Over-education, Educational-job Mismatch, and Skills of Job seekers with Tertiary Education in the Labor Market of Iran

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Abstract

This study was aimed at exploring the correlation among over-education, educational-job mismatch and the skills of university graduates job seekers in the labor market of Iran. Based on micro-data taken from local job seekers with university degrees who registered in private job-finding agencies (JFAs) in Urmia city in 2015, this relationship was estimated. Out of a population of 3481 job applicants with tertiary education (bachelor's or above degrees), 366 were selected based on random sampling. Regression analysis and Logit model were utilized to investigate this relationship. In our regression analysis, over-education was considered as the dependent variable, while age, gender and skill acted as explanatory variables. The findings of this study indicate that with rising qualifications of the university graduates job applicants, the possibility of over-education and education-occupation mismatch increases, but there is a negative correlation with age and probability of educational mismatch.

Keywords: Labor Market, Over-education, Education-job Mismatch, University Graduates, Job Skills.
JEL Classification Codes: E24, R23, J210.

Aşırı Eğitim, Eğitim-İş Uyuşmazlığı ve İran İşgücü Piyasasında Üniversite Mezunu İş Arayanların İş Becerileri

Öz

Bu çalışmada, İran işgücü piyasasında üniversite mezunu iş arayanların becerileri ile aşırı eğitim, eğitim iş uyumsuzluğu ilişkileri incelenmektedir. Bu doğrultuda, 2015 yılında Urmia'da özel istihdam bürolarına (JFA) kayıtlı olan üniversite mezunu iş arayanlar arasından elde edilen mikro veriler vasıtasıyla söz konusu ilişki hesaplanmıştır. İş başvurusunda bulunan, yükseköğrenim diploması olan üç bin dört yüz seksen bir kişi içinden (lisans veya lisansüstü) iş arayan üç yüz altmış altı kişilik rastgele bir örneklem seçilmiştir. Bu ilişkiyi araştırmak için regresyon analizi ve Logit modeli kullanılmıştır. Regresyon analizinde, aşırı eğitim bağımlı değişken olarak kabul edilirken; yaş, cinsiyet ve beceri açıklayıcı değişkenler olarak modelde yer almıştır. Çalışma bulgularına göre, iş başvurusunda bulunan üniversite mezunu adayların iş becerileri ile aşırı eğitim ve de eğitim meslek uyumsuzluğu riskleri artmaktadır; ancak yaş ile eğitim uyumsuzluğu arasında negatif bir ilişki tespit edilmiştir.

Anahtar Kelimeler: İşgücü Piyasası, Aşırı Eğitim, Eğitim-İş Uyuşmazlığı, Üniversite Mezunları, İş Becerileri
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1. Introduction

The high unemployment rate can affect the adjustment mechanism of supply and demand of the labor market. In unemployment, especially in the case of unemployed people with a university education, job seekers are forced to choose jobs that do not fit with the level of education and the type of field of study for not attracting into the job market. In such a situation that the level of education and training of job seekers exceeds the level of education required to perform the desired job, the phenomenon of so-called "over-education" and "job-education mismatch" occur. Over-education is said to indicate that the individual's education is more than the required education for job (Freeman, 1976). In Bishop's (1993) view, over-education is a situation where a community (or individual) has more education than "required education" or "good education". Whether a community is over-educated or under-educated depends on the standard definition of "required education" or "good education". In terms of Galasi (2004, p. 248), over-education and under-education is the description of the relationship between the employer's demand and the level of education. Overeducation has many negative impacts on workforce such as job dissatisfaction (Gervasi and McGuinnes, 2018, p. 158-159), productivity and wage reduction and increased psychological stress (Meroni and Vera-toscano, 2017, p. 121).

In Iran, high rates of unemployment, especially the unemployment of educated young people, are one of the main concerns of policymakers. With the expansion of facilities and opportunities for higher education and increased entry of women into universities the young population of the country has been absorbed by the ever-increasing acceleration in the higher education system on the one hand. On the other hand, academic graduates have not been able to absorb into the labor market due to lack of infrastructure investments, economic sanctions, poor engagement with the global economy, and a weak correlation between Iran's economic growth and job creation.

In such an environment, many university graduates job seekers in the labor market after long searches are forced to choose jobs that do not adapt with their education both in terms of the level of their education and in terms of field of study so inefficient allocation of manpower occurs (Linsley, 2005, p. 122). Regardless of micro and macroeconomic and social effects of this phenomenon such as reduction of wages, productivity, job satisfaction and welfare of employees, the study of factors affecting the prevalence of over-education and education-job mismatch is of great importance with regard to the supply of workforce approach. In other words, in terms of individual components of job seekers factors such as gender, age, skill, marital status, etc., can affect the issue of over-education and educational-job mismatch. In this study, I focus on the same point, and specifically on the skills of job seekers. Therefore, the main aim of this research is to analyze the correlation of incidence of the over-education phenomenon with the level of skills of university graduates job seekers in the labor market of Iran. In

other words, this study tries to answer the question does skill of university graduates job seekers can have a significant effect on the reduction of job-educational mismatch and the over-education phenomenon among job seekers? It seems that those job seekers who are skilled and participated in training courses in technical and vocational training organization are less likely to experience over-education and job-education mismatch compared to their competitors.

The structure of this study is as follows. After explaining the concept of over-education and job-education mismatch and problem statement, the second part will outline the structure of Iranian labor market. Section three provides the theoretical foundations and the background of the research. In the fourth section, the methodology of the research is discussed. In the fifth section, the findings of the research are presented and finally, in the last section, the topic will be summarized and concluded.

2. Iran Labor Market

Chronic high unemployment and low participation rate is the fundamental feature of the labor market in Iran. After the 1979 revolution, the unemployment rate almost never fell below 10 percent (Table (1)). Low investment rates, weak integration with global economy and, most significantly, the comprehensive financial and economic sanctions of 2011-2013, weakened the economy of Iran and limited the employment opportunities for the young and educated job seekers. On the supply side, the higher education policies, which focused on increasing access to university education and permission to establish non-profit private universities, led to a sharp increase in the number of university students in Iran (Figure (1)).
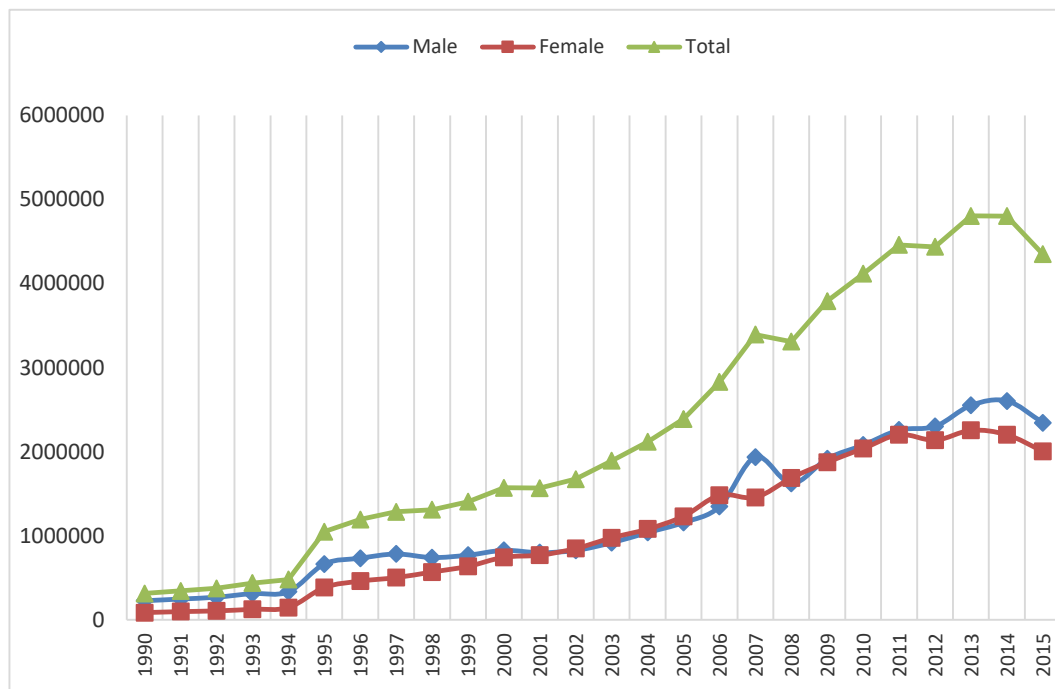
Table 1: Labor Force Participation and Unemployment Rate for University Graduates in Iran in Period of 1976.

Variable /year	1976	1986	1996	2006	2012
University Graduates (000 Person)	283	588	1501	4331	6361
Graduated Labor Force	279	520	1461	3690	5036
Employed	268	497	1403	3316	4268
Un-employed	11	23	58	374	768
Graduate Labor Force Activity Rate (%)	98.6	88.4	97.4	85.2	79.1
Graduate Unemployment rate (%)	3.9	4.4	4.1	10.1	15.3
Graduated Ratio of the Employed to Total Employment (%)	3	9.6	9.6	16.2	24.5
Total Unemployment Rate (%)	10.2	14.2	9.1	11.2	12.3
Young People (15-24) Unemployment Rate (%)	13.2	24.9	19.2	23.3	26.5

Source: Statistical Center of Iran, 2016

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At the same time, the poor labor market conditions for university graduates have motivated many recent graduates with bachelor degrees to enroll for masters and PhD programs with the anticipation that they will have better employment prospects with more advanced degrees. On the other hand, most employers have shown a strong preference for hiring the graduates of well-known and high prestige universities. This puts the graduates of less competitive universities at a disadvantage and the country is faced with an "army of college graduates" that are desperate for any type of employment opportunity even if it does not require a university degree.

Figure 1: University Enrollment in Iran in Period of 1990-2015 School Years.

Source: Statistical Center of Iran, 2016

According to the data of statistics center of Iran, while in the year 1992, the total number of students of universities and higher education institutions was about 312 thousand, as a result of the adoption of the policy of expansion of higher education, the figure in 2016 surged to more than 4802 thousand people (more than fourteen times). Another important point is that in the school year of 1992-1993, only more than 85,000 female students were studying in Iran's higher education system, however this figure has surged to more than 2200 thousand students in the 2015-2016 school year (ie, an increase of more than 24 times) (Statistical Center of Iran, 2016). Besides, in terms of job market index, the share of university-educated workers has increased significantly from employment as well as the unemployment rate of this group. Based on the results of the General Census of Population and Housing in 1978, the share of employed university

graduates from the total employment of Iran was 3% which increased by 24.5% based on census data in 2012. The unemployment rate of university graduates job seekers in 1978 was equivalent to 3.9% which during the last two decades, in 2012, the unemployment rate of graduate students increased to 15.3% due to the acceleration of the supply of educated labor force to its demand where three scale percentage points is more than the total unemployment rate (12.3 %) (Statistical Center of Iran, 2012).

3. Literature Review

Different theories have been proposed in the literature in explaining the issue of over-education and job-education mismatch. One of the first theories that attempt to explain the above mentioned issue is Becker's (1964) human capital theory. The human capital theory is a supply side theory. This theory assumed that productivity is the upward function of individual human capital which is affecting on individual work and experience by means of formal education. Business enterprises are also inclined to fully utilize people's skills. Wages are always equal to the marginal product of labor which is determined by the human capital earned by the workforce. Over-education makes the relative wages of high-skilled workforce reduced and given that the supply of educated labor becomes cheaper, the previously filled situations with less skilled workforce is replaced by high educated workforce (Linsley, 2005, p.124-125).

Another theory related to the explanation of over-education is career mobility theory which Sicherman presented in his doctoral thesis at Columbia University in 1987, like human capital theory, this theory is also focused on the supply side. According to this theory, over-education is considered an imbalance of the labor market. The over-educated workforce consciously accepts jobs that require less years of study than their actual education. While doing these jobs, human resources acquire a new form of human capital in the form of experience and in-service training. Since these jobs are considered temporary, people over time move to jobs that do not have over-education so that they can use all their qualifications (Sicherman and Galor, 1990, p. 169-171). In the sense that the phenomenon of over-education is a temporary issue, human capital theory and occupational mobility theory will imply the same concepts. The point that distinguishes these two theories is the assumption that in the job mobility theory people temporarily choose a job that is over- education in but they also expect to improve their job prospects in the future job market.

Another theoretical framework in which over-education can be analyzed is the job competition theory (Thurow, 1975). This theory is an explanation of the demand side for over-education. The main assumption of this theory is that workforce is competing for higher-paid jobs in the labor market. In this case, when the workforce is looking for a job, there are two types of queues: job queue and workforce queue. Job queue is created by the competition between the workforces

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for jobs ranked in income order. The workforce queue is also emerging as an outcome of the competition between firms for highly productive employees ranked by their potential education costs. Since formal and job education are complementary, it seems that the workforce with more education will impose the lower cost of education. As a result, people with higher education are at the forefront of the queue, and are employed in higher-paid jobs.

The last theory that analyzes over-education is "recruitment matching with assignment approach" (Sattinger, 1993, p. 832-837). This theory reflects both supply and demand sides. Like other models that consider a positive relationship between workforce productivity and education, people with similar education in different jobs cannot be equally efficient in this theory. Each workforce may have a comparative advantage in one job compared to other jobs and the reason that over- education is seen in the labor market is that the workforce is not assigned to a job that has a comparative advantage in. Under these assumptions, skills are not fully utilized and over- education may be evaluated as an inefficiency that has a negative impact on productivity. Unless highly efficient workforce to improve the process of job matching or government policies in order to reduce inefficiencies are allocated.

Research on skill matching and over-education in the labor market has entered academic discussions and studies seriously since the 1970s, when the supply of skilled workforce surpassed its demand in the United States with the publication of "over- educated Americans" by Freeman (1976). According to his research, the average earnings of university graduates dropped by 16-40 % in comparison with high school diploma graduates from 1969 to 1974. In his view, many job seekers have been forced to accept jobs that require lower educational level than the level of workers' education and as a result they have received lower wages. Since then, there has been widespread worldwide literature on this topic and concerns about over-education. Many studies in different countries also concluded that a significant part of the workforce has more education and usually fewer income according to their job requirements (Rumberger, 1981; Alba-Ramirez, 1993; Dolton & Vignoles, 2000; Kler, 2005; Linsley, 2005; Mavromaras et al., 2010; Tsai, 2010). Providing different methods for evaluation and assessment of over-education, the effect of over-education on the level of wages, productivity and job satisfaction, as well as determining the impact of individual characteristics on the possibility of occurrence of this phenomenon are of the research areas in this case. One of the studies that directly models the factors affecting over-education is Verhast and Omey's (2009) study. In their study, researchers have examined the factors affecting over-education among people who dropped out studying in their first job. In addition to individual characteristics of employees in the model that considered over-education as a dependent variable macroeconomic indices, industry status as well as regional features as imaginary variables were investigated in the form of Probit model in this study. There are three types of

mismatch measurement in this study and it provided the appropriate conditions for sensitivity analysis of different measurement methods. With a sample of 3,000 people, the educational mismatch was calculated using job analysis, employees' self-assessment and compliance detecting methods. The findings indicate there is a higher possibility of over-education among women as well as in inexperienced individuals. In another study by Eriş (2013) in Turkey the impact of job seekers' individual characteristics on the incidence of over- education in the Turkish labor market has been examined. In this research, using the logit model, the relationship between over- education and explanatory variables such as the age of job seekers, the academic credentials that the worker graduated from as well as studying in private or public universities and the experience of job seekers. Findings indicate that the relationship between age and the possibility of accepting a job disproportionate to the level of education of job seekers depends on the method of over-education measurement. As in the requested jobs model the relationship between age and the possibility of occurrence of over- education is far from negative. Also, according to the results of this study, the possibility of over-education and job-education mismatch among men is higher than that of women. Another finding of this study is the negative and significant effect of the university's credit on the possibility of occurrence of job mismatch.

In the present study like the above two studies, the effect of individual characteristics of job seekers on job mismatch is examined with the differences that first, it focused on university graduates with bachelor's or above degrees and second, in terms of explanatory variables the main focus of the model is on the skill of the job seekers and the use of technical and vocational qualifications as a successor variable.

4. Data and Methodology

This research is based on the data obtained from private sector job-finding agencies in Urmia. The statistical population of the study consisted of registered job seekers in Urmia city job-finding agencies which were a total of 7648 people. From this statistical population, based on the Cochran formula with a 5% error the sample size of 366 people was selected. The sample included job seekers with a bachelor's degree and higher. The gender segregation of the sample was 65% female and 35% male. 83% of the job seekers had a bachelor's degree and 17% had a master's degree. In the case study, only 30% of job seekers have had a degree in technical and vocational education from technical and vocational education institution or free schools affiliated with it and the rest 70% of the job seekers lacked technical and vocational qualifications. To evaluate the educational mismatch variable the analytic objective desired job method has been used in this research. That way, the individual's education has first been converted into the academic year of the ministry of science, research and technology. Therefore, for a jobseeker with a bachelor's degree this indicator is considered as 16 years of

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study and for a person with a master's degree 18 years of education is taken into account. Then, with regard to the selected occupations by people, the required education level has been extracted from the classification and evaluation plan of the occupations. The difference between the actual education level of an individual and the average amount of that required for the selected occupations represents the educational mismatch variable of the person which in case of being positive the person has been considered over- educated.

To investigate the effect of different explanatory variables on the possibility of over-education and job-educational mismatch the logit model has been used in this study. To examine the effect of explanatory variables on the dependent variable the logit model is shown as follows:

$$Z_i^* = \alpha + \beta X_i + u_i \tag{1}$$

Where Z_i^* denotes job-education mismatch among university graduates job seekers and X_i is a vector of personal characteristics of i-th jobseeker. α and β are model parameters and u_i is random error component of the model. If another variable named Z_i is defined that is composed of 0 and 1, if $Z_i^* > 0$, then the Z_i variable has a value of 1 otherwise it will be equal to zero. Therefore, the dependent variable of the model is defined as a zero and one variable in this study which includes $Z_i = 1$ for job seekers whose academic education exceeds the level of education required for jobs and $Z_i = 0$ for job seekers whose education is in line with the average education required for jobs requested and so the issue of over- education does not arise for these job seekers.

In the logit model of study, the possibility that the i-th jobseeker would suffer from job- education mismatch due to over- education is defined as:

$$P_i = F(Z_i) = F(\alpha + \beta X_i) = \frac{1}{1+e^{-z_i}} = \frac{1}{1+e^{-(\alpha+\beta X_i)}} \tag{2}$$

In the above model e is the base of natural logarithm and P_i is nonlinearly related to Z_i. As for the estimation of this model, P_i is not only nonlinear in terms of x but also is in terms of β and the OLS method is not suitable for estimating the parameters of the model. Accordingly, the model is estimated using the maximum likelihood method (Gujarati, 2004, p. 595-597).

If P_i is the possibility of mismatching in the labor market, then $1 - P_i$ means the possibility of job- education matching in the labor market. By dividing the possibility of job- education mismatch of i-th jobseeker by the possibility of job match:

$$\frac{P_i}{1-P_i} = \frac{1+e^{Z_i}}{1+e^{-Z_i}} = e^{Z_i} \tag{3}$$

The above relationship indicates the possibility of occurrence of job- education mismatch to the possibility of job-education matching. Taking the natural logarithm of both sides, the following equation is obtained:

$$L_i = ln\left(\frac{P_i}{1-P_i}\right) = \alpha + \beta X_i \tag{4}$$

Where l is the logarithm of the job-education mismatch ratio to its matching and is linear in terms of x and parameters.

Although, the estimated coefficient can show the relationship between dependent variables and explanatory variables in these models, a measure that that could better guide to determine the effect value of explanatory variables on the dependent variable is the criterion for the final effect. The final effect shows the possibility of choosing the value of one or the possibility of the desired option for a unit of change in each of the explanatory variables.

The final effect of each of the independent variables in the logit model is calculated from the following relationship:

$$MF_{x_i} = \frac{e^{X\hat{\beta}}}{\left(1+e^{X\hat{\beta}}\right)^2}\hat{\beta}_i \tag{5}$$

This relationship reflects the effect of a unit change in explanatory variables on job-education mismatch and over- education variables among job seekers.

5. Estimations and Results

To determine the coefficient of correlation and the level of influence of the skill level of the job seekers on the occurrence of the over-education phenomenon the binomial Logit regression model has been used. As in the Logit model the over-education variable is considered as a dependent variable of the model with two values of 1 for over-education and mismatch and zero for job- education matching. The variables of age, gender, and having a technical and vocational qualification as an alternative to skill are also entered as independent variables into non-linear regression model.

$$MM_i = \beta_0 + \beta_1 age_i + \beta_2 Skill_i + \beta_3 gender_i + e_i \tag{6}$$

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E-views software and maximum likelihood method have been used for estimating the above relation. The estimation results are summarized in Table 1.

Table 2: Logit Model Estimates For Dependent Variable Of Job-Education Mismatch and Model Explanatory Variables

Variable	Coefficient	Std. Error	Z-statistic	Prob.
C	2.137970	0.685921	3.116933	0.0018
Age	-0.078259	0.024074	-3.250773	0.0012
Skill	0.474067	0.239159	1.982228	0.0475
Mcfadden r-squared	0.032430	mean dependent var		0.519774
S.d. Dependent var	0.500316	s.e. of regression		0.490652
Akaike info criterion	1.356772	sum squared resid		84.49962
Schwarz criterion	1.389562	log likelihood		-237.1486
Hannan-quinn criter.	1.369818	Deviance		474.2972
Restr. Deviance	490.1944	restr. Log likelihood		-245.0972
Lr statistic	15.89719	avg. Log likelihood		-0.669911
Prob(lr statistic)	0.000353			
Obs with dep=0	170	total obs		354
Obs with dep=1	184			

Source: Researcher Calculations

The initial results of Logit nonlinear model based on maximum likelihood and Z test showed that the gender variable did not have a significant effect on the possibility of occurrence of the phenomenon of over-education and mismatch. The reason for this output can be due to poor labor market conditions that affected all groups including male and female job seekers from the high unemployment rate in the country. Therefore, with the elimination of this variable, the relationship between over-education and job-education mismatch as dependent variables was re-evaluated with two explanatory variables of skill and age. Research findings indicate that there is a significant and inverse relationship between the age of university graduates with academic qualifications and educational mismatch at the 5% level. In other words, by increasing the age of job seekers the possibility of applying for jobs that require a level of education more than job seekers' education reduces. The significance of this relationship is confirmed by Z test. This result is consistent with the findings of some researchers, such as Eriş (2013) in the Turkish labor market.

Also, the relationship between the possibility of occurrence of over-education and the availability of vocational and technical certificate training for job seekers suggests that having these certificates has a positive and significant relationship with job-education mismatch. In other words, university graduates job seekers

with technical and vocational qualifications are likely to be over-educated in comparison with those who do not have these certifications and apply for jobs in job-finding agencies that the level of education required for these jobs is lower than the level of education of job seekers. Therefore, the main hypothesis of the study about the possibility of job-education mismatch among skilled job seekers and those with technical and vocational qualifications is not accepted. As seen in table 1 the Mcfadden statistic which is a measure for goodness of fit in Logit nonlinear regression models represents the relative fit of the model. The LR statistic also indicates the overall significance of the regression line in Logit models.

The final effect, which indicates the effect of a unit change in the value of the explanatory variable on the dependent variable using the relationship (5) for the age variable of job seekers, was (0.31) and 0.19 for the skill of the job seekers. In other words, with a one-unit increase in the average age of job-seekers, the possibility of over-education and job mismatch decline by 31%. Also having technical and vocational qualifications as a successor to job seekers' skill, can increase the average possibility of job- education mismatch in labor market up to 19%.

6. Summary and Conclusions

By improving the quality of supply and increasing labor productivity education especially university education as a kind of investment in human resources can lead to higher wages, increasing the welfare of workers and an overall increase in economic growth. But, if the level of education of the workforce is not balanced with the required education for jobs demanded by firms this imbalance in the labor market will be characterized by over-education and job-education mismatch and lead to unwanted complications such as reduced wages, reduced job satisfaction and increased job turnover. In addition to examining the macro and micro effects of job mismatch, identifying the accelerating or decreasing components of this issue is especially important in our country. In this study, focusing on university graduates job seekers in Urmia I examined the effects of individual variables such as age, gender, and skill on the possibility of occurrence of over-education and as a result job-education mismatch of the workforce. Using Logit model and maximum likelihood estimation, there was no meaningful relationship between job seekers gender and the possibility of over-education. Because in today's high-unemployment rate of the labor market- although women's unemployment is almost twice as high as men's- it cannot be claimed that male university graduates find jobs that are more in line with their level of education than women. But the results of the nonlinear model show that as the age of job seekers grows the possibility of taking jobs that require less education than that of job seekers' decreases. In other words, the possibility of asking for jobs that are not consistent with the level of education of young job seekers is relatively

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higher. The reason for this result can be due to high unemployment among educated young people to escape unemployment, and given the theory of career mobility which makes them to consider this mismatch temporary and apply for jobs with less education than that of theirs. This finding is consistent with many previous studies. In the case of skills of job seekers which considered the proof of having a technical and vocational qualification as a criterion for jobseeker's skill, a positive and significant relationship with mismatch has been extracted contrary to previous expectations. University graduates job seekers that have a technical and professional qualification are more prone to job-education mismatch in comparison with those who do not have these certifications. However, what can be said as a policy strategy is reviewing the system of higher education and adapting it to the needs of the labor market. The gap between the supply of labor and the demand of firms and ignoring the updated needs of the labor market will only wipe out the government's huge spending in education as well as the non-optimal allocation of labor. To provide a comprehensive picture of all the individual characteristics of job seekers, conducting studies at the national level seems necessary.

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