

THE RELATIONSHIP BETWEEN UNIVERSITY PRESTIGE AND INCIDENCE OF OVEREDUCATION: EVIDENCE FROM TURKEY*

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Abstract

Overeducation indicates a position in which a worker possesses a level of education in excess of the required level of education to hold and perform a particular job. Using micro dataset from Turkish Employment Agency (Türkiye İş Kurumu, İŞKUR) for the period 2008-2011, this study attempts to analyze the determinants of the incidence of overeducation in Turkish labor market, with an emphasis on the effect of university prestige. Annual multinomial logistic regressions are estimated. The findings indicate that as the prestige of the university from which the individual graduated increases, the probability of being overeducated decreases. Other research findings can be summarized as follows: Men are more probable of being overeducated than women. Deteriorated local labor market conditions affect overeducation adversely. Finally, geographic mobility of individuals decreases the probability of being overeducated.

Keywords: Overeducation, University Prestige, Turkey

JEL Classifications: C21, I20, J21

ÜNİVERSİTE PRESTİJİ VE FAZLA EĞİTİMLİLEŞME ARASINDAKİ İLİŞKİ: TÜRKİYE ÖRNEĞİ

Öz

Fazla eğitilme, bir işte çalışmakta olan bir bireyin sahip olduğu eğitim düzeyinin çalışmakta olduğu işin gerektirdiği eğitim düzeyinden yüksek olduğu durumu ifade eder. Bu çalışmanın amacı 2008-2011 dönemi için İŞKUR mikro verilerini kullanarak Türkiye işgücü piyasasında fazla eğitilmenin belirleyicilerini analiz etmek ve bireyin mezun olduğu üniversitenin fazla eğitilmeye etkisini incelemektir. Her yıl için ayrı multinominal lojistik regresyonlar tahmin edilmiştir. Bulgular, bireyin mezun olduğu üniversitenin prestiji arttıkça fazla eğitilme olasılığının düştüğünü göstermektedir. Diğer temel bulgular ise şu şekilde özetlenebilir: Erkeklerin fazla eğitilme olasılığı kadınların fazla eğitilme olasılığından yüksektir. Bozulan işgücü piyasası göstergeleri fazla eğitilmeyi olumsuz olarak etkilemektedir. Son olarak, coğrafi hareketlilik bireylerin fazla eğitilme olasılıklarını düşürmektedir.

Anahtar Kelimeler: Fazla Eğitilme, Üniversite Prestiji, Türkiye

JEL Sınıflaması: C21, I20, J21

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1. Introduction

Determinants of economic growth changed, diversified and became sophisticated especially in the last decades. Education and expenditure on it became one of the most important determinants of economic growth— and development — throughout this process. Educational indicators were evaluated as central to human capital components together with basic health, research and development indicators. Following the emphasis on education as an important determinant of both growth and development, governments started to invest more on it. As the share of education expenditure in GDP increased, illiteracy rates started to decrease and the share of workers with higher education degree increased. These changes came up with the phenomenon “overeducation” which indicates the position in which a worker possesses a level of education in excess of the required level of education to hold and perform a particular job.²

Like many other countries Turkey has been experiencing an upgrading in the education level of its population and workers. One of the main factors contributing to this process has been the increase in the number of new founded universities, both public and private, since 2000. According to the data provided by the Council of Higher Education of Turkey, the number of public and private universities was 53 and 20 in 2000; respectively. Turning to 2011 these numbers jumped to 103 and 62 which indicates nearly a doubling in the number of universities in the last ten years. As a result, the number of graduates with higher education has increased steadily. Following that, the fraction of workers with a higher education within the total unemployed increased, too. Most of the individuals with higher education end up with accepting jobs which require lower level of education than they actually acquire. This situation seems like signaling for increasing incidence of overeducation in Turkish labor market.

The term overeducation was first uttered by Freeman (1976) following his detailed observations on American labor market. The main argument of Freeman (1976) is that American labor market entered a new episode during the 1970s in which students invested too high in education and in return their prospects of finding a “good” job deteriorated due to the unabsorbed high labor supply in the market. Eventually graduates had to accept jobs that required fewer skills and educational attainment than they actually obtained.

² Borghans and de Grip (2000) states that skill underutilization, overqualification, underemployment and overtraining are often used interchangeably with overeducation.

The overeducation literature has spanned since early 1990s and the twenty first century has witnessed a great increase in the number of empirical studies as more data became available. Studies varied in terms of their explanations of overeducation. Sicherman (1999) provides two explanations of educational mismatch. First explanation is a possible trade off between different forms of human capital and second explanation is the potential mismatch between worker and the job. Empirical findings of Sicherman (1999) based on Panel Study of Income Dynamics (PSID) indicate that overeducated workers are younger, less experienced workers and more mobile across occupations. Empirical findings of Sloane et al. (1995) exploring UK data indicate that the probability of being overeducated is higher for single, male, less experienced workers. Groot and van den Brink (2000), Linsley (2005), Varhaest and Omey (2010) are among the recent studies on the determinants of overeducation and their findings are in accordance with the findings of previous studies.

The subject matter of this study is the identification of the determinants of the incidence of overeducation with a special emphasis to university prestige in Turkey. The effects of worker and school characteristics on overeducation, taking into account the local labor market conditions and geographic worker mobility are analyzed via descriptive analysis and multinomial logistic regressions. Turkish Employment Agency (İŞKUR) microdata of job seekers between 2008 and 2011 are employed for the analysis. This dataset is unique for the fact that the universities from which the individuals are graduated from are inherent in the data set. To the best of my knowledge, this study is the first one that incorporates university prestige as a determinant of the incidence of overeducation to the model and exploring Turkish data set to explain the determinants of overeducation.³

Differently from the majority of the literature, this study focuses on the determinants of the incidence of overeducation rather than its effects on various variables; because it is assumed that detection of its determinants is potential of yielding important policy implications in terms remedying labor market failures emanating from the disequilibrium caused by overeducated workers. Taking into account the rare number of studies on overeducation in developing countries and lack of human capital in these countries and importance of designing policies so to allocate human capital efficiently, the results of this study are expected to yield important implications. The dataset consists of narrowly specified education categories, which is rarely used in the literature. Educational mismatch is calculated by two different methodologies and the results are compared with each other.

³ Filiztekin (2011) uses Household Budget and Expenditure Surveys to examine the incidence of education mismatch and returns to over and undereducation.

The findings of the study indicate that as the prestige of the university from which the individual graduated increases, the probability of being overeducated decreases. Moreover, this result does not change with measurement of educational mismatch. This finding has a very important policy implication: The additional universities create additional overeducated workers in the labor force. The level and composition of investment in education may be suboptimal. This may lead to inefficient allocation of human capital resources. There may be a role for reallocation of investment in education toward vocational education and training institutions that provide individuals with intermediate skills. For the other variables the results can be summarized as follows: Men are more probable of being overeducated than women. The kind of university— public or private— does not have a significant effect on overeducation. Deteriorated local labor market conditions affect overeducation adversely. Finally, mobility of workers across cities decreases the probability of being overeducated. The findings may be validation for the job competition theory and signaling for inefficient allocation of human capital resources and suboptimal investment in education.

The paper is structured as follows: Section 2 briefly discusses related theoretical frameworks and discusses various methodologies used to calculate educational mismatch. Section 3 describes the dataset used for the analysis and some basic descriptive statistics are presented. Section 4 presents the results of the complete model. Section 5 concludes.

2. Theoretical background and measurement issues

2.1 Theoretical frameworks

The existence of overeducation has been explained by several conventional labor market theories. There are four main competing theoretical frameworks which have been employed to explain overeducation: Human capital theory, career mobility theory, job competition theory, and assignment theory. These theories differ from each other in their explanations for the causes, costs and duration of overeducation.

First — supply side— theory explaining overeducation is human capital theory based on seminal work of Becker (1964). Central to this theory is the assumption that productivity is an increasing function of the human capital level of the worker, which is accumulated by formal education, on-the-job training and experience. Wages are determined by workers' human capital level. The existence of overeducation causes the relative wage of high skilled workers to fall. Workers reduce their human capital investment in turns to lower returns. Overeducation might be a temporary phenomenon within the human capital framework.

Firms could adapt themselves to fully utilize the skills or workers could move to a better matching job to themselves or reduce their education investment in response to lower relative earnings of skilled workers. In the existence of short run disequilibria, human capital theory can be rationalized. Moreover, since formal education and on-the-job training are substitutes in terms of human capital accumulation; workers with higher education may be lacking of other forms of human capital and hence overeducation may occur. Relative lower skill of high educated workers than their adequately educated counterparts might be another explanation for lower wages. To sum up; within the human capital framework overeducation could exist in the short run and in cases for which different forms of human capital accumulation are allowed to be substitutes to formal education and worker skill heterogeneity is controlled.

The second theory by which overeducation can be explained is the career mobility theory based on Rosen (1972) and Sicherman and Galor (1990). Overeducated workers are predicted to knowingly accept jobs requiring less years of schooling than they actually acquire. Through performing in those occupations they accumulate other forms of human capital for purposes of increasing future career prospects. This period is assumed to be temporary as individuals move to occupations in which they are not overeducated anymore and can make full use of their qualifications.

Another theoretical framework within which overeducation can be analyzed is the job competition theory, which is based on Thurow (1975). In the labor market, workers compete for high wage jobs and firms compete for high productivity workers. Since formal education and training are complements to each other in terms of human capital, more educated workers are expected to create lower training costs. Firms are willing to hire highly educated workers. As a result, highly educated workers are at the fronts of the job queue and recruited to jobs with higher wages. Within this framework, as the educational attainment of the workers increase, overeducation arises and this bumps down the lower-skilled workers of the labor market. As lower skilled individuals are out of the labor market, high educated workers who are still at the queue are forced to accept lower-skilled jobs, which in turns lower the returns to education. However, lower returns to education do not avoid individuals investing in education, because they want to keep their advantageous positions in the labor queue. Overeducation may persist and economic costs may arise due to suboptimal investment.

Final theory analyzing overeducation is the matching theory employed by assignment model, based on Sattinger (1993). As is the case in other models, positive relationship between worker productivity and education is assumed. Workers are assumed to have

comparative advantage in specific jobs and overeducation arises if workers are not allocated to jobs in which they have a comparative advantage. Unless a better match is realized and workers are allocated more efficiently to jobs, overeducation is assumed to be a permanent phenomenon.

Mincer (1974) earning model provides the empirical framework for assessing and measuring the main predictions of the conventional theories. Unfortunately the dataset used in this study lacks the wage data which is used to estimate the earnings to test the validity of the theories.

2.2 Measurement issues

Overeducation (undereducation) indicates the position in which a worker possesses a level of education more (less) than the required level of education to hold and perform a particular job. The important point measuring educational mismatch is the calculation of the required level of education that a worker must hold to perform a particular job. There are mainly three methodologies to measure the required level of education: Objective methodology, subjective methodology and empirical— sometimes referred as realized— methodology.

The objective methodology -sometimes referred as systematic job evaluation- is based on professional and systematic evaluation of job analysts on the required level and type of education necessary to perform particular jobs.⁴ Dictionary of Occupational Titles (DOT) published by the US Employment Service is the most widely used source to measure the required level of education objectively. The advantageous aspect of objective measure is that it is a detailed measure and has clear definitions. However; since the dictionaries are rarely constructed and updated, the potential change in job requirements through time is subject to the risk of being ignored.

The second methodology is the subjective methodology, sometimes named as self-assessment.⁵ To calculate this measure, workers are asked how much formal education is required in order to perform their actual job. This means that required years of schooling are obtained through workers' own assessment. The most widespread examples of this sort of measurement include Michigan Panel Study of Income Dynamics, British Social Change

⁴ Rumberger (1987b), Kiker and Santos (1991) and Hartog and Oosterbeek (1988) are examples of empirical studies using this measure.

⁵ Examples of empirical studies using this method include Sloane et al. (1996), Dolton and Vignales (2000).

and Economic Life Initiative and Spanish Living and Working Conditions Survey. The subjective measure is criticized due to the workers' potential of overstating the requirements of their job in order to promote the perceived status of their job. On the other side, they can assess the qualifications and education level necessary to perform that specific job more appropriately than job analysts can. Moreover, they can quickly respond to changes in the requirements of the job as time passes.

Empirical method, first employed by Verdugo and Verdugo (1989) takes into account the education distribution of workers in a given occupation, differently from the above measures.⁶ The required level of education is calculated as the mean educational level of the workers actually holding a certain occupation. An overeducated (undereducated) worker is defined as the one bearing the level of education one standard deviation above (below) the mean education level. This measurement technique has quick adaptation to requirement changes, since the calculations arise from actual workers within specific occupations. However, if the distribution of education is skewed, the results of the required levels of education may be biased.

The selection of the appropriate measurement technique is usually constrained by the limitations of the dataset. The dataset used in this study is suitable for measuring both objective and realized measures of educational mismatch. The results obtained by both measures are compared with each other and interpreted taking into account the different implications of the techniques.

3. Data and descriptive analysis

3.1 Data description

Turkish Employment Agency (İŞKUR) is the institute dealing with public employment services in Turkey. Both job seekers and employers are registered to the institute.

The dataset⁷ used in this study consists of job seekers who apply to İŞKUR.⁸ Applicants create an online account and fill out the necessary micro level information to apply for a vacancy. The information they need to fill out—the dataset itself—consists of

⁶ Kiker et al (1997), Groot (1996) are among the empirical studies using the empirical methodology.

⁷ The data set is not publicly published or distributed. After several meetings with the coordinators of the labor department, the data set is shared personally with the author taking into account the importance of results.

⁸ İŞKUR is the institute providing unemployment benefits to individuals. The data set also consists of individuals who wish to get unemployment benefit. However, the study considers only employed individuals and existence of structure of the data set used for the analysis does not change with the inclusion of unemployment benefit applicants.

age, gender, education level, the school of final graduation, the department of final graduation and the jobs they are capable to perform and wish to hold. Those jobs might be acquired through formal education, vocational training courses or experience. The applicant has to specify at least one job, where he can specify up to five jobs. In principal, an individual is recruited to one of those specified jobs.⁹ In addition to the individual level information, the city of application is inherent in the data set. Moreover, if the applicant is recruited to a job, the occupation and the city of this recruitment are also available in the data set.

3.2 Calculation of educational mismatch variables

There are three methodologies used to calculate the educational. In this study, education mismatch is calculated by the objective methodology and realized methodologies.

Calculation of the “objective mismatch” measure requires the acquired and required levels of education. The acquired education level of individual which is inherent in the data set is converted into cumulative years of schooling.¹⁰ For the required years of education, occupational dictionaries published by İŞKUR are used. In these dictionaries, required education for specific occupations and jobs are reported.¹¹ These levels are also converted into cumulative years of schooling as done for the acquired education level.¹² Once the acquired and required years of schooling are defined; the objective measure of educational mismatch is calculated as the difference between them. If acquired education level is higher (lower) than the required education level the workers is categorized as overeducated (undereducated). If both levels of education are equal to each other, then the individual is said to be necessarily educated to perform the job.

To calculate the realized measure, required years of schooling are calculated as the mean educational level of the workers actually performing in the same occupation.¹³ Once the average education level is calculated, the mismatch variable is calculated as the difference between the acquired and required years of schooling. An overeducated (undereducated) worker is the one with the education level one standard deviation above (below) the average schooling. If the acquired years of schooling of the worker stays between

⁹ This specification does not reflect any preference order.

¹⁰ Taking into account Turkish education system; primary, secondary, college, bachelor, master and PhD degrees are converted to 8, 12, 14, 16, 18 and 22 years of schooling respectively.

¹¹ Jobs are classified by ISCO-08 classification system.

¹² Since both acquired and required education level of education are taken from the same source, the transformation to cumulative years of schooling are in accordance with each other.

¹³ Occupations with workers less than 20 are omitted.

one standard deviation below and above the mean; then the worker is claimed to be necessarily educated. This measure yields normally distributed mismatch variable since it fluctuates around the mean. Since it takes into account the average schooling of actual workers, the mismatch of the individual can be interpreted as in comparison with other individuals performing that particular job. The mismatch of the individual is dependent on the education level of other individuals holding the same job.

3.3 Descriptive statistics

Basic descriptive statistics of the whole sample are presented in Table 1. It is observed that the sample size— applicants to İŞKUR— nearly doubles from 810.977 in 2008 to 1.602.527 in 2011. Primary school graduates constitute the majority of the sample. The fraction of primary school graduates is 47 percent and 49 percent in 2008 and 2011, respectively. Individuals with higher education— the sample of consideration— constitute approximately 16 percent of the whole sample. It is observed that 11 percent and 18 percent of the applicants are recruited to vacancies in 2008 and 2011, respectively. Although the percentage of men decreases through the period, 72 percent in 2008 and 65 percent in 2011, more than half of the applicants are men in the sample through the whole period.

Table 1: Basic descriptive statistics

	2008	2009	2010	2011
Number of observations	810.977	1.440.809	1.357.878	1.602.527
No Formal Education (%)	4	3	4	4
Primary (%)	47	52	50	49
Secondary (%)	33	32	30	31
College and Higher (%)	16	13	16	16
Recruited (%)	11	9	13	18
Men (%)	72	65	64	65
Women (%)	28	35	36	35

Table 2 presents the same descriptive statistics for individuals with tertiary education. It is observed that college and bachelor degree graduates constitute the highest fraction of the individuals with tertiary education. The fraction of college graduates are 48 percent and 51 percent in 2008 and 2011, respectively. Bachelor degree graduates own very similar shares with college degree graduates; being 49 percent in 2008 and 46 percent in 2011. The

fraction of workers with higher degree who are recruited to a job by İŞKUR increases from 6.8 percent in 2008 to 10 percent in 2011. Men constitute the higher share within this subsample, the gap being less in comparison with the whole sample.

Table 2: Basic descriptive statistics for individuals with tertiary education

	2008	2009	2010	2011
Number of observations	136741	198512	228092	263064
College (%)	48	51	46	51
Bachelor (%)	49	46	50	46
Master (%)	2	2	2	2
PhD (%)	1	1	2	1
Employed (%)	6.8	6.3	7.3	10
Men (%)	58	55	52	53
Women (%)	42	45	48	47

In Table 3, distribution among acquired and objectively defined required education is presented for 2008.¹⁴ Each cell on the diagonal gives the fraction of necessarily educated workers at each education category. Each cell lying at the left side of the diagonal cell gives the proportion of overeducated workers at that education level. For the workers with higher education, it is observed that a very high fraction can be considered as overeducated. The incidence of overeducation is 68 percent and 87 percent for the workers with college and bachelor degree, respectively. All of the workers with a master or PhD degree are found to be overeducated.¹⁵ It is also observed that overeducation is a problem not only for workers with tertiary education but also for workers with all education levels.

¹⁴ The distribution stays almost the same for the remaining years.

¹⁵ This is mainly because İŞKUR mainly offers low skill jobs.

Table 3: Distribution among acquired and objectively defined required years of education (2008)

		required				
		No formal	Primary	High school	College	Bachelor
acquired	No formal	83	16	1	0	0
	Primary	75	24	1	0	0
	High school	44	34	22	0	0
	College	27	29	31	12	1
	Bachelor	22	10	33	3	32
	Master	14	8	23	3	52
	PhD	0	28	15	0	57

4. The complete model

4.1 Additional variables

The variables used in the analysis can be classified into four categories: Demographic variables (age, gender, education level which are inherent in the dataset), university characteristics (type of the university and university prestige), local labor market conditions (unemployment rate) and geographic worker mobility.

The main concern of this study is to identify the effect of university prestige on educational mismatch. The main argument is that, as the number of universities increases, only the graduates of prestigious universities are recruited to jobs which match with their education level, whereas the graduates of other universities have to accept low-education-requiring jobs.

There are two different measures which capture all Turkish universities within an academic quality ranking. First measure is the University Ranking by Academic Performance (URAP) calculated by URAP Research Laboratory— established at Informatics Institute of Middle East Technical University— and adjusted by Sabanci University.¹⁶ The second measure is Webometrics Ranking of World Universities (WEBO) published by Consejo Superior de Investigaciones Científica (CSIC-Spanish National Research Center).¹⁷ The first measure only captures Turkish universities, whereas the second measure is a worldwide indicator including approximately all universities in Turkey.

¹⁶ <http://tr.urapcenter.org/2012/>

¹⁷ <http://www.webometrics.info/> This measure is used for robustness checks.

For both measures; top 15 Turkish universities in the ranking are considered as prestigious. A dummy variable (prestige) is generated which takes the value 1 if the university is prestigious and 0 otherwise. In addition, another dummy variable (public) is generated which takes the value 1 if the university type is public and 0 if private.

Regional or provincial macroeconomic conditions are expected to influence the educational mismatch. Local unemployment rates gathered from Turkish National Statistics Institute (TÜİK) are incorporated to the model as an explanatory variable.

The effect of geographic worker mobility on educational mismatch is also analyzed. Using the inherent information on the city of application and recruitment, a dummy variable (move) for mobility is generated. The variable takes the value 1 if the individual moves to another city to work and 0 if the individual stays in the city of application.

Finally, İŞKUR classifies the jobs according to the International Standard Classification of Occupations (ISCO)-08 classification system published by International Labor Organization (ILO). ILO lets domestic institutions to report the occupations up to six digits to capture the country specific differences across jobs. Based on the original ISCO-08 classification, İŞKUR reports the jobs at six digits. The jobs are aggregated to four digits and 302 identical jobs remain in the end.

4.2 The model and the results

The following models are estimated by multinomial logistic regression technique for each year separately. The dependent variable is either objective mismatch or realized mismatch. It is a dummy variable that takes the value -1 if the individual is undereducated, 0 if necessarily educated and 1 if overeducated.

- I. $Objective\ mismatch = \beta_0 + \beta_0age + \beta_1age^2 + \beta_2men + \beta_3prestige + \beta_4public + \beta_5unemployment + \beta_6move + u$
- II. $Realized\ mismatch = \beta_0 + \beta_0age + \beta_1age^2 + \beta_2men + \beta_3prestige + \beta_4public + \beta_5unemployment + \beta_6move + u$

The base category for the multinomial logistic estimations is chosen as being adequately educated. Since the emphasis of this paper is on the determinants of overeducation, results for only log odds in favor of being overeducated rather than being adequately educated are presented. This can be indicated as following:

$$\log\left(\frac{P_1}{P_0}\right) = \gamma_0 + \gamma_1age + \gamma_2age^2 + \gamma_3men + \gamma_4prestige + \gamma_5public + \gamma_6unemployment + \gamma_7move + \epsilon$$

P_0 denotes the probability that a worker is adequately educated and P_1 denotes the probability that a worker is overeducated.

4.2.1 Results for objective measure: 2008-2011

The results of the multinomial logistic estimation in which the dependent variable is objective mismatch are given in Table 4. It is important to state that, when objective measure is taken into account; the mismatch is defined as deviations of individual's acquired education from objectively defined required education. All of the individuals in these estimations are employed workers with tertiary education.

The square of the age is inserted to the model, assuming that the relationship between educational mismatch and age is not linear. The results are similar for all years. Age does not have statistically significant effect on the probability of being overeducated.

Table 4: Multinomial Logit Estimates for 2008-2011 (Objective Measure)

(Objective mismatch)	(1) log(P_1/P_0) 2008	(2) log(P_1/P_0) 2009	(3) log(P_1/P_0) 2010	(4) log(P_1/P_0) 2011
Age	-0.02	-0.03	-0.02	0.01
Agesq	0.0004	0.0002	0.0002	-0.0001
Men	0.2***	0.4***	0.3***	0.4***
Edu	-0.4***	-0.2***	-0.2***	-0.4***
Prestige	-0.009***	-0.004**	9.44e-05*	-0.0008*
Public	0.3	0.3***	0.1	0.1***
Unemp	0.01*	0.01*	0.005*	0.007*
Move	-0.8***	-0.09*	-0.02*	-0.09*
Constant	9.02***	6.4***	6.1***	7.6***
Observations	7,327	8,650	10,560	18,028

*** p<0.01, ** p<0.05, * p<0.1

It is observed that men dummy is statistically significant and positive for log odds in favor of being overeducated. The results indicate that a man is more likely than a woman to be overeducated relative to having an adequate education. These results hold for all years. As bread winners, men have to work whatever the required years of schooling for the job is. In the end, they have to accept low-education-requiring jobs and they become overeducated.

The effect of education level variable is statistically significant and negative. This result indicates that, graduates of higher degrees are less likely to be overeducated. It is important

to remember that, the individuals in the sample are college and higher degree graduates. So, mainly college and bachelor degree graduates are more likely to be overeducated than master and PhD degree graduates.

The main focus of study is on the effect of university prestige on overeducation. The estimations incorporate the prestige dummy relying on the URAP measure.¹⁸ The results indicate that being graduated from a prestigious university makes the individual less likely to be overeducated.

The public dummy is insignificant for all years, except for the model of 2011. This indicates that the type of university does not have a significant effect on the probability of being overeducated. What makes sense is the prestige level of university, rather than its type.

For the local market conditions, the local unemployment rates of cities in which individuals apply to İŞKUR are incorporated to the model. The results indicate significant and positive effects for the log odds in favor of being overeducated. The workers in cities with higher levels of unemployment rates are more likely to be overeducated relative to having an adequate education. As the unemployment rate increases, individuals have to accept any job whatever the educational requirements of the job are.

Final variable in consideration is the mobility dummy. Workers who move to another city for working are less likely to be overeducated relative to being adequately educated. The negative relationship between mobility and mismatch can be justified with the explanation that individuals accept to move to another city for work as long as the job fits more to her education level.

4.2.2 Results for within measure: 2008-2011

The results of the multinomial logistic estimation in which the dependent variable is realized mismatch are given in Table 5. This mismatch measure puts forward a comparison among workers who actually hold the same job.

Starting with the effect of age, it is observed that results are different from the previous results. The results indicate an inverted U-shaped relationship between age and log odds of being overeducated. When the mismatch is considered among workers in the same occupations,

¹⁸ Models are estimated using WEBO as the prestige dummy, and the results are robust.

younger workers are more likely to be overeducated. It is appropriate to assume that younger workers are new graduates with higher education and this result shows that new graduates are more probable of being overeducated.

Turning to the gender, results stay the same. A man is more likely than a woman to be overeducated relative to being adequately educated.

The effect of university prestige is in accordance with previous results. The results indicate that probability of being overeducated is lower for workers who graduated from more prestigious universities. Being graduated from a prestigious university makes the individual less likely to be overeducated.

The type of the university has significant effect on log odds in favor of being overeducated. Graduates of public universities rather than private universities are more probable of being overeducated than being adequately educated, when mismatch is considered among workers employed in the same occupation.

Differently from the previous results, unemployment rate does not have significant effect on overeducation. When individuals in the same occupation are taken into account, local labor market conditions have insignificant effect on mismatch. Nonetheless, the sign of the variable is positive indicating similar results for both log odds.

Last variable is the worker mobility dummy. The worker mobility has a significant negative effect on overeducation. Mobility decreases the probability of being overeducated.

Table 5: Multinomial Logit Estimates for 2008-2011 (Realized Measure)

(Realized mismatch)	(1) log(P ₁ /P ₀) 2008	(2) log(P ₁ /P ₀) 2009	(3) log(P ₁ /P ₀) 2010	(4) log(P ₁ /P ₀) 2011
Age	0.02*	0.01*	0.05*	0.07**
Agesq	-0.0005*	-0.0003*	-0.001*	-0.0008*
Men	0.08*	0.2***	0.2***	0.251***
Edu	-0.2***	-0.1***	0.06**	-0.25***
Prestige	-0.005***	-0.003*	-0.002*	-0.001*
Public	0.5*	0.3***	0.009*	0.2***
Unemp	0.004	0.008	0.001	0.01
Move	-0.6*	-0.1*	-0.2***	-0.3***
Constant	5.8***	4.5***	1.5**	4.1***
Observations	7,073	8,447	10,370	17,825

*** p<0.01, ** p<0.05, * p<0.1

5. Conclusion

The main attempt of this study has been the identification of the determinants, mainly university prestige, of the incidence of overeducation in Turkish labor market. Educational mismatch is calculated by two different methodologies using the İŞKUR job seekers dataset for 2008-2011.

Along with basic descriptive statistics, multinomial logit models are estimated to detect the determinants of educational mismatch. The determinants of overeducation are grouped within four categories: Demographic characteristics, university characteristics, local market conditions and geographical worker mobility. Most of the factors are found to have significant effects on educational mismatch. Results for the effect of age, type of university and unemployment rate differ by the mismatch measure.

The main findings of the models in which the dependent variable is the objective mismatch can be summarized as follows: Age does not have a significant effect on mismatch. Men are more likely to be overeducated than being adequately educated. Increase in the education level decreases the probability of being overeducated. University prestige has the expected effect. As the prestige of the university that a worker is graduated from increases, the probability that he is overeducated decreases. Whether the university is public or private does not have a significant effect on educational mismatch. Deteriorated labor market conditions increase the probability of being overeducated. Finally, the geographic worker mobility decreases the probability of being overeducated.

The main findings of the models in which the dependent variable is the within mismatch can be summarized as follows: Relatively to the other workers who hold the same specific job; younger men who are graduates of nonprestigious public universities and staying in the city of application are more likely to be overeducated. Compared to the workers in the same job; being graduated from a prestigious university make the worker less likely to be overeducated. Local market conditions have an insignificant effect on educational mismatch.

The most important implication of the study is related with the effect of university prestige. All of the models indicate that a higher university prestige reduces the probability of being overeducated. Among the workers with college and higher degree workers; graduates of prestigious universities are more probable of working at matching jobs. The argument that the number of universities nearly doubled since 2000 and this caused graduates of non-prestigious universities being overeducated is supported by the estimation results. This finding has a very important policy implication: The level and composition of

investment in education may be suboptimal. This may lead to inefficient allocation of human capital resources. There may be a role for reallocation of investment in education toward vocational education and training institutions that provide individuals with intermediate skills.

The mobility dummy indicates that, if workers move to another city rather than the city of application for working, they relatively become less mismatched. It is because an individual is accepting to move to another city if the job is matching with his acquired education and skills and hence provides better wage opportunities. This result can be evaluated as a proposition for policies to provide benefits to workers who wish to move across cities for work. Actually, mobility decision has so many other determinants rather than the working at a matching job. However, mobility has a reductive effect on overeducation.

The findings may be validation for the job competition theory and signaling for inefficient allocation of human capital resources and suboptimal investment in education. Reallocation of investment in education toward vocational education and training institutions may be the primary policy implication to be drawn.

There remain some parts to be explored further. For instance, it is important to deal with the selectivity bias problem. Second, a pseudo panel analysis can be explored to analyze the effects of time-variant determinants. A more detailed regional analysis is another important aspect to be taken into account for further studies.

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