property leads to an increase in economic needs because of the increase in population numbers. Karl Marx criticised the capitalist system, which he believed was one of the most important factors that led to the rise of private ownership and money owners. He showed that poverty is the percentage of weakness in the employment system and the lack of providing greater opportunities for workers and job seekers, not the population law, and that every era and every society have their own population law, meaning that poverty is not linked to population growth but rather a problem in the economic system. (Brackett, 1968; Petersen, 1988; Al-Halayqa, 2021).

Theory of Demographic Transition: Malthus's theory is famous, but there is a theory that explains the science of population in a comprehensive manner and attempts to explain the changes that occur to the population in a comprehensive way, which is the theory of demographic transition, which states that societies are going through stages that affect the population growth.

Stage one: It is a stage of reverse competition; high birth and death rates lead to slower population growth.

Stage two: If the death rate decreases due to improving living conditions in terms of health care and attention to nutrition with an increase in the birth rate, it leads to accelerating population growth.

Stage three: Social and economic effects that lead to a decrease in the birth rate, thus leading to slowing population growth.

Stage four: The decrease in the birth rate with a decrease in the death rate; thus, this stage is known as stability in population growth.

Stage five: When the number of deaths among the population is greater than the number of new births, this leads to a decrease in the population, thus decreasing the population of that area. (Libretexts, 2021; Abdul Jawad, 2009, p. 30-34).

When comparing the stages of demographic transition, some developed countries are classified as Stages 4 and 5., while a large portion of developing countries are classified within the first, second, and third stages. As for Iraq, it is in the transition

phase from the second to the third stage and then gradually reaches the fourth stage. It is essential that population policies in general adapt to these stages to ensure balanced population growth while avoiding excessive pressure on resources and services, thus achieving economic and social development.

1.3. Working Age Reasons for Determining the Working Age and Child Labour

According to Al-Saeed (2021, p. 9), work in the economy is all the work that requires physical or mental effort carried out by a person whose goal is to accomplish a certain thing and earn a wage for these works to earn a living, such as factory workers, general production, craftsmen, and other work that requires effort.

It is the legal and internationally permitted age that allows individuals to work and exert effort for the purpose of providing the requirements and necessities of life, as the working age according to international laws is 15 years, while for the Republic of Iraq it is between 15 and 64 years (United Nations, 1973).

On 20/6/1973, the following convention was adopted, which will be called the Minimum Age Convention, 1973.

The Governing Body of the International Labour Organisation held a meeting in Geneva in 1973 and agreed to set the minimum age for work in industrial, maritime, agricultural, and other liberal jobs, which included the issue of child labour in all sectors, and to develop ways to solve these problems and eliminate them once and for all. The Council also decided to adopt some proposals related to the minimum age for work, as it decided that these proposals would be taken in the form of an international convention, as stated in Article 1 of this Convention (each Member State to which this Convention applies undertakes to follow a national policy aimed at the effective elimination of work at the age that is considered acceptable for work, whether mentally or physically, and the endurance of young people (United Nations, 1973).

The agreement also stipulated, according to Article Two, that the working age be set at 18 years for jobs that require greater effort and, according to Article Seven, from 13 to 15 for light jobs (United Nations, 1973).

Child labour began to appear in Europe, specifically in Britain, where Britain was the first to employ children in factories and workshops during the British

Industrial Revolution (1760-1840). Children constituted about a third of the workforce in British factories from immigrants and with low wages. This was due to the lack of individual skills and the immigrants' lack of education. It also appeared in America after the American Revolution. This was due to immigration across the American coasts and the lack of laws and legislation protecting children from engaging in work reserved for men and the welfare of some societies at the expense of others at that time and classism. However, during the Depression in 1929, American societies began sending their children to the labour market at an early age. According to reports from the International Labour Organisation, one million children around the world between the ages of five and fourteen are engaged in various jobs, with an estimated (report 2003) 61% of them in Asia, 32% in Africa, and 7% in America (Bhalotra, 2003, p. 4).

Child labour is an important issue that must be addressed, and ways to address this problem that poses a threat to childhood and children at this dangerous age must be considered, and it is increasing in poor countries that have been exposed to wars that have led to a shortage in the workforce. Children are the future of societies, and whatever the child's orientation, he forms the future of the country.

The child's distance from school and education negatively affects his healthy growth and the building of the child's personality.

The involvement of children in open societies, working in the market, and mixing with the elderly makes the child lose his sense of childhood, so you see the child at an age older than his real age, in addition to the psychological and emotional effects, as the work of children at these ages affects his psychological and emotional health, which makes the child anxious and always cautious, and some may be exposed to attacks that create a psychological and mental state. In addition, the effort exerted by children is usually considered for older ages and thus exhausts their bodies and leads to many organic diseases. These children also receive lower wages compared to physical strength, which makes them work daily, and most of them work to provide the necessities of life for their families.

One of the most important factors that led to this condition in Iraq is the many wars that it witnessed during the previous years, where many young people of working age sacrificed their lives to defend the homeland and the land.

There is also a large part of the terrorist operations that led to the martyrdom of many breadwinners for their families.

Therefore, families that do not have a breadwinner have no alternative but child labour to meet the requirements and needs of living, considering the high cost of living and the increase in life requirements, in addition to the increase in poverty rates, all of which are factors that lead to an increase in child labour rates.

1.4. Unemployment

According to the international definition, it is all persons capable of working within the legal age and who meet the following points (ILOSTAT):

Without Work, i.e., they are people who work individually, i.e., within a single business, not with a company, organisation, or job affiliation.

Any work for an individual or a person for a short period and paid work for a short period

Seeking Work, i.e., they are people who have decided to look for work and work for a short period or work for themselves.

Through this definition, it becomes clear that the unemployed can work and are looking for work but cannot find it. Therefore, there are segments in society that are not considered unemployed, for example, the elderly, retirees, the disabled, and students.

Therefore, healthy, strong, young people who are willing to work for wages and cannot find work or someone who can provide them with work that will create a decent living for them are called the unemployed, and thus they are part of the labour force.

The labour force includes all individuals of working age within a given population who are currently employed or actively seeking work. It includes both the employed (those who currently have jobs) and the unemployed (those who do not have jobs but are actively seeking work). This concept is crucial in understanding the dynamics of the labour market and the overall economic health of a country (Quickonomics, 2024).

The most important types of unemployment that have been focused on will be shown, and they are:

1. Frictional Unemployment: It is a type of unemployment that can be defined as including all people looking for work who have never worked in a job before, people who have been fired from their jobs, and people who leave their jobs and look for another different job for any reason. This type of unemployment decreases during economic crises because workers hold on to their jobs more (Al-Dabbagh, 2020; Abdullah, 2013).
2. Structural Unemployment: Structural unemployment occurs as a result of the entry of electronic devices into service in institutions; in other words, when there is a technological development, these devices replace the employee who is accustomed to manual work, so the employee cannot perform work similar to what these devices do, and it also occurs as a result of the demand for skills and experiences that workers do not have as a result of the development that occurs in factories or laboratories. This is considered a type of long-term unemployment (Al-Dabbagh, 2020; Abdullah, 2013).
3. Cyclical Unemployment: This unemployment occurs in economic changes such as recovery or recession, so it increases with economic recession and decreases with economic recovery, and this unemployment also occurs when there is insufficient demand for labour by institutions and companies, such as a decrease in demand for a particular good or service, and the collapse of stock exchange shares may lead to an increase in cyclical unemployment rates (Al-Dabbagh, 2020; Abdullah, 2013).

The Classical Theory: This theory states that unemployment is caused by workers' wages, as wages do not match the requirements of companies and operating institutions. When high wages are requested, companies resort to foreign workers or are satisfied with a smaller number of workers to compensate for double the effort, thus increasing the unemployment rate. It is necessary for workers' wages to be adapted to the requirements of the labour market (supply and demand). (Pettinger, 2019).

John Maynard Keynes :he was one of the most active. It appeared in the twentieth century, and their ideas greatly influenced economics in general as well as the economic policies adopted by governments. John Maynard Keynes rejected the classical theory and believed that unemployment occurs because of a lack of aggregate demand in the economy, i.e., the economy is the one that affects unemployment rates;

for example, if consumers stop buying a commodity or requesting a certain service, then the revenues achieved by companies or institutions decrease and lead to a reduction in the number of workers and then an increase in unemployment rates. Keynes put the solution to this theory, which is to increase government spending to encourage consumers to buy, thus moving the market and increasing the need for workers, i.e., increasing the aggregate demand for labour (Skidelsky, 2017; Amadeo, 2024), (Keynes, 1936).

Milton Friedman: He analysed consumption and money supply and his theory of explaining equilibrium policies, for which he received the Nobel Prize in Economic Sciences. (Chicago School), This scholar had a great influence on economics, as many of his students became prominent economists. He played a prominent role in recruiting and supervising many students at the University of Chicago since the 1940s. (Friedman & Friedman, 1998).

He explained the relationship between unemployment and inflation and showed that there is a short-term relationship between them, and there is no fixed relationship between average inflation rates and average unemployment rates, and that the relationship between an increase in growth and the amount of money in circulation has nothing to do with inflation or wage rigidity and labor unions and the main reason for it is the speed of the increase in the amount of money is greater than the speed of the increase in production, as he disagreed with the Keynesian theory that unemployment is caused by a deficiency in aggregate demand, but the natural unemployment rate cannot be reduced except by increasing natural inflation (Abdul Jawad, 2009, p. 35-38; Britannica, 2020; Al-Khazaali, 2020; Milton Friedman – Econlib, 2024).

Karl Heinrich Marx: His most famous writings are The Communist Manifesto and Capital in its three parts. His political and philosophical thought had a tremendous impact on world intellectual and economic history, and his name was used to express a highly developed school of thought, the Marxist school. Karl found the relationship between the economy and workers through the theory of conflict, which is a conflict between social classes, the working class and the class of leaders, rulers, and the rich. He focused on the fact that the most important causes of unemployment are the control of the upper classes over the labour market and money and their unequal distribution, which caused social inequality, and he showed that unemployment is an inevitable

result of capitalism (Hardcastle, 2007; Petersen, 1988; Brackett, 1968; Al-Halayqa, 2021).

Émile Durkheim was a French philosopher and sociologist, one of the founders of modern sociology, and developed an independent methodology for this science based on theory and experimentation at the same time. His most notable works are on the Division of Social Labour (1893) and The Rules of the Sociological Method (1895). He formally founded the academic discipline of sociology—along with Du Bois, Karl Marx, and Max Weber. Durkheim is often cited as the main founder of modern social science and wrote a book entitled the Division of Social Labour,(Émile Durkheim,1893) in which he discussed the division of labour in societies into two types: mechanical solidarity, which exists in simple societies where individuals are similar in the same work performed and are equal, and spontaneous solidarity, which exists in complex societies where the division of labour varies so that the individual becomes complementary to the other. It is indispensable, and he talked about unemployment in his book (Suicide) in 1897. Émile Durkheim introduced the concept of non-standard, which he defined as a state of lack of social values and standards, and unemployment is associated with this state, and individuals lose their jobs and feel lost, which leads to psychological illness and the disintegration of social ties (Durkheim, 1984; Prainsack & Buyx, 2018; Al-Halayqa, 2021; Crossman, 2024).

Alfred Marshall: He is famous for his book Principles of Economics (1890), which was the dominant book for teaching economics for a long time in England, through which he explained the main ideas of economics, such as supply and demand, marginal utility, and the cost of production. Alfred is considered one of the most important founders of modern economics. Marshall did not focus specifically on unemployment in his works, but he made important contributions to understanding economics in general. Explaining the theory of supply and demand in his book (Principles of Economics, Marshall, 1890), in which he explained the two most important factors for determining prices in the market, which are supply and demand, as these changes that occur in the market because of supply and demand are what affect unemployment rates. He also explained that the economy works in a way that can organise itself without interference, that free competition and work can improve living standards and a fair distribution of income, thus reducing the unemployment rate. Alfred Marshall also focused on profits and production costs, which in turn affect

prices; thus, companies resort to making important decisions regarding employment, which leads to an impact on unemployment rates. (Henderson, 2019b; Britannica, 2024).

CHAPTER TWO

MEASUREMENT AND ANALYSIS OF POPULATION AND UNEMPLOYMENT IN IRAQ

The second chapter includes an analysis of the research data collected from the World Bank data as a basis and the Iraqi Central Statistical Organization data for comparison. The data will be presented in detail as well as the study, analyze and test it using statistical tools to measure the relationship between the study variables, which include population growth and the increase in the age groups of working age (15-64 years) for males and their relationship to unemployment rates in Iraq.

2.1. Iraq Population Growth Total and The Working Age Group of Males

Iraq is considered a country with rapid population growth, with an estimated population growth rate of about one million births per year, or about 2.5% or more per year. When studying the population of Iraq in 1960, the population was 7 million, while in 1990 the population of Iraq was 17 million, a difference of 10 million, an increase of 142%. In 2023, the population of Iraq was 45 million, a difference of 28 million, an increase of 164% over the past thirty years. The population is expected to rise to 50 million in 2030; according to reports from the Iraqi Ministry of Planning, Iraq ranks 86th in the world in population growth. (Alforatnews, 2023). The population increase in Iraq is characterised by explosion and speed, and it has become necessary to find solutions to this problem. The population has increased with a shortage of housing and cities. A civilisation that can contain these annual increases will be very dangerous to all aspects of life, from services to infrastructure, as it is possible to be able to contain these increases and direct them to achieve tremendous economic growth.

The annual growth rate of the Iraqi population for the targeted years will be calculated in the form of three parts, each 10 years representing one part, and then it will be compared with the number of males of working age between 15 and 64 years and what percentage this category represents of the Iraqi population. The number of males in the youth age range of 25-29 years will also be calculated, and the numbers will be compared with the total number of males within the working age.

A specific encoding will be used as described in the search content in the (Abbreviations) paragraph, according to the study variables to facilitate the application of the titles in the tables.

The annual growth rate of the Iraqi population for the targeted years will be calculated in the form of three parts, each 10 years representing a part, and then it will be compared with the number of males of working age between 15 and 64 years and what percentage this category represents of the Iraqi population. The number of males in the youth age range of 25-29 years will also be calculated, and the numbers will be compared with the total number of males within the working age. To calculate the population growth rate, data from the previous year must be used for each year. Data from the previous year for the target school years are included in each table to calculate the population growth rate.

Population Growth rate = ((New Population - Old Population) / Old Population) × 100

= ((19295818-18385673)/ (18385673)) x 100

Table 1. Iraq Population Growth Rate Between 2004-2013

S	Years	IPT	GR %
1	1993	19295818	
2	1994	20248073	4.94
3	1995	20948858	3.46
4	1996	21639332	3.30
5	1997	22330770	3.20
6	1998	23053488	3.24
7	1999	23820734	3.33
8	2000	24628858	3.39
9	2001	25425663	3.24
10	2002	26255343	3.26
11	2003	27068823	3.10
		Sum	**34.44**

Source: Compiled and Calculated by (author) Based on (Worldbank.org) Date.

To find a comparison between the targeted study years, the arithmetic mean of the population growth rate has been extracted to facilitate comparison.

Arithmetic Mean of The Population Growth Rate = Total Population Growth Rate / Number of Years

The arithmetic average for the initial ten years (1994-2003) is 34.44 / 10, which equals 3.44%.

Therefore, the average population growth rate for the first ten years (1994-2003) within the study years is 3.44%. When comparing the population growth for the first ten years, note that the growth rate begins to decline starting from 1995 and begins to stabilise approximately in the following years.

Table 2. Iraq Population Growth Rate Between 2004-2013

S	Years	IPT	GR %
1	2003	27068823	
2	2004	27858948	2.92
3	2005	28698684	3.01
4	2006	28905607	0.72
5	2007	28660887	-0.85
6	2008	29218381	1.95
7	2009	30289040	3.66
8	2010	31264875	3.22
9	2011	32378061	3.56
10	2012	33864447	4.59
11	2013	35481800	4.78
		Sum	**27.57**

Source: Compiled and Calculated by (author) Based on (Worldbank.org) Date.

The arithmetic mean for the years (2004-2013) = 27.57/10 = 2.75%.

The average population growth rate for the second ten years (2004-2013) is (2.75), Note that there is a significant decline, instability and a negative indicator of population growth in 2007 and it begins to rise again in the following years, and the reason for this is the economic and deterioration due to the war, social unrest and sectarian violence that the country witnessed, these conditions greatly affected the population growth rate, as they led to the deterioration of health and education services and infrastructure, and almost paralyzed movement within cities, which negatively affected the quality of life and demographic balance, and when comparing population growth in this period with the previous period by calculating the difference in the

product between the two periods (3.44-2.75 = 0.69), Noting a significant decrease in the growth rate by 0.69%.

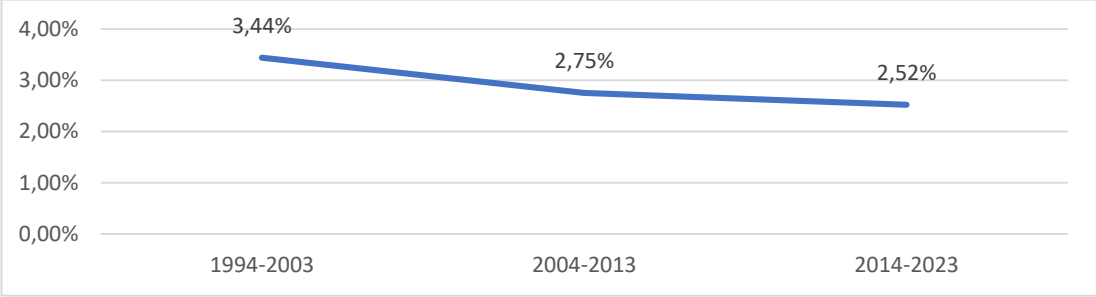
Table 2. Iraq Population Growth Rate Between 2014-2023

S	Years	IPT	GR %
1	2013	35481800	
2	2014	36746488	3.56
3	2015	37757813	2.75
4	2016	38697943	2.49
5	2017	39621162	2.39
6	2018	40590700	2.45
7	2019	41563520	2.40
8	2020	42556984	2.39
9	2021	43533592	2.29
10	2022	44496122	2.21
11	2023	45504560	2.27
			25.20

Source: Compiled and Calculated by (author) Based on (Worldbank.org) Date.

The arithmetic mean for the last ten years of study (2014-2023) = 25.20/10 = 2.52%.

The average population growth rate for the last ten years (2014-2023) is 2.52. When comparing the stability of population growth, the difference between the second ten years (2004-2013) and the last ten years is 0.23, meaning that the difference is simple. Therefore, the population growth in the last twenty years, according to the average growth rate from the year 2004 to 2023, is stable at 2.5%-2.6%.



Graphic 1. The Difference Between the Total Population Growth Rate Divided into Three Stages in Iraq from 1994 to 2023

Source: Compiled and Calculated by (author) Based on (Worldbank.org) Date.

The growth rate over the three periods, which were divided by year, represents the sum of the stages of total population growth in Iraq. Thus, each decade represents a stage of growth or change, representing a transition from one demographic change to another. The line started to decline from 2004 to 2013 and then stabilised in the following years. The growth rates for the total population in general began to decline and then stabilised at 2.5%, after having been at 3.44%. This explains why Iraq is in a state of stability, as the population growth rates for the last 10 years have reached 2.5%.

Percentage of male population in Iraq in the age group 15-64 (working age) out of the total population:

The percentage of the Iraqi population of males in the age group 15-64 of working age will be calculated from the total population of Iraq to know what this group constitutes from the total population of Iraq according to the years of study for the years (1994-2023).

Table 4. Percentage of Male Population in Iraq in the Age Group 15-64 (Working Age) of the Total Population:

S	Years	IPT	IPT GR	IPM WA	IPM WA % from IPT
1	1994	20248073	4.94	5155907	25
2	1995	20948858	3.46	5362673	26
3	1996	21639332	3.30	5569033	26
4	1997	22330770	3.20	5776447	26
5	1998	23053488	3.24	5992009	26
6	1999	23820734	3.33	6221258	26
7	2000	24628858	3.39	6462727	26
8	2001	25425663	3.24	6702640	26
9	2002	26255343	3.26	6953643	26
10	2003	27068823	3.10	7199079	27
11	2004	27858948	2.92	7435566	27
12	2005	28698684	3.01	7688868	27
13	2006	28905607	0.72	7775507	27
14	2007	28660887	-0.85	7740771	27
15	2008	29218381	1.95	7929571	27
16	2009	30289040	3.66	8266559	27
17	2010	31264875	3.22	8577908	27
18	2011	32378061	3.56	8919801	28

19	2012	33864447	4.59	9365183	28
20	2013	35481800	4.78	9853023	28
21	2014	36746488	3.56	10249906	28
22	2015	37757813	2.75	10588815	28
23	2016	38697943	2.49	10912579	28
24	2017	39621162	2.39	11234222	28
25	2018	40590700	2.45	11581057	29
26	2019	41563520	2.40	11939220	29
27	2020	42556984	2.39	12311784	29
28	2021	43533592	2.29	12686734	29
29	2022	44496122	2.21	13068184	29
30	2023	45504560	2.27	13473714	30
			87.21		**830**
	$\bar{X}$			87.21/30=2.91	830/30=0.27

Source: Compiled and Calculated by (author) Based on (Worldbank.org) Date.

Percentage of Male Population in the Age Group 15-64 of Working Age Out of the Total Population of Iraq = Number of Males Aged (15-64) Years / Total Population of Iraq.

IPM WA % from IPT = IPM WA / IPT

- **IPM WA % from IPT year 1994= 5155907/20248073=0.2546369 = 25%**

Average Rate IPM WA % from IPT for 30 years:

$$\bar{X}= \Sigma xi/n$$

830/30=0.27=27%.

The permissible working age in the Republic of Iraq, according to the decision of the Presidency of the Republic No. 40, which states ' The decision of the Republic of Iraq regarding legal work No. 40

Iraqi Labour Law No. 37 of 2015 was issued to the Ministry of Labour and Social Affairs (Department of Employment and Social Security). Article 7: The minimum working age in the Republic of Iraq is (15) fifteen years. (Ministry of Justice - Republic of Iraq,2015; UNICEF,2021).

According to the Iraqi Ministry of Planning, the rate of child labour decreased (2.0%) in 2022, and 95% of children are enrolled in schools. (Abdul Amir- Iraqi News Agency,2022).

When calculating the average growth rate of the male population aged (15-64), it cannot be divided into three stages as is the case with the total population and then compared because the growth of this population category does not include the total population. When comparing the population growth, note: the average includes all categories of society consecutively and annually and includes demographic indicators such as births, deaths and migration, and all of this is subject to changes that occur during that period. As for the male category, it is not possible to conclude from the events affecting the growth of this category, considering that it is between the years (15-64) and that the demographic changes that occur in this category are for several years and appear in the long term; it cannot include births in the same year, but rather after 15 years, but it includes deaths and migration, so it is not possible to attribute the current events to this period because it takes many years to measure the effects, so the growth rate of this category will be calculated and compared as a whole for all years.

Table 5. Iraq Male Population Growth in The Age Group 15-64 (1994-2023)**:**

S	Years	IPM AGE (15-64)	GR %
1	1993	4887214	
2	1994	5155907	5.50
3	1995	5362673	4.01
4	1996	5569033	3.85
5	1997	5776447	3.72
6	1998	5992009	3.73
7	1999	6221258	3.83
8	2000	6462727	3.88
9	2001	6702640	3.71
10	2002	6953643	3.74
11	2003	7199079	3.53
12	2004	7435566	3.28
13	2005	7688868	3.41
14	2006	7775507	1.13
15	2007	7740771	-0.45
16	2008	7929571	2.44
17	2009	8266559	4.25

18	2010	8577908	3.77
19	2011	8919801	3.99
20	2012	9365183	4.99
21	2013	9853023	5.21
22	2014	10249906	4.03
23	2015	10588815	3.31
24	2016	10912579	3.06
25	2017	11234222	2.95
26	2018	11581057	3.09
27	2019	11939220	3.09
28	2020	12311784	3.12
29	2021	12686734	3.05
30	2022	13068184	3.01
31	2023	13473714	3.10
			3.44=30/103.32

Source: Compiled and Calculated by (author) Based on (Worldbank.org) Date.

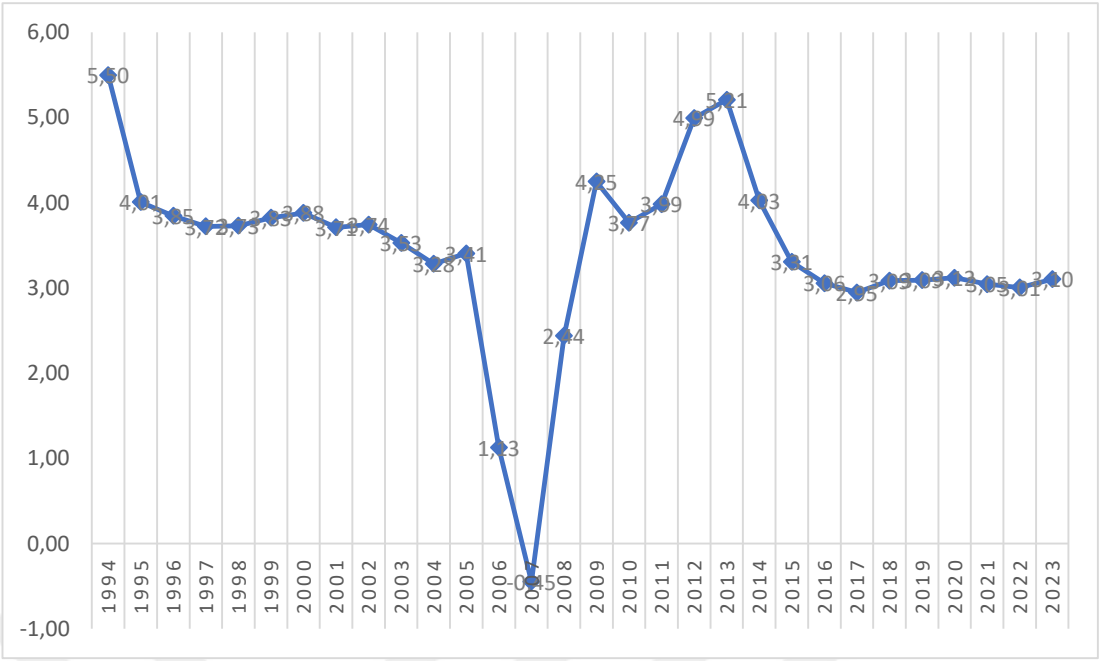
Growth rate of male population aged 15-64 Total working age for 30 years (IPM WA GR):

Population Growth Rate = ((New Population - Old Population) / Old Population) × 100 = ((1994-1993)/1993) x100 = ((5155907-4887214)/ 4887214) x100 =5.5 %

Average Growth Rate of Male Working-Age Population (IPM WA) For 30 Years:

$$\bar{X} = \Sigma xi/n = 103.32/30 = 3.44$$

(IPM WA) for the total 30 years is (3.44 %).



Graphic 2. Iraq's Population Growth Rate of Working-Age Males in Iraq from 1994 to 2023

Source: Compiled and Calculated by (author) Based on (Worldbank.org) Date.

The growth rate of working-age groups, especially the youth group, is subject to the influences that the country is experiencing during that period, whether security, economic, or political. Therefore, this group is always more vulnerable to these influences than other groups. Through the chart, there is relative stability from 1995, and then growth begins to decline until it reaches a negative value in 2007, and then it rises and returns to stability in 2015 and until 2023. Iraq has gone through several wars that led to great losses in young age groups, including the war between Iraq and Iran that began on September 22, 1980, which ended with a ceasefire in 1988, as well as several influential factors, including the strict economic sanctions imposed by the United Nations and the siege of Iraq after the Second Gulf War and the American war on Iraq, which led to a deterioration in the economic and living conditions. So many working-age groups, especially young people, resorted to immigration in search of a better life. Looking at the years 2005, 2006, and 2007, it is heading downwards with a negative value forming the letter V. The growth rate in 2005 was 3.41, in 2006 it was 1.13, and in 2007 it was (-0.45), a negative value, then it rose again in the following years. The reason for this is due to the security situation that Iraq witnessed during that period and the sectarian war that led to great fears of life coming to a halt in 2007, and many young people were forced to emigrate with their families in search of a better

life, as well as the economic situation as a result of the decline in oil prices and the period of austerity that Iraq went through, as well as the security situation that occurred in 2013 and 2014 and the mobilisation of all state institutions to confront terrorism, which claimed the lives of a large number of young people in defence of the homeland.

The age group of young people between 25 and 29 years in Iraq is considered the ideal age group for starting a married life and starting a family for the young Iraqi man and getting a permanent job or position. His need to work or practice business is necessary to provide a decent living for him and his family. Therefore, focusing on the working group of these ages represents the strongest working group in relation to the targeted ages of males. It is necessary to calculate what these ages represent in terms of the percentage of the workforce in Iraq.

The male population in the age group 25 and 29 was calculated by multiplying the percentage value from the World Bank data by the total male population in Iraq. (For more details on changes in unemployment rates, please refer to APPENDIX-A).

The male population for the age group 25 and 29 is calculated by multiplying the percentage of the male population between the ages of 25 and 29 by the total male population.

The year (1994) male population for the age group 25 and 29 = 7.85% x 10015107, which equals 786654.

Growth rate of males aged 25 and 29 years from the rate of what constitutes these ages of males of working age

Aged (29-25) male from IPM WA = 25 and 29 age males from IPMT/ IPM WA.

Aged (29-25) years male from IPM WA for year (1994) = 786654/5155907=0.1526

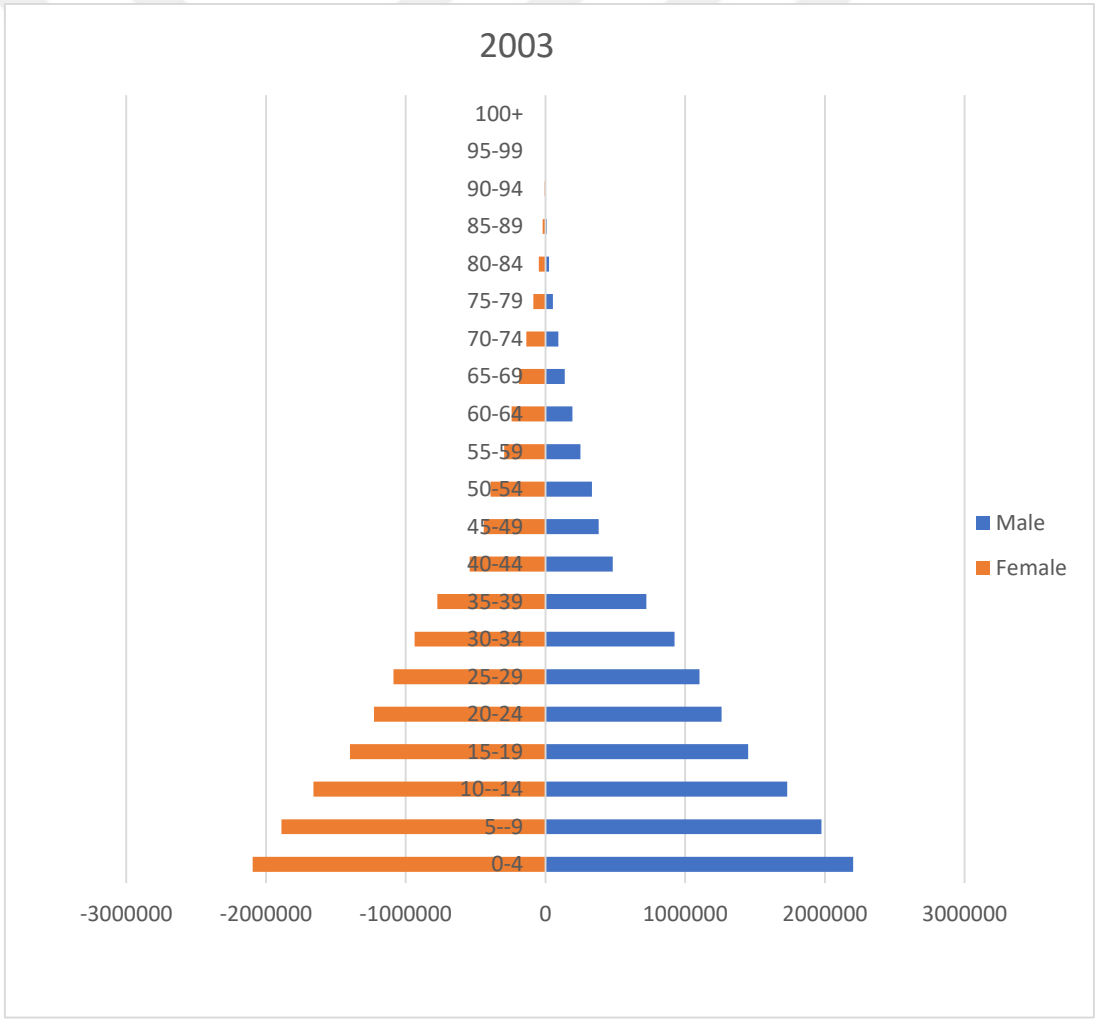
Average growth rate of males aged 25-29 years from the rate of what constitutes these ages of males of working age = Total growth rate of males aged 25-29 years divided by the total number of years.

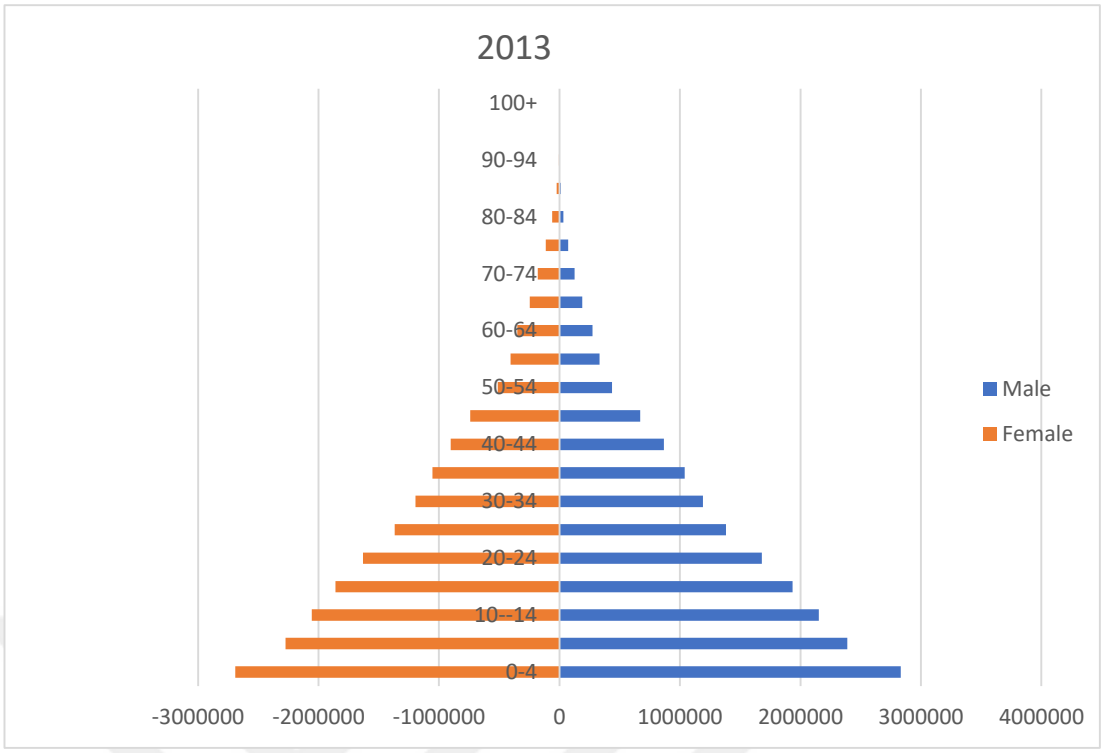
Average growth rate of males aged 25 and 29 years = -6% / 30 = -0.002%

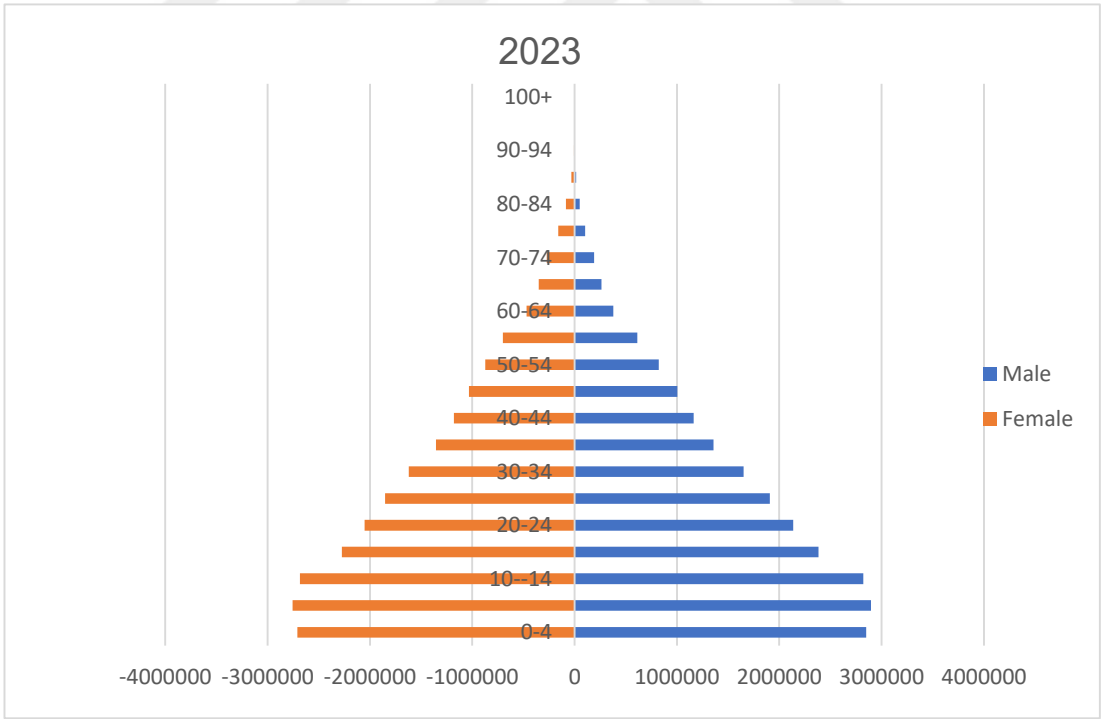
The growth rate applied to the number of males aged 25-29 years out of the number of males of working age between 15 and 64 years is 3.25% when following Table 6. The growth rates for these ages in the years between (2006-2007) gradually

decreased with negative signs (-0.26, -1.79) with the stability of the growth of the male population of working age, and these decreases in the numbers of these age groups are matched by the stability of the percentage of what constitutes the number of males of working age annually.

It is worth noting that young people in these categories have almost finished university education and are usually inclined to build their future and seize future opportunities as well as improve life and self-development by striving to raise the educational level or innovation and development of skills and also interest in life. Therefore, this category is a very important category because it is considered the pulse of life for young people, and the high rates of unemployment in this category have significant negative effects on society and the Iraqi economy.







Graphic 3. The pyramid chart illustrates the distribution of Iraq's population by age groups and gender year **(**2023 ,2013 ,2003**)**.

Source: Compiled and Calculated by (author) Based on the population pyramid from 1950 to 2100.

This graphic (3.) represents three years. These years (2003, 2013, 2023) were fixed because they represent the end of every 10 years that passed from the targeted years in the research. The pyramid chart is a picture of the population numbers in those three years and according to the order of age groups and gender. The population of Iraq is almost equally divided between the numbers of males and females, as well as the slight change in the growth of age groups for the three years in general and for the age groups between 25 and 29 years. Therefore, population increases occur in age groups outside the working age of children under the age of 15, and these percentages begin to decrease with age. Note that in 2023, compared to 2003 and 2013, the population in the 0-4 age group is declining compared to the 5-9 age group. This indicates that the number of births and births decreased between 2020 and 2023, resulting in a clear decline in the graph. The conclusion from this graph is that the working-age group (15-64 years) represents the largest portion of the population pyramid compared to other groups.

The total growth rate of Iraq's population was studied and measured, where the study period was divided into three stages, each stage the result of 10 years ago, for the purpose of accurately comparing growth rates, where the result of the growth rate for the first ten years (1994 to 2003) was 2.75% and the second ten years (2004 to 2013) was 2.75%, meaning a decrease of approximately 0.69%. As for studying the growth rates for the last ten years, i.e., from 2014 to 2023, the growth rate was 2.52%; thus, the average growth rate for the last 20 years (2004 to 2023) is 2.5% - 2.6%. Studying and analysing population growth rates in a comprehensive manner gives a clear understanding of the population movement in general. Which helps in assessing the economic and social needs of the population, such as infrastructure, health services, work, and employment, as well as giving a picture of the population's need for resources and drawing up future population policy and strategic planning.

The growth rate for the working-age male category was calculated between 15 and 64, where the average rate for 30 years was 3.44. It was found that the growth rate of this category is greater than the growth rate of the total population; thus, the numbers of age groups within the working age increase annually compared to other age groups. When analysing what this category represents of the total population for a period of thirty years, note that in 1994, their proportion was 25% of the total population, while in 2023, it became 30%, thus increasing by 5%. This is where this study comes in:

providing a clear understanding of the population movement of this category as well as the division and strategic planning of work and employment.

Also, the impact of age groups on some factors that lead to a decrease in growth rates in some years because of economic or security conditions or immigration, as was the case in 2007, which witnessed a significant decrease with a negative sign of (0.45 -%). Also, the age groups of young people between 25 and 29 years were studied, which is considered the ideal age group to start married life and form a family in Iraq, as well as obtain a job or permanent work that guarantees a decent living for him and his family. Therefore, this group is an important part of the age group within the work. The growth rate for this age group over 30 years is 3.25%, which is close to the growth rate of the working-age group. Therefore, it has become necessary to focus on and monitor these large numbers of annual growth rates.

2.2. The Labour Force in Iraq and Unemployment

The male and female labour force in Iraq will be studied and measured, as well as growth rates calculated and the proportion of males and females in the total workforce compared.

Table 6. Percentage of Male to Female Labour Force and Annual Growth Rate

S	years	Total Labour Force in Iraq	Labour Force, Male (% of Total Labour Force) - Iraq	Labour Force, Female (% of Total Labour Force) - Iraq	Male Labour Force	Female Labour Force	Male Labour Force Growth Rate **%**	Female Labour Force Growth **%**Rate
1	1994	4792392	0.893	0.107	4281205	511187	5.182	5.42
2	1995	4963865	0.893	0.107	4432968	530897	3.545	3.86
3	1996	5139446	0.893	0.107	4588567	550879	3.510	3.76
4	1997	5298924	0.892	0.108	4728622	570302	3.052	3.53
5	1998	5475444	0.889	0.111	4866572	608872	2.917	6.76
6	1999	5664232	0.885	0.115	5013343	650889	3.016	6.90
7	2000	5864591	0.881	0.119	5168048	696543	3.086	7.01
8	2001	6063313	0.877	0.123	5318959	744354	2.920	6.86
9	2002	6271603	0.873	0.127	5475732	795871	2.947	6.92
10	2003	6477441	0.869	0.131	5627174	850267	2.766	6.83
11	2004	6679058	0.864	0.136	5771330	907728	2.562	6.76

12	2005	6897082	0.859	0.141	5926300	970782	2.685	6.95
13	2006	6967997	0.854	0.146	5951787	1016210	0.430	4.68
14	2007	6932361	0.849	0.151	5884617	1047744	-1.129	3.10
15	2008	7077686	0.849	0.151	6009916	1067770	2.129	1.91
16	2009	7347180	0.850	0.150	6242515	1104665	3.870	3.46
17	2010	7588942	0.850	0.150	6452545	1136397	3.365	2.87
18	2011	7854695	0.851	0.149	6683489	1171206	3.579	3.06
19	2012	8207067	0.852	0.148	6988676	1218391	4.566	4.03
20	2013	8827667	0.844	0.156	7452374	1375293	6.635	12.88
21	2014	9385898	0.837	0.163	7852771	1533127	5.373	11.48
22	2015	9709072	0.832	0.168	8076834	1632238	2.853	6.46
23	2016	10025430	0.827	0.173	8290205	1735225	2.642	6.31
24	2017	10020634	0.862	0.138	8639057	1381577	4.208	-20.38
25	2018	10315657	0.862	0.138	8892263	1423394	2.931	3.03
26	2019	10543641	0.861	0.139	9079073	1464568	2.101	2.89
27	2020	10307044	0.861	0.139	8878517	1428527	-2.209	-2.46
28	2021	10683686	0.861	0.139	9193908	1489778	3.552	4.29
29	2022	11356412	0.864	0.136	9811577	1544835	6.718	3.70
30	2023	11811525	0.861	0.139	10171518	1640007	3.669	6.16
							93.472 30/% = 3.116	**30 / %129.04 %4.30=**

Source: Compiled and Calculated by (author) Based on (Worldbank.org) Date.

Note: Data on the labour force female (% of total labour force) - Iraq are available on the World Bank Group data site, but the percentages of males are not available. Therefore, the labour force table, males (% of total labour force) - Iraq was extracted by extracting the female representation from the numbers by multiplying the percentage value by the total number, which gives us the total number of females in the labour force for each year, and then subtracting the number of females from the total number to give us the total number of males.

Labour Force Total 1994 = 4,792,392

Labour Force, Female (% of Total Labour force) 1994 = 10.666

10.666% x 4,792,392= 511,187

511,187-4,792,392= 4,281,205 (For more details on changes in labour force total, please refer to APPENDIX-B) **Represents Labour Force, Male (% of Total Labour Force) – Iraq.**

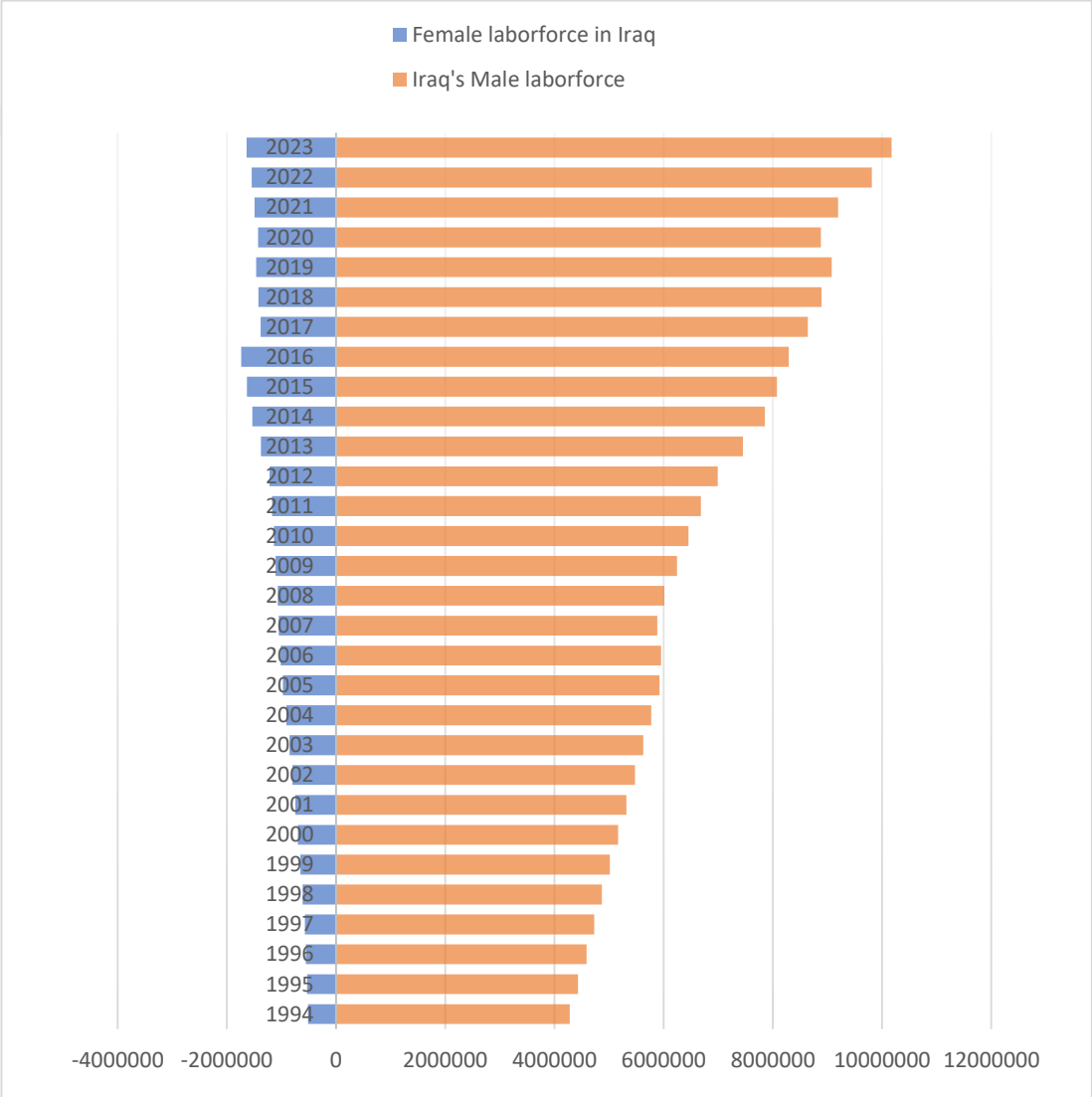
The Average 30-Year Growth Rate for the Male Labour Force is:

93.472%/30=3.116%

The Average 30-Year Growth Rate for the Female Labour Force is:

129.04%/30=4.30%

The average overall growth rate for women over 30 years is higher than that for men. Referring to the table, the female labour force share from 2007 to 2015 was higher than in other years. The female labor force growth rate reached 12.88% in 2012 and 11.48% in 2013.



Graphic 4. Number of Males in the Labour Force Compared to Females in Iraq (Years 1994-2023)

Source: Compiled and Calculated by (author) Based on (Worldbank.org) Date.

Through the pyramid graphic (4) The conclusion is that the proportion of the male labor force is much larger than the proportion of the female labor force in Iraq for a period of 30 years from 1994 to 2023, with regular growth for males and fluctuations for females for the years 2012-2017, with regularity for the remaining years.

The growth rates of the male labour force compared to females show that there is a significant decrease with a negative value for female employment compared to males, as recorded (-20.38) in 2016. Iraq Labour Force Survey 2021, (ILO. (2021):

The unemployment problem in Iraq became prominent after the year 1991, the first Gulf War, and the dismissal of thousands of Iraqi soldiers, which led to the pressure of the labour force on the market to obtain jobs, as well as the economic blockade imposed on Iraq during that period, which lasted for about 13 years. After the unemployment rates during the seventies and eighties of the last century recorded low rates estimated at (3.7%) of the total labour force (15) years and older, it rose to (13.5%) in 1997. After 2003 and the American war on Iraq, which led to the destruction of many facilities, the disruption of industrial projects for long periods, the loss of a significant part of human investments, and the dismissal of many workers from their jobs, turning them into an army of the unemployed, the unemployment rate recorded an amount of (10.28%), which represents more than half of the active population in 2003, which is a very dangerous and large percentage, which exacerbated the economic and social conditions, the decline in the standard of living, and the spread of unemployment significantly, and was one of the most important reasons for the security deterioration and the increase in violence. (Mahdi, 2021).

Unemployment rates in Iraq are increasing compared to the labour force; according to World Bank statistics, Iraq recorded a rate of 8.40% in 1992 and continued to stabilise in subsequent years at similar rates until 2013 and 2014, when it recorded a jump in unemployment rates compared to the labour force, recording 9.20% in 2013 and 10.60% in 2014, then rose further to reach 13% of the total labour force in 2017 and continued to rise in subsequent years until 2021, recording the highest number in 25 years (16.20%), after which unemployment rates began to gradually decline to reach 15.50% of the total labour force in 2023.

Table 7. Percentage of Unemployed in The Labour Force in Iraq with Annual Growth Rate**:**

S	years	Total Labour Force	Unemployment, Total (% of Total Labour Force)	Total Unemployment	Total Unemployment Growth rate %
1	1994	4792392	8.298	397673	3.41
2	1995	4963865	8.488	421333	5.95
3	1996	5139446	8.559	439885	4.40
4	1997	5298924	8.319	440817	0.21
5	1998	5475444	8.126	444935	0.93
6	1999	5664232	8.042	455518	2.38
7	2000	5864591	8.095	474739	4.22
8	2001	6063313	8.288	502527	5.85
9	2002	6271603	8.636	541616	7.78
10	2003	6477441	8.965	580703	7.22
11	2004	6679058	8.736	583483	0.48
12	2005	6897082	8.596	592873	1.61
13	2006	6967997	8.434	587681	-0.88
14	2007	6932361	8.646	599372	1.99
15	2008	7077686	8.467	599268	-0.02
16	2009	7347180	8.41	617898	3.11
17	2010	7588942	8.262	626998	1.47
18	2011	7854695	8.186	642985	2.55
19	2012	8207067	7.965	653693	1.67
20	2013	8827667	9.208	812852	24.35
21	2014	9385898	10.59	993967	22.28
22	2015	9709072	10.838	1052269	5.87
23	2016	10025430	10.82	1084752	3.09
24	2017	10020634	13.02	1304687	20.28
25	2018	10315657	13.509	1393542	6.81
26	2019	10543641	14.142	1491082	7.00
27	2020	10307044	15.776	1626039	9.05
28	2021	10683686	16.173	1727873	6.26
29	2022	11356412	15.588	1770238	2.45
30	2023	11811525	15.529	1834212	3.61
					161.77%/30=5.39

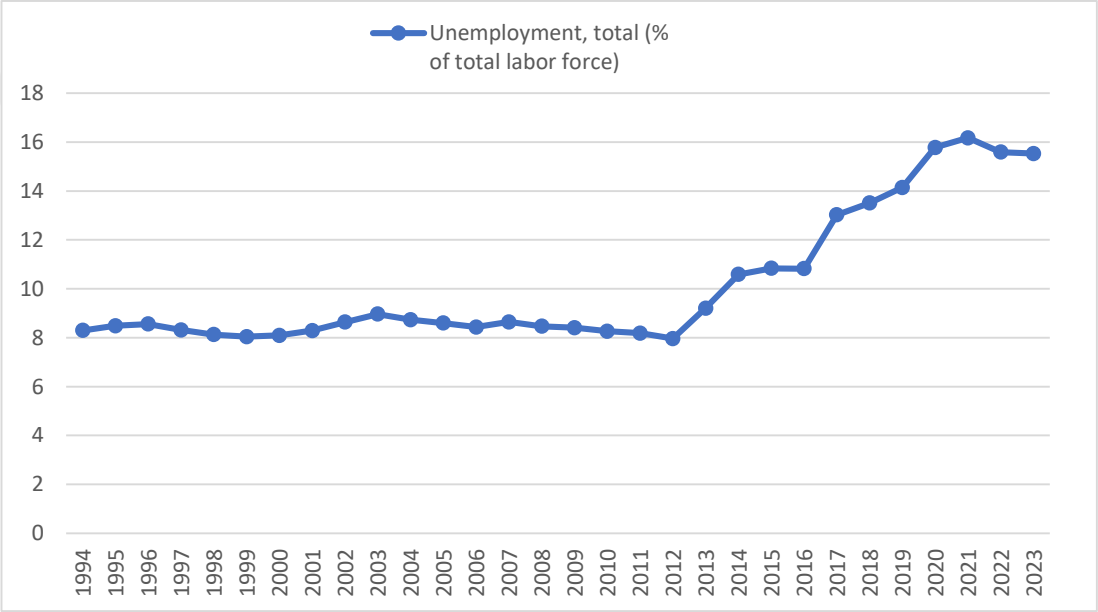
Source: Compiled and Calculated by (author) Based on (Worldbank.org) Date.

The total number of unemployed was calculated by multiplying the percentage of unemployed in the labour force (data available from the World Bank Group) by the total number of labour force. Number of unemployed in 1994:

4792392 x 8.298% = 397673

Arithmetic Mean or Average Unemployment, Total (% of total labour force): $\bar{X}= \Sigma xi/n$

161.77% %5.39 = 30/The Average Growth Rate of The Total Unemployment Rate of The Labour Force in Iraq for 30 Years.



Graphic 5. Unemployment, Total (% of Total Labour Force) (1994-2023).

Source: Compiled and Calculated by (author) Based on (Worldbank.org) Date.

Note (for more details on changes in the overall unemployment growth rate, please refer to APPENDIX-C): There was significant fluctuation in the overall unemployment growth rate between 2013 and 2018. The unemployment rate rose from 1.67% in 2012 to 24.35% in 2013, then declined in 2015 and 2016 by 5.87% and 3.09%, then rose again in 2017 by 20.28%, and then declined again in 2018 to 6.81%. These fluctuations are typically linked to the security and economic conditions the country experiences during that period; thus, improved security opens the door to investment and employment, in addition to the economy's connection to fluctuations in global oil prices.

Table 8. . Comparison of the Percentage of Unemployed People (Males and Females) Out of the Total Labour Force Years (1994-2023):

years	Total Unemployment	Unemployment, Male (% of Male in Labour Force) - Iraq	Unemployment, Female (% of Female in Labour Force) - Iraq	Male Unemployment in the Labour Force	Female Unemployment in the Labour Force	Male Unemployment Growth Rate	Female Unemployment Growth rate
1993	384546	8.584	7.258	349392	35193		
1994	397673	8.433	7.165	361034	36627	3.33	4.07
1995	421333	8.631	7.287	382609	38686	5.98	5.62
1996	439885	8.706	7.333	399481	40396	4.41	4.42
1997	440817	8.456	7.18	399852	40948	0.09	1.37
1998	444935	8.26	7.06	401979	42986	0.53	4.98
1999	455518	8.177	7.009	409941	45621	1.98	6.13
2000	474739	8.237	7.047	425692	49085	3.84	7.59
2001	502527	8.444	7.177	449133	53422	5.51	8.84
2002	541616	8.815	7.405	482686	58934	7.47	10.32
2003	580703	9.168	7.619	515899	64782	6.88	9.92
2004	583483	8.934	7.48	515611	67898	-0.06	4.81
2005	592873	8.792	7.396	521040	71799	1.05	5.75
2006	587681	8.628	7.297	513520	74153	-1.44	3.28
2007	599372	8.861	7.441	521436	77963	1.54	5.14
2008	599268	8.474	8.427	509280	89981	-2.33	15.42
2009	617898	8.217	9.497	512947	104910	0.72	16.59
2010	626998	7.871	10.487	507880	119174	-0.99	13.60
2011	642985	7.598	11.542	507811	135181	-0.01	13.43
2012	653693	7.187	12.426	502276	151397	-1.09	12.00
2013	812852	7.757	17.07	578081	234763	15.09	55.06
2014	993967	8.399	21.813	659554	334421	14.09	42.45
2015	1052269	8.543	22.195	690004	362275	4.62	8.33
2016	1084752	8.454	22.125	700854	383919	1.57	5.97
2017	1304687	10.187	30.738	880061	424669	25.57	10.61
2018	1393542	10.912	29.729	970324	423161	10.26	-0.36
2019	1491082	11.759	28.913	1067608	423451	10.03	0.07
2020	1626039	13.603	29.281	1207745	418287	13.13	-1.22
2021	1727873	14.224	28.2	1307741	420117	8.28	0.44
2022	1770238	13.326	29.951	1307491	462694	-0.02	10.13
2023	1834212	13.232	29.772	1345895	488263	2.94	5.53
						/%142.97 4.77=30	**/%290.29 9.68=30**

Source: Compiled and Calculated by (author) Based On (Worldbank.org) Date.

The table 2.9. shows the growth rate of male and female unemployment, which was calculated using the following equation: ((New Year - Old Year) / Old Year) x 100.

The number of unemployed males was calculated by multiplying the percentage of unemployed males (data available from the World Bank Group) by the total number of the male labour force (Table 2.6). The same steps were applied to females as well.

Calculate the Number of Unemployed Males In 1994 = 4281205 X 8.433% = 361034.

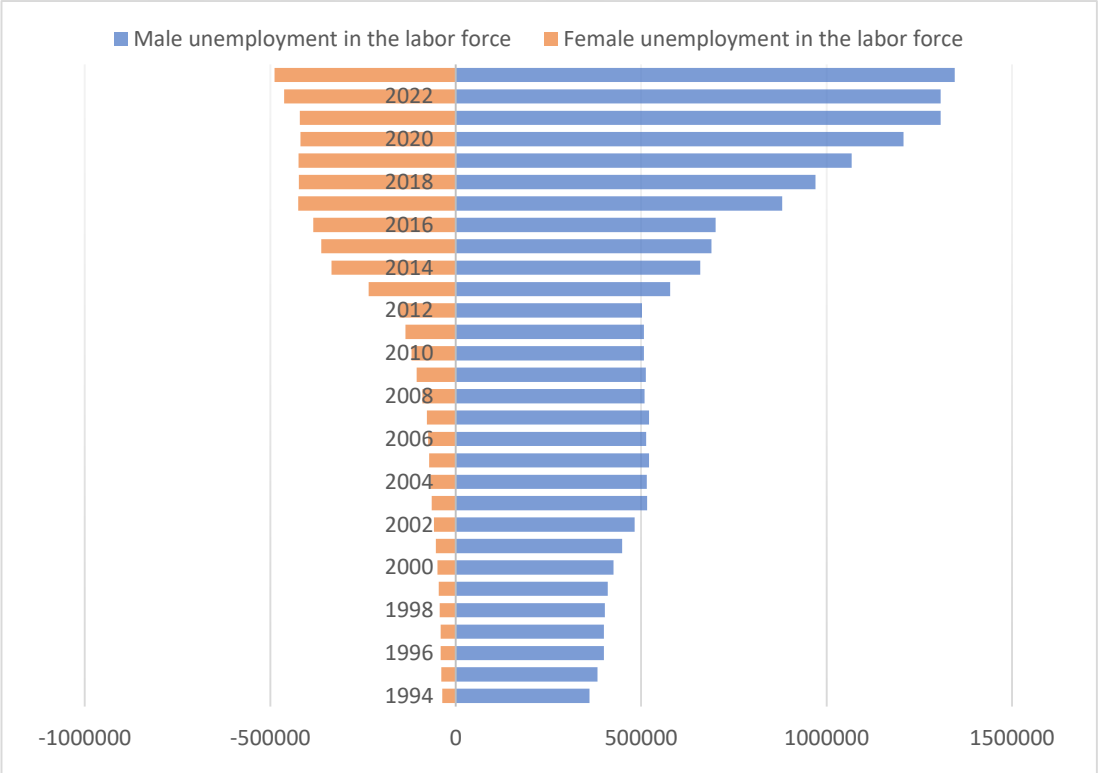
Calculate the Number of Unemployed Females In 1994 = 511187 X 7.165% = 36627.

Number of Unemployed Males In 1994 + Number of Unemployed Females In 1994 = 361034 + 36627 = 397661

Note that some numbers change in the last two places due to the difference in calculation when converting the number to a percentage.

Average growth rate of male unemployed for 30 years =142.97%/30=**4.77**.

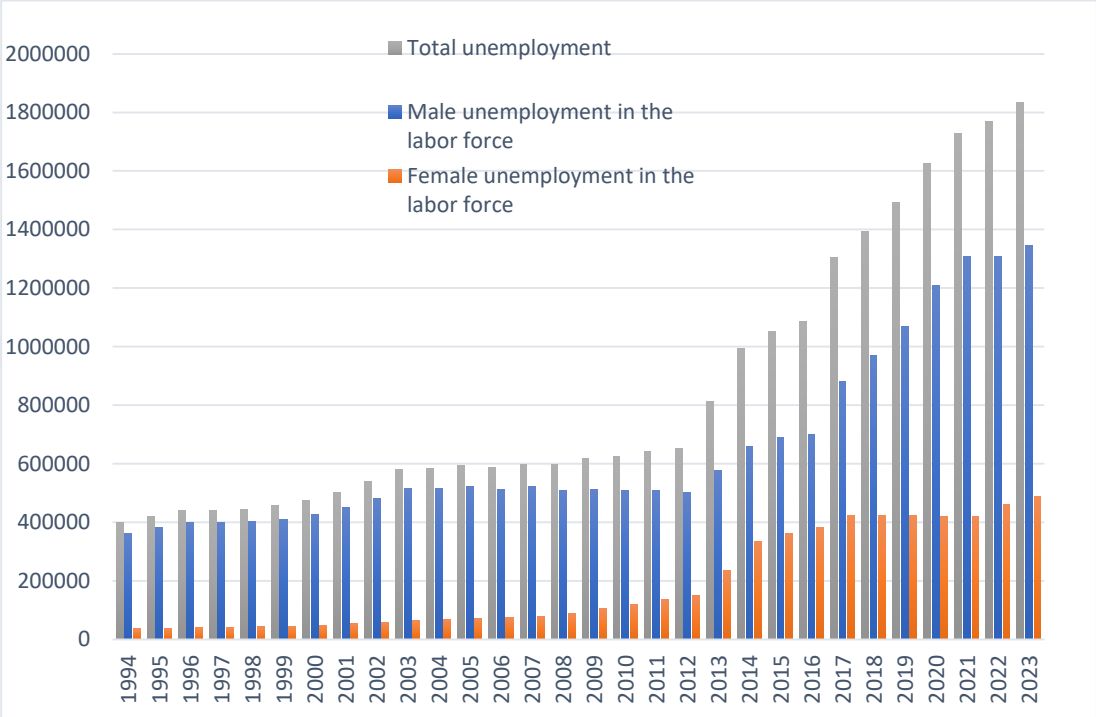
Average growth rate of female unemployed for 39 years =290.29%/30=**9.68**%.



Graphic 6. Hierarchical Chart to Compare the Number of Unemployed Males with Females.(2023-1994)

Source: Compiled and Calculated by (author) Based on (Worldbank.org) Date.

This pyramid graphic (6.) shows the number of unemployed males and females as well as the comparison between them. Also, the unemployment rate for males in the workforce is much greater than the number of unemployed females in the workforce because the base of the workforce for males is much greater than for females, as the average percentage of males was 89.03% and for females 14.04%.



Graphic 7. Number of Unemployed Men and Women of The Total Number (1994-2023).

Source: Compiled and Calculated by (author) Based on (Worldbank.org) Date.

This graphic 7 shows the percentage of unemployed males and females in the total number of unemployed people. The percentage of males is very close to the total number of unemployed, while the percentage of females is very low compared to the total number of unemployed.

The Central Statistical Organisation in Iraq conducted a census of employment and unemployment indicators for the years (2014, 2016), including the Social and Economic Survey of the Household in Iraq for the year 2014 and the Survey of the Nutritional Status and Vulnerability of the Household in Iraq for the year 2016, where the unemployment rate by age 15+ was fixed at (10.6, 10.8)%, the unemployment rate among youth ages (15-24)/males (20.1, 17)%, the unemployment rate among youth ages (15-24)/females (64.8, 38)%, the youth unemployment rate for ages (15-24)/total (20, 22.7)%, and also the economic activity rate for ages greater than +15 (42.7,

43.2)%. The unemployment rates of the total female labour force are higher than the unemployment rates of the total male labour force, one of the reasons being that there are some required jobs that women cannot work in or perform because they require effort. And physical structure, such as factories, construction, and other hard work. (Authority of Statistics and Geographic Information Systems-Iraq, 2016).

According to the World Bank Group data and calculations extracted from the above tables, the labour force for the years (1994, 2004, 2014, 2023) for males was (4,281,205, 5,771,330, 7,852,771, 10,171,518), and the labour force (1994, 2004, 2014, 2023) for females was (511,187, 907,728, 1,533,127, 1,640,007); thus, the female labour force constitutes only 16% of the total male labour force. This percentage represents what the female labour force constitutes as a percentage compared to the male labour force, not a comparison with the total labour force.

The stability of the total number of unemployed people from the total labour force from 1994 to 2013, and then it began to rise in 2014, and this rise will continue until 2023. Therefore, it is necessary to focus on the way the blue line rose over approximately 10 years. These increases are considered dangerous because they came after stability. Therefore, it is necessary to address the problem to maintain stability again. (For more details on changes in the total unemployment rate growth rate, please refer to APPENDIX-D).

It is also considered an illustrative chart to compare the unemployment growth rate between males and females, where the orange line represents the unemployment growth rate for females and the blue line represents the unemployment growth rate for males. The growth rates are roughly similar, but between 2012 and 2015 there was a significant increase in the unemployment growth rate among females, meaning that between these two years the unemployment rates were very high compared to males, whose growth rate is considered almost moderate, meaning it grows almost regularly. (For more details on changes in the total unemployment rate growth rate, please refer to APPENDIX-E).

2.3. Comparison of Working Age, Labor Force and Unemployment Rates for Males

In this part, the percentage of the population of males of working age (between 15 and 64) outside the labour force is calculated, representing the part that does not

work but is not unemployed, such as retirees, students, people with disabilities, etc., as well as calculating the percentage of the number of unemployed people from the number of males of working age.

Unemployment Rate = (Number of Unemployed / Total Labor Force) × 100

Table 9. Comparison of The Percentage Number of IPM WA (Out of) Number of Labour Force and The Percentage of The Unemployed as A Percentage of The IPM WA (1994-2023):

S	Years	Unemployment Rate of Males from IPM WA (Percentage)	Unemployment Rate of Males from IPM WA Without Number of Males (Out of) Labour Force (Percentage)	Inside IPM WA and (Out of) The Labour Force (Percentage)	Inside IPM WA Inside Labour Force (Percentage)
1	1994	0.07	0.08	0.17	83%
2	1995	0.07	0.09	0.17	83%
3	1996	0.07	0.09	0.18	82%
4	1997	0.07	0.08	0.18	82%
5	1998	0.07	0.08	0.19	81%
6	1999	0.07	0.08	0.19	81%
7	2000	0.07	0.08	0.2	80%
8	2001	0.07	0.08	0.21	79%
9	2002	0.07	0.09	0.21	79%
10	2003	0.07	0.09	0.22	78%
11	2004	0.07	0.09	0.22	78%
12	2005	0.07	0.09	0.23	77%
13	2006	0.07	0.09	0.23	77%
14	2007	0.07	0.09	0.24	76%
15	2008	0.06	0.08	0.24	76%
16	2009	0.06	0.08	0.24	76%
17	2010	0.06	0.08	0.25	75%
18	2011	0.06	0.08	0.25	75%
19	2012	0.05	0.07	0.25	75%
20	2013	0.06	0.08	0.24	76%
21	2014	0.06	0.08	0.23	77%
22	2015	0.07	0.09	0.24	76%
23	2016	0.06	0.08	0.24	76%
24	2017	0.08	0.1	0.23	77%
25	2018	0.08	0.11	0.23	77%
26	2019	0.09	0.12	0.24	76%
27	2020	0.1	0.14	0.28	72%
28	2021	0.1	0.14	0.28	72%

29	2022	0.1	0.13	0.25	75%
30	2023	0.1	0.13	0.25	75%
		2.06/30=0.07	2.80/30=0.09	6.79/30=0.23	

Source: Compiled and Calculated by (author) Based on (Worldbank.org) Date.

The number of males of working age and (out of) the labour force was calculated by subtracting the value of the male labor force from the total number of males of working age between the ages of (15-64).

Unemployment rate of males from IPM WA (percentage) year 2023=IPM WA/Male unemployment in the labour force = 1345895/13473714=0.10.

Average rate for 30 years=2.06/30=0.07 Of the number of males of working age.

That is, the average rate of the percentage of unemployed people out of the number of males of working age between (15-64) years for 30 years is 0.07.

Unemployment rate of males from IPM WA without the number of males (out of) the labour force (percentage) = Male unemployment in the labour force/IPM WA - Inside IPM WA and (out of) the labour force=1345895/10171518=0.13.

Average rate for 30 years=2.80/30=0.09 Of the number of working-age males, isolating working-age males and those (out of) the labour force.

That is, the average rate of the percentage of unemployed people out of the number of males of working age (between 15 and 64 years) isolating the number of males of working age out of the labour force for 30 years is 0.09.

Inside IPM WA and (out of) the labour force (percentage)= Inside IPM WA and (out of) the labour force/IPM WA= 3302196/ 10171518=0.25 from IPM WA.

Average rate for 30 years=6.79/30=0.23 from IPM WA.

That is, the average rate of the percentage of males of working age and outside the labour force out of the total number of males of working age for 30 years is 0.23. (For more details on changes in the total unemployment rate growth rate, please refer to APPENDIX-F)

The average growth rate of the total labour force and the growth rate of the male and female labour forces were calculated by calculating what these categories constitute of the total labour force and measuring the annual growth rate. After

studying and measuring the data, it was found that the male labour force is much larger than the female labour force. This does not mean that the numbers are larger, but rather comparisons with the annual growth rates. The reason for the high growth of the female labour force is the increase in some years compared to other years, and this fluctuation and increase affect the average annual growth rate. One of the most important reasons for calculating the labour force is understanding the labour market, as well as measuring and analysing economic performance and strategic planning. When calculating the annual growth rate for a given year and comparing it with previous years, it gives a clear understanding of the amount of supply and demand in the labour market, as it shows the extent of the market's ability to absorb the labour force, thus setting future policies and plans to employ and provide job opportunities for the unemployed. The average and total unemployment rates were also calculated, and a comparison was made between male and female unemployment. The result was that male unemployment is much greater than female unemployment. This is due to some economic, social, and cultural factors in Iraq. There are influences of societal customs and traditions, as well as roles and traditions, as many women work in jobs such as health, education, and housework, while men work in hard work that requires effort and endurance, such as construction and industries. Women often work in part-time jobs, which makes unemployment less obvious. Males also participate in the labour force more than females, considering that Iraq is one of the societies in which the man is responsible for providing the family's requirements.

CHAPTER THREE
THE IMPACT OF GROWTH RATE OF WORKING-AGE MALES AND UNEMPLOYMENT RATE- IRAQ

3.1. The growth rate of working-age males and unemployment rate

In this chapter, the research data has been analyzed. and find the relationship between the study variables using statistical tools through the SPSS program and the Excel program and extract the simple linear regression equation as well as the Pearson correlation coefficient to measure the strength of the relationship.

The target data is the percentage of the Iraqi population of males of working age between the ages of (15-64) of the total population, and the unemployment rate in Iraq from the labor force. To measure and analyze the relationship, The independent variable will be used, which is the percentage of the Iraqi population of males of working age from the total population, and the dependent variable is the percentage of the number of unemployed from the labor force.

Table 10. The Percentage of the Working-Age Male Population in the Total Population Compared to the Percentage of Unemployed in the Labor Force (1994-2023):

S	Years	IPM WA OF IPT	IUMPT OF LF
1	1994	0.25	0.083
2	1995	0.26	0.085
3	1996	0.26	0.086
4	1997	0.26	0.083
5	1998	0.26	0.081
6	1999	0.26	0.080
7	2000	0.26	0.081
8	2001	0.26	0.083
9	2002	0.26	0.086
10	2003	0.27	0.090
11	2004	0.27	0.087
12	2005	0.27	0.086
13	2006	0.27	0.084
14	2007	0.27	0.086
15	2008	0.27	0.085
16	2009	0.27	0.084
17	2010	0.27	0.083
18	2011	0.28	0.082

19	2012	0.28	0.080
20	2013	0.28	0.092
21	2014	0.28	0.106
22	2015	0.28	0.108
23	2016	0.28	0.108
24	2017	0.28	0.130
25	2018	0.29	0.135
26	2019	0.29	0.141
27	2020	0.29	0.158
28	2021	0.29	0.162
29	2022	0.29	0.156
30	2023	0.30	0.155

Source: Compiled and Calculated by (author) Based on (Worldbank.org) Date.

The independent variable will be symbolised as X, and the dependent variable will be symbolised as Y, where the independent variable X is (IPM WA OF IPT) and represents the percentage of the male population of working age from the total population, and the dependent variable Y is (IUMPT OF LF) and represents the unemployed from the labour force.

Table 11. Value of X and Y That Represent the Independent and Dependent Variables (1994-2023):

S	years	X	Y	X^2	Y^2	XY	$(X - \bar{X})$	$(Y - \bar{Y})$	$^2(X - \bar{X})$	$(X - \bar{X})$ $(Y - \bar{Y})$
1	1994	0.25	0.08	0.065	0.01	0.021	-0.013	-0.019	0.0002	0.0002
2	1995	0.26	0.08	0.066	0.01	0.022	-0.003	-0.017	0.0002	0.0001
3	1996	0.26	0.09	0.066	0.01	0.022	-0.003	-0.016	0.0002	0.0000
4	1997	0.26	0.08	0.067	0.01	0.022	-0.003	-0.018	0.0002	0.0001
5	1998	0.26	0.08	0.068	0.01	0.021	-0.003	-0.020	0.0002	0.0001
6	1999	0.26	0.08	0.068	0.01	0.021	-0.003	-0.021	0.0002	0.0001
7	2000	0.26	0.08	0.069	0.01	0.021	-0.003	-0.021	0.0002	0.0001
8	2001	0.26	0.08	0.069	0.01	0.022	-0.003	-0.019	0.0002	0.0001
9	2002	0.26	0.09	0.070	0.01	0.023	-0.003	-0.015	0.0000	0.0000
10	2003	0.27	0.09	0.071	0.01	0.024	0.007	-0.012	0.0000	-0.0001
11	2004	0.27	0.09	0.071	0.01	0.023	0.007	-0.014	0.0000	-0.0001
12	2005	0.27	0.09	0.072	0.01	0.023	0.007	-0.016	0.0000	-0.0001

13	2006	0.27	0.08	0.072	0.01	0.023	0.007	-0.017	0.0000	-0.0001
14	2007	0.27	0.09	0.073	0.01	0.023	0.007	-0.015	0.0000	-0.0001
15	2008	0.27	0.08	0.074	0.01	0.023	0.007	-0.017	0.0000	-0.0001
16	2009	0.27	0.08	0.074	0.01	0.023	0.007	-0.017	0.0000	-0.0001
17	2010	0.27	0.08	0.075	0.01	0.023	0.007	-0.019	0.0000	-0.0001
18	2011	0.28	0.08	0.076	0.01	0.023	0.017	-0.020	0.0000	-0.0003
19	2012	0.28	0.08	0.076	0.01	0.022	0.017	-0.022	0.0000	-0.0004
20	2013	0.28	0.09	0.077	0.01	0.026	0.017	-0.009	0.0000	-0.0002
21	2014	0.28	0.11	0.078	0.01	0.030	0.017	0.004	0.0000	0.0001
22	2015	0.28	0.11	0.079	0.01	0.030	0.017	0.007	0.0000	0.0001
23	2016	0.28	0.11	0.080	0.01	0.031	0.017	0.007	0.0000	0.0001
24	2017	0.28	0.13	0.080	0.02	0.037	0.017	0.029	0.0000	0.0005
25	2018	0.29	0.14	0.081	0.02	0.039	0.027	0.034	0.0003	0.0009
26	2019	0.29	0.14	0.083	0.02	0.041	0.027	0.040	0.0003	0.0011
27	2020	0.29	0.16	0.084	0.02	0.046	0.027	0.056	0.0003	0.0015
28	2021	0.29	0.16	0.085	0.03	0.047	0.027	0.060	0.0003	0.0016
29	2022	0.29	0.16	0.086	0.02	0.046	0.027	0.054	0.0003	0.0015
30	2023	0.30	0.16	0.088	0.02	0.046	0.037	0.054	0.0007	0.0020
		0.274	0.10	2.243		0.841	0.310	0.000	0.0039	0.0081

Source: Compiled and Calculated by (author) Based on (Worldbank.org) Date.

Table 11. Calculate the Value of X and Y That Represent the Independent and Dependent Variables for The Purpose of Calculating the Simple Linear Regression Equation(2023-1994):

- Finding a simple linear regression equation using the least squares method:

  Simple linear regression equation: Y =a +b X

  X: Independent variable

  Y: Dependent variable

  b: Slope, is the amount of change in the dependent variable Y when the independent variable X changes by one unit

  a: The expected (constant) value of Y when X=0

  To find the simple linear regression equation, The value must be found (a, b).

$$\mathbf{b} = \frac{\sum(\boldsymbol{X}-\bar{\boldsymbol{X}})(\boldsymbol{Y}-\bar{\boldsymbol{Y}})}{\sum(\boldsymbol{X}-\bar{\boldsymbol{X}})\text{^}\mathbf{2}} = \frac{\mathbf{0.0081}}{\mathbf{0.0039}} = \mathbf{2.03}$$

$$a = \bar{Y} - b\,\bar{X} = 0.102 - 2.03*(0.274) = 0.45$$

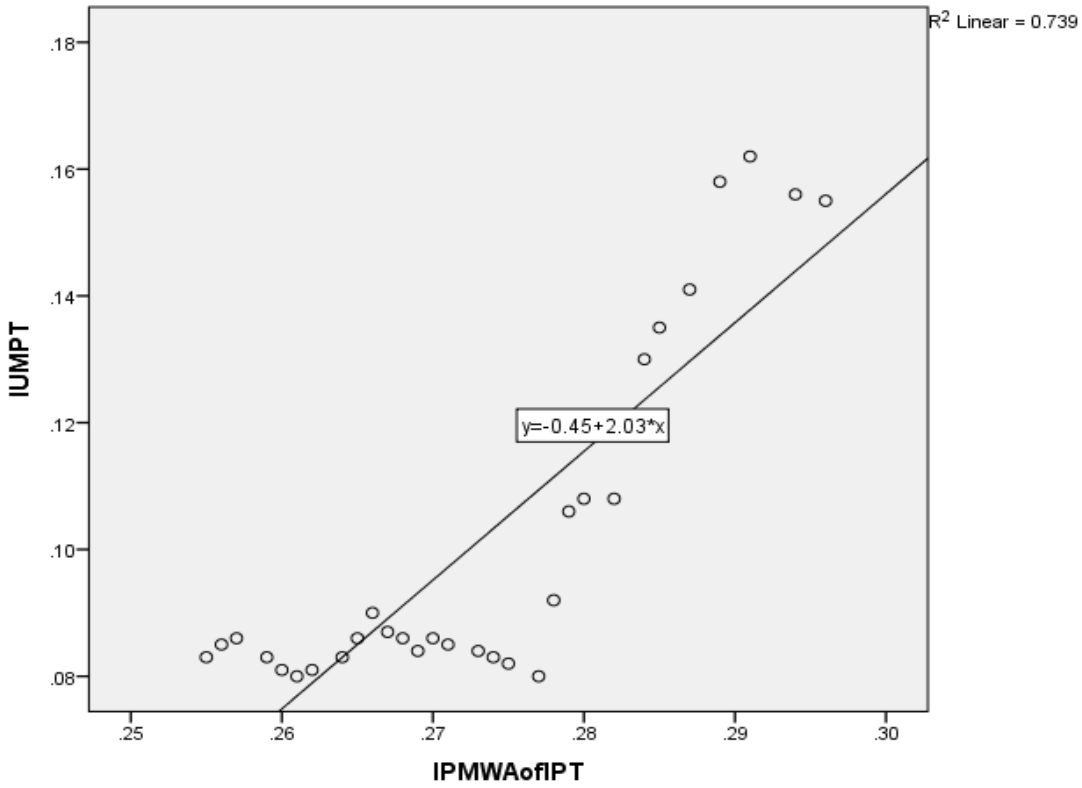
Therefore, the regression equation = **Y= -0.45+2.03*X**

- correlation coefficient:

  r = n(∑x y) – (∑x) (∑y) / √[n∑x²-(∑x) ²][n∑y²-(∑y)² =0.0081 / 0.0095= 0.86

- Coefficient of Determination:

  R^2 Linear = $(0.86)^2$ = 0.739.



Graphic 8. Simple Linear Regression Equation as well as the R2.
Source: Compiled (author)

This graphic shows a simple linear regression equation as well as the R2 coefficient of determination, indicating a strong linear relationship through the spread and distribution of the points along the line.

The simple linear regression equation (Y= -0.45+2.03*X) can be used to know, understand, or predict the relationship between the two study variables:

- The expected value of Y is -0.45 when the value of X is 0.

- The value of Y increases by 2.03 units when the value of X increases by one unit. This is evidence that X and Y move in the same direction, i.e., there is a positive linear relationship between the two study variables and that X has a direct and strong effect on Y.
- b = 2.03 means that a large part of the variance in Y is explained by the independent variable X, as for each unit increase in X, Y increases significantly.
- Since the value of R^2= 0.739 is close to 1, the model largely explains the variances in the dependent variable, which means that the linear model represents the data well.

Descriptive Statistics

	Mean	Std. Deviation	N
IUMPT	.1015	.02776	30
IPMWA of IPT	.2731	.01175	30

The mean value is the expected central value of the data for the two variables, Standard deviation: measures how spread out the values are around the mean.

Larger value (IUMPT) = 0.0 2776: means that the values are more spread out around the mean compared to (IPMWA of IPT)

(IPMWA of IPT) = 0.0 1175: indicates that the values are moderately spread out and not significantly spread out when compared to IUMPT.

Correlations

		IUMPT	IPMWA of IPT
Pearson Correlation	IUMPT	1.000	.859
	IPMWA of IPT	.859	1.000
Sig. (1-tailed)	IUMPT	.	.000
	IPMWA of IPT	.000	.
N	IUMPT	30	30
	IPMWA of IPT	30	30

Pearson Correlation Coefficient: which expresses the strength and direction of the relationship between the two variables. The correlation coefficient between IUMPT and IUMPT is equal to 1 and is constant. The correlation coefficient between IUMPT and IPMWA of IPT is 0.859. It is a strong and positive linear relationship between the two variables. That is, the more the percentage of males of working age increases from the total population, the more the percentage of unemployed from the labour force increases significantly. The probability value (sig. = 0.000), indicating

that there is a strong statistical significance between the two variables according to the law. If sig < 0.05, then the relationship between the two variables is a real relationship, and the regression is significant. Therefore, we:

Reject the null hypothesis (H0).

accept the alternative hypothesis (H 1).

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	IPMWA of IPT[b]	.	Enter
a. Dependent Variable: IUMPT			
b. All requested variables entered.			

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.859[a]	.739	.729	.01444
a. Predictors: (Constant), IPMWA of IPT				
b. Dependent Variable: IUMPT				

Since the coefficient of determination R2 = 0.739, this means that 73.9% of the changes in the unemployment rate (the dependent variable) can be explained by the linear model (the independent variable, the proportion of working-age males).

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.017	1	.017	79.151	.000[b]
	Residual	.006	28	.000		
	Total	.022	29			
a. Dependent Variable: IUMPT						
b. Predictors: (Constant), IPMWA of IPT						

The ANOVA table measures the proportion of variance in the variables, thus the sum of squares (Sum of Squares - SS) is the amount of variance in the dependent variable (IUMPT) that can be explained by the independent variable (IPMWA) and equals Regression SS (0.017), the amount of variance in IUMPT that is not explained by the model Residual SS (0.006), and the total variance in IUMPT (Regression SS + Residual SS) Total SS (0.022), Regression df (1): Number of independent variables in the model. Residual df (28): Number of observations minus number of model coefficients (constant + number of independent variables). Total df (29): Total number of observations minus 1

Coefficients[a]						
Mode		Unstandardized Coefficients		Standardized Coefficients Beta	t	Sig.
1		B	Std. Error			
	(Constant)	-.453	.062		-7.261	.000
	IPMWA of IPT	2.03	.228	.859	8.897	.000

a. Dependent Variable: IUMPT

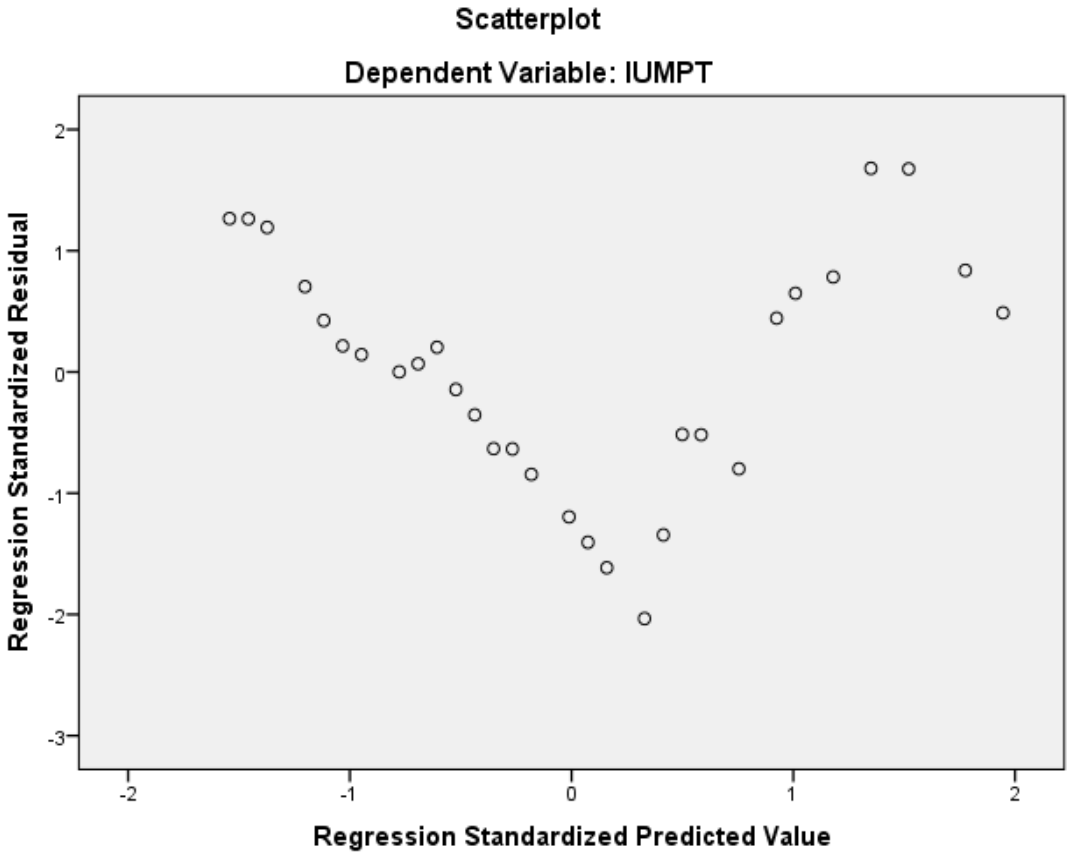
IUMPT=−0.453+2.03 * IPMWA of IPT

If the independent variable, which is the percentage of males in the working-age population out of the total population, is equal to zero, then the value of the dependent variable (constant), which is the unemployment rate in the labour force, is equal to (-.453), Std. Error = 0.062: refers to the standard error of the estimate. This means that the estimate for the constant falls within ±0.062 of its true value. The value of (2.03) is the regression coefficient for the independent variable, and it indicates the amount of expected change in each unit that occurs in the unemployment rate in the labour force for each unit increase in the percentage of males in the working age out of the total population, Std. Error = 0.228: Represents the standard error of the regression coefficient estimate. This means that the estimate is within ±0.228 of the true value.

Residuals Statistics[a]					
	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	.0647	.148	.1015	.02386	30
Residual	-.02938	.02425	.000000	.01419	30
Std. Predicted Value	-1.543	1.946	.000	1	30
Std. Residual	-2.035	1.679	.0000	.983	30

a. Dependent Variable: IUMPT

The Predicted Values appeared very close to the actual values; thus, the accuracy of the model is excellent, and the residuals are normally distributed with a mean equal to 0, thus there is no bias in the model. The standard deviation of the residuals is 0.01419, This indicates that the errors are relatively small, that the standard value appears without any obvious extremes (outliers), and that it shows a very normal distribution.



Graphic 9. Scatter Plot of the Residuals and Predicted Values.

Source: Compiled (author)

Although there is a slight skewness in the residuals plot, the linear regression model was retained in the analysis due to its clarity and ease of interpretation, in addition to the high coefficient of determination ($R^2 = 0.910$), which indicates that a large proportion of the variance of the dependent variable is explained by the independent variable and likely affects the quality of the model.

The target data is the number of Iraqi males of working age (15-64 years) and the number of unemployed. To measure and analyse the relationship, Use of the independent variable, which is the number of Iraqi males of working age, and the dependent variable, which is the number of unemployed.

Table 12. Number of Male Populations of Working Age Compared to The Number of Unemployed Between (1994-2023):

S	years	IPM WA	IUMPT
1	1994	5.2	0.40
2	1995	5.4	0.42
3	1996	5.6	0.44
4	1997	5.8	0.44

5	1998	6.0	0.44
6	1999	6.2	0.46
7	2000	6.5	0.47
8	2001	6.7	0.50
9	2002	7.0	0.54
10	2003	7.2	0.58
11	2004	7.4	0.58
12	2005	7.7	0.59
13	2006	7.8	0.59
14	2007	7.7	0.60
15	2008	7.9	0.60
16	2009	8.3	0.62
17	2010	8.6	0.63
18	2011	8.9	0.64
19	2012	9.4	0.65
20	2013	9.9	0.81
21	2014	10.2	0.99
22	2015	10.6	1.05
23	2016	10.9	1.08
24	2017	11.2	1.30
25	2018	11.6	1.39
26	2019	11.9	1.49
27	2020	12.3	1.63
28	2021	12.7	1.73
29	2022	13.1	1.77
30	2023	13.5	1.83

Source: Compiled and Calculated by (author) Based on (Worldbank.org) Date.

The independent variable will be symbolised by X, and the dependent variable will be symbolised by Y, where the independent variable X is (IPM WA) and represents the number of males of working age, and the dependent variable Y is (IUMPT) and represents the number of unemployed.

To simplify the numbers and find the relationship between the two variables, the number of working-age males was divided by (1,000,000), and the number of unemployed by (1000,000).

Note: The table of the number of unemployed in Iraq was used through Table No. 9, which explains the method of calculating the total number of unemployed.

Table 13 . Value of X and Y That Represent the Independent and Dependent Variables (1994-2023):

S	years	X	Y	X^2	Y^2	XY	$(X - \bar{X})$	$(Y - \bar{Y})$	$^2(X - \bar{X})$	$(X - \bar{X})$ $(Y - \bar{Y})$
1	1994	5.2	0.40	26.6	0.2	2.1	-3.61	-0.45	13.0	1.6
2	1995	5.4	0.42	28.8	0.2	2.3	-3.40	-0.42	11.6	1.4
3	1996	5.6	0.44	31.0	0.2	2.4	-3.20	-0.40	10.2	1.3
4	1997	5.8	0.44	33.4	0.2	2.5	-2.99	-0.40	8.9	1.2
5	1998	6.0	0.44	35.9	0.2	2.7	-2.77	-0.40	7.7	1.1
6	1999	6.2	0.46	38.7	0.2	2.8	-2.55	-0.39	6.5	1.0
7	2000	6.5	0.47	41.8	0.2	3.1	-2.30	-0.37	5.3	0.8
8	2001	6.7	0.50	44.9	0.3	3.4	-2.06	-0.34	4.3	0.7
9	2002	7.0	0.54	48.4	0.3	3.8	-1.81	-0.30	3.3	0.5
10	2003	7.2	0.58	51.8	0.3	4.2	-1.57	-0.26	2.5	0.4
11	2004	7.4	0.58	55.3	0.3	4.3	-1.33	-0.26	1.8	0.3
12	2005	7.7	0.59	59.1	0.4	4.6	-1.08	-0.25	1.2	0.3
13	2006	7.8	0.59	60.5	0.3	4.6	-0.99	-0.26	1.0	0.3
14	2007	7.7	0.60	59.9	0.4	4.6	-1.03	-0.24	1.1	0.3
15	2008	7.9	0.60	62.9	0.4	4.8	-0.84	-0.24	0.7	0.2
16	2009	8.3	0.62	68.3	0.4	5.1	-0.50	-0.23	0.2	0.1
17	2010	8.6	0.63	73.6	0.4	5.4	-0.19	-0.22	0.0	0.0
18	2011	8.9	0.64	79.6	0.4	5.7	0.15	-0.20	0.0	0.0
19	2012	9.4	0.65	87.7	0.4	6.1	0.60	-0.19	0.4	-0.1
20	2013	9.9	0.81	97.1	0.7	8.0	1.09	-0.03	1.2	0.0
21	2014	10.2	0.99	105.1	1.0	10.2	1.48	0.15	2.2	0.2
22	2015	10.6	1.05	112.1	1.1	11.1	1.82	0.21	3.3	0.4
23	2016	10.9	1.08	119.1	1.2	11.8	2.15	0.24	4.6	0.5
24	2017	11.2	1.30	126.2	1.7	14.7	2.47	0.46	6.1	1.1
25	2018	11.6	1.39	134.1	1.9	16.1	2.81	0.55	7.9	1.5
26	2019	11.9	1.49	142.5	2.2	17.8	3.17	0.65	10.1	2.1
27	2020	12.3	1.63	151.6	2.6	20.0	3.55	0.78	12.6	2.8
28	2021	12.7	1.73	161.0	3.0	21.9	3.92	0.88	15.4	3.5
29	2022	13.1	1.77	170.8	3.1	23.1	4.30	0.93	18.5	4.0

30	2023	13.5	1.83	181.5	3.4	24.7	4.71	0.99	22.2	4.7
		8.8	0.84	2489.1	27.5	254.0	0.00	0.00	183.6	32.2

Source: Compiled and Calculated by (author) Based on (Worldbank.org) Date.

Table 13. Calculate the Value of X and Y That Represent the Independent and Dependent Variables for The Purpose of Calculating the Simple Linear Regression Equation(2023-1994):

- Finding a simple linear regression equation using the least squares method:

Simple linear regression equation: Y =a +b X

X: Independent variable

Y: Dependent variable

b: Slope, is the amount of change in the dependent variable Y when the independent variable X changes by one unit

a: The expected (constant) value of Y when X=0

To find the simple linear regression equation, The value must be found (a, b).

$$\mathbf{b} = \frac{\sum(X-\bar{X})(Y-\bar{Y})}{\sum(X-\bar{X})\text{^}2} = \frac{32.2}{183.6} = \mathbf{0.18}$$

$$\mathbf{a} = \bar{Y} - b\,\bar{X} = 0.84 - 1.8 * (0.87) = -0.7$$

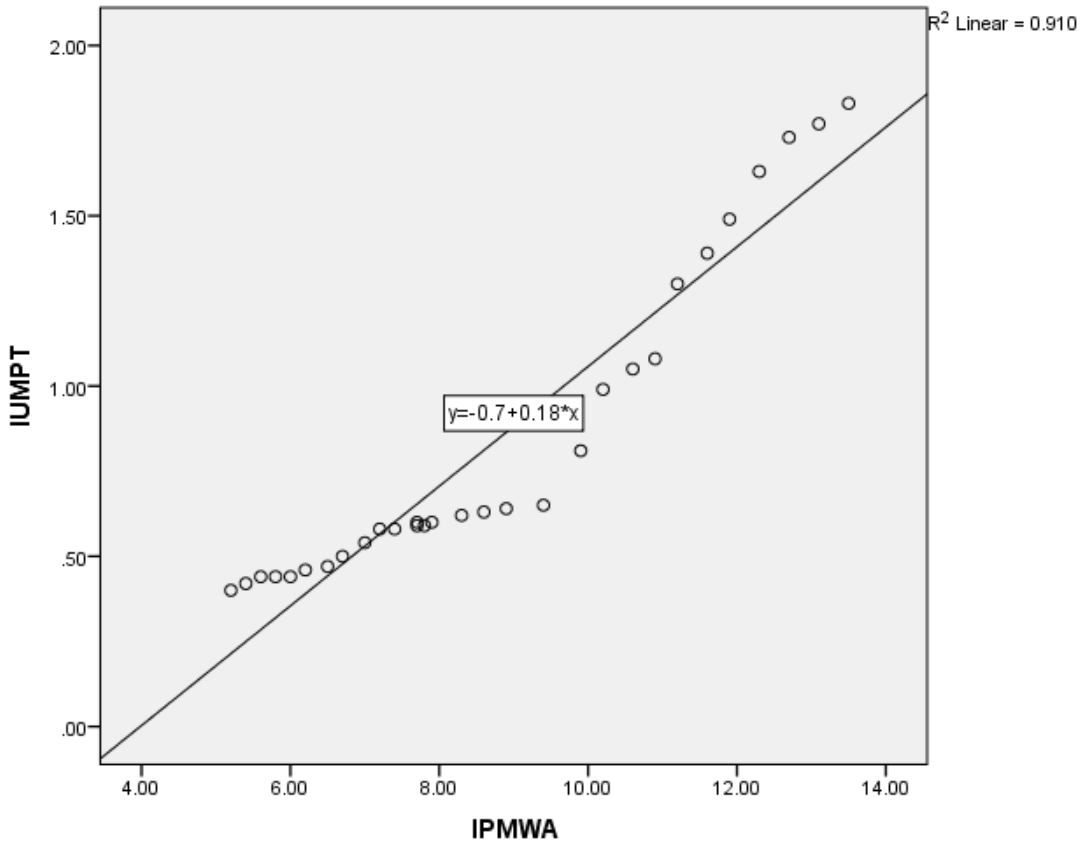
Therefore, the regression equation = **Y= - 0.7+0.18*X**

- correlation coefficient:

$$\mathbf{r = n(\sum xy) - (\sum x)(\sum y) / \sqrt{[n\sum x^2-(\sum x)^2][n\sum y^2-(\sum y)^2} = 963.5/1010=0.953}$$

- Coefficient of Determination:

R^2 Linear = $(0.9538)^2$ = **0.910**.



Graphic 10. simple linear regression equation as well as the R2.
Source: Compiled (author)

This graph shows the simple linear regression equation as well as the R2 coefficient of determination and indicates a strong linear relationship through the spread and distribution of points along the line.

The simple linear regression equation (Y= - 0.7+0.18*X) can be used to know, understand, or predict the relationship between the two study variables:

- The expected value of Y is – 0.7 when the value of X is 0.
- The value of Y increases by 0.18 units when the value of X increases by one unit. This is evidence that X and Y move in the same direction, i.e., there is a positive linear relationship between the two study variables and that X has a direct and strong effect on Y.
- b = 0.18 means that a large part of the variance in Y is explained by the independent variable X, as for each unit increase in X, Y increases significantly.
- Since the value of R^2= (0.910) is close to 1, the model largely explains the variances in the dependent variable, which means that the linear model represents the data well.

Descriptive Statistics			
	Mean	Std. Deviation	N
IUMPT	0.8420	0.46251	30.00
IPMWA	8.7733	2.5103	30.00

The mean value is the expected central value of the data for the two variables, Standard deviation: measures how spread out the values are around the mean.

(IUMPT) = 0.46251: indicates an average and not significant spread of the values when compared to IPMWA.

The larger value (IPMWA) = 2.5103: means that the values are more spread out around the mean than (IUMPT).

Correlations			
		IUMPT	IPMWA
Pearson Correlation	IUMPT	1.000	.954
	IPMWA	.954	1.000
Sig. (1-tailed)	IUMPT	.	.000
	IPMWA	.000	.
N	IUMPT	30	30
	IPMWA	30	30

Pearson Correlation Coefficient: which expresses the strength and direction of the relationship between the two variables. The correlation coefficient between IUMPT and IUMPT is equal to 1 and is constant. The correlation coefficient between IUMPT and IPMWA is 0.954. It is a strong and positive linear relationship between the two variables. That is, the more the percentage of males of working age increases from the total population, the more the percentage of unemployed from the labour force increases significantly. The probability value (sig. = 0.000), indicating that there is a strong statistical significance between the two variables according to the law. If sig < 0.05, then the relationship between the two variables is a real relationship, and the regression is significant. Therefore, we:

Reject the null hypothesis (H0).

accept the alternative hypothesis (H 1).

Variables Entered/Removed[a]			
Model	Variables Entered	Variables Removed	Method
1	IPMWA[b]	.	Enter
a. Dependent Variable: IUMPT			

b. All requested variables entered.

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.954[a]	.910	.906	1.41435

a. Predictors: (Constant), IPMWA

b. Dependent Variable: IUMPT

Since the coefficient of determination R2 = 0.910, this means that 91% of the changes in the number of unemployed people (the dependent variable) can be explained by the linear model (the independent variable, the number of working-age males).

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	5.644	1	5.644	282.124	.000[b]
	Residual	0.560	28	0.20		
	Total	6.204	29			

a. Dependent Variable: IUMPT

b. Predictors: (Constant), IPMWA

The ANOVA table measures the proportion of variance in the variables, so the sum of squares (Sum of Squares - SS) is the amount of variance in the dependent variable (IUMPT) that can be explained by the independent variable (IPMWA) and the regression SS is equal to (5.644) This value is very large, indicating that the model explains the majority of the variance, and the amount of variance in (IUMPT) that is not explained by the residual SS of the model (0.560), and the total variance in IUMPT (Regression SS + Residual SS) Total SS (6.204), df, the model explains a very large proportion of the variance (91%), and the unexplained variance (9%) is quite reasonable, Regression (1): the number of independent variables in the model. Residual df (28): the number of observations minus the number of model coefficients (constant + number of independent variables). Total df (29): the total number of observations minus 1.

Coefficients[a]						
Mode		Unstandardized Coefficients		Standardized Coefficients Beta	t	Sig.
1		B	Std. Error			
	(Constant)	-0.7	.95		-7.338	.000
	IPMWA	.176	.010	.954	16.797	.000
a. Dependent Variable: IUMPT						

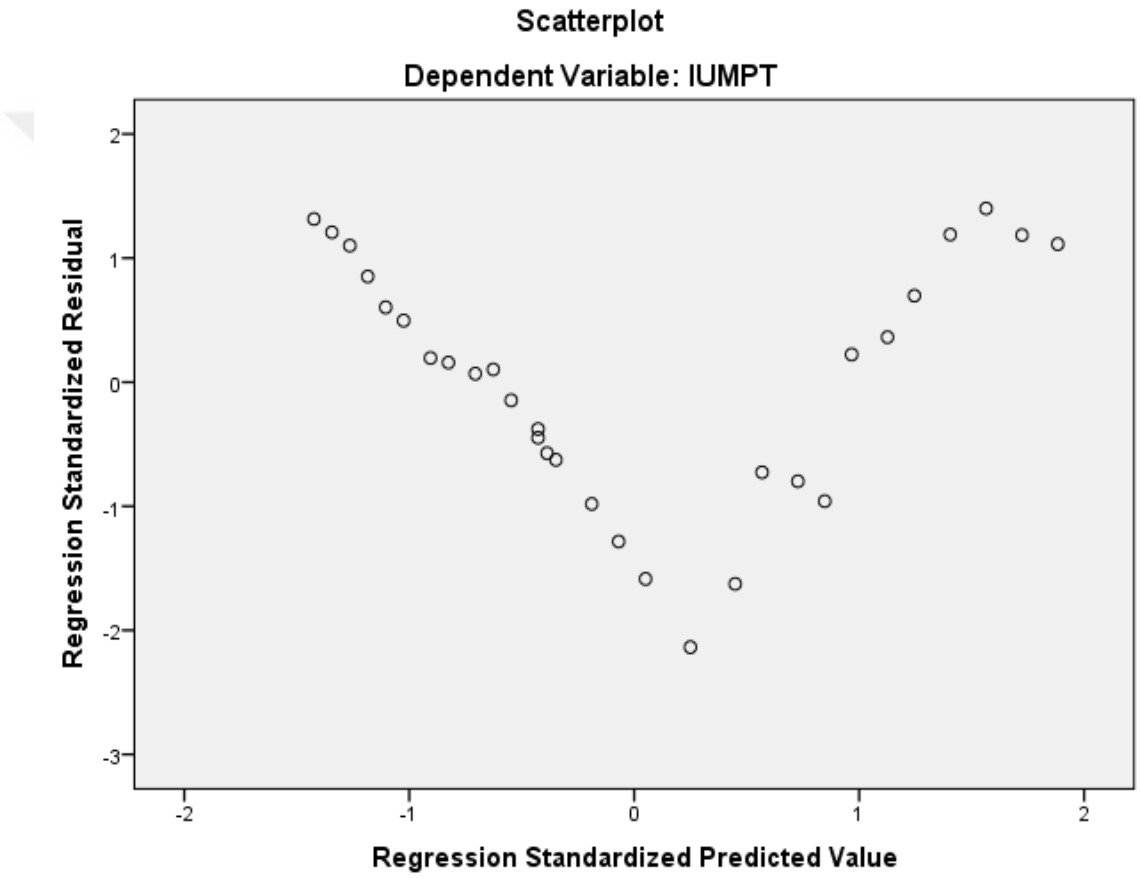
IUMPT= -0.7+0.18* IPMWA

If the independent variable, the number of working-age males, is zero, then the value of the dependent variable (constant), the number of unemployed, is (-0.7). Standard error = 0.954: It indicates the standard error of the estimate. This means that the estimate for the constant is within ±0.954 of its true value. The value (0.18) is the regression coefficient for the independent variable, and it indicates the amount of expected change per unit in the number of unemployed for each unit increase in the number of working-age males. Standard error = 0.010: It represents the standard error of the regression coefficient estimate. This means that the estimate is within ±0.010 of the true value.

Residuals Statistics[a]					
	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	0.2141	1.6726	0.84200	0.441142	30
Residual	-0.302122	0.19798	.00000	0.13898	30
Std. Predicted Value	-1.423	1.883	.000	1.000	30
Std. Residual	-2.136	1.400	.0000	0.983	30
a. Dependent Variable: IUMPT					

The expected values appear to be within a reasonable range and represent the variance in the data, so the model accuracy is good, and the residuals are normally distributed with a mean of 0, so there is no bias in the model. The standard deviation of the residuals is 0.1389. The errors are about 16.5% of the mean of the expected values, which is an acceptable level, and they show a normal distribution; the presence of large negative residuals (such as -0.302122) may indicate cases where the model is less accurate.

When analysing the data using real data numbers, the results showed that the relationship between the variables was (linear), but the estimates may be inaccurate in some cases, which increases the negative or positive residuals of the standard deviation. A large negative minimum was found, which is (-0.302122). This phenomenon is normal in statistical models, especially when the data is complex or the large difference in the range of values between the independent and dependent variables can lead to large differences in the residuals, as the difference between the working-age population is much larger than the unemployment variable.



Graphic 11. Represents the Scatter Plot of the Residuals and Predicted Values.
Source: Compiled (author)

Although there is a slight skewness in the residuals plot, the linear regression model was retained in the analysis due to its clarity and ease of interpretation, in addition to the high coefficient of determination ($R^2 = 0.910$), which indicates that a large proportion of the variance of the dependent variable is explained by the independent variable and likely affects the quality of the model.

The relationship between the percentage of working-age males in the total Iraqi population aged 15-64 and the percentage of the total unemployment rate in the total labour force was analysed. There was also a statistically significant linear relationship between the two variables, meaning that an increase in the percentage of working-age males in the total population leads to an increase in the unemployment rate in the total labour force. A simple linear regression equation indicated $Y = -0.45 + 2.03 X$.

The relationship between the number of working-age males in Iraq and the total number of unemployed in the labour force was also analysed. The relationship was statistically significant, meaning that an increase in the percentage of working-age males leads to an increase in the unemployment rate. The linear regression equation was $Y = -0.7 + 0.18 X$.

CONCLUSION

Iraq is considered one of the countries where the percentage of males is greater than females, as it is witnessing a significant increase in the number of males within the working-age category between 15 and 64 years. This increase has significant implications for economic indicators, particularly unemployment, which is an important economic indicator that greatly affects the working-age group. The high rate of entrants into the labour market leads to an increase in demand for jobs, while the supply declines. This creates a surplus in the labour force. This increase has a significant impact on infrastructure and services, including health and social services. Working-age groups are considered a key force in stimulating the economy by supplying the market with a workforce. It is possible to absorb the population increase in this group through the implementation of several economic measures and transform it into an economic force by striving to achieve a general balance between supply and demand in the labour market. This, in turn, leads to a reduction in unemployment and the achievement of economic growth and prosperity in the country. The high unemployment rates in Iraq significantly impact economic development, with thousands of new graduates entering the labour market annually. Consequently, the large surplus of labour in the labour market leads to the addition of large numbers of young talent to the ranks of the unemployed annually. With the significant development and construction in Iraq and the efforts being made, it has become imperative to address the annual increase in the male labour force, as this is the largest working group and the backbone of the Iraqi economy. Several solutions or measures can accommodate these large numbers entering the labour market, including encouraging investment, supporting entrepreneurs, training youth, supporting small businesses, developing industry and agriculture, and investing in this sector. Studying the growth in the working-age male population in Iraq (aged 15-64) and measuring its impact on unemployment rates is an important topic that highlights the importance of an important economic indicator: unemployment. Unemployment is a tool for destroying the dreams and future of Iraqi youth and a means of destroying them socially and psychologically. Conversely, paying attention to this group represents an economic renaissance that rivals the world's most economically advanced countries. The population growth rate of Iraq was calculated in general for a period of 30 years according to the years targeted in the research, and after dividing it into three stages,

each stage represents the total result of 10 years of the annual growth rate, which was 44.3% representing the first third, as well as 2.75% for the second third and 2.5% for the last third. When looking at the year 2023, the total population was 45,504,500, and the annual growth rate for this year is (2.27%). When multiplying this year by the annual number, the annual increase rate for the year (2023) is (1,032,952). The increase rate is considered large. Therefore, the conclusion based on the growth rate of the last third of the study years, which is equal to 2.5%, is that it is possible to predict the population increase for the next 10 years. 2.5 x % 10 = 25% 45,504,500 x 25% = 11,376,125 When adding this number to the general census for the year 2023, 11,376,125 + 45,504,500 = 56,880,625 This represents the prediction of the total population of Iraq in 2033. The percentage of the population of males of working age (15-64 years) of the total population increases annually, meaning that number of males of working age increases annually when compared to the total population. the percentage of males of working age of the total population was 25%, but in 2023, and within 30 years, the percentage became 30% of the total population, meaning it increased by approximately 5% Thus, when comparing the total population, which increased by 155% from 1994 to 2023, the number of working-age males increased by 201% from 1994 to 2023. Although the percentage within the population only increased from 25% to 30% (which seems small), the number of individuals in this category more than tripled due to the large population growth. The overall annual growth rate for 30 years was 3.44% for males of working age. The overall annual growth rate for 30 years was 3.44% for males of working age. Therefore, the conclusion based on the total growth rate for the 30 years of the study, which is equal to 3.44%, is that it is possible to predict the population increase for this category for the next 10 years by dividing.3.44% x 10 = 34.4% 13,473,714 x 34.4% =4,634,957 4,634,957 + 13,473,714 = 18,108,671This represents the prediction of the total Iraqi population of males of working age in 2033. Also, the male labour force was much larger than the females, as the percentage of the male labour force was between 83% and 89% of the total labour force, but the growth rate of the female labour force was greater than the growth of the males. The percentage of unemployed from the male labour force is greater than that of females, and the growth rate of the unemployment rate for the total males is smaller than the growth rate for the total females, as males represented (4.77%) as a total percentage for 30 years and females (9.68) for 30 years also The total unemployment growth rate for 30 years is 5.39% based on the annual

growth rate of the unemployed for the year 2023, which is equal to 3.61%. When calculating this percentage, %3.61 x 10 = 36.1% 36.1% x 1,834,212= 662,150 662,150 + 1,834,212 = 2,496,362This represents the prediction of the total number of unemployed in Iraq in 2033. The study data was analysed by focusing on measuring the association between the variables of the percentage of males of working age in the total population and its relationship to the percentage of unemployed in the labour force. The relationship was positively proportional, and the probability value = 0.0000. This value is less than 0.05 (the common significance level). This indicates that the relationship is statistically significant. Therefore, when the number of males of working age increases, the unemployment index increases, so reject the null hypothesis, and accept the alternative hypothesis. The study data for the second part were analyzed by measuring the correlation between the variables of the number of males of working age and its relationship to the number of unemployed people. The relationship was positively proportional, and the probability value = 0.0000. This value is less than 0.05 (the common significance level). This indicates that the relationship is statistically significant, Therefore, when the number of males of working age increases, the unemployment rate increases. Therefore, reject the null hypothesis and accept the alternative hypothesis. It is possible to use a model based on time series, which may be more accurate in estimating the results and requirements of linear regression when reapplying or building on the results and benefiting from methodological developments in the field of statistical analysis. the study results gave a clear picture of the research objectives to know and predict the extent of the annual increase in population numbers, as well as the labour force, unemployment rates, and annual changes that occur in growth rates, thus the impact of increased population growth on unemployment rates.

The results of the study and measurement were largely consistent with many previous studies, as it was proven that the population increase in the category of males within the working age has a significant impact on the increase in unemployment rates in Iraq. However, after studying the data of males of working age, it was proven that the percentage of this category increases annually on a regular basis. Compared to the total population, this category is considered an economic wealth for the country, and it is possible to achieve great economic development by paying attention to this category and exploiting all resources.

RECOMMENDATIONS

In light of the large population increases and the high percentage of males of working age, which leads to an increase in the demand for the labor market with a lack of supply as well as pressure on services and infrastructure, the role of government institutions comes here in absorbing this national wealth in economic development and advancing the country to the highest levels of economic development, despite Iraq's heavy dependence on oil, but the country has recently witnessed many industrial and service developments as well as economic development and industrial and agricultural development, through working on several very important topics to reduce the percentage of unemployed compared to the labor force.

1. Focus on training and education: It is necessary to provide vocational training for young people for the purpose of engaging in the labor market and knowing the market requirements as well as training on work methods and the appropriate time and place to choose any job.
2. Supporting entrepreneurs: It necessary to support entrepreneurs and owners of small projects from young people as well as drawing a roadmap to achieve their goals or providing them with the necessary funding to complete projects and provide free consultations.
3. Supporting local investments and industries: The importance of supporting investment in the country as well as opening idle factories and completing unfinished ones to absorb the workforce and expand production to make economic development in the country successful.
4. Developing infrastructure: The interest and periodic development of infrastructure is sufficient to accommodate the population increase from all segments of society and not to crowd one segment at the expense of another.
5. Holding awareness seminars and conferences for youth groups for the purpose of education and providing a clear social and economic image as well as presenting an image and understanding of the relationship and family life and the formation of the family and how to manage the economic requirements of the family.

REFERENCES

Abdul Jawad, M. (2009). Sociology of population. *Dar Al Masirah for Publishing, Distribution and Printing*.

Abdullah, M. (2013). Youth crisis and its problems between reality and ambition: a contemporary psychological vision. *University Knowledge House*, 70–78.

Acton, H. B. (2024, October 11). Herbert Spencer. *Encyclopedia Britannica*. https://www.britannica.com/biography/Herbert-Spencer

Al Bayati, F. (2011). Population explosion and societal challenges. *Dar Ghaida for Publishing and Distribution*, 157–158.

Al-Awidi, A. M. R. (2022). Thomas Malthus and population theory. *AL Mustaqbal University, Faculty of Administrative Sciences*. https://uomus.edu.iq/NewDep.aspx?depid=7&newid=12816

Al-Dabbagh, Q. A. (2020). The reality of unemployment in Iraq. *House of Wisdom*. https://www.citethisforme.com/bibliographies/5d3cbbbf-5326-456b-9c14-9293879698ae

Alforat News. (2023). In numbers: the latest population statistics in Iraq and its global and Arab ranking. *Alforat News*. https://alforatnews.iq/news/-بالأرقام-آخر-إحصاءات-السكان-في-العراق-وترتيبه-عالمياً-وعربياً

Al-Halayqa, G. (2021). The most important pioneers of sociology. *Mawdoo3*. https://mawdoo3.com/أهم_رواد_علم_الاجتماع#google_vignette

Al-Khazaali, J. T. A. (2020). Thinker Milton Friedman and his views on unemployment. *Electronic Reference for Information Technology*. https://almerja.com/more.php?idm=140077

Al-Saeed, S. (1983). *The concept of work and its general provisions in Islam* (p. 9). World Culture Foundation Press.

Amadeo, K. (2024). *How Keynesian economics works*. The Balance. https://www.thebalancemoney.com/keynesian-economics-theory-definition-4159776

Anderson, D. R., Williams, T. A., & Sweeney, D. J. (2024, August 31). *Statistics*. Encyclopedia Britannica. https://www.britannica.com/science/statistics

Asteriou, D., & Hall, S. G. (2007). *Applied econometrics: A modern approach* (2nd ed.). Palgrave Macmillan.

Authority of Statistics and Geographic Information Systems–Iraq. (2016). *Employment and unemployment indicators*. https://cosit.gov.iq/ar/2013-01-31-08-48-55

Bhalotra, S. (2003). *Child labour in Asia and Africa* (Report, pp. 4–4).

Boston University Economics in Context Initiative. (2021). *Comparative economic systems: Capitalism and socialism in the 21st century* (p. 15). Global Development Policy Center. https://www.bu.edu/eci/files/2021/08/Comparative-Economic-Systems.pdf

Brackett, J. W. (1968). The evolution of Marxist theories of population: Marxism recognizes the population problem. *Demography, 5*(1), 158–173. https://doi.org/10.2307/2060202

Britannica, T. Editors of Encyclopaedia. (2020, May 2). *Milton Friedman summary*. Encyclopedia Britannica. https://www.britannica.com/summary/Milton-Friedman

Britannica, T. Editors of Encyclopaedia. (2021, April 29). *Economics summary*. Encyclopedia Britannica. https://www.britannica.com/summary/economics

Britannica, T. Editors of Encyclopaedia. (2024, July 22). *Alfred Marshall*. Encyclopedia Britannica. https://www.britannica.com/money/Alfred-Marshall

Britannica, T. Editors of Encyclopaedia. (2024, May 24). *Census*. Encyclopedia Britannica. https://www.britannica.com/science/census

Britannica, T. Editors of Encyclopaedia. (2024, October 11). *Demography*. Encyclopedia Britannica. https://www.britannica.com/topic/demography

Britannica, T. Editors of Encyclopaedia. (2024, October 2). *Sir Alexander Carr-Saunders*. Encyclopedia Britannica. https://www.britannica.com/biography/Alexander-Carr-Saunders

Crossman, A. (2020). *Demography – The statistical study of human populations*. ThoughtCo. https://www.thoughtco.com/what-is-demography-3026275

Crossman, A. (2024, July 27). *Durkheim's "Division of Labor" and evaluation of social change*. ThoughtCo. https://www.thoughtco.com/mechanical-solidarity-3026761

Durkheim, É. (1984). *The division of labour in society*.

Econlib. (2024, March 1). *Milton Friedman*. https://www.econlib.org/library/Enc/bios/Friedman.html

Engle, R. F., & Granger, C. W. J. (1987). *Co-integration and error correction: Representation, estimation, and testing*. *Econometrica, 55*(2), 251–276. https://doi.org/10.2307/1913236

Foflonker, F. (2024, November 11). *Population growth*. Encyclopedia Britannica. https://www.britannica.com/science/population-growth

Friedman, M., & Friedman, R. D. (1998). *Two lucky people: Memoirs*. University of Chicago Press.

Gelişim, Ü. (2023). *Thomas Malthus haklı mıydı? - İktisadi İdari ve Sosyal Bilimler Fakültesi - Ekonomi ve Finans (İngilizce)*. IGU - İstanbul Gelişim Üniversitesi. https://iisbf.gelisim.edu.tr/tr/akademik-bolum-ekonomi-ve-finans-(ingilizce)-haber-thomas-malthus-hakli-miydi

Hardcastle, E. (2007). *Marx and Keynes on unemployment*. Marxists Internet Archive. https://www.marxists.org/archive/hardcastle/1971/unemployment.htm

Henderson, D. R. (2019). *Alfred Marshall*. Econlib. https://www.econlib.org/library/Enc/bios/Marshall.html

International Labour Organization (ILO). (2021). *Iraq labour force survey 2021*. https://www.ilo.org/sites/default/files/wcmsp5/groups/public/@arabstates/@ro-beirut/documents/publication/wcms_850656.pdf

International Labour Organization (ILO). (2024, January 22). *Labour force statistics (LFS, STLFS, RURBAN databases) – ILOSTAT*. ILOSTAT. https://ilostat.ilo.org/methods/concepts-and-definitions/description-labour-force-statistics/

International Labour Organization. (2008). *Beyond unemployment: Measurement of other forms of labour underutilization*. 18th International Conference of Labour Statisticians, Geneva.

Johansen, S., & Juselius, K. (1990). *Maximum likelihood estimation and inference on cointegration—with applications to the demand for money*. *Oxford Bulletin of Economics and Statistics*, *52*(2), 169–210. https://doi.org/10.1111/j.1468-0084.1990.mp52002003.x

Keynes, J. M. (1936). *The general theory of employment, interest and money*. Macmillan.

Labor Law No. (37) of 2015. (2015). *Ministry of Justice – Republic of Iraq*. https://www.moj.gov.iq/view.1925/

Libretexts. (2021). *17.2E: Demographic transition theory*. Social Sci LibreTexts. https://socialsci.libretexts.org/.../17.2E%3A_Demographic_Transition_Theory

Libretexts. (2023, July 17). *22.1: Introduction to unemployment*. Social Sci LibreTexts. https://socialsci.libretexts.org/.../22.1%3A_Introduction_to_Unemployment

Mahdi, A. A. A. (2021). *The problem of unemployment in Iraq after 2003: Its reality, causes, effects, and options public policies*. Bayancenter. https://www.bayancenter.org/wp-content/uploads/2021/08/8635r3f.pdf

Malthus, T. (2022, November 23). *Thomas Malthus on population*. Encyclopedia Britannica. https://www.britannica.com/topic/Thomas-Malthus-on-population-1987927

Marshall, A. (1890, January 1). *Principles of economics*. Internet Archive. https://archive.org/details/principleseconо00marsgoog

Mfk. (2024). *Working age population by country: Global comparison 2024*. Worldostats. https://worldostats.com/working-age-population-by-country-global-comparison-2024/

Omira, J. (2014). *Trends in demographics* (pp. 20–25). Joanna Publishing and Distribution.

Petersen, W. (1988). Marxism and the population question: Theory and practice. *Population and Development Review, 14*, 77–101. https://doi.org/10.2307/2808091

Pettinger, T. (2019, March 8). *Real wage unemployment*. Economics Help. https://www.economicshelp.org/blog/1507/economics/wages-and-unemployment/

PopulationPyramid.net. (n.d.). *Population pyramids of the world from 1950 to 2100*. https://www.populationpyramid.net/

Prainsack, B., & Buyx, A. (2018). The value of work: Addressing the future of work through the lens of solidarity. *Bioethics, 32*(9), 585–592. https://doi.org/10.1111/bioe.12507

Quickonomics. (2024, April 29). *Labour force definition & examples*. https://quickonomics.com/terms/labour-force/

Ricardo, D. (1817). *On the principles of political economy and taxation*. London: John Murray.

Skidelsky, R. (2017). *John Maynard Keynes and his general theory of the eighty* (I. M. Ali, Trans.). Project Syndicate. https://www.project-syndicate.org/.../keynesian-policy-at-80...

Smith, A. (1776). *An inquiry into the nature and causes of the wealth of nations*. London: W. Strahan and T. Cadell.

Spencer, H. (1992). *Herbert Spencer on the survival of the fittest*. New Learning Online. (Original work published 1884). https://newlearningonline.com/.../herbert-spencer-on-the-survival-of-the-fittest

Teitelbaum, M. S. (2024, October 19). *Population*. Encyclopedia Britannica. https://www.britannica.com/science/population-biology-and-anthropology

UN Statistics Division. (2006). *Demographic and social statistics: Vital statistics, Series A (Complete edition)*. https://unstats.un.org/unsd/demographic-social/products/vitstats/sets/SeriesA_%20Jan2006_complete.pdf

UNICEF. (2021). *Child labour rises to 160 million – First increase in two decades*. https://www.unicef.org/press-releases/child-labour-rises-160-million-first-increase-two-decades

United Nations. (1973). *Minimum age convention, 1973 (No. 138)*. https://www.ohchr.org/ar/instruments-mechanisms/instruments/minimum-age-convention-1973-no-138

United Nations. (2017). *Principles and recommendations for population and housing censuses: Revision 3*. United Nations.

Warad, A. A. (2022). Planning announces a decrease in the rate of child labor and an increase in school enrollment. *Iraqi News Agency*. https://www.ina.iq/155227--.html

World Bank. (n.d.-c). *World Bank open data between 1994–2013*. https://data.worldbank.org/indicator/SP.POP.TOTL?locations=IQ&page=2

APPENDIXES

APPENDIX-A

POPULATION TABLE FOR AGES 25 TO 29

Table A.1: Young People Aged (25-29) Growth Rate.

S	Years	25-29 Age Male from IPMT %	29-25 Age Male /100	IPMT	25-29 Age Male From IPMT	IPM WA	29-25 Age Male from IPM WA	29-25 age Male from IPM WA GR%
1	1994	7.85	0.079	10015107	786654	5155907	0.15	6.74
2	1995	7.99	0.080	10371444	828349	5362673	0.15	5.30
3	1996	8.11	0.081	10723470	869763	5569033	0.16	5.00
4	1997	8.22	0.082	11076608	909986	5776447	0.16	4.62
5	1998	8.29	0.083	11445529	948812	5992009	0.16	4.27
6	1999	8.33	0.083	11836024	986031	6221258	0.16	3.92
7	2000	8.34	0.083	12245808	1021548	6462727	0.16	3.60
8	2001	8.33	0.083	12649980	1053702	6702640	0.16	3.15
9	2002	8.30	0.083	13070653	1084773	6953643	0.16	2.95
10	2003	8.25	0.083	13479925	1112105	7199079	0.15	2.52
11	2004	8.18	0.082	13872761	1134848	7435566	0.15	2.05
12	2005	8.10	0.081	14287950	1157987	7688868	0.15	2.04
13	2006	8.03	0.080	14384444	1154976	7775507	0.15	-0.26
14	2007	7.96	0.080	14253474	1134260	7740771	0.15	-1.79
15	2008	7.91	0.079	14526220	1148582	7929571	0.14	1.26
16	2009	7.89	0.079	15062364	1187796	8266559	0.14	3.41
17	2010	7.87	0.079	15555695	1224928	8577908	0.14	3.13
18	2011	7.85	0.079	16119318	1266033	8919801	0.14	3.36
19	2012	7.83	0.078	16870903	1320975	9365183	0.14	4.34
20	2013	7.82	0.078	17688677	1382752	9853023	0.14	4.68
21	2014	7.82	0.078	18331660	1434271	10249906	0.14	3.73
22	2015	7.86	0.079	18850267	1482568	10588815	0.14	3.37
23	2016	7.94	0.079	19328788	1535503	10912579	0.14	3.57
24	2017	8.05	0.080	19794794	1593458	11234222	0.14	3.77
25	2018	8.17	0.082	20289270	1657477	11581057	0.14	4.02
26	2019	8.27	0.083	20788703	1720020	11939220	0.14	3.77
27	2020	8.35	0.083	21297577	1777403	12311784	0.14	3.34

28	2021	8.38	0.084	21797409	1826695	12686734	0.14	2.77
29	2022	8.40	0.084	22290370	1871506	13068184	0.14	2.45
30	2023	8.41	0.084	22806498	1916920	13473714	0.14	2.43
								%3.25 = 30 / %97.49

Source: Compiled and Calculated by (author) Based on (Worldbank.org) Date.

APPENDIX-B

EMPLOYMENT (MALES AND FEMALES)

Graphic B.1: Comparison Growth Rates (Males and Females) In Terms of Employment.

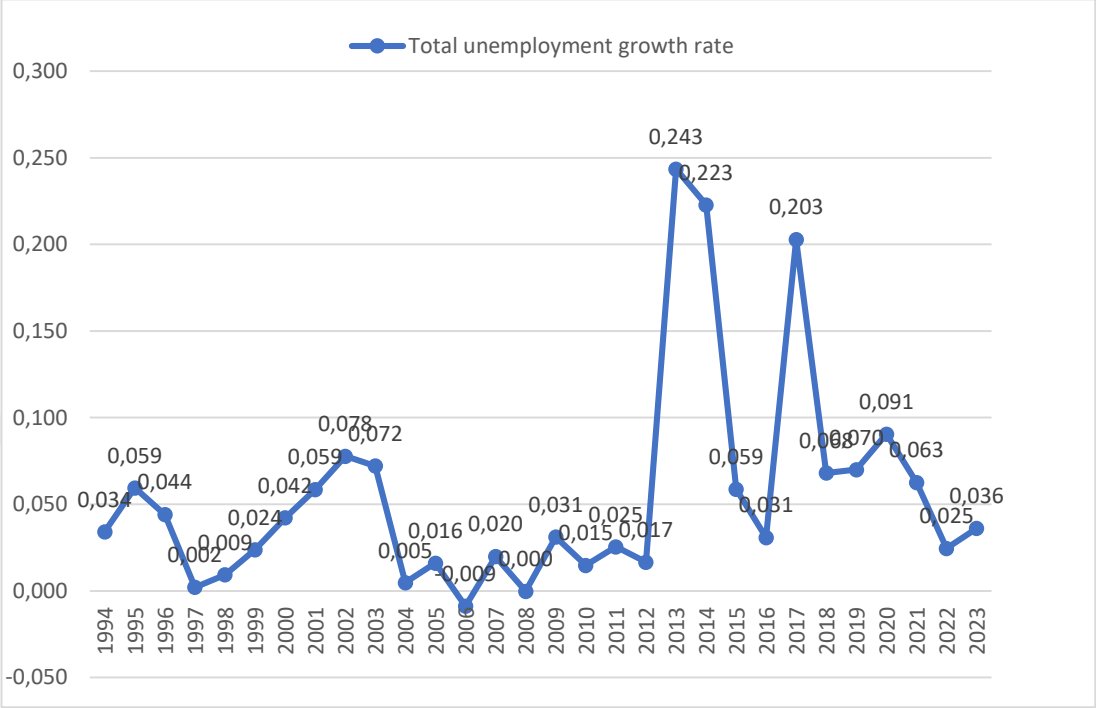


Source: Compiled and Calculated by (author) Based on (Worldbank.org) Date

APPENDIX-C

TOTAL UNEMPLOYMENT RATE GROWTH RATE

Graphic C.1: Total Unemployment Rate Growth Rate in Iraq from 1994 to 2023.

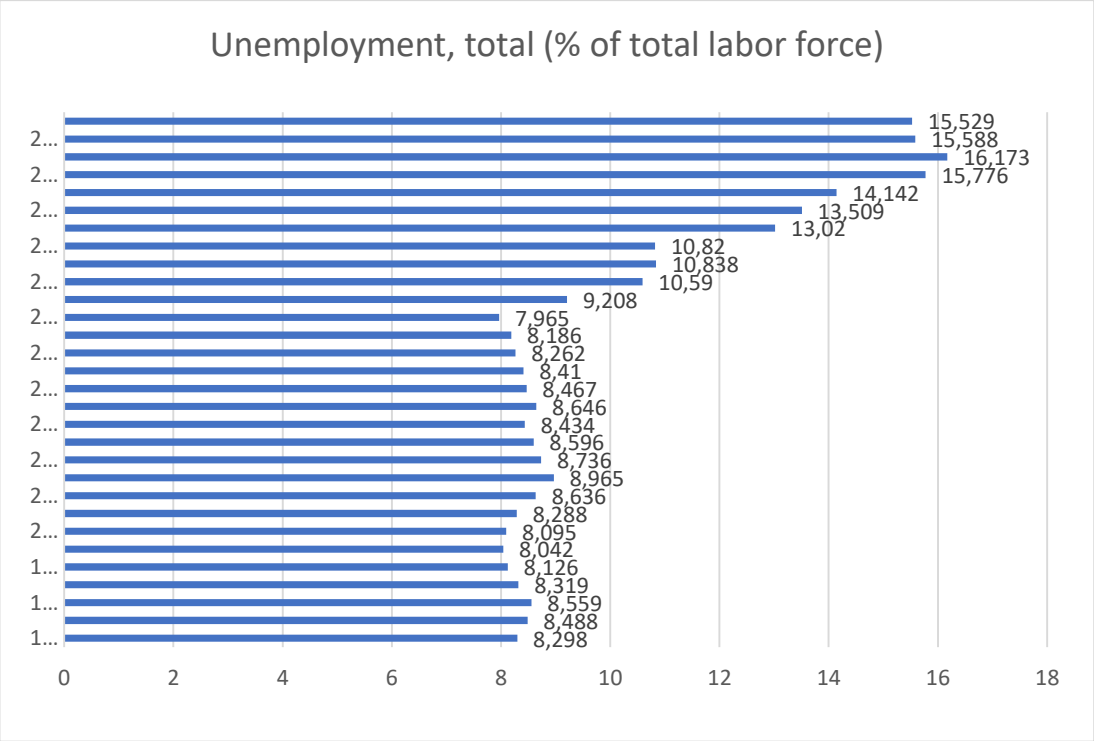


Source: Compiled and Calculated by (author) Based on (Worldbank.org) Date

APPENDIX-D

TOTAL UNEMPLOYMENT RATE (% OF TOTAL LABOUR FORCE)

Graphic D.1: Total Unemployment Rate (% of Total Labour Force) in Iraq from 1994 to 2023.



Source: Compiled and Calculated by (author) Based on (Worldbank.org) Date

APPENDIX-E

COMPARISON THE UNEMPLOYMENT(MALES AND FEMALES)

Graphic E.1: Comparison the Unemployment Growth Rate Between Males and Females in Iraq from 1994 to 2023.

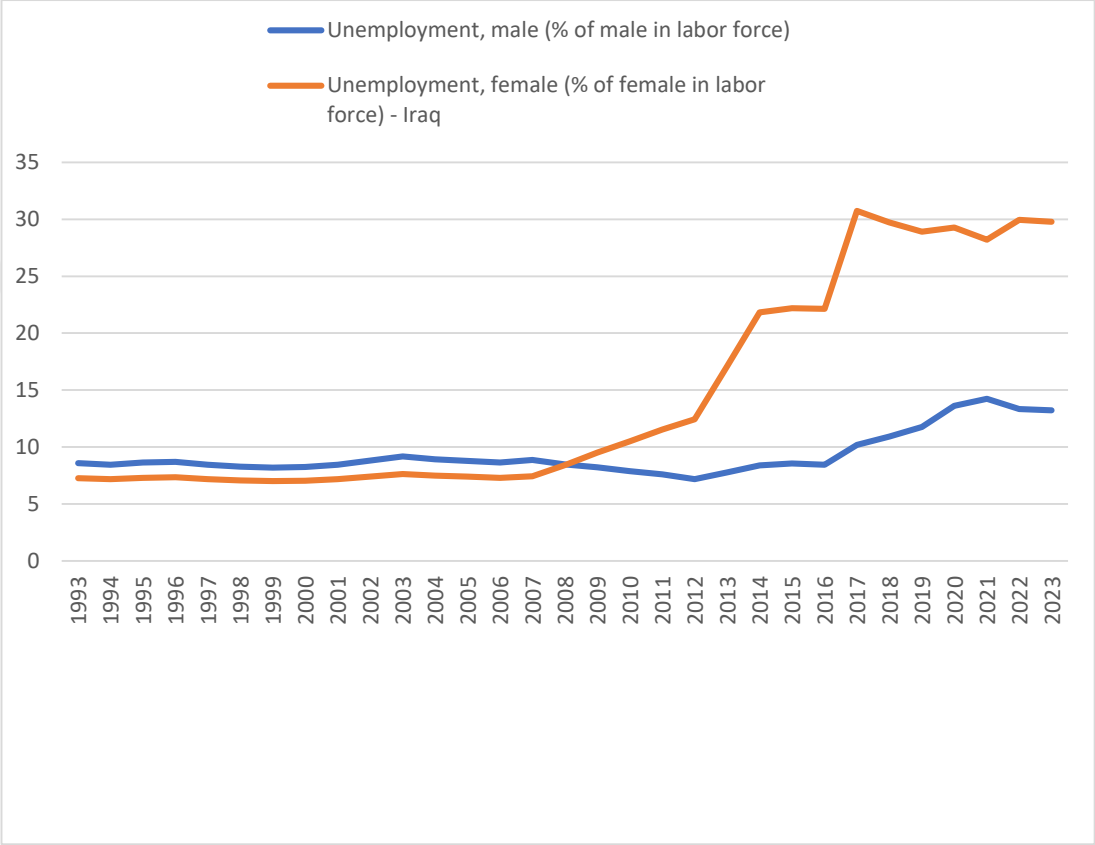


Source: Compiled and Calculated by (author) Based on (Worldbank.org) Date

APPENDIX-F

COMPARISON OF THE UNEMPLOYED (MALES AND FEMALES)

Graphic F.1: Comparison of The Percentage of Unemployed People (Males and Females) Out of The Total Labor Force in Iraq from 1994 To 2023. This Graphic Represents the Total Number of Unemployed Males and The Total Number of Unemployed Females Out of The Total Labor Force in Iraq from 1994 to 2023.



Source: Compiled and Calculated by (author) Based on (Worldbank.org) Date