Marmara Üniversitesi İktisadi ve İdari Bilimler Dergisi • Cilt: 39 • Sayı: 2 • Aralık 2017, ISSN: 2149-1844, ss/pp. 519-530
DOI: 10.14780/muiibd.384186

DETERMINANTS OF EDUCATION MISMATCH IN TURKEY: EVIDENCE FROM HOUSEHOLD LABOR FORCE SURVEYS

Bilge ERİŞ DERELİ*

Abstract

Educational mismatch indicates the position in which a worker possesses a level of education higher or lower than the required level of education to hold and perform a particular job. Using Turkish Household Labor Surveys for the period 2009-2014 and 2-digit occupations, this study attempts to analyze some stylized facts about and determinants of educational mismatch in Turkish labor market. It is observed that the incidence of overeducation and its evolution differ for high school and higher education graduates. Taking into account these differences, general profile of overeducated workers is presented via rich descriptive analysis. Separate annual multilogistic regressions are estimated for 2009 and 2014 to find and compare the determinants of educational mismatch. Results indicate that the incidence of overeducation is rising among high school graduates. Gender gaps are observed to be wider across high school graduates. The probability of being overeducated is higher for younger workers with less tenure. The effect of marital status, and status of the workplace (public/private) has different effects on the probability of being overeducated for high school and higher education graduates.

Keywords: *Educational Mismatch, Multinomial Logistic Regression*

JEL Classification: *J16, J31, J71*

TÜRKİYE'DE EĞİTİM UYUŞMAZLIĞININ BELİRLEYİCİLERİ: HANEHALKI İŞGÜCÜ ANKETLERİNDEN BİR ÖRNEK

Özet

Eğitim uyuşmazlığı, bir bireyin sahip olduğu eğitim seviyesinin o bireyin çalışmakta olduğu işin gerektirdiği eğitim seviyesinden daha yüksek ya da daha düşük olduğu durumu ifade eder. Bu çalışma, 2009-2014 dönemi için Hanehalkı İşgücü Anketleri'ni ve 2-basamaklı meslek verilerini kullanarak Türkiye işgücü piyasasında eğitim uyuşmazlığının sebeplerini araştırmayı hedeflemektedir. Fazla eğitimlileşme seviyesinin ve seyrinin lise ve yüksek öğrenim mezunları arasında farklılaştığı gözlemlenmiştir. Bu farklılıkları dikkate alarak, fazla eğitimlileşmiş bireylerin genel profilleri zengin betimsel analizler ile sunulmuştur. Eğitim uyuşmazlığının nedenlerini tespit etmek ve dönemsel kıyaslama yapmak için ise 2009 ve 2014 yılları için ayrı ayrı yıllık multinominal lojistik regresyonlar tahmin edilmiştir. Sonuçlar, fazla eğitimlileşmenin lise mezunları arasında daya yaygın olduğuna işaret etmektedir. Aynı zamanda cinsiyet farkları da lise

* Asst. Prof. Dr., Marmara University, Faculty of Economics, Economics (Lectured in English), bilge.eris@marmara.edu.tr

mezunları arasında daha belirgindir. Fazla eğitimlileşmiş olma olasılığı daha genç ve kurum içi tecrübesi daha az çalışanlar için daha yüksektir. Medeni durum ve çalışılan işyerinin statüsünün (devlet/özel) fazla eğitimlileşme olasılığı üzerindeki etkisi lise ve yüksek öğrenim mezunları için farklılaşmaktadır.

Anahtar Kelimeler: *Eğitim Uyuşmazlığı, Multinominal Lojistik Regresyon*

JEL Sınıflaması: *J16, J31, J71*

1. Introduction

Turkey has witnessed an increase in the share of educated population in the 21st century. According to Turkish Statistical Institute's Education Statistics, the share of high school graduates in the population is recorded as 19% and 22% in 2009 and 2014, respectively. The share of higher education graduates increased from 9.5% in 2009 to 14% in 2014. The increase in the share of educated individuals contributes to the human capital accumulation, which is considered as an important component of sustainable economic growth by Lucas[2], Barro[3] and Mankiw et al[4]. In addition to the increasing share of high school and higher education graduates, it is observed that employment rate of individuals with these degrees has been increasing, too. 49% of high school graduates was employed in 2009, whereas this fraction has been recorded as 54% in 2014. Employment rate for the higher education graduates increased from 68% in 2009 to 72% in 2014. The increase in the share of educated population and their increasing employment levels are improvements in favor of these groups.

However, we know little about the details of the occupations in which the workers with higher degrees are employed. Being more specific, there is not much research questioning whether educational mismatch for high school and higher education graduates exists in Turkish labor market, where educational mismatch is defined as a position in which a worker possesses a level of education higher or lower than the required level of education to hold and perform a particular job. There is an ongoing literature stressing the importance of measuring the incidence of mismatch, as it is considered as a signaling for a suboptimal investment in education and increased income inequalities.

Most of the studies on educational mismatch are for developed countries due to data availability. This study attempts to analyze some stylized facts about and determinants of educational mismatch in Turkish labor market using Turkish Household Labor Surveys collected at individual level for the period 2009-2014[5]. The incidence of educational mismatch, its distribution over basic worker and job characteristics and its determinants are investigated via rich descriptive

2 Lucas, R. E. (1988). On the Mechanics of Economic Development, Journal of Monetary Economics, 22: 3-42.

3 Barro, R. J. (1991). Economic Growth in a Cross Section of Countries, The Quarterly Journal of Economics, 106 (2): 407-443

4 Mankiw, N. G. et .al (1992). A Contribution to the Empirics of Economic Growth, The Quarterly Journal of Economics, 107(2): 407-437.

5 The starting year of the period is 2009, since 2-digit occupations are available since that year.

analysis and multinomial logit models. Basic findings of the study can be summarized as follows: Incidence of overeducation is rising among high school graduates. Gender gaps are observed to be wider across high school graduates. The probability of being overeducated is higher for younger workers with less tenure. The effect of marital status, and status of the workplace (public/private) has different effects on the probability of being overeducated for high school and higher education graduates. The results suggest important implications in terms of designing education policies.

The paper is organized as follows: Section 2 briefly summarizes the relevant literature on educational mismatch and overeducation. Section 3 introduces the dataset used in the analysis and discusses the calculation of educational mismatch. Section 4 presents the results of the descriptive analysis and multinomial logit estimations. Section 5 concludes.

2. Literature Survey

The term overeducation has been used in literature for the first time by Freeman[6]. He uses the term overeducation to indicate the unabsorbed high labor supply in the American labor market.

Smith and Welch[7] follows Freeman's arguments and run simple regressions to find demographic determinants of overeducation. They mainly conclude that what Freeman has observed was a temporary situation due to the depression basically affecting the new entrants.

Sicherman[8] focuses on the determinants of educational mismatch within a human capital framework. It is observed that workers with low mean level of market experience and low mean level of on-the-job training are more likely to be overeducated.

There is not much study about educational mismatch for Turkey, basically due to lack of data. As I am aware of, there are two prominent studies among the few studies about Turkey: Filiztekin[9] and Orbay and Aydede[10]. Filiztekin uses 1994 and 2002 Household Budget Surveys to examine the incidence of and returns to overeducation in Turkey. He basically finds out that the overeducated workers are significantly paid less than workers in the same occupation with required level of education. Orbay and Aydede analyze the economic returns of educational mismatch in Turkey, using Household Labor Force Surveys between 2009 and 2012. Main conclusion of Orbay and Aydede is that there is a substantial underutilization cost and productivity loss due to educational mismatch in Turkey.

6 Freeman, R.B., (1976). Over-educated American, New York, Academic Press.

7 Smith, J., Welch, S. (1978). Local Labor Markets and Cyclic Components in Demand for College Trained Manpower, Annales de l'inséé , 30(31): 599-629.

8 Sicherman, N. (1999). Overeducation in the Labor Market, Journal of Labor Economics, 9(2): 101-122.

9 Filiztekin, A., (2011). Education-occupation Mismatch in Turkish Labor Market, MPRA Paper No:35123.

10 Benan, O., Aydede, Y. (2015). Educational Mismatch and the Cost of Underutilization in Turkish Labour Markets, MPRA Paper No: 65713.

3. Data and Mismatch Variable

Turkish Household Labor Surveys conducted by TURKSTAT are used as the data for this study. The research period is 2009-2014, 2009 being the year when 2-digit occupations become available. The analysis is restricted to workers aged between 15 and 64, working at non-agricultural formal sectors. The categorical education variable is converted to cumulative years of schooling taking into account the education system in Turkey. Primary, secondary, high, college, bachelor, master and PhD degrees correspond to 5,8,12,14,16,18 and 22 years of schooling.

Educational mismatch variable serves as the most important variable of this analysis. The critical point for calculating educational mismatch is the determination of required level of education to hold and perform a specific job. Then, educational mismatch is basically the difference between the acquired education level of the worker and the required education level of the job.

There are basically three different methodologies used to calculate required level of education. First one is objective measure (sometimes referred as systematic job evaluation) employed by Rumberger[11] and Tsang et al.[12]. Education requirements of occupations are obtained from occupational dictionaries prepared by professional job evaluaters. Second methodology uses the subjective measure (sometimes referred as worker self-assessment) employed by Duncan and Hoffman[13] and Sicherman[14]. Workers are asked about educational requirements of their own jobs and required levels are assigned by self-assessments of workers. Final methodology uses the realized measure (sometimes referred as econometric) employed by Verdugo and Verdugo[15]. Required education level is calculated as the average education level of all workers employed in a specific occupation. Then a worker is classified as overeducated (undereducated) if his acquired education level is one standard deviation above (below) that average education level.

4. Results

4.1. Descriptive Statistics

In this section, general profile of overeducated workers is presented taking into account the distinction between high school and higher education graduates. Figure 1 presents the evolution of the incidence of undereducation and overeducation between 2009 and 2014. The results indicate that the incidence of undereducation has been increasing since 2009, whereas the incidence of overeducation has been decreasing.

11 Rumberger, R. W. (1987). High school dropouts: A review of issues and evidence, Review of Educational Research, 57: 101-121.

12 Tsang, M., Levin, H. (1991). The Economics of Overeducation, Economics of Education Review, 4(2): 93-104.

13 Duncan, G., Hoffman, D. (1981). The incidence and wage effects of eovereducation, Economics of Education Review, 1(1):75-86.

14 Sicherman, N. (1991). Overeducation in the Labor Market, Journal of Labor Economics, 9(2): 101-122.

15 Verdugo, R., Verdugo, N. T. (1989). The Impact of Surplus Schooling on Earnings, The Journal of Human Resources, 24(4): 629-643.

It is useful to observe the incidence of overeducation differentiating workers with high school and higher education graduates, since decrease in the incidence of overeducation seems questionable. Figure 2 depicts the incidence of overeducation separately for high school and higher education graduates. It is observed that the incidence of overducation for higher education graduates is higher than that for high school graduates until 2012. The share of overeducated higher education graduates decreases from 35% in 2009 to 27% in 2014, whereas this share jumps from 34% in 2009 to 37% in 2014 for high school graduates. Following graphs are obtained taking into account the differences both in the share of overeducated workers and its evolution for high school and higher education graduates.

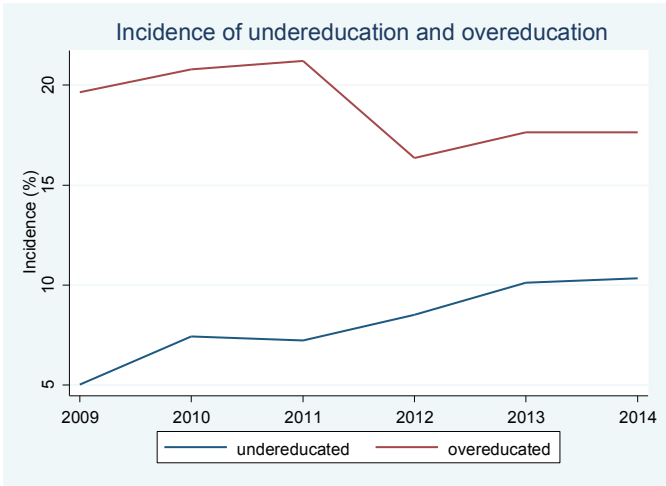

Figure 1: Incidence of Undereducation and Overeducation

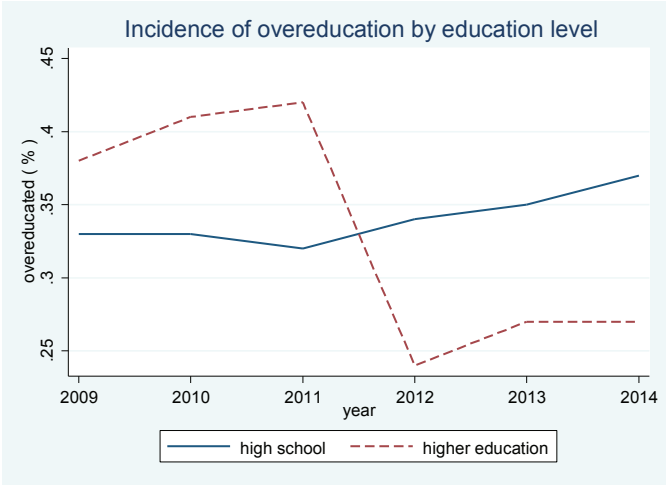

Figure 2: Incidence of Overeducation For High School And Higher Education Graduates

Distribution of mismatch across gender for high school and higher education graduates is provided in Figures 3 and 4. For the high school graduates, there are stark differences of the distribution of mismatch across gender[16]. The share of overeducated male is much more higher than that of female. However, this gap gets narrower in 2014 with the share of overeducated male not changing much and increase in the share of overeducated female.

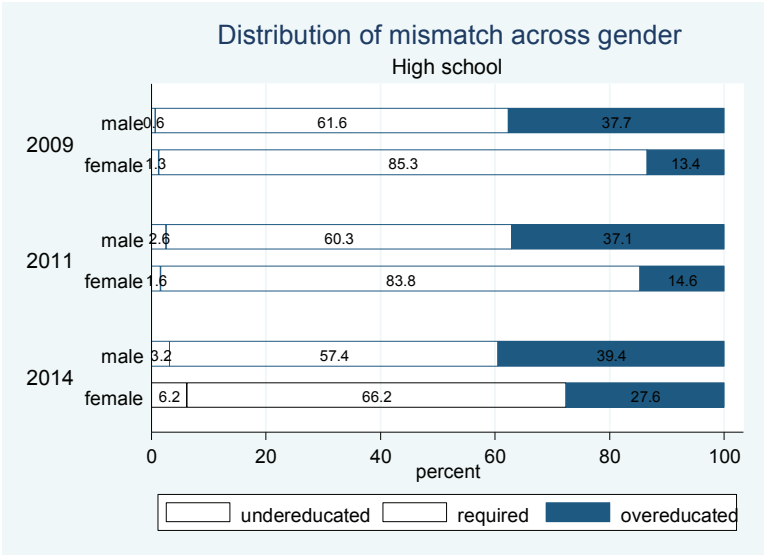

Figure 3: Distribution of Mismatch Across Gender (High School Graduates)

Among higher education graduates, gender gaps are not as remarkable as they are for high school graduates. Moreover, both the share of overeducated male and female is lowest in 2014. The proportion of overeducated higher education graduate males is calculated as 41% in 2009 and this proportion decreases to 30% in 2014. The proportion of overeducated higher education graduate females decrease from 32% in 2009 to 21% in 2014.

Figures 5 and 6 provide the distribution of mismatch in 2014 across 3 age groups: young, middle and old. Although it is clearer for high education graduates, it is observed that the share of overeducated workers decrease by age. The share of overeducated young workers are very close to each other, approximately 40%, for high school and higher education graduates. The lowest fraction of overeducated workers by age groups is monitored for older higher education graduates. These findings suggest that, fresh graduates as new entrants to the labor market encounter the problem of mismatch more frequently.

16 Gender gaps are present in Turkish labor market not only in terms of mismatch distribution but also in some other aspects of the market. Düzgün-Öncel (2015), Aktaş and Uysal (2016) are some recent examples indicating gender gaps across health status and wage distribution.

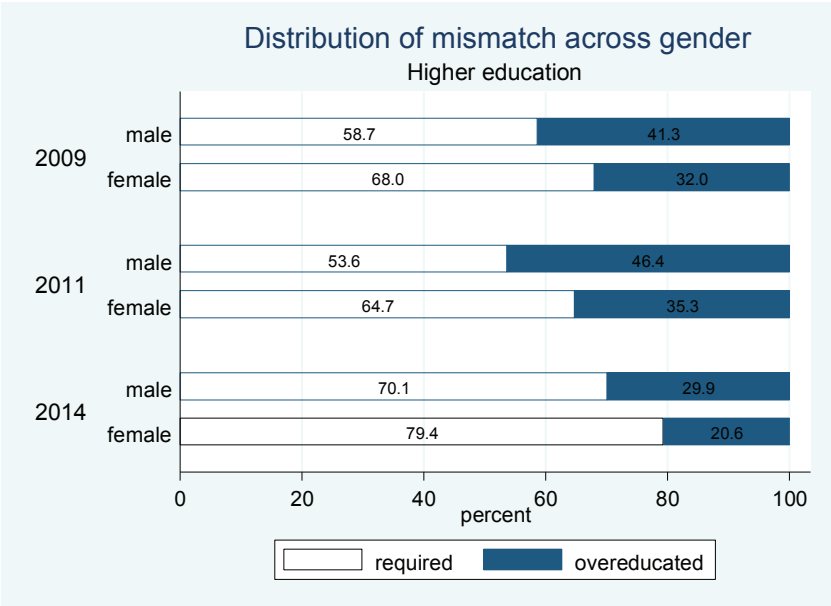

Figure 4: Distribution of Mismatch Across Gender (Higher Education Graduates)

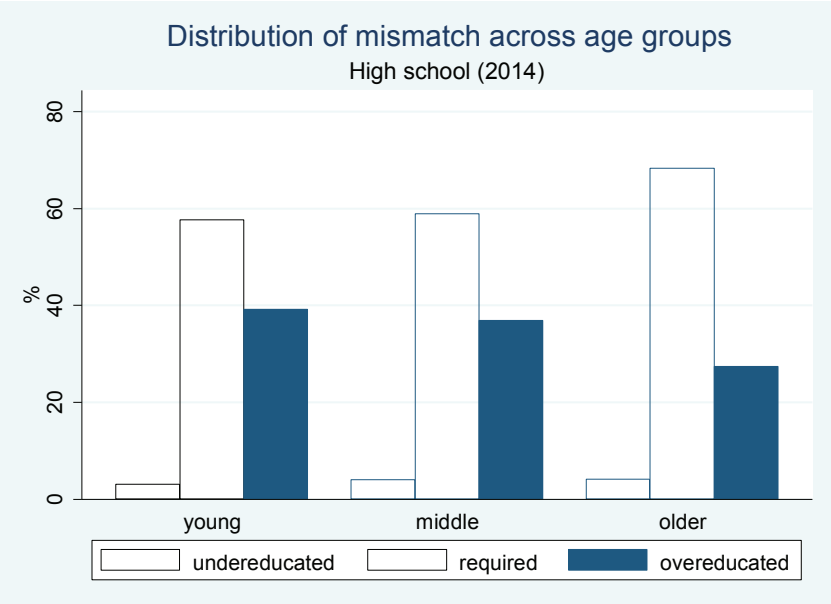

Figure 5: Distribution of mismatch across age groups (High school graduates)

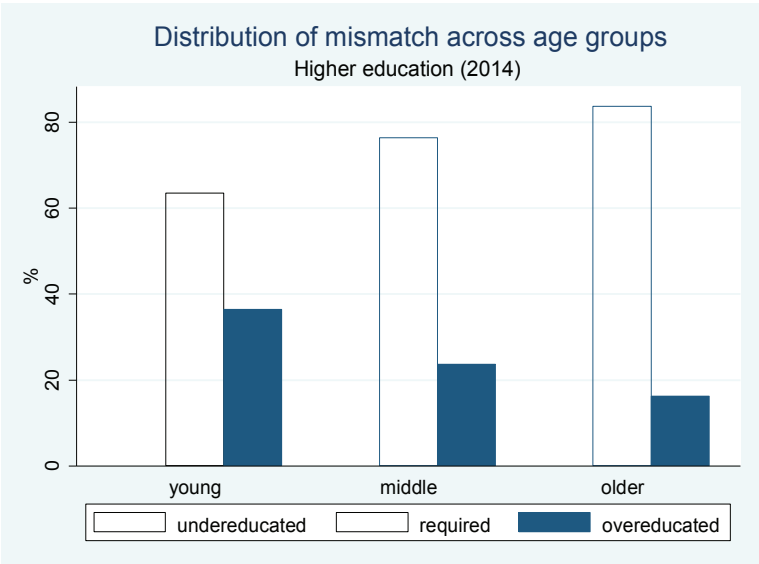

Figure 6: Distribution of Mismatch Across Age Groups (Higher Education Graduates)

Distribution of mismatch across marital status is presented in Figures 7 and 8. For the high school graduates, the share of overeducated workers is highest for married workers in 2009 and there is no remarkable difference in 2014. Among higher educated graduates, single workers pertain the highest share of overeducation both in 2009 and 2014.

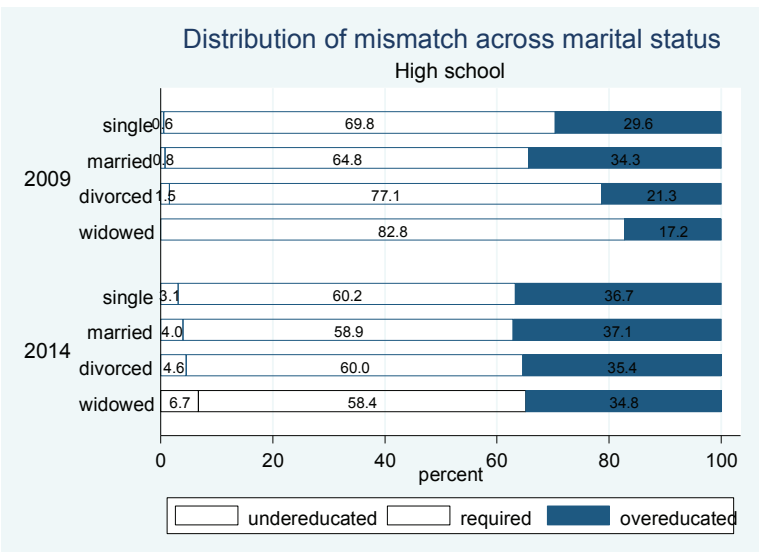

Figure 7: Distribution of Mismatch Across Marital Status (High School Graduates)

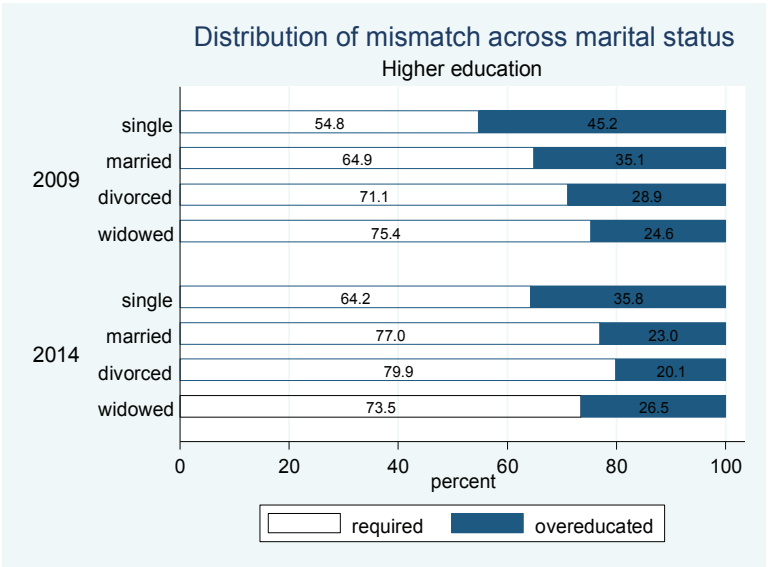

Figure 8: Distribution of Mismatch Across Marital Status (Higher Education Graduates)

4.2. Multinomial Logit Models

In this section, separate annual multilogistic regressions are estimated for high school and higher education graduates for 2009 and 2014 to find and compare the determinants of overeducation.

The following model is estimated by multinomial logistic regression methodology:

$$Mismatch = b_0 + b_1 female + b_2 age + b_3 maritalstatus + b_4 tenure + b_5 public + e$$

where female is a dummy variable that takes the value 1 if the worker is female and 0 if male. Age is the categorical age variable with 3 categories; young, middle and old. Marital status is the categorical marital status variable with 4 categories; single, married, divorced and widowed. Tenure indicates the number of years that the worker has been working in the firm. And finally public is a dummy variable that takes the value 1 if the status of workplace is public and 0 if private.

As described in Section 3, the mismatch variable is a categorical variable with 3 categories: undereducated, required education and overeducation. The base category for the multinomial logit models are selected as the "required education" category. Since the research purpose of this study is to find the determinants of overeducation, log odds in favor of being overeducated rather than having required education are presented in Table 1.

The results indicate that for either of the education level and year, the probability of being overeducated is lower for female than male, the effect being larger for high school graduates. Düzgün-Öncel and

Eriş-Dereli[17] finds that female with higher education levels have lower probabilities of working in part-time jobs. Combined with the findings of this study, it is possible to claim that female with higher education has lower probabilities of both being overeducated and being employed in part-time jobs. For the age variable, the probability of being overeducated is lower for middle aged and elder workers in comparison with younger workers. The effect of the marital status change by education level. For the high school graduates, the probability of being overeducated for married, divorced and widowed workers higher in comparison with being single. In contrary; the probability of being overeducated for married, divorced and widowed workers lower for the higher education category. These results indicate that the probability of being overeducated for single workers is lower for high school and graduates and higher for higher education graduates. The effect of tenure on the probability of being overeducated is same for both education categories: As the number of years a worker spends within a firm, her probability of being overeducated decreases. The status of the workplace does not have a statistically significant effect on overeducation for high school graduates, whereas this effect is significant for higher education graduates. The probability of a worker working in public has a lower probability of being overeducated than a worker working at private workplaces.

Table 1: Determinants of overeducation (2009, 2014)

	2009 high	2009 higher	2014 high	2014 higher
female	-1.07***	-0.03	-0.65***	-0.17***
	(0.05)	(0.04)	(0.05)	(0.04)
middle	-0.41***	-2.17**	-0.30**	0.16
	(0.12)	(0.68)	(0.11)	(0.60)
elder	-0.73*	-3.03***	-0.75**	-0.80
	(0.37)	(0.72)	(0.26)	(0.63)
married	0.21***	-0.11*	0.19***	-0.16***
	(0.05)	(0.05)	(0.05)	(0.04)
divorced	0.10	-0.32*	0.17	-0.22
	(0.15)	(0.14)	(0.11)	(0.12)
widowed	0.25	-0.44	0.43	0.14
	(0.40)	(0.36)	(0.29)	(0.29)
tenure	-0.03***	-0.01	-0.04***	-0.02***
	(0.00)	(0.00)	(0.00)	(0.00)
public	-0.07	-0.29***	0.09	-0.58***
	(0.08)	(0.07)	(0.08)	(0.09)
Industry c.	Yes	Yes	Yes	Yes
Regional c.	Yes	Yes	Yes	Yes
N	20775	19322	24382	27999
pseudo R-sq	0.250	0.299	0.267	0.287

17 Düzgün-Öncel, B., Eriş-Dereli, B. (2015). Why Do Women Prefer Part Time Employment in Turkey?, Topics in Middle Eastern and African Economics, 17(2): 82-109.

5. Conclusion

In this paper, I attempted to analyze some stylized facts about and determinants of overeducation in Turkish labor market using Turkish Household Labor Surveys for the period 2009-2014 and 2-digit occupations. It is observed that the incidence of overeducation and its evolution differ for high school and higher education graduates. Taking into account these differences, general profile of overeducated workers is presented via rich descriptive analysis. Separate annual multinomial logistic regressions are estimated for 2009 and 2014 to find and compare the determinants of overeducation. Results indicate that the incidence of overeducation is rising among high school graduates. Gender gaps are observed to be wider across high school graduates. The probability of being overeducated is higher for younger workers with less tenure. The effect of marital status, and status of the workplace (public/private) has different effects on the probability of being overeducated for high school and higher education graduates.

References

AKTAŞ, A. and Uysal, G. (2016). The Gender Wage Gap in Turkey, Marmara Üniversitesi İktisadi ve İdari Bilimler Dergisi, 38 (2): 1-19.

BARRO, R. J. (1991). Economic Growth in a Cross Section of Countries, The Quarterly Journal of Economics, 106 (2): 407-443

DUNCAN, G. J. and Hoffman, S. D. (1981). The Incidence and Wage Effects of Eovereducation, Economics Of Education Review, 1(1): 75-86.

DÜZGÜN-ÖNCEL, B. and Eriş-Dereli, B. (2015) Why Do Women Prefer Part Time Employment in Turkey?, Topics in Middle Eastern and African Economics, 17(2): 82-109.

DÜZGÜN-ÖNCEL, B. (2015). Shattered Health for Women: How Gender Roles Affect Health & Socio-Economic Status Relationship?. Topics in Middle Eastern and African Economics, 17(2): 122-155.

FİLİZTEKİN, A. (2011). Education-occupation Mismatch in Turkish Labor Market, MPRA Paper No:35123.

FREEMAN, R.B. (1976). Over-educated American, New York, Academic Press.

LUCAS, R. E. (1988). On the Mechanics of Economic Development, Journal of Monetary Economics, 22: 3-42.

MANKIW, N. G., Romer, D. and Weil, D. N. (1992). A Contribution to the Empirics of Economic Growth, The Quarterly Journal of Economics, 107(2): 407-437.

ORBAY, B. and Aydede, Y. (2015). Educational Mismatch and the Cost of Underutilization in Turkish Labour Markets, MPRA Paper No: 65713.

RUMBERGER, R. W. (1987). High School Dropouts: A Review of Issues and Evidence, Review of Educational Research, 57: 101-121.

SICHERMAN, N. (1999). Overeducation in the Labor Market, Journal of Labor Economics, 9(2): 101-122.

SICHERMAN, N., (1991). Overeducation in the Labor Market, Journal of Labor Economics, 9(2): 101-122.

SMITH, J.P. and Welch, F. R. (1978). Local Labor Markets and Cyclic Components in Demand for College Trained Manpower, Annales de l'inséé , 30(31): 599-629.

TSANG, M. C. and Levin, H. M. (1991). The Economics of Overeducation, Economics of Education Review, 4(2): 93-104.

VERDUGO, R. R. and Verdugo, N. T. (1989). The Impact of Surplus Schooling on Earnings, The Journal of Human Resources, 24(4): 629-643.