



Impact of Gender-Specific Unemployment on Economic Growth in Iran

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ARTICLE INFO

Received: 2026/07/01

Revised: 2026/07/13

Accept: 2026/08/16

Keywords:

Female unemployment,

Male unemployment,

Economic growth, Iran.

ABSTRACT

Unemployment is one of the most important economic and social challenges that can affect economic growth by reducing the utilization of labor force capacity, wasting human capital, and reducing potential output. Considering the significant differences in unemployment rates between women and men in Iran, examining the economic effects of unemployment with gender dimensions in mind can provide a more accurate understanding of its consequences for economic growth. Therefore, the present study aims to investigate the effects of male and female unemployment on Iran's economic growth. For this purpose, annual data for Iran from 1984 to 2023 have been used, and the effect of male and female unemployment rates on economic growth has been investigated using the Autoregressive Distributed Lag (ARDL) method. The results of the cointegration analysis reveal that, in the long run, male and female unemployment significantly reduce economic growth, with the effect of male unemployment greater than that of female unemployment. Accordingly, adopting employment-oriented policies with an emphasis on increasing labor absorption capacity, developing productive and sustainable job opportunities, and adapting labor market policies to the characteristics of male and female unemployment can, while reducing unemployment, lay the groundwork for more efficient use of human capacity and improved economic growth.

1. Introduction

High unemployment has destructive effects on the individual, society, and the entire economic structure. This phenomenon imposes a significant financial burden on the government, wastes vital resources, and poses a serious obstacle to sustainable, long-term growth. It also undermines social stability and provides the ground for social unrest and crises. At the individual level, unemployment fuels financial insecurity and paves the way for poverty, increased debts, and the

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DOI: <https://doi.org/10.22034/ijieor.v8i2.222>

Available online 2026/08/17

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commission of crimes. In addition, it exacerbates widespread social consequences such as the breakdown of the family foundation, health disorders, and other social harms. Vulnerable groups such as deprived minorities, low-literate individuals, and the youth are more exposed to these harms than others. At the macro level, high unemployment weakens economic actors' expectations and, by reducing private investment and slowing technological progress, erodes labor force skills. This process will ultimately undermine productivity and slow economic growth [1].

Unemployment is considered one of the key challenges in developing economies. A high unemployment rate indicates insufficient and inefficient utilization of the labor force; therefore, achieving full employment should be considered one of the fundamental goals of any government's macroeconomic policies, as it maximizes production. Reducing the unemployment rate is of significant importance in both developed countries and, especially, today's emerging economies. Hence, explaining the precise and comprehensive relationship between unemployment and economic growth has always been of particular interest to economic policymakers and economists [2].

In fact, the relationship between the labor market and economic growth is two-way. On the one hand, the increase in production activities and economic development can create more job opportunities and reduce the unemployment rate through increasing demand for labor; on the other hand, increasing unemployment, by reducing the use of labor force capacity, reducing household incomes, decreasing aggregate demand, and weakening productivity, can limit the economic growth process. From this perspective, the state of the labor market is not only a consequence of economic performance but also a determinant of the economic growth path. Therefore, examining the various dimensions of unemployment and their effects on economic performance is essential to understanding the mechanisms that drive economic growth.

Economic growth is considered the most important pillar of economic policy in any country and economic system. In general, it can be accepted that economic growth will pave the way for increased economic opportunities and the promotion of social justice [3]. One undeniable fact is that global economic growth over the past two centuries has had two prominent and fundamental effects: first, increasing the welfare and living standards of people around the world, and second, creating new job opportunities for the growing world population [4].

Considering that labor is one of the most important factors of production and a basic pillar of the production process and economic growth, the extent and manner of utilizing human capacity can

have important consequences for countries' economic performance. Therefore, merely focusing on the overall unemployment rate to assess the state of the labor market and its effects on economic growth may be insufficient, because the labor market comprises different groups with varying conditions in participation, employment, and unemployment. One of the most important dimensions of this difference is the difference in the labor market status of women and men. In this regard, attention to women's employment and unemployment status is particularly important because limiting women's participation in the labor market can result in the underutilization of a portion of society's human capital.

In general, a country's economic development is driven by two main factors: the transfer of workers from the traditional agricultural sector to the industrial and service sectors, and the migration of the population from rural to urban areas. These changes occur alongside rising education levels, declining birth rates, shifts in the participation ratios of men and women in the labor force, and greater prominence of women's roles in the labor force. Women's labor supply can be both a driver and a result of economic development in countries. With the entry of women into the labor market, the increase in labor supply accelerates economic growth, and conversely, in developed countries where women's participation is lower due to social and economic reasons, economic growth improves women's working conditions [5].

The importance and necessity of women's economic participation and the removal of the obstacles they face provide a suitable context for the sustainable growth and development of societies. In recent years, the world has witnessed a new phenomenon in the socio-economic field: an increase in women's participation in the labor market. Empowering women and removing existing obstacles play an important role in improving their political, social, and economic status, and this process can lead to sustainable and comprehensive development [6]. In societies where the rate of women's participation in employment and economic activities is higher, social welfare also increases significantly, because greater women's presence in the labor market improves production levels, increases per capita income, and ultimately improves macro social welfare indicators. Therefore, accurate recognition of the position and role of women in the development process and its various dimensions should be considered as one of the main priorities of development planners [7].

Despite the growing importance of women's participation in production and economic activities, the labor market in many countries still exhibits significant differences between women and men. These differences are not limited to the rate of economic participation but are also reflected in

indicators such as employment and unemployment. In many economies, women face greater obstacles to entering and remaining in the labor market, and as a result, their unemployment rate can be higher than that of men. From this perspective, examining unemployment by gender is particularly important because women's and men's unemployment rates can affect the use of human capital and, ultimately, economic performance through different channels.

In this framework, the difference between the unemployment rates of women and men can be considered as one of the important dimensions of inequality in the labor market. When the unemployment rates of women and men diverge, a portion of society's human capacity, in proportion to existing capabilities and human capital, does not engage in productive economic activities. The continuation of such a situation can lead to the waste of human capital, a reduction in the effective supply of labor, a decrease in potential productivity, and a limitation of the economy's production capacity. Therefore, the issue of unemployment is not limited to whether the overall rate is high or low, but the distribution of unemployment among women and men can also be important for economic performance.

Accordingly, studying the effect of gender-specific unemployment on economic growth is important because it can determine whether differences in the unemployment status of women and men, beyond their direct effects, have significant consequences for economic performance. Such an approach makes it possible to examine the extent of utilization of human capacity, the role of women's and men's human capital, and the economic consequences of inequality in the labor market. Hence, examining the relationship between gender-specific unemployment and economic growth can help better understand the mechanisms by which labor market developments affect economic performance and provide evidence for policymaking towards more efficient use of human capacity.

The aim of this study is to investigate the impact of male and female unemployment on economic growth in Iran from 1984 to 2023. For this purpose, after the introduction, the second section presents the theoretical foundations and empirical literature of the research. The third section is devoted to the research methodology. In the fourth section, the analysis of the empirical results is conducted, and in the fifth section, the conclusion and suggestions are presented.

2. Literature Review

Economic development is a comprehensive process for improving the quality of human life that, by enhancing welfare, raising living standards, and creating new job opportunities, seeks to reduce

challenges such as poverty, unemployment, and economic inequality [8]. In this regard, economic growth, as one of the most important indicators of economic performance, can be measured at the national and regional levels. According to Todaro, economic growth is a continuous process in which an economy's production capacity steadily increases, and, as a result, society's real income rises over time. Kuznets also defines economic growth as the sustainable, long-term increase in a country's capacity to supply a diverse range of goods and services to its population [9]. From this perspective, economic growth depends not only on the accumulation of physical capital and technological progress, but also on the extent to which human capacity is utilized and on the efficient use of human capital.

Labor, as one of the basic factors of production, plays an important role in determining production levels and the capacity for economic growth. When people of working age with the ability and willingness to engage in economic activity enter the labor market and achieve productive employment, the production capacity of goods and services increases. In contrast, unemployment refers to the underutilization of part of the economy's potential labor force and can cause real output to deviate from potential output. Hence, the relationship between economic growth and unemployment has long interested economists, and one of the most important theoretical frameworks in this field is Okun's Law.

Okun's Law was proposed in the 1960s. According to this theory, economic growth and unemployment are significantly and reciprocally related, and labor, as a key factor, plays a central role in increasing the production of goods and services. Therefore, a precise analysis of the response of economic growth to changes in the unemployment rate is of great importance, especially in developing countries with growing populations and high fertility rates [2].

Based on United States data for the period 1947 to 1960, Okun showed that when real output is 1 percent above potential output, the actual unemployment rate is about 0.3 percent below its natural rate. Okun's Law shows that for every 3 percent increase in gross domestic product, the unemployment rate decreases by approximately 1 percent. Within this framework, changes in the labor force participation rate, hours worked, and labor productivity also affect the intensity of the relationship between output and unemployment.

Despite the importance of Okun's Law for analyzing the relationship between the labor market and economic performance, this relationship is empirical in nature [10]. Therefore, the intensity of this law cannot be assumed to be the same in all countries, periods, and labor force groups. This issue

provides grounds for paying closer attention to the structure of the labor market and the differences among groups in the labor force.

Global economic developments have also shown that output growth does not necessarily lead to a proportional increase in employment. After the global financial crisis of 2008, although the global economy began to recover in 2010 and some Asian countries were at the forefront of this trend, the unemployment rate in many countries remained high [11]. One factor contributing to this phenomenon is increased labor productivity. An increase in productivity can lead to output growth without proportional job creation, because firms may produce more using existing technology, capital, and labor. Hence, the phenomenon of "jobless growth" shows that the relationship between economic growth and unemployment can be influenced by changes in productivity, technology, and production structure [11].

Given this point, analyzing the relationship between unemployment and economic growth requires attention to the fact that labor is not a completely homogeneous set. Individuals differ from one another in gender, education level, skills, work experience, type of economic activity, and labor market participation rate. In this regard, one of the most important dimensions of labor market heterogeneity is the difference in the economic status of women and men. The economic participation rate of women in many countries is significantly lower than that of men, and this difference is influenced by various factors, including family responsibilities, the intra-household division of labor, employment in household activities, differential access to job opportunities, and labor market discrimination [12]. Therefore, female unemployment and male unemployment can have different consequences and mechanisms for economic performance.

Education level and skills are also important factors in determining individuals' employment status. Increasing education and skills enhances individuals' employability and earning potential [13]. From the perspective of human capital theory, education and work experience are investments that, by increasing individual productivity, also increase the economy's productive capacity. Accordingly, when educated and skilled individuals remain unemployed, a portion of the economy's human capital goes unused, and the economic return on investment in education decreases. This issue can have different effects on the economic growth of women and men, depending on their participation rates and labor market presence.

Neoclassical theories, in explaining gender differences in the labor market, consider factors such as family responsibilities, physical ability, general and technical education, working hours,

absenteeism, job mobility, and their impact on productivity and labor supply. Alongside this, human capital theory emphasizes the role of differences in education and work experience in shaping productivity and income. According to this approach, even if women and men are similar in terms of ability and education level, differences in labor market participation rates and work experience can lead to differences in human capital accumulation and productivity. Therefore, the employment and unemployment status of women and men can not only reflect labor market conditions but also be an important factor in the extent of human capital utilization in the economy [14].

From this perspective, female unemployment can affect economic growth through several channels. First, an increase in female unemployment reflects the underutilization of a portion of the economy's human capital. If women have education and skills, the underuse of their abilities can lead to the waste of human capital and a reduction in the economy's productive capacity. In other words, the investment of households and society in women's education can lead to economic growth only when this human capital is employed in productive economic activities. Therefore, an increase in female unemployment can reduce the economic return on educational investment, thereby limiting the capacity for economic growth.

Second, female unemployment can affect economic activity by reducing household incomes and purchasing power. Women's employment, in addition to providing them with direct income, can increase household income. An increase in female unemployment, even when they have the intention and ability to participate in the labor market, can reduce household income and, consequently, limit consumption and effective demand. A decrease in demand can also affect economic activity by reducing firms' sales, reducing investment incentives, and limiting labor demand.

Third, female unemployment can affect productivity and resource allocation. If individuals are denied employment opportunities commensurate with their abilities and skills due to gender or labor market constraints, the allocation of human resources across economic activities deviates from the optimal state. As a result, even when the volume of physical capital and technology does not change, the inappropriate use of human resources can reduce the economy's overall productivity. From this perspective, increasing women's employment, especially among educated and skilled women, can expand production capacity and economic growth by better leveraging human capital.

In contrast, male unemployment can also have direct effects on economic growth. Given the higher participation of men in the labor market and their extensive presence in many productive activities, an increase in male unemployment can reduce labor utilization and, consequently, production of goods and services. A reduction in male employment also reduces labor income and, through reducing household consumption, affects effective demand. On the other hand, persistent unemployment can lead to reduced work experience, skill erosion, and a decline in human capital, thereby reducing the economy's productive capacity in the long run.

The relationship between male unemployment and economic growth can also be explained within the framework of Okun's Law. In recessionary conditions, a decrease in demand for goods and services leads to reduced production by firms and, consequently, reduced demand for labor. Given the extensive participation of men in the labor market, this decrease in demand can lead to increased male unemployment. On the other hand, persistent male unemployment and underutilization of the existing labor force can keep the economy's real output below its potential capacity. Therefore, the relationship between male unemployment and economic growth can be two-way: a decrease in economic growth can lead to an increase in unemployment, and an increase in unemployment, through reductions in labor use and income, can weaken economic activity.

However, the relationship between female and male unemployment and economic growth is not necessarily the same in terms of intensity and mechanism. Differences in the economic participation rate, types of job activities, education and skill levels, family responsibilities, and employment structure can cause increases in unemployment in each group to have different consequences for the economy. For example, female unemployment, in addition to reducing potential output, may affect output and income by reducing the return on investment in women's education and lowering household income, while male unemployment, given their higher share in employment, may have a more direct effect on current output and income. Therefore, a separate examination of female and male unemployment can provide more accurate information about how the labor market relates to economic growth.

Overall, the theoretical framework shows that both female and male unemployment can affect economic growth by reducing labor use, potential output, and income; weakening effective demand; reducing human capital accumulation; and leading to the suboptimal allocation of resources. However, differences in labor market structure and in the economic and social characteristics of women and men can lead to variations in the intensity and direction of these

effects. Therefore, the simultaneous, disaggregated study of the effects of female and male unemployment on economic growth can provide a more accurate picture of the role of the labor market in the economic growth process. This issue is of particular importance at the provincial level because the provinces of Iran differ significantly in economic structure, the rates of economic participation of women and men, levels of human capital, the composition of productive activities, and employment opportunities. Accordingly, an empirical investigation of the effects of female and male unemployment on the economic growth of Iran's provinces can help identify regional differences in this relationship and provide evidence for labor market and economic growth policymaking.

In the following, the studies conducted in this area are briefly presented:

Yenipazarlı et al. [2] in a study examined the relationship between economic growth and gender-specific unemployment for Eastern European countries and Middle Eastern oil exporters over the period 1996 to 2021. The findings showed that in oil-exporting countries, male and female unemployment rates have a negative and significant effect on economic growth, and an increase in unemployment leads to a decrease in growth; while in Eastern European countries, female unemployment has a positive effect, and male unemployment has a negative effect on economic growth.

Akhtar et al. [15], in a study using the ARDL model over the period 1980 to 2019, show that women's labor force participation has a positive and significant impact on economic growth; they also confirm an asymmetric long-term relationship between women's participation and economic growth. Granger causality analysis also indicates a bidirectional relationship between male and female labor force participation and a unidirectional relationship between economic growth and labor force participation.

Abbasi Esfajir et al. [16] in a study investigated the role of women's employment in economic growth using panel data methodology for 13 Middle Eastern countries (Jordan, Iran, Saudi Arabia, Egypt, Turkey, Israel, United Arab Emirates, Lebanon, Kuwait, Oman, Iraq, Bahrain, and Yemen) over the period 2010 to 2015. The findings showed that women's employment across all sectors of agriculture, industry, and services has a positive and significant effect on GDP per capita.

Zahed et al. [17] in a study examined the impact of gender discrimination in four areas of education, labor market, women's empowerment, and social conditions on economic growth using panel data of developing countries during the period 2000 to 2018. The results of this study indicate

that labor force growth and trade openness, with a negative and significant effect, reduce economic growth, while investment growth plays a positive and significant role in promoting it. On the other hand, gender equality in the studied countries did not show a significant relationship with economic growth.

Kalu et al. [18] examined the relationship between economic growth and unemployment from a gender-classification perspective in the Nigerian economy, using annual time-series data from 1981 to 2017 and applying the ARDL model. According to the results, female unemployment has a positive and significant effect on GDP growth in Nigeria, while youth unemployment has a negative and significant effect on economic growth, and male unemployment has no significant effect on GDP growth.

Zareh et al. [19] examined the asymmetric effect of labor force gender inequality shocks on Iran's economic growth over the period 1966 to 2016 using the ARDL model. The results showed that positive and negative shocks of labor force gender inequality have asymmetric and significant effects on Iran's economic growth. In the long term, a positive shock to women's employment share had a significant negative effect on economic growth, whereas a negative shock had a positive effect. In the short term, a positive shock to women's employment share significantly increased economic growth, but a negative shock to women's employment share, with a one-period lag, had a negative effect on economic growth.

Victoria [20], in a study, examined the relationship between unemployment and economic growth in Nigeria over the period 1981 to 2016, using the Granger causality method based on the VAR technique to determine the direction of the relationship between the unemployment rate and economic growth. The results indicate a unidirectional causal relationship between unemployment and economic growth, meaning that changes in economic activity do not cause changes in the unemployment rate.

Asadzadeh et al. [21], using the Gravitational Search Algorithm (GSA) and the Firefly Optimization Algorithm (FA), estimated the country's economic growth and development function as nonlinear equations, with the women's economic participation rate and their education level considered key variables. The research findings showed that increasing women's labor market participation rate has a positive and significant effect on the country's GDP, and that improving women's education level, through its interaction with the economic participation rate, plays an effective role in strengthening economic growth.

Alotaibi [22] examined the relationship between unemployment and economic growth in Saudi Arabia from 2000 to 2015. The results of the study showed that employment has a positive relationship with real income, investment, government spending, and exports, and a negative relationship with imports. Also, an inverse relationship was observed between the unemployment rate and economic growth.

Rahmani et al. [23] examined the role of gender inequality in economic growth and development using panel data econometric models for a sample of 26 OECD member countries during the period 1990 to 2010. The findings indicate that gender discrimination in education and wages has significant negative effects on the economic growth process, while gender discrimination in employment has a non-linear and concave effect on economic growth.

A review of previous studies shows that the relationship between labor market conditions and economic growth has been examined from various dimensions. Some studies have focused on the effect of women's employment or economic participation on economic growth and have generally shown that increasing women's participation and employment can lead to strengthening economic growth. Another group of studies have examined the relationship between unemployment and economic growth; however, in many of these studies, the unemployment rate has been used as an aggregate measure, and gender differences in unemployment have received less attention. Also, studies that have addressed gender dimensions have mainly examined gender inequality, the employment gap, or participation of women and men, and have paid less attention to the independent effect of male and female unemployment on economic growth. In addition, the results of existing studies are inconsistent, and in some countries, different effects are reported for male and female unemployment, suggesting the importance of structural conditions and labor market characteristics in each country.

Given this research gap, the present study, focusing on gender-specific unemployment, examines the separate effects of female and male unemployment on economic growth. The main distinguishing feature of this study is that, instead of using a general unemployment indicator or focusing solely on women's participation and employment, the intensity and direction of the effect of unemployment on the economic growth of each of the two groups, women and men, is compared. From this perspective, the present study enables the identification of the distinct roles of male and female unemployment in economic performance and provides a more accurate picture of the economic consequences of unemployment within a gender framework. Also, examining

these relationships within the framework of Iran's economy provides more empirical evidence on how the gender structure of the labor market affects economic growth.

3. Empirical Model and Data

The aim of this study is to investigate the effect of gender-specific unemployment on economic growth in Iran over the period 1984-2023, based on the following regression equation:

$$GDP_t = \alpha + \beta_1 UNEMM_t + \beta_2 UNEMF_t + \beta_3 OPEN_t + \beta_4 INF_t + \beta_5 GINI_t + \varepsilon_t$$

Accordingly, GDP denotes real per capita gross domestic product at constant 1400 prices (million rials), OPEN represents trade openness, measured as the ratio of the sum of exports and imports to GDP, and INF denotes the inflation rate (percentage). The statistical data for these variables were obtained from the Central Bank of Iran. In addition, UNEMM represents the male unemployment rate (percentage), UNEMF denotes the female unemployment rate (percentage), and GINI represents the Gini coefficient (income inequality index). The statistical data for these variables were obtained from the Statistical Center of Iran [26, 27].

Table 1: Descriptive statistics (Source: Central Bank and Statistical Center of the Islamic Republic of Iran)

Variable	Observations	Mean	Median	Std. Dev	Minimum	Maximum
GDP	38	0.068211	0.071285	0.012320	0.045256	0.085633
UNEMM	38	9.945000	10.00000	1.698444	6.600000	13.84000
UNEMF	38	17.82800	18.35000	2.586278	11.78000	22.40000
OPEN	38	0.430420	0.444193	0.117533	0.148693	0.668335
GINI	38	0.414123	0.421150	0.027667	0.352200	0.464200
INF	38	22.81250	19.25000	12.68632	6.900000	52.30000

Some descriptive statistics related to the data are reported in Table 1.

These statistics summarize the distributional characteristics of the data for each variable by providing measures of central tendency (mean) and variability (standard deviation, minimum, and maximum). The trends in female and male unemployment rates over the period 1984–2024 are presented in the following figure.

Examining the trend in male and female unemployment rates from 1984 to 2023 (1363 to 1402 in the Persian calendar) shows that the female unemployment rate was higher than the male unemployment rate in all years under review. The average female unemployment rate during this period was 17.83 percent, while the male unemployment rate was 9.95 percent, indicating a significant difference in the labor market status of the two groups. Also, the female unemployment rate decreased from 18.91 percent in 1984 to 15 percent in 2023, and the male unemployment rate

decreased from 10.74 percent to 6.6 percent. However, the larger decrease in the male unemployment rate has kept the gap between the two groups' unemployment rates significant at the end of the period. This situation may indicate that the reduction in unemployment in Iran's labor market has not been evenly distributed between women and men, and that women still face greater obstacles to being absorbed into the labor market and to remaining in it.

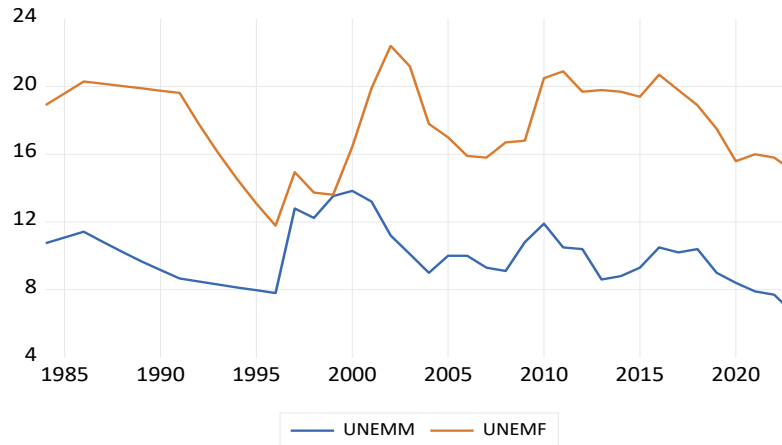


Figure 1: Female and Male Unemployment Rates (Source: Research finding)

The female unemployment rate in the early years of the period increased to 20.3 percent in 1986, then decreased to 11.78 percent in 1996. This decrease can be partly attributed to improvements in labor absorption conditions and labor market developments during this period. However, from the late 1990s onward, the female unemployment rate increased again, reaching 22.4 percent in 2002, the highest value of the entire period. The increase in female unemployment during this period can be attributed to the gradual entry of educated women into the labor market and the increase in women's labor supply, while the creation of job opportunities commensurate with this increase in supply has not kept pace. After this period, the female unemployment rate fluctuated, with a downward trend in the final years.

For men, the unemployment rate in the early years of the period declined, from 10.74 percent in 1984 to 7.8 percent in 1996. Then, in the late 1990s, a significant increase was observed, and the male unemployment rate reached 13.84 percent in 2000. This increase can be partly related to cyclical economic developments, changes in the level of productive activity, and labor absorption capacity. After this period, despite occasional fluctuations, the overall trend in the male unemployment rate has been declining, and in 2023 it reached 6.6 percent, the lowest value of the entire period. The noticeable decrease in male unemployment in the final years of the period may indicate a relative improvement in the absorption of male labor across various economic sectors;

however, to attribute this change to specific factors, a separate examination of labor market variables is necessary.

Overall, the persistently higher unemployment rate among women than men is a stable characteristic of Iran's labor market during the period under review. The average gap between the two groups' unemployment rates was about 7.88 percentage points, and the largest gap, 11.2 percentage points, was observed in 2013. The persistence of this gap can be considered a sign of a structural difference in employment opportunities for women and men; a difference that can be influenced by factors such as the economic participation rate, family responsibilities, the structure of labor demand, differences in the type and sector of employment, access to job opportunities, and barriers to the entry and retention of women in the labor market.

4. Empirical Results

The results obtained from the Phillips-Perron (PP) test with different specifications are reported in Table 2:

Table 2. The Results of the PP Unit Root Test (Source: Research finding)

Level				First difference			
Variable	Specification	t-Statistic	p-value	Variable	Specification	t-Statistic	p-value
GDP	C	-0.644996	0.8486	Δ GDP	C	-4.424990	0.0011
	C/T	-2.633181	0.2687		C/T	-4.373625	0.0068
	No	0.985899	0.9113		No	-4.430780	0.0000
UNEMM	C	-1.949658	0.3071	Δ UNEMM	C	-5.746339	0.0000
	C/T	-2.130175	0.5135		C/T	-5.708679	0.0002
	No	-0.834666	0.3479		No	-5.771606	0.0000
UNEMF	C	-2.069166	0.2577	Δ UNEMF	C	-4.301067	0.0016
	C/T	-2.052263	0.5553		C/T	-4.244048	0.0094
	No	-0.642615	0.4324		No	-4.339534	0.0001
OPEN	C	-1.158076	0.6826	Δ OPEN	C	-5.756871	0.0000
	C/T	-2.877500	0.1805		C/T	-5.611541	0.0002
	No	0.846448	0.8894		No	-5.056334	0.0000
GINI	C	-1.692527	0.4270	Δ GINI	C	-7.859787	0.0000
	C/T	-2.583535	0.2894		C/T	-7.815387	0.0000
	No	-1.078745	0.2492		No	-7.801685	0.0000
	C	-2.020644	0.2771		C	-5.946314	0.0000
	C/T	-2.287899	0.4303		C/T	-6.201924	0.0000

Level				First difference			
Variable	Specification	t-Statistic	p-value	Variable	Specification	t-Statistic	p-value
INF	No	0.276862	0.7611	Δ INF	No	-5.712874	0.0000

Note: Symbols "C", "C/T", and "No" indicate the model specifications with constant and no trend, with constant and trend, and without constant and trend, respectively. The p-values are calculated based on McKinnon's critical values. The null hypothesis is that the series has a unit root.

According to the results, the variables in Equation (1) are I(1), so the ARDL approach is used to analyze cointegration among the variables.

In this approach, first, the number of optimal intervals of explanatory variables in an ARDL (p,q) model should be determined in the following form:

$$y_t = \alpha + \sum_{j=1}^p \phi_j y_{t-j} + \sum_{j=0}^q \theta_j' x_{t-j} + \varepsilon_t \quad (2)$$

where x_t is a $k \times 1$ vector of multiple regressors and θ_j is a $k \times 1$ vector of relevant coefficients. Standard information criteria can be used for this purpose. Also, depending on the diagnosis, the intercept can be removed from the above model, or a time trend or dummy variables can be added. In addition, in this model, it is assumed that the number of regressors' lags (x_t) is the same and equal to q . Nevertheless, these regressors may have different numbers of lags.

In the next step, the regression model (2) is rewritten in an error correction form as follows:

$$\Delta y_t = \alpha + \rho y_{t-1} + \theta' x_{t-1} + \sum_{j=1}^{p-1} \gamma_j \Delta y_{t-j} + \sum_{j=0}^{q-1} \varphi_j' \Delta x_{t-j} + \varepsilon_t \quad (3)$$

Where:

$$\rho = \sum_{j=1}^p \phi_j - 1, \gamma_j = -\sum_{i=j+1}^p \phi_i \text{ for } j = 1, \dots, p-1$$

and

$$\theta = \sum_{j=0}^q \theta_j, \varphi_0 = \theta_0, \varphi_j = -\sum_{i=j+1}^q \theta_i \text{ for } j = 1, \dots, q-1.$$

Then, the bounds test is applied to determine whether a long-run cointegration relationship exists among the variables. If the calculated F-statistic from the bounds test is greater than the upper bound critical value, a long-run cointegration relationship exists among the variables under investigation.

The ARDL model with Unrestricted Constant and Trend is used in this study. According to the ARCH test, the null hypothesis of homogeneity of variance cannot be rejected at an acceptable confidence level. Based on the F-statistic, the model is statistically significant. The Durbin-Watson (DW) statistic also indicates that the model has no autocorrelation. Also, according to the results

of the LM test in the model, the null hypothesis that there is no serial correlation of error terms cannot be rejected at an acceptable confidence level. The results are presented in Table 3.

Table 3. Diagnostic tests (Source: Research finding)

Diagnostic tests		
F-Statistic (p-value)	LM Test(p-value)	ARCH (p-value)
96.34558 (0.000000)	1.276289 (0.2981)	0.130752 (0.7198)
DW – statistic		R-squared
1.971622		0.978834

The F-test statistic proposed by Pesaran et al. [25] is used to test for the presence of a long-term relationship between the variables. According to the results presented in Table 4, the value of the calculated statistic is 7.7563, and because the calculated F-statistic is higher than the upper band (critical value) at the significance level of 1%, the null hypothesis that there is no long-term relationship is rejected. It can be concluded that there is a long-term relationship between the variables.

Table 4. Bounds test (Source: Research finding)

Bounds test			
F-Statistic	Significance Level	Bound Critical Values	
		I(0)	I(1)
7.5763175	%10	2.75	3.79
	%5	3.12	4.25
	%2.5	3.49	4.67
	%1	3.93	5.23

Another issue with the ARDL approach concerns the stability of the estimated model. In fact, statistical inference, forecasting, and the use of regression model results rely on the assumption that the coefficients of the variables remain stable over the period under review. The common cumulative residual test proposed by Brown et al. [24] has been used to check the stability of the estimated model. As shown in Figure 2, because the test statistic across periods falls between the critical lines, the null hypothesis of model stability cannot be rejected at the 95% confidence level, indicating that the model parameters are stable.

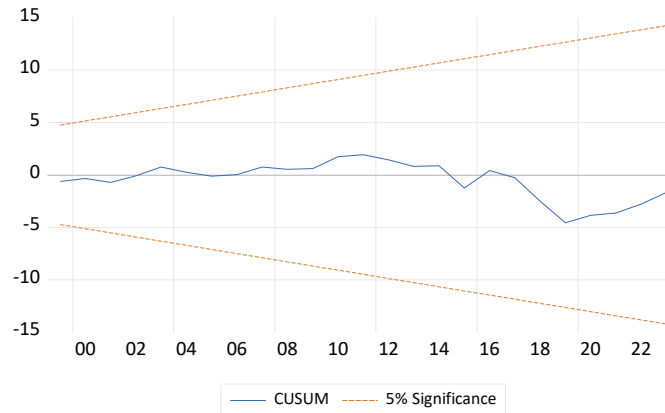


Figure 2. CUSUM for ARDL Model (Source: Research finding)

The long-run coefficients (cointegration vectors) estimated in Table 5 are reported:

Table 5. Estimation Results (Source: Research finding)

Long-Run coefficients			
Regressor	Coefficient	t-Statistic	P-value
UNEMM	-0.003689	-7.868327	0.0000
UNEMF	-0.001150	-4.506496	0.0001
OPEN	+0.006602	-0.705131	0.4872
GINI	0.110292	3.489110	0.0018
INF	-0.000844	-11.16590	0.0000
Speed of adjustment			
$\hat{\rho}$	Std. Error	t-Statistic	p-value
-0.594920	0.080550	-7.385762	0.0000

The results of the long-run coefficient estimation are presented in Table 5. The results show that, in the long run, both female and male unemployment have a negative and significant effect on economic growth, such that increases in unemployment are associated with decreases in economic growth. This relationship can be explained through two main mechanisms. First, unemployment means the incomplete use of one of the basic factors of production, namely labor. When a part of the labor force is removed from the production process, the economy cannot use its full potential capacity, and a gap forms between actual and potential output. The continuation of this situation can, while reducing resource productivity, also undermine investment incentives and the process of capital accumulation, ultimately limiting long-term economic growth. Second, the persistence of unemployment can weaken human capital, as long-term unemployment is accompanied by the erosion of skills, reduced motivation, and the loss of some individuals' job-related abilities. As a

result, the quality and productivity of the labor force decline, and the economy's long-run growth potential is weakened.

The significant negative effect of female unemployment indicates that the underutilization of women's labor capacity also has direct consequences for economic performance. Especially for women with education and skills, unemployment means that a part of society's human capital remains unused, which can limit economic growth by reducing the effective supply of labor and potential output. On the other hand, male unemployment also has a negative and significant effect on economic growth, and its magnitude is greater than that of female unemployment. This difference can be partly explained by the structure of the labor market and the difference in the participation rate and employment share of women and men; in such a way that the higher participation and employment of men causes an increase in their unemployment, affecting a larger part of the active labor force and the economy's production capacity. Also, differences in the distribution of women's and men's employment across economic sectors can help explain differences in the intensity of the effect of their unemployment on economic growth. Therefore, although the effect of male unemployment is stronger, the significance of the effect of female unemployment also indicates that the underutilization of women's economic capacity is associated with a long-run decrease in economic growth.

According to the results, income inequality has a positive and significant effect on economic growth. In endogenous growth models, inequality usually hurts growth by weakening human capital (especially by reducing low-income groups' access to quality education). In contrast, the classical interpretation of growth theories (such as the Solow or Keynesian-Kaldor models) states that the concentration of income in higher deciles of society, due to these groups' higher marginal propensity to save, increases the total savings rate and, consequently, the financial resources available for physical investment. The positive inequality coefficient in this study's empirical results indicates that, during the period under review, the negative effect of inequality on human capital accumulation was weaker than its positive effect on physical capital accumulation.

Also, the results indicate that the effect of trade openness on economic growth is not significant. On the other hand, the results show that an increase in inflation significantly reduces economic growth. High inflation reduces households' purchasing power, especially among low-income groups, leading to a decrease in aggregate demand. A decrease in demand means a decrease in sales of production units and in incomes, which ultimately leads to a decrease in employment and

investment across various economic sectors. Also, higher inflation increases economic uncertainty, so economic actors, investors, and entrepreneurs are less willing to invest and expand their businesses due to uncertainty about future prices and costs.

The estimation results of the error correction model are reported in the lower part of Table 4. As shown, the coefficient of the first lag of the error correction term is estimated as -0.594920 and is significant at the 1% level. Based on this value, 59.49% of the dependent variable's deviation (positive or negative) from its equilibrium path is corrected in each period.

5. Conclusion and Recommendations

From a theoretical perspective, unemployment, regardless of gender disaggregation, reflects the underutilization of human capital and the economy's deviation from the production possibilities frontier, thereby reducing total factor productivity and slowing potential growth. Disaggregated analysis of the effects of male and female unemployment on economic growth is a fundamental scientific and policy need in Iran's economy. In Iran's economic structure, the low participation rate of women in economic activities and the high unemployment among educated women indicate a serious distortion in resource allocation. This allocative inefficiency weakens the economy's competitive ability and innovation capacity. Moreover, at the macroeconomic level, high unemployment rates in both groups exacerbate income inequality and social risks, which in turn destabilize long-term economic growth. Therefore, a separate analysis of this issue is a vital tool for designing effective labor market policies; policies that can both enhance the employability and absorption of women and ensure the sustainability and productivity of men's jobs in the main sectors of the economy.

This study aims to investigate the impact of male and female unemployment on economic growth in Iran from 1984 to 2023 (1363 to 1402 in the Persian calendar). For this purpose, GDP per capita is considered an indicator of economic growth. The results from applying the ARDL technique show that both male and female unemployment significantly reduce economic growth, with the effect of male unemployment greater than that of female unemployment. This result is rooted in the structural and institutional realities of Iran's economy and is supported by several academic justifications. First, the deep gap in labor force participation rates is the main factor: given that men's participation rate is higher than women's, the exit of men from the labor market directly reduces the active labor force, and its effect on GDP volume is more noticeable. Second, the nature of employment and concentration in productive sectors is also a determining factor; the majority

of men's employment in Iran is concentrated in large industries, extractive industries, construction, and transportation, which, in economic terms, have the largest share of value added and the greatest backward and forward linkages with other sectors. As a result, recession and unemployment in these areas (where male employment dominates) cause a more severe shock to the macroeconomy. Third, households' dependence on men's income for their livelihoods reinforces this effect. Male unemployment, as the main breadwinner, immediately leads to a sharp and sudden decline in aggregate demand and exacerbates recessionary cycles. Finally, given Iran's rentier, state-dominated economy, a large share of formal, insured, and higher-marginal-productivity employment is still held by male workers, and the loss of these jobs leads to a greater reduction in tax revenues and insurance premiums, putting pressure on the government's financial sustainability.

At the same time, the smaller effect of female unemployment should not be interpreted as meaning that women's employment is unimportant for economic growth. The significance of the negative effect of female unemployment indicates that even when women's economic participation is lower than men's, the underutilization of women's labor capacity still carries an economic cost. In other words, a part of women's human capital that could be used in the production process and value creation remains unused due to unemployment. From this perspective, reducing female unemployment can, in addition to increasing their employment and income, lead to more efficient use of human capital and an increase in the economy's production capacity.

Overall, the results show that both male and female unemployment constrain economic growth, although the effect of male unemployment is stronger. Therefore, reducing unemployment and increasing the utilization of human capacity, especially through strengthening productive employment, should be one of the main axes of economic policymaking. In this regard, improving the business environment, removing barriers to production and investment, creating economic stability, and reforming labor market laws and regulations can reduce unemployment and increase labor market dynamism by strengthening productive activities and increasing labor demand. Also, enhancing human skills and providing the ground for attracting investment are among the requirements for creating sustainable employment and strengthening economic growth.

Given the significant effect of female unemployment on economic growth, special attention to increasing women's economic participation and employment is also essential. In this regard, structural reforms to facilitate women's entry and retention in the labor market, improvements in

education and job skills, and the creation of employment opportunities commensurate with their capabilities and expertise can provide the basis for more effective use of women's human capital. Furthermore, reforming cultural attitudes towards the economic role of women, strengthening the self-confidence of educated women, developing specialized and professional training, and drawing on the successful experiences of other countries can help increase women's effective presence in the labor market. Finally, simultaneous attention to reducing unemployment among both women and men and removing structural barriers to women's economic participation can pave the way for fuller utilization of human capacity and achieving more sustainable economic growth.

Other results show that inflation reduces economic growth. Based on this result, it is suggested that economic policies be designed and implemented to control and stabilize inflation, and that policies that exacerbate price fluctuations and increase economic uncertainty be avoided. Also, given the negative relationship between inflation and economic growth, strengthening the stability of the economic environment and reducing price uncertainty can provide a more suitable context for producers' and investors' decision-making, thereby increasing productive activity. On the other hand, supporting increased production and supply of goods and services, especially in sectors facing supply constraints, can help reduce inflationary pressures while preventing a decline in productive activity. Overall, adopting a coordinated approach to controlling inflation and strengthening economic stability can lay the foundation for reducing inflation's negative effects on economic growth.

References

- [1] Ssebulime, K., & Muvawala, J. (2019). Estimating the cost of unemployment to Uganda's growth and growth trajectory 1980–2016: An auto-regressive distributed lag modeling approach. *International Journal of Econometrics and Financial Management*, 7(1), 27–36.
- [2] Yenipazarlı, A., Şanlı, O., Çondur, F., & Cömertler, N. (2024). Economic growth and gender-specific unemployment: Comparison of selected oil exporters and Eastern European countries (1996–2021). *Uluslararası Yönetim Akademisi Dergisi*, 7(3), 774–789.
- [3] Chen, J., Su, F., Jain, V., Salman, A., Tabash, M. I., Haddad, A. M., & Shabbir, M. S. (2023). Does renewable energy matter in achieving sustainable development goals? The impact of renewable energy strategies on sustainable economic growth. *Frontiers in Energy Research*, 10, 829252.
- [4] Sadiq, M., Ngo, T. Q., Pantamee, A. A., Khudoykulov, K., Thi Ngan, T., & Tan, L. P. (2023). The role of environmental social and governance in achieving sustainable development goals: Evidence from ASEAN countries. *Economic Research-Ekonomska Istraživanja*, 36(1), 170–190.
- [5] Verick, S. (2014). Female labor force participation in developing countries. *IZA World of Labor*, 87, 1–10.
- [6] Akbari, N., Emadzadeh, M., & Razavi, S. A. (2004). Barresi-ye avāmel-e mo'asser bar qeymat-e maskan dar shahr-e Mashhad: Rāhkar-e eqtesād-e sanji-ye fazāyi dar rāvesh-e Hedānik [Investigating the factors affecting housing prices in Mashhad: A spatial econometric approach in the Hedonic method]. *Pazhouheshhā-ye Eqtesādi (Reshteh va Tose'eh-ye Pāydār)*, 4(11–12), 57–78.
- [7] Salatin, P., & Rostami Ankas, S. (2018). Tāsir-e bārāvari bar nekhbat-e moshārekāt-e zanān dar gorooh-e keshvarhā-ye montakhab: Rāhkar-e dādehhā-ye panel [The impact of fertility on women's participation rate in selected countries: A panel data approach]. *Zan va Motāle'āt-e Khānevādeh (Women and Family Studies)*, 11(41), 7–22.
- [8] Harahap, I. (2019). Ekonomi pembangunan: Pendekatan transdisipliner. Rosda Mulia.

- [9] Khan, S., Yahong, W., & Zeeshan, A. (2022). Impact of poverty and income inequality on the ecological footprint in Asian developing economies: Assessment of Sustainable Development Goals. *Energy Reports*, 8, 670–679.
- [10] Dornbusch, R., Fischer, S., & Startz, R. (1998). *Macroeconomics*. McGraw-Hill Publisher.
- [11] Vakıfbank Economic Research Directorate. (2021). Okun's Law: The relationship between growth and unemployment (Special Report II). Vakıfbank Press.
- [12] Rajaeian, M. M., & Bagherpour, P. (2015). Study on influential factors of women's employment rate using system dynamics approach. *Women's Studies Sociological and Psychological*, 13(2), 7–36.
- [13] Magidu, N. (2010). Socioeconomic investigation into determinants of labour force participation in labour markets: Evidence from Uganda [Mimeo]. Economic Policy Research Centre, Makerere University.
- [14] Zafarānchi, L. S. (2009). Barresi-ye vaz'iyat-e eshteghāl-e zanān dar Irān [Investigating the employment status of women in Iran]. Markaz-e Omur-e Zanān va Khānevādeh, Nehād-e Riyāsāt-e Jomhuri (Center for Women and Family Affairs, Presidential Institution).
- [15] Akhtar, R., Masud, M. M., Jafrin, N., & Shahabudin, S. M. (2023). Economic growth, gender inequality, openness of trade, and female labour force participation: A nonlinear ARDL approach. *Economic Change and Restructuring*, 56, 1725–1752.
- [16] Abbasi Esfajir, A. A., & Rezaei Roshan, H. (2020). Barresi-ye tāsir-e eshteghāl-e zanān bar rashd-e eqtesādi dar keshvarhā-ye montakhab-e Khāvar-e Miyāneh [Investigating the impact of women's employment on economic growth in selected Middle Eastern countries]. *Zan va Jāme'eh (Jāme'eh-shenāsi-ye Zanān)*, 11(2), 207–226.
- [17] Zahed, Z., Nasrollahi, Z., & Mahini Zadeh, M. (2020). Az tab'iz-e jensiyati be su-ye barābari va rashd-e eqtesādi (Motāle'eh-ye keshvarhā-ye dar hāl-e tāvseh) [From gender discrimination towards equality and economic growth (A study of developing countries)]. *Zan dar Tose'eh va Siyāsāt (Women in Development and Politics)*, 18(4), 643–662.
- [18] Kalu, E. U., Achike, C., Ogbo, A., & Ukpere, W. (2020). Economic growth and unemployment linkage in a developing economy: A gender and age classification perspective. *Problems and Perspectives in Management*, 18(4), 527–538.
- [19] Zareh Shohaneh, M. M., Nasrollahi, Z., & Parsa, H. (2019). Asar-e nāmotaghāren-e shokhā-ye nābarābari-ye jensiyati-ye niruye kār bar rashd-e eqtesādi-ye Irān [The asymmetric effect of labor force gender inequality shocks on Iran's economic growth]. *Eqtesād va Tejārat-e Novin (Modern Economics and Trade)*, 14(1), 39–59.
- [20] Victoria, K. S. (2019). A causal relationship between unemployment and economic growth (MPRA Paper No. 93133). Munich Personal RePEc Archive.
- [21] Asadzadeh, A., Mirani, N., Ghazi Khani, F., Esmail Darjani, N., & Honardoust, A. (2017). Barresi-ye naghsh-e eshteghāl va tahsilāt-e zanān bar rashd-e eqtesādi-ye Irān [Investigating the role of women's employment and education on Iran's economic growth]. *Zan dar Tose'eh va Siyāsāt (Women in Development and Politics)*, 15(3), 359–381.
- [22] Alotaibi, M. M. (2017). Unemployment and economic growth in Saudi Arabia 2000–2015. *International Journal of Economics and Finance*, 9(9).
- [23] Rahmani, T., & Sepideh, K. (2015). Āyā tab'iz-e jensiyati 'āmel-e bāz-dārande-ye rashd-e eqtesādi-ye keshvarhāst? [Is gender discrimination a deterrent to countries' economic growth?]. *Tahghighāt-e Eqtesādi (Economic Research)*, 50(3), 593–616.
- [24] Brown, R. L., Durbin, J., & Evans, J. M. (1975). Techniques for testing the constancy of regression relationships over time. *Journal of the Royal Statistical Society: Series B (Methodological)*, 37(2), 149–163.
- [25] Pesaran, M. H., Shin, Y., & Smith, R. J. (2001). Bounds testing approaches to the analysis of level relationships. *Journal of Applied Econometrics*, 16, 289–326.
- [26] Keramatizadeh, N., & Maddah, M. (2024). The Effect of Unemployment Rate on Fiscal Policy in the Political Cycle. *International journal of industrial engineering and operational research*, 6(1), 146-158.
- [27] Tarnabi, F. S., & Raghfar, H. (2025). The impact of inflation on inequality and income distribution in Iran by emphasizing expenditure centile. *International journal of industrial engineering and operational research*, 7(1), 27-45.