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Youth unemployment duration in Turkey*

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Abstract

This study analyzes the determinants of unemployment duration for youth in Turkey. We use the individual level data obtained from the Household Labor Force Surveys of 2000 and 2001 to construct the duration of unemployment. The analyses are carried out by using both non-parametric and semi-parametric methods for men and women separately. In the semi-parametric part we employ the group duration method. We find that young women have lower chance of getting a job from unemployment than young men. Urban residents have higher hazard than rural residents. An interesting result is that young men who are residents of South-East and East Anatolia have larger hazards than the other regions of Turkey. Further, vocational-high school graduates are not more likely to find a job compared to high school graduates. Having a university degree makes a positive and significant effect on the hazard for young men, but not for young women.

1. Introduction

"Youth unemployment is generally viewed as an important policy issue for many economies, regardless of their stage of development" (ILO, 1999). Youth unemployment remained

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remarkably high and warranted special attention of the researchers in both the developed and developing countries (e.g. Lynch, 1989; Manning and Junankar, 1998 and van den Berg and van Ours, 1999). Youth unemployment is a concern in Turkey also. Earlier studies on Turkey mostly focus on the general characteristics of the labor market. (e.g. Bulutay, 1996; Şenses, 1994 and Tunalı, 2003). This is the first study on youth unemployment duration in Turkey.

In Turkey, in 1988, 17.6 percent of the labor force aged 15-24 was unemployed and increased to 19.7 percent in 2004. In 2004, this rate was 21.3 percent in France, 11.7 percent in Germany, 23.5 percent in Italy and 22.0 percent in Spain. Higher rates were experienced in the transition economies such as 40.8 percent in Poland and 32.7 percent in the Slovak Republic (OECD, 2005). The level of youth unemployment varies with the overall unemployment rate and the conditions in the labor market. In Turkey, while the incidence of unemployment among the young workers is high, the fraction of the long-term unemployed among the young is lower than that among the other age groups. The fraction of the long-term unemployed for the 15-24 age group was 16.08 percent for men, 23.33 percent for women, in 2003. The corresponding country averages were 21.23 and 28.33 percent for men and women, respectively. Therefore, one can argue that young workers encounter unemploymet as part of an effective job search course.

In this study we use the individual level unemployment duration data constructed from the quarterly Household Labor Force Surveys (HLFS) of 2000 and 2001 conducted by the State Institute of Statistics of Turkey. We examine the determinants of unemployment duration for the youth unemployed (aged 15-24) in a hazard function framework. In the analysis we consider the effects of personal, household and local labor market characteristics on the probability of finding a job. In estimation the grouped nature of the duration data is taken into account by specifying interval hazard models. We compare and test different specifications with different distributional assumptions. The analysis is carried out for young men and women separately, in order to identify the differences in their labor market experiences. One of the most important results is that young women have lower exit rates from unemployment than young men. Urban residents have higher hazard than rural residents. Young men who are residents of South-East and East Anatolia are more likely to find a job from unemployment compared to the other geographical regions of Turkey. Having a vocational high school diploma does not make a

significant effect on the hazard of both young males and females. Furthermore, having a university degree increases the hazard for young men but not for women.

This study is organized as follows. Section 2 describes the HLFS data used and discusses the construction of unemployment duration. Section 3 provides descriptive statistics regarding youth unemployment as well as non-parametric survival and hazard functions. The specification of the reduced-form, group duration models are discussed in Section 4. Estimation results are provided in Section 5. Policy implications and conclusions appear in Section 6.

2. The data

The data used in this study is taken from the HLFS, which covers rich information about the Turkish labor market. The rounds of the data we acquired for this study include three quarters (Q1, Q2 and Q4) from the 2000 survey and two quarters (Q1 and Q2) from the 2001 survey. There were about 23,000 households in every rounds of the survey. Sampling design of the Household Labor Force Survey allows us to observe the changes between the successive quarters and years (see SIS, 2001b:17). Approximately, half of the individuals surveyed in the first quarter of 2000 are re-interviewed in the second quarter of 2000 in which the sample is still representative of the country. This property allows us to follow the changes in the labor force status of the same individuals. For instance, one can observe whether an unemployed finds a job or goes to out-of-the labor force, i.e. become discouraged. The subgroups that we use to construct unemployment durations are generally interviewed minimum two times in two subsequent quarters or one year apart. There are of course some individuals who are not re-interviewed because they may have moved elsewhere to take up a job or to follow their partner or refused to be interviewed. Particularly, if they have moved to take up a job this would indicate that the unemployed are over-represented in the panel data set and this would bias the results. In our data set the sample attrition rate was about 6.2 (7.95) percent between the first and second quarters of 2000 (2001). To address the potential problem of self-selection we employed a robustness analysis by comparing the results from the full data where attrition is not taken into account with those from the date set obtained by dropping the observations due to attrition. The results did not differ qualitatively. Hence, we, as in Tansel and Taşçı (2004), concluded that the potential problem of self-selection was not significant. For brevity we only presented the

results obtained from the full data set. Other findings are available from the authors upon request.

In the analysis we utilize the standard definition of unemployment used by the State Institute of Statistics of (SIS) Turkey which employs International Labor Organization (ILO)'s definition. According to this definition the unemployed comprises of all persons 15 years of age and over who were not employed during the reference period who have used at least one of the search channels for seeking a job during the last three months and were available to start work within 15 days (See SIS, 2001b). In the analysis we restrict the sample to individuals between 15-24 years of age.

The survey participants answer a question about when they become unemployed. The question no. 40 asks "How long have you been seeking a job (in months)?" (See SIS, 2001b: Appendix 6, 3)[1]. The unemployment duration is calculated from the response to this question. The data set that we have includes total of 3218 unemployed youth (2066 men; 1152 women) for 2000 and 2001[2]. For the individuals who found a job during the period of observation (for instance, between the first and second interviews) we have no information when they found a job. We only know that they found a job between the two interviews. The number of youth who found a job between the periods of observations is 422 (338 men; 84 women). The average truncated (or right censored) duration of unemployment for youth individuals is 6.18 months. The same number is 5.47 and 7.46 months, for young men and women, respectively.

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[1] The unemployed individual is also asked if he/she registered at the Job-Placement office, his/her current job search strategies and the sector at which he/she is looking for a job. The registration at the Job-Placement Office is rather low. Only 7.11 per cent of unemployed individuals are registered at the Office in our sample.

[2] Owing to the age group of the sample it is possible to observe that some people both at school and searching for a job. The share of these individuals in our sample is about 7 percent, inclusive of Open University students. This number declines to less than 3 percent if we exclude the Open University students. Further, one may wonder employment status of young people both at school and searching for a job but it is only observed for two sub-groups in our sample, not for the whole sample. These are non-first-time job seekers and those who found a job during our observation period. HLFS distingueshes six types of statuses in employment: regular employees, casual employees, paid family workers, employer, self-employed and unpaid family workers. Among both of these sub-groups, the largest share is observed for the regular employees with about 80 percent. The share of the casual employees is about 18 percent for the non-first-time job seekers and 7 percent for the individuals who found a job during our observation period. Unpaid family workers have the third share for both sub-samples. The other remaining types of statuses in employment (i.e. paid family workers, employer and self-employed) have lower than 3 percent shares.

Table 1 gives the percentage distribution of unemployment duration by gender for the raw data. The figures show that the percentage of the long-term unemployed is higher among young women than among young men. These percentages are about 15.92 for men and 25.26 for women. Thus, as in the Turkey's average (see Tansel and Tasci (2004)), young women are more likely to be long-term unemployed compared to young men.

Table 1
Unemployment Duration by Gender for Youth, Turkey 2000-2001

	N	<3 month (%)	3-5 months	6-8 month (%)	8-11 months (%)	12 and Over months (%)
Male	2066	36.79	33.25	10.75	3.29	15.92
Female	1152	30.47	27.00	13.11	4.17	25.26

Source: Authors' calculations using raw data.

Table 2
Distribution of Unemployment Duration by Education for Youth, Turkey 2000-2001

	N	<3 month (%)	3-5 months	6-8 month (%)	8-11 months (%)	12 months and over (%)
Total	3218	34.52	31.01	11.59	3.60	19.27
Non-Graduate	110	40.91	32.73	10.00	5.45	10.91
Primary	1055	35.83	33.27	9.95	3.13	17.82
Middle School	530	41.13	28.87	12.26	2.45	15.28
High School	836	29.9	28.83	12.56	3.95	24.76
Voc. High Sc.	423	35.7	26.71	12.77	4.26	20.57
University	264	26.14	39.39	12.50	4.92	17.05

Source: Authors' calculations using raw data.

Table 2 provides the percentage distribution of unemployment duration by education level. The highest percentage of the long-term unemployed is observed among the high school and the vocational high school graduates. These percentages are about 24.76 and 20.57, respectively. The lowest percentage of the long-term unemployed is observed for the non-graduates, and for middle school graduates. These percentages are about 10.91 and 15.28, respectively.

Before moving on the estimation results it should be noted that the HLFSs of 2000 and 2001 data did not collect information on earnings or unearned incomes of the individuals and the households. Therefore, such information could not be included in our analysis. To capture this effect we include the number of earners within the household. Further, it has been popular to investigate the effect of unemployment insurance on unemployment duration. Such analysis was carried out recently by Moffit (1985), Katz and Meyer (1990) and Hunt (1995). The effect of unemployment insurance could not be analyzed in this study since the unemployment benefit system was instituted only recently in Turkey on June 1, 2000 and no-benefits were being paid when the survey was conducted in 2000 and 2001.

3. Descriptive statistics

3.1. Youth unemployment in Turkey

Figure 1 depicts the youth unemployment rates in comparison to those of the other age groups for the years between 1988 and 2003. We observe that male and female youth unemployment rate is always larger than those for the other age groups. Individuals in their late career (age group 55+) have the lowest unemployment rates throughout the period. We further observe in Figure 1 that for Turkey as a whole, male and female youth unemployment rates are somewhat similar. However, urban female youth unemployment rate is much higher than the urban male youth unemployment rate. For instance, in 2002 urban female youth unemployment rate was 30.6 percent while that of urban male was 23.6 percent (SIS database, 2004). Rural female youth unemployment seems to be lower than the rural male youth unemployment.

Youth unemployment exhibits a declining trend over time until the 2000-2001 crises. This decline can be attributed to “increases in high school and university enrolments” (Tunalı, 2003:49 and Tansel, 2002). After the 2000-2001 crises the economy recorded high rates of economic growth with 6.6 percent in 2003. However, the overall unemployment rate kept increasing. This is dubbed as “jobless growth”. We observe in Figure 1 that the overall and rural youth unemployment rates show an increase in 2003 for both men and women while youth unemployment rates show a decline in 2003 for both men and women.

Figure 2 provides the unemployment rates for youth by educational attainment for the period 1988-2003[3]. We observe that young men and women with no-degree (illiterates and literates with no degree) and primary school graduates have the lowest unemployment rates. However, young men and women with high school degree and over have higher unemployment rates than the country average. The highest rate for the young men is observed for the university graduates. The education effects are similar when we consider urban and rural young individuals. The unemployment rate for the univesity graduate urban young men increased from about 27 percent in 2000 to about 71 percent in 2003. The same increase for university graduate urban young women was less than for men. It increased from about 30 percent in 2000 to about 49 percent in 2003. For rural young women the unemployment rate is zero for some education levels. This is due to the limited number of observations for these educational levels.

We now consider long-term unemployment. An individual searching for a job for twelve months or more is defined as long-term unemployed. The proportion of the long-term unemployed in total unemployment was about 23.44 percent in Turkey in 2003[4]. Figure 3 provides the proportion of the long-term unemployed by age group for men and women. We observe that the incidence of the long-term unemployment for the youth is lower than for the country average for both men and women. Machin and Manning (1999) and OECD (2002) find the same result in several OECD countries. Incidence of long-term unemployment has a declining trend over the period 1988-2003. The sharp decline over the 1999-2000 period may be attributed to change in the definition of unemployment[5].

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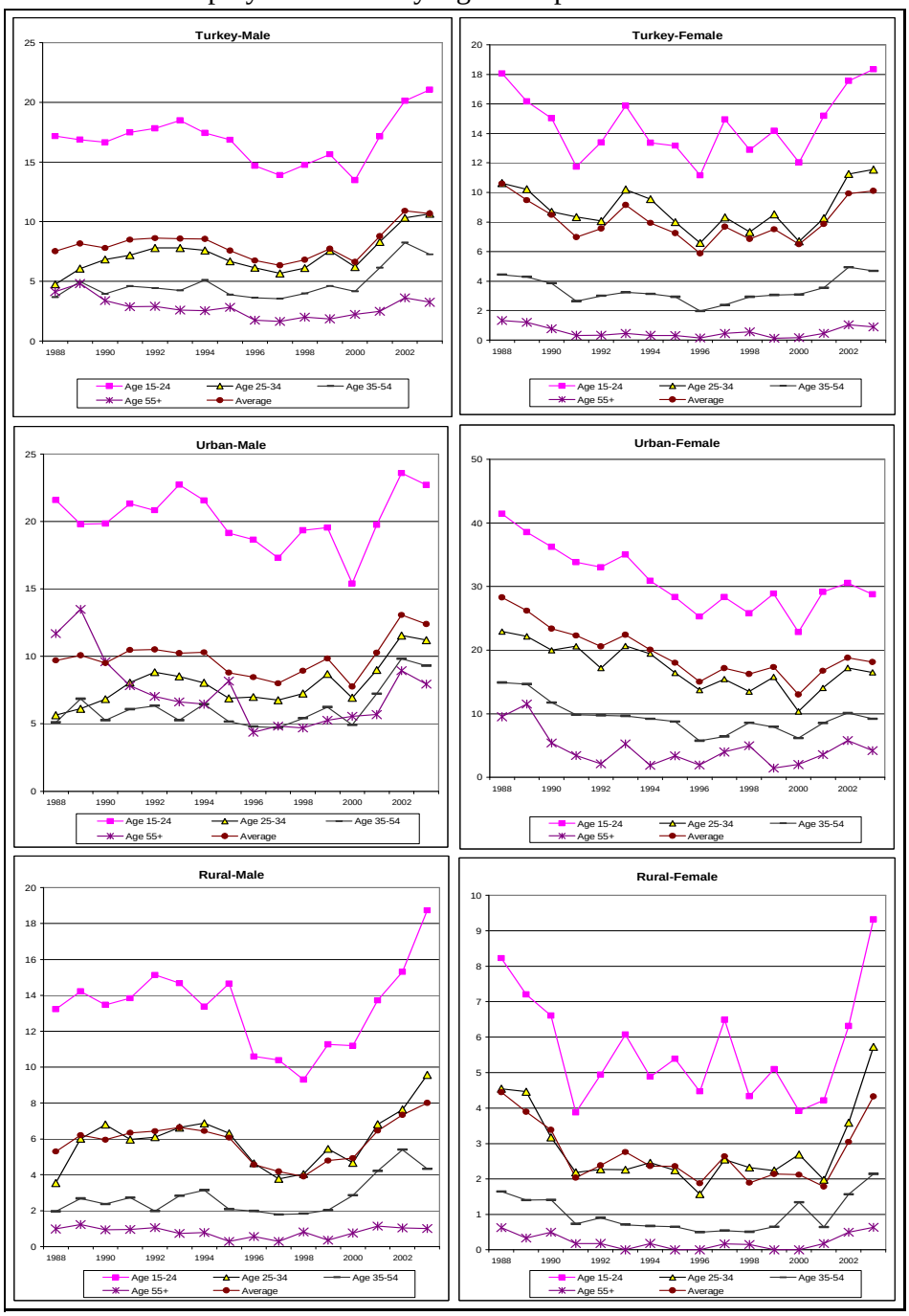
[3] Since the unemployment data on education by age group is not available from the website of the SIS for the year of 1999, we skip this year.

[4] The data on the duration of unemployment comes from the Household Labor Force Survey. In the survey unemployed individuals are only asked their unemployment spells (ongoing spells) until the time when the survey conducted. Hence we do not know the exact duration of unemployment, i.e. our observations on the duration of unemployment are all right censored. For the individuals who just find a job, we do not have any information when they are employed. Thus, it is possible to say that unemployed individuals have longer unemployment duration than those of which they reported.

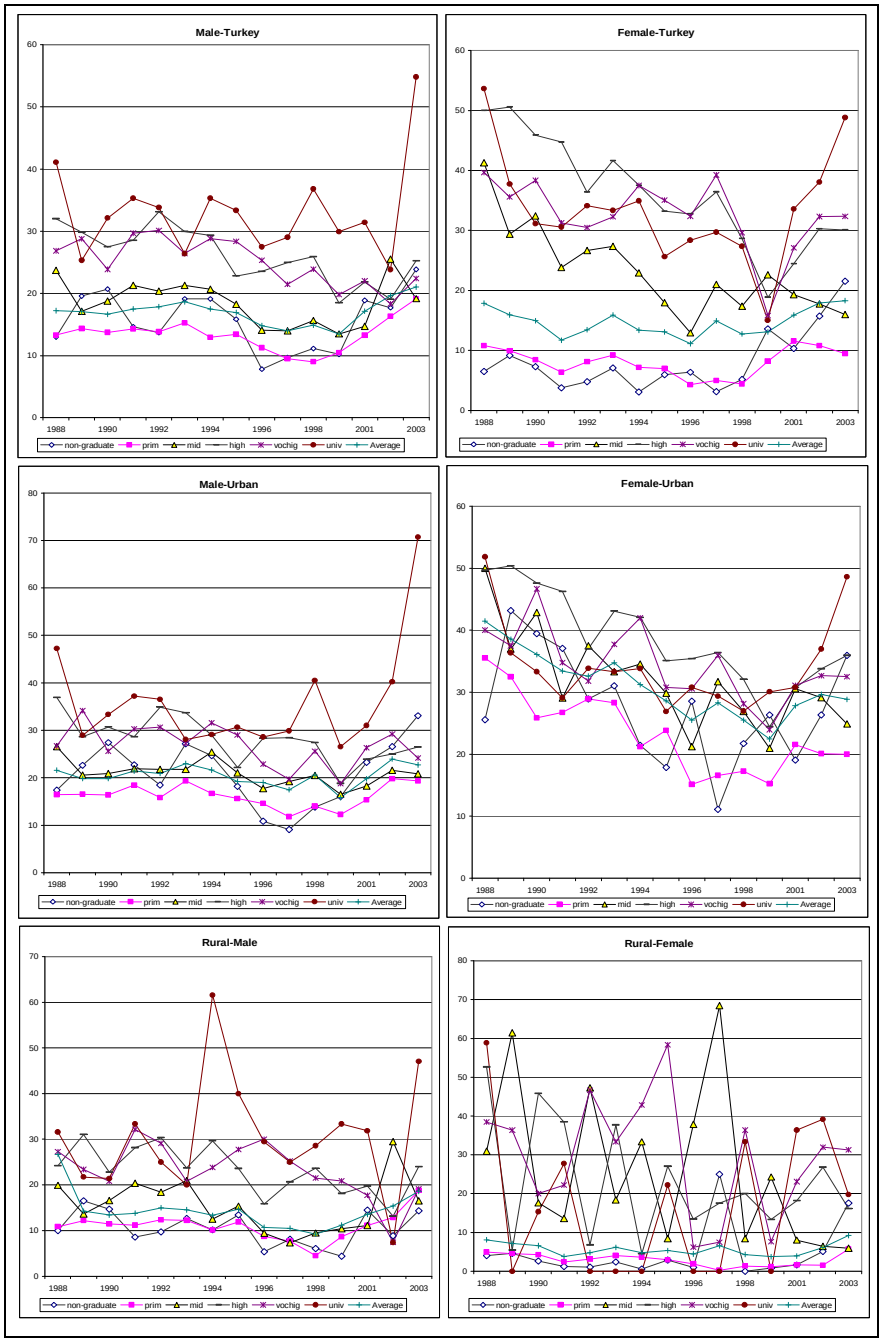
[5] Until 2000 an individual were accepted as an unemployed if he or she used one of the job search method within the last six months. This criterion was changed in 2000. After 2000 an individual were accepted as an unemployed if he or she used one of the job search method within the last three months.

Figure 1
Unemployment Rates by Age-Group 1988-2003



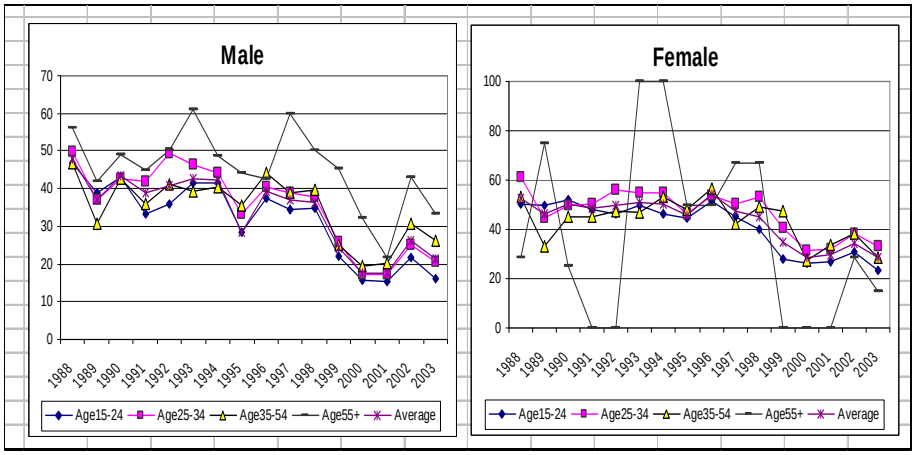
Source: SIS Database, as reported in Taşçı (2005).

Figure 2
Unemployment Rates by Education for Youth, 1988-2003



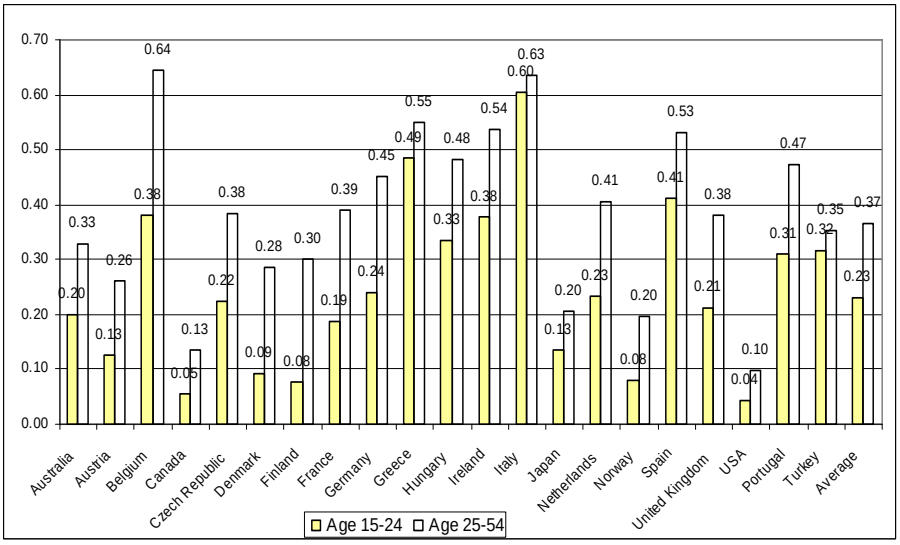
Source: SIS database, 2004.

Figure 3
Proportion of Long-Term Unemployed by Age Group, 1988-2003



Source: SIS Database, as reported in Taşçı (2005).

Figure 4
Incidence of Long-Term Unemployment Among Youth and Prime Aged Individuals in OECD Countries; 1990-2002 Average[6]



Source: OECD Database, as reported in Taşçı (2005).
Notes: 1) Data for Austria refer to the average annual rate in 1992-2002
2) Data for Hungary refer to the average annual rate in 1994-2002
3) Data for Czech Republic refer to the average annual rate in 1993-2002
4) Data for Finland refer to the average annual rate in 1992-2002

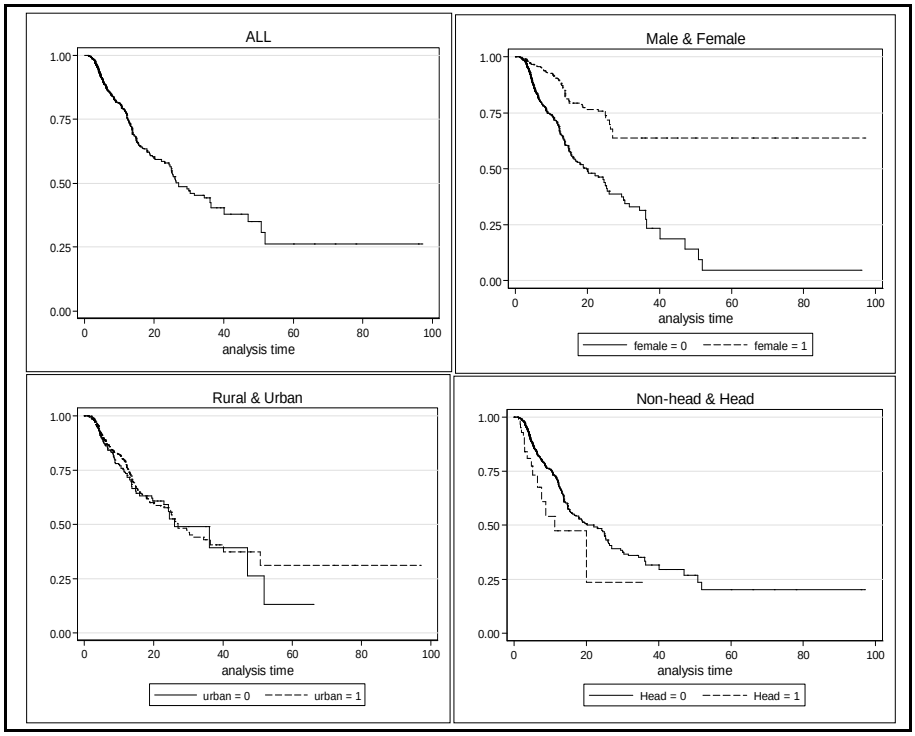
[6] The percentages were calculated from OECD Database (2005).

Figure 4 provides the average values of the proportion of the long-term unemployed youth and prime aged individuals in selected OECD countries for the period 1992 to 2002. We observe that incidence of long-term unemployed for the prime aged is higher than for the youth. The highest rates for the youth are observed for Italy and Spain while the lowest rates are for the USA, Canada and the Nordic countries. The highest rates for the prime aged are observed for Belgium, Italy and Greece while the lowest rates are observed for the USA, Canada, Japan and Norway.

3.2. Non-parametric duration analysis

In this part we provide the results obtained by using non-parametric survival and hazard function techniques. Figure 5 gives the plot of the Kaplan-Meier's survivor functions for the all youth, for young men and young women, and for urban and rural youth.

Figure 5
Survival Function for Youth



The survivor function shows the proportion of people who survive unemployment as time proceeds. The graphs imply that the young women have longer unemployment durations than men. The survivor function for young men declines more steeply than for young women implying that unemployed young men find jobs sooner than unemployed young women. The figures also imply that for young women the probability of surviving beyond 12 months is approximately 89.2, but for young men the same percentage is 69.0. The survivor functions also show that there is not much difference between urban and rural residents. Further, we observe that the head of households have lower unemployment durations compared to non-head of households, since the survivor function for the head of households declines more steeply than those for the non-head of households.

Figure 6
Smoothed Hazard Function for Youth

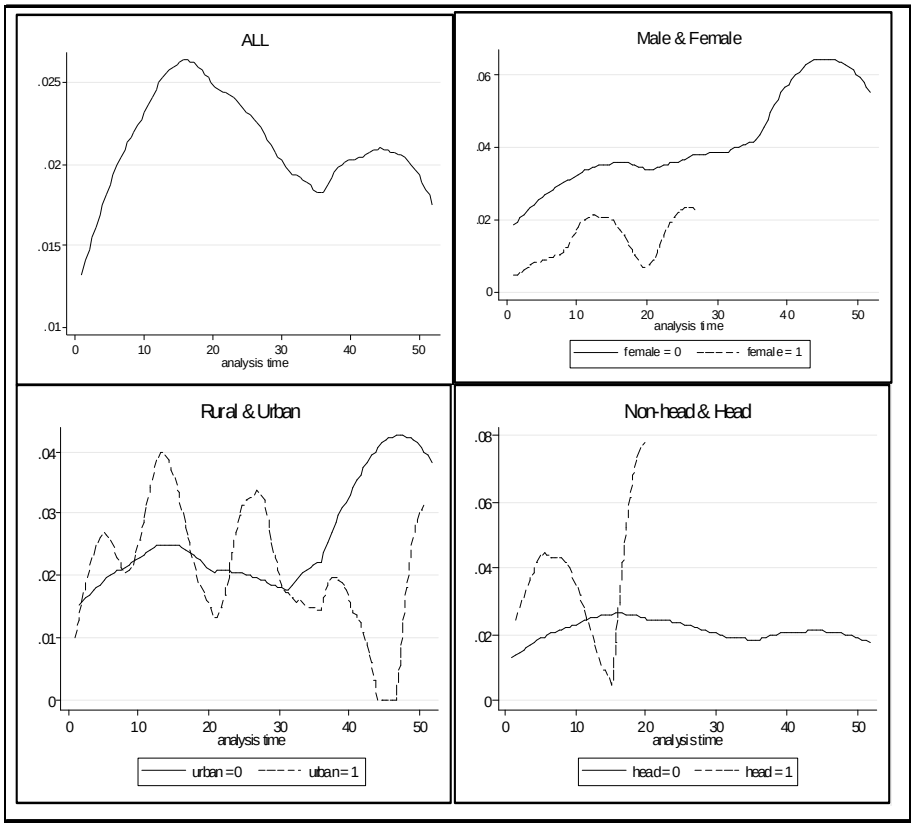


Figure 6 gives the plots of the smoothed hazard functions for all the data, and for male and female, for urban and rural residents, and for household heads and non-heads separately. As can be seen from the graphs for all data, the hazard rate initially increases until about the 15th month, then starts to decrease until about 35th month. After that month we observe again increases and decreases in the hazard. Actually, there is no clear time profile for the hazard. Another observation is that the hazard rate stays mostly below 3 percent. If we look at the results for male and female samples separately, we observe that the hazard is always is larger for men than that for women. The shape of the hazard seems to have an increasing trend for young men until about the 45th month. Further, we observe high volatility in the hazards of urban resident individuals.

Table 3
Log Rank Test of Differences in Hazard Rates of Selected Labor Market Groups

	Calculated X^2 Statistics		
LABOR FORCE GROUPS	ALL	MALE	FEMALE
Male/Female	96.82***		
First-time/Others	35.11***	16.81***	12.65***
Married/Others	0.40	0.08	0.39
Graduated from University/Others	0.00	0.15	7.39***
Lives in Urban Areas/Others	0.23	0.66	1.53
Head/Non-Head	6.57**	2.59	1.74

*** Significant at 1% level, ** Significant at 5% level.

The log-rank test allows for testing for the equality of two or more survivor functions. Table 3 gives the log-rank test results for different labor force groupings. We observe from the table that the equality of the survivor functions for men versus women, first-time job-seekers versus others, and head versus non-head of households is rejected. The equality of survivor functions for urban versus rural, married versus other groups are not rejected. The equality of survivor functions for university graduates versus other levels of education is rejected only for the female youth sample.

4. Econometric method

The main variable of interest is the duration of unemployment, which is stochastic and denoted by T. *F(t)=Pr(T<=t), is the* cumulative distribution function of T, where *t* denotes a realization of *T,* and *S(t)=1-F(t)* is the survivor function of T. We are interested in the following question. What is the probability that the spell of unemployment will end in the next short interval of time, say *dt*, given that it has lasted until time t. This defines the hazard function which is very popular way of analyzing duration data for several reasons. These models can handle censored durations, the variables that change over time and allow the examination of duration dependence (see Ham and Rea, 1987). In the empirical literature, T is taken as a continuous random variable (for example Grogan and van den Berg, 2001) for convenience. However, T is, in practice, usually available in monthly form (or grouped into time intervals). Kiefer (1988) refers to this kind of failure time data as "grouped duration data". Bergström and Edin (1992) show that biased estimators result from treating grouped data as if they are continuous. The theoretical developments of the hazard function and the associated likelihood function with the grouped duration data are provided by Prentice and Gloeckler (1978), Kiefer (1988), Han and Hausman (1990) and Sueyoshi (1995). In this paper we take grouped nature of the unemployment duration data we have explicitly into account. Our analyses also take into account the right censored data since there are individuals who have not completed their unemployment spells. They are taken into account in the definition of the likelihood function.

The grouped hazard is given by:

$$h_i(t) = 1 - \exp[-\exp(X_i(t)\beta + \delta(t)]$$

where i denotes the individual, X is a set of covariates, β are the coefficients to be estimated, and δ(t) is the logarithm of the integral of the baseline hazard and they are estimated along with the elements of β[7]. In this paper we focus on the transitions from unemployment to employment by treating the transitions to other labor market states as right censored at the point of exit i.e. we assumed independence between risks –transition probabilities-, as it is done in the literature (see for example, Narendranathan and Stewart, 1993; Carling *et al*., 1996, Gonzalo, 1998 and Addison and Portugal, 2003).

[7] See Prentice and Gloeckler (1978) and Sueyoshi (1995) for a derivation of the likelihood function.

Before estimation, we re-organized the data in person-period form depending on the choice of interval difference or grouping. The time axis is divided into intervals such that they contain each spell's reported durations. We assigned three months intervals until the end of the second year. The final group includes the unemployment durations more than two years. This gives a total of nine grouping intervals. For instance, if a respondent states that s/he has been unemployed for nine months then the grouped observations take the values of 0, 0, 0. If the respondent states that s/he found a job in the ninth month then the grouped observations take the values of 0, 0, 1. In this grouping we reached from 3218 individual observations to 8593 person period observations. Estimation of the models with alternative groupings did not change the overall results. We now briefly describe the alternative specifications about the hazard rate for the grouped duration approach following Sueyoshi (1995).

The first alternative is the Proportional Hazard Model (PHM). In this model for each group interval we assume a Type-I extreme value random variable. The result is a proportional hazard specification which is separable in time and the vector of covariates. The derivatives of the log-hazards with respect to the covariates are independent of time. Jenkins (1995) and Jenkins and Serrano (2004) show that the log-likelihood function for the discrete time PHM is the same as the log-likelihood for a generalized linear model of the binomial family with complementary log-log link. The two other alternatives are log-logistic and log-normal grouped duration models. In these non-proportional hazard specifications we assume a logistic cumulative and standard normal distributions, respectively. Then the likelihood function for the log-logistic model is the same as that for a standard binary-logit regression model (Jenkins, 1995) while that of the Log-normal model is the same as that for a probit model (Sueyoshi, 1995). In both cases the derivatives of the log-hazards with respect to the covariates are weighted by a time-dependent term. This term depends on elapsed duration and the hazard level in the log-logistic model and on the covariates values, the coefficient estimates, and time in the log-normal model. The details of the various specifications can be found in Kiefer (1988) and Sueyoshi (1995). Note that even though most of the relevant variables are included in the estimation, there may be some factors which may not be included or measured or observed. Motivation and ability can be considered as examples of some of the unobserved factors. The effect of their omission is like that of the

omitted variables in the ordinary least squares. In particular, the estimate of the duration dependence in the hazard is affected by the omission of unobserved heterogeneity. The estimates of the duration dependence become inconsistent. Therefore, it is important to incorporate unobserved heterogeneity. We assume that an unobserved variable ν is independent of the observed covariates as well as the censoring times and the starting times. It has a distribution up to a finite number of parameters and that it enters the hazard multiplicatively (see Wooldridge, 2002). For the unobserved heterogeneity it is usual to assume a gaussian distribution with unit mean and variance σ^2. Meyer (1990) assuming a gamma distribution finds the log-likelihood function in closed form. Since the models with and without unobserved heterogeneity are nested they can be compared with the Likelihood Ratio (LR) test.

5. Estimation results[8]

Table 4 gives a list of the variables that are included in the estimations. Table 6 shows the estimates of the PHM, Log-Logistic and Log-Normal grouped duration specifications for the all youth, young men and women, separately. The initial estimations of the models with the neglected heterogeneity show that the inclusion of Gaussian heterogeneity does not have any significant contribution to our models. Thus, by using the LR test, we reject the inclusion of the unobserved heterogeneity term. Consequently, in the Table 6, we present the results without neglected heterogeneity. In the estimation of the alternative specifications duration dependence is built into the specification through a period-specific constant (see Sueyoshi, 1995).

In the following sections we initially test for proportionality assumption in the PHM model and select the best fitting model among the alternative models in section 5.1, and then discuss the main findings in section 5.2.

[8] In this study we initially estimate our models in the context of continuous time framework. Since our data is interval censored, we initially applied some rules of thumb, about the unobserved period that are commonly used in the literature (see for example, Grogan and van den Berg, 2001 and Foley, 1997). These rules included the assumptions of zero time spent in unemployment, 50 percent time spent in unemployment, all time spent in unemployment and the random time spent in unemployment. Specifically in the continuous time framework we estimated exponential, Weibull, log-logistic and log-normal models. Best results are obtained with the log-normal model according to Akaike's Information Criterion. These results are available from the authors upon request. Later on, we switched to the grouped duration framework recognizing the grouped nature of the data. Here we take the interval-censoring explicitly into account. We consider the groups narrow enough to prevent information loss but wide enough to include each unemployment spell's true durations.

Table 4
Variables Used in the Estimation of the Models

1. "Urban" is a dummy variable taking value 1 if the individual lives in a town of more than 20,000 inhabitants and 0 otherwise
2. "Female" is a dummy variable taking value 1 if the sex is female and 0 otherwise
3. "Married" is a dummy variable taking value 1 if the survey respondent is married and 0 otherwise
4. "FemMar" is an interaction dummy taking value 1 if the sex is female and marital status is married and zero otherwise.
5. "Head" is a dummy variable taking value 1 if the survey respondent is head of the household and 0 otherwise
6. Region of residence is a set of seven dummies: "Central Anatolia" (base category), "Marmara", "Aegean", "Mediterranean", "Black Sea", "East Anatolia" and "South East Anatolia".
7. Education consists of a set of six dummies:
   "Non-Graduate": Illiterate plus those who are literate but did not graduate from a school
   "Primary Sch.": Primary School
   "Middle Sch.": Middle School
   "High Sch.": High School (Base Category)
   "Voc.High Sch.": Vocational High School
   "University": Two-Year plus Four-Year University and over
8. Age consists of a set of two dummies: "Age1519" (base category) and "Age2024"
9. "Unemprate" is the provincial unemployment rate.
10. Occupations of the unemployed persons consist of eight dummies:
    "Occup1": Professional and Related Workers (base category)
    "Occup2": Administrative and Managerial Workers
    "Occup3": Clerical and Related Workers
    "Occup4": Sales Workers
    "Occup5": Service Workers
    "Occup6": Agricultural Workers
    "Occup7": Non-Agricultural Workers
    "Occup8": Workers not Classified by Occupation
11. "Firsttime" is a dummy variable taking value 1 for the first-time job-seekers, zero otherwise.
12. "Numearn" is the number of earners in the household
13. h's are period specific constants that measure the duration dependence.

5.1. Testing for proportionality and model selection

The PHM model assumes that the coefficients of the covariates in the hazard function are constant over time. This assumption is called as the proportionality assumption. Kiefer (1988) explains two alternative tests regarding the proportionality assumption in the PHM model. In the first-test, we assume that baseline hazards are the same between each of the intervals. This gives the exponential model as the restricted model. In this test, PHM is the unrestricted model. The calculated LR test statistic that the baseline hazards are the same over the intervals are reported in Table 5 (part –I-). The results indicate that the hypothesis of equal baseline hazards is rejected for all of the models and the PHM is chosen over the exponential model. In the second test, the model with time varying coefficients is taken as the unrestricted model. Its log-likelihood values are obtained by summing the values obtained in each interval estimation. In the second test, the restricted model is the PHM. The LR test statistics are reported in Table 5 (part -II-). The test results indicate that PHM is again accepted for all the alternative models.

As alternatives to the PHM, two non-proportional models namely Log-Logistic and Log-Normal are also estimated. Since the last two models are non-nested, the models are compared by using Akaike Information Criterion (AIC)[9] as a model selection tool. Akaike's information criterion (AIC) basically allows us to select the model with the largest explanatory power, small bias and good precision. We choose the model with smallest value of AIC. The values of AICs are reported in Table 6. As can be seen from the Table 6, the AIC values for various models are very close to each other, but one can choose the "PHM" model with a slight difference. In the following section we discuss the general results.

5.2. The covariate effects

Table 6 provides the estimation results[10] for the youth sample. We observe that urban variable is positive and significant for all specifications. This indicates that urban individuals are more likely to find a job compared to rural ones. This result also means that duration

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[9] AIC values are obtained using the following formula, ***AIC=-2(loglikelihood + 2M)/n***, where, M is the number of covariates and n is the number of observations (see Hardin and Hilbe, 2001, p.45).

[10] In the Table 6 h's denote period specific constants that measures the duration dependence. "Wald Chi2" is the Wald Chi-squared test statistic for the overall significance of the model. "AIC" is the Akaike's Information Criterion.

of unemployment is lower in the urban areas as compared to the rural areas which may be a factor behind the high-rates of rural-urban migration.

Table 5
Testing For Proportionality

I- Proportional Hazard Model and Exponential Model					
	Proportional Hazard Model	Exponential Model	LR test PH& Exponential	Critical Value	Decision
All	-1430.24	-1527.80	195.12	15.50	Accept PH
Male	-1055.08	-1141.52	172.88	15.50	Accept PH
Female	-348.36	-362.44	28.16	15.50	Accept PH
II- Proportional Hazard Model & Unrestricted Model with time varying Coefficients					
	PH Model	Non-PH	LR test Non-PH and PH	Critical Value	Decision
All	-1430.24	-1286.74	287.00	289.74	Accept PH
Male	-1055.08	-929.20	251.77	270.40	Accept PH
Female	-348.36	-231.04	234.64	270.40	Accept PH

In the pooled sample (all-data) the coefficient estimate of the female dummy variable is highly significant with a negative sign indicating that young women have significantly higher unemployment durations than young men. This is in contrast to what Grogan and van den Berg (2001) found with the Russian data. Being married, for young men, is highly significant, seems to decrease the hazard, but it is insignificant for the young women. Being head of household is not statistically significant.

Regarding the estimation results for the geographical regions in the young male sample, each of the regions is not statistically significantly different from the Central Anatolia except the East and the Southeast Anatolia. The positive sign indicates that residents of these two regions are more likely to find a job compared to those in the other regions of Turkey. This is in contrast to our expectation, since these regions are the most economically under-developed

Table 6
Estimation Results

	All			Male			Female		
	Proportional Hazard	Log-Logistic	Log-Normal	Proportional Hazard	Log-Logistic	Log-Normal	Proportional Hazard	Log-Logistic	Log-Normal
Urban	0.533***	0.603***	0.311***	0.527***	0.595***	0.316***	0,7	0.745*	0.333*
	[0.134]	[0.146]	[0.071]	[0.145]	[0.160]	[0.079]	[0.433]	[0.449]	[0.184]
Female	-0.519***	-0.545***	-0.241***						
	[0.134]	[0.139]	[0.064]						
Married	-0.369*	-0.423*	-0.224**	-0.463**	-0.533**	-0.286**	-0,382	-0,384	-0,191
	[0.207]	[0.220]	[0.111]	[0.206]	[0.221]	[0.112]	[0.444]	[0.448]	[0.176]
FemMar	-0,254	-0,229	-0,087						
	[0.476]	[0.496]	[0.218]						
Head	0,442	0,486	0.254*	0,427	0,472	0,229	0,26	0,314	0,243
	[0.281]	[0.299]	[0.149]	[0.301]	[0.323]	[0.162]	[0.863]	[0.896]	[0.377]
Marmara	0,281	0,271	0,099	0,324	0,322	0,139	0,101	0,078	-0,033
	[0.179]	[0.190]	[0.090]	[0.200]	[0.215]	[0.105]	[0.465]	[0.470]	[0.179]
Aegean	0,037	0,027	-0,014	0,049	0,044	-0,003	-0,099	-0,109	-0,086
	[0.217]	[0.228]	[0.106]	[0.254]	[0.270]	[0.128]	[0.498]	[0.506]	[0.197]
Mediterrian	-0,185	-0,206	-0,117	-0,158	-0,176	-0,096	-0,485	-0,527	-0,299
	[0.209]	[0.222]	[0.104]	[0.233]	[0.250]	[0.120]	[0.524]	[0.532]	[0.204]
Black Sea	-0,147	-0,166	-0,111	-0,077	-0,1	-0,078	-0,225	-0,264	-0,202
	[0.218]	[0.231]	[0.108]	[0.256]	[0.274]	[0.132]	[0.562]	[0.564]	[0.211]
East Anatolia	0.460**	0.457**	0,173	0.618***	0.618***	0.261**	-0,265	-0,301	-0,222
	[0.205]	[0.218]	[0.106]	[0.220]	[0.237]	[0.118]	[1.117]	[1.120]	[0.431]
South East Anatolia	0.579***	0.579***	0.227**	0.790***	0.813***	0.361***	-1,46	-1,495	-0,575
	[0.207]	[0.221]	[0.107]	[0.222]	[0.240]	[0.120]	[1.125]	[1.146]	[0.429]
Non-Graduate	0,053	0,047	0,015	0,147	0,146	0,066	-0,653	-0,683	-0,336
	[0.299]	[0.313]	[0.149]	[0.325]	[0.344]	[0.172]	[0.718]	[0.719]	[0.304]
Primary Sch.	0.291**	0.309**	0.147**	0.408**	0.442**	0.220**	-0,48	-0,477	-0,182
	[0.147]	[0.155]	[0.073]	[0.164]	[0.175]	[0.086]	[0.380]	[0.387]	[0.161]
Middle Sch.	0,211	0,222	0,111	0,245	0,264	0,131	0,134	0,13	0,047
	[0.170]	[0.180]	[0.086]	[0.192]	[0.205]	[0.101]	[0.395]	[0.403]	[0.170]
Voc. High Sch.	0,246	0,256	0,122	0,17	0,171	0,059	0,369	0,385	0,167
	[0.205]	[0.214]	[0.099]	[0.246]	[0.258]	[0.122]	[0.379]	[0.386]	[0.160]
University	0.638***	0.730***	0.360***	0,258	0,345	0,18	1.605***	1.659***	0.712***
	[0.239]	[0.255]	[0.119]	[0.318]	[0.347]	[0.164]	[0.456]	[0.464]	[0.194]
Age2024	0.191*	0.191*	0,076	0.340***	0.355***	0.171***	-0.580**	-0.595**	-0.255**
	[0.108]	[0.115]	[0.055]	[0.121]	[0.131]	[0.065]	[0.247]	[0.254]	[0.106]
Unemprate	-0,386	-0,377	-0,24	0,739	0,806	0,352	-3,817	-4,038	-1,857
	[1.133]	[1.189]	[0.552]	[1.268]	[1.339]	[0.639]	[3.011]	[3.058]	[1.222]
Occup2	-11.722***	-11.279***	-3.308***	-12.002***	-11.653***	-3.431***	-10.170***	-11.027***	-2.692***
	[0.366]	[0.377]	[0.173]	[0.440]	[0.455]	[0.191]	[0.647]	[0.654]	[0.224]
Occup3	-0,036	-0,001	0,042	-0.827*	-0.808*	-0,322	0.855*	0.884*	0.359*
	[0.312]	[0.320]	[0.137]	[0.474]	[0.488]	[0.208]	[0.469]	[0.477]	[0.202]

Table 6 (continued)

	All			Male			Female		
	Proportional Hazard	Log-Logistic	Log-Normal	Proportional Hazard	Log-Logistic	Log-Normal	Proportional Hazard	Log-Logistic	Log-Normal
Occup4	1.115***	1.179***	0.553***	1.018***	1.092***	0.528***	1.417***	1.460***	0.614**
	[0.299]	[0.309]	[0.139]	[0.377]	[0.393]	[0.180]	[0.530]	[0.548]	[0.243]
Occup5	0.969***	1.043***	0.492***	0.711*	0.792**	0.392**	2.048***	2.094***	0.870***
	[0.311]	[0.323]	[0.145]	[0.382]	[0.400]	[0.182]	[0.609]	[0.626]	[0.277]
Occup6	2.694***	2.924***	1.463***	2.524***	2.769***	1.419***	3.177***	3.267***	1.455***
	[0.299]	[0.324]	[0.154]	[0.369]	[0.401]	[0.191]	[0.693]	[0.731]	[0.354]
Occup7	1.331***	1.410***	0.663***	1.182***	1.269***	0.612***	1.854***	1.911***	0.808***
	[0.274]	[0.286]	[0.129]	[0.350]	[0.368]	[0.168]	[0.478]	[0.500]	[0.230]
Occup8	0,61	0,661	0,297	0,112	0,163	0,091	2.237***	2.304***	0.976***
	[0.471]	[0.486]	[0.215]	[0.625]	[0.645]	[0.280]	[0.764]	[0.795]	[0.363]
Firsttime	-0,153	-0,166	-0,089	-0,032	-0,036	-0,017	-0.653**	-0.656**	-0.277***
	[0.110]	[0.116]	[0.056]	[0.122]	[0.131]	[0.066]	[0.261]	[0.262]	[0.106]
Numearn	-0,001	-0,001	-0,005	-0,001	-0,006	-0,014	-0,015	-0,011	-0,003
	[0.053]	[0.056]	[0.027]	[0.058]	[0.062]	[0.031]	[0.141]	[0.141]	[0.059]
Year- 2001	-0.449***	-0.490***	-0.247***	-0.395***	-0.430***	-0.209***	-0.738**	-0.759**	-0.331***
	[0.117]	[0.122]	[0.058]	[0.130]	[0.137]	[0.068]	[0.320]	[0.320]	[0.121]
	[0.149]	[0.156]	[0.071]	[0.167]	[0.175]	[0.082]	[0.336]	[0.342]	[0.140]
h2	1.050***	1.083***	0.461***	1.103***	1.143***	0.506***	0.874**	0.890**	0.362**
	[0.180]	[0.187]	[0.085]	[0.204]	[0.214]	[0.099]	[0.382]	[0.390]	[0.162]
h3	0.847***	0.875***	0.368***	0.952***	0.991***	0.440***	0,476	0,486	0,193
	[0.211]	[0.219]	[0.099]	[0.237]	[0.249]	[0.116]	[0.470]	[0.477]	[0.190]
h4	1.797***	1.866***	0.838***	1.879***	1.970***	0.930***	1.553***	1.567***	0.640***
	[0.188]	[0.200]	[0.096]	[0.213]	[0.230]	[0.115]	[0.407]	[0.413]	[0.176]
h5	1.335***	1.381***	0.607***	1.510***	1.572***	0.720***	0,857	0,871	0,349
	[0.263]	[0.276]	[0.131]	[0.297]	[0.316]	[0.156]	[0.576]	[0.587]	[0.242]
h6	0.701*	0.735*	0.344*	0,585	0,618	0,313	0,813	0,83	0,343
	[0.403]	[0.420]	[0.186]	[0.529]	[0.553]	[0.249]	[0.648]	[0.662]	[0.274]
h7	0,046	0,039	-0,022	0,098	0,086	-0,03	-0,137	-0,131	-0,015
	[0.584]	[0.584]	[0.242]	[0.711]	[0.710]	[0.298]	[1.033]	[1.048]	[0.387]
h8	3.059***	3.230***	1.563***	3.267***	3.538***	1.818***	2.657***	2.738***	1.217***
	[0.253]	[0.293]	[0.162]	[0.286]	[0.354]	[0.205]	[0.604]	[0.632]	[0.300]
Constant	-5.415***	-5.519***	-2.776***	-5.691***	-5.838***	-2.986***	-4.985***	-5.010***	-2.440***
	[0.382]	[0.410]	[0.189]	[0.465]	[0.501]	[0.234]	[0.946]	[0.969]	[0.391]
Wald chi2	3005,655	2567,524	1081,574	2535,17	2188,433	1163,555	883,061	972,375	898,834
Prob>chi2	0	0	0	0	0	0	0	0	0
Log-Likelihood	-1430,238	-1431,23	-1435,81	-1055,083	-1056,13	-1058,82	-348,362	-348,481	-349,091
AIC	0,341	0,342	0,343	0,423	0,423	0,424	0,223	0,223	0,224
Observations	8593	8593	8593	5159	5159	5159	3434	3434	3434

Robust standard errors in brackets
* significant at 10%; ** significant at 5%; *** significant at 1%

regions of Turkey (For similar results, see Tansel and Taşçı, 2004). For the young female sample, we observe that living in each of the regions is not significantly different from that in Central Anatolia.

Estimation results for the education dummies indicate that for the all data the having a university or primary school diploma makes a positive and significant effect in finding a job. The findings are somewhat different under gender separation. Having a university degree makes a positive and significant effect on the hazard of young females, while having a primary school degree has the same effect on the hazard of young males. Regarding the age group variable we observe contradicting results for young males and females. Being in the age group of "20-24" increases the hazard for the young males, while it decreases the hazard for the young females. We further find no significant effect of the local unemployment rate on the probability of finding a job for both the male and the female samples

Regarding the "occupational dummy" variables we find the following. The administrative and managerial workers (occup2) have lower exit rates from unemployment for employment than the base category of professionals and related workers for both young men and women. However, regardless of the gender difference, sales workers (occup4), service workers (occup5), agricultural workers (occup6) and nonagricultural workers (occup7) all have higher hazards than the base category of professionals and related workers. The main difference between young males and females is that, in the female sample "occup8" which represent those workers not classified by occupation is highly significant with a positive effect on the hazard. Regarding the job-market experience variable we expect that first-time job-seekers are less likely to find a job compared to other job-seekers. However, we found that the hazard for the first-time job seeker young men is not significantly different from those of the non-first-time job-seekers. However, the probability of leaving unemployment for a job for the first-time job seeker young women is significantly lower than those for the non-first-timers. To capture the income support from the family we included the number of earners within the household in our models. However, we find that this variable is not statistically significant in none of the equations.

Figure 7
Baseline Hazard for Youth under Alternative Distributions

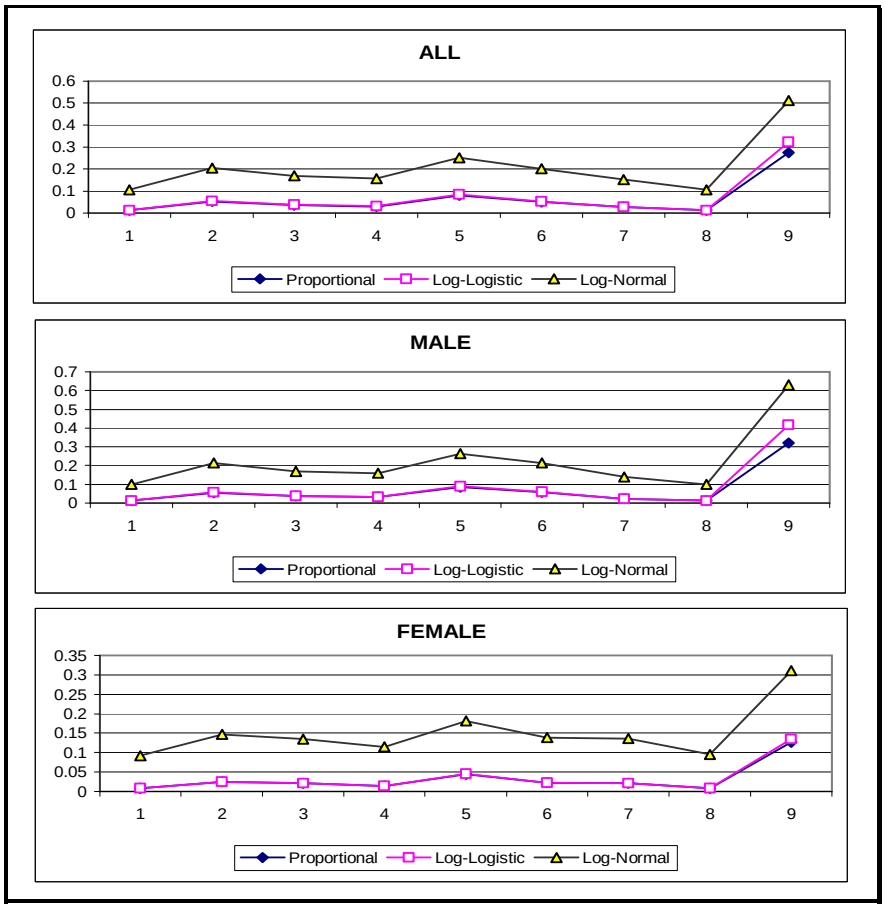


Figure 7 gives the baseline hazard for youth under alternative distributions. We observe neither an increasing nor a declining tendency for all the samples. It seems from the Figure 7 that the hazard initially with the increase in time until about the 2nd grouping interval (i.e. 4-6 month), then decline with the increase in time until about 4th grouping interval (i.e. 10-12 month), and then increases. After the 5th interval (i.e. 13-15 month) it declines until about the 8th interval, i.e. 22-24 month. Finally, after being unemployed for 24 months the hazard seems to increase sharply for both males and females.

We now examine the average predicted hazard values. Since the best results are obtained under the proportional hazard assumption we

discuss the results under this distribution[11]. For example, given the other characteristics of the individuals[12], the probability finding a job within three months for urban youth female is about 1.35 percent, while the same probability for urban youth male is about two-times larger and is 2.57 percent. The difference between urban youth female and youth male gets larger if we consider the probability of finding a job within twelve months. The predicted probabilities are 5.90 and 2.25 percent for urban youth male and female, respectively. We observe a similar difference between young men and women in rural areas. The probability of finding a job within three (twelve) months is about 2.28 (5.67) percent for males, while it is 0.82 (1.66) percent for females in rural areas. Hence, young women regardless of living in urban or rural areas are less likely to find a job compared young men and the difference between them seems to become larger with the increase in time passed in unemployment.

Figure 8 depicts the average predicted hazard values (i.e. probability of finding a job within three months) by gender with and without considering the residence difference for different geographical regions of Turkey. We observe that young women, regardless of regional difference, have lower hazards than young men. Further, for males, we observe that residents of Black Sea, Central Anatolia, Mediterranean and Aegean have lower hazards than the country average and the lowest hazard is observed for the residents of Black Sea region. We further observe that males in the South-East and East Anatolia have larger predicted hazards compared to other geographical regions of Turkey, regardless of living in urban or rural areas. If we consider the predicted hazards for urban and rural residents separately, the lowest hazard for the urban males is observed for Central Anatolia and then for Black Sea region residents. Further, the lowest hazard for the rural males is observed for Black Sea region residents. Furthermore, rural or urban females seem to have lower hazards compared to males in all regions.

Figure 9 shows the average predicted hazard values for different education level by gender and residence. The lowest hazard is observed for the high school graduates for both urban males and females. Similarly, the lowest probability of finding a job is observed for the vocational high school graduate rural females, and for the university graduate rural males. Rural females have the lower

[11] The predicted values under log-logistic and log-normal distributions are available from the authors, upon request.

[12] i.e. other variables are assumed to be in their mean values.

predicted hazards compared to urban females for all education levels, except for the university level. Similar pattern is observed for urban and rural males until high school level. After this level of education, predicted hazard is higher for urban males.

Figure 8
Predicted Hazard by Gender, Residence and Geographical Region

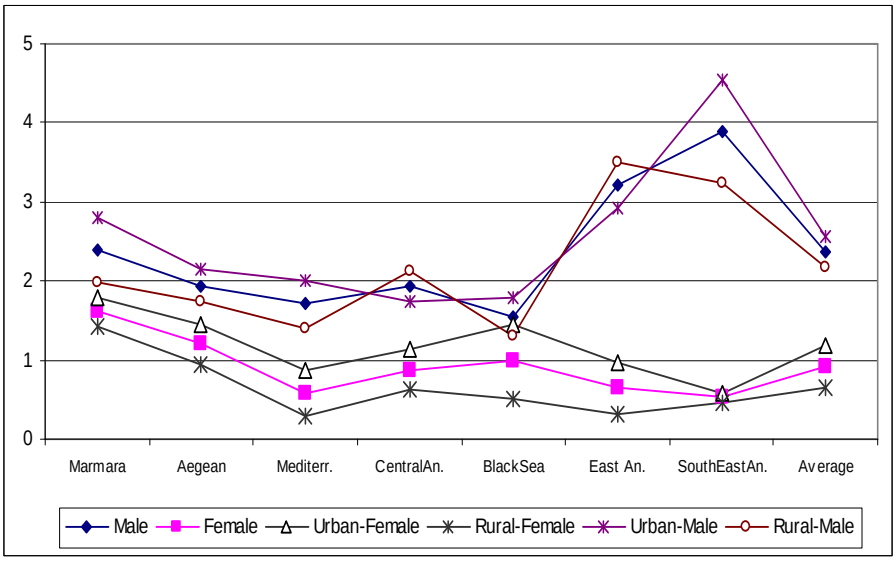
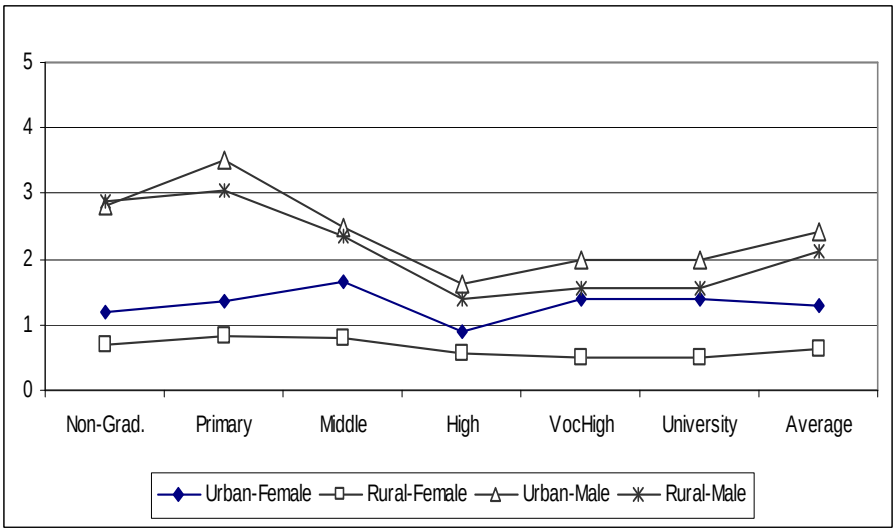


Figure 9
Predicted Hazard by Gender, Residence and Education



6. Concluding remarks

In this paper we examine the youth unemployment problem and analyze the determinants of unemployment duration for them in Turkey. Although the incidence of unemployment among youth, compared to adults, is quite large, the incidence of long-term unemployment among them is lower than that of for the adults. Further, findings related to the duration analysis show neither an increasing nor a decreasing trend in the baseline hazard. This observation means that there is no duration dependence, i.e. the probability of finding a job does not change with the increase in unemployment duration.

We further find that, although average unemployment rates for the urban youth are always larger than the rates for the rural ones during the last 15 years, urban youth are more likely to get a job compared to rural ones during the years under examination, i.e. in the years of 2000 and 2001. This result does not change under gender separation. We also observe that young women are less likely to find a job compared to young men. This may suggest young women as a special target group for the policy designers.

We also find that married young men are less likely to find a job compared to unmarried individuals. Being head of household captures the "family responsibility" of individuals and should increase the hazard, but it has no significant effect. Another interesting finding of the study is that young men who reside in East and South-East Anatolia have larger hazards compared to those in the other regions of Turkey. This finding may be explained by the two facts that, first, unemployment may be higher among those who can afford it. Second, the individuals, particularly young men, who are most likely to be unemployed in these regions, migrate. This finding may also suggest that living in the "most developed" regions, such as Marmara and Aegean, of Turkey does not create an advantage, for the unemployed individuals regardless of gender difference.

Regarding the education level effects we observe the following. Having a primary school diploma makes a positive and significant effect on the hazard of young men, while having a university degree increases the hazard for young women. Findings related to education levels also show that having a vocational high school diploma does not have a significant effect on the hazard of both young men and women. We further observe that labor market conditions, proxied here by the local unemployment rate, are not a significant determinant of

the unemployment durations of both young males and females. Not having a labor market experience, denoted by "first-time" job-seeking dummy, as expected, has a negative effect on the probability of finding a job for both young men and women, but it was significant only in the male equation. In the analyses we included the "number of earners" in the household for capturing the income support from the family while unemployed. However it was not statistically significant for both young men and women.

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Özet

Türkiye'de gençlerin işsizlik süresi

Bu çalışmada Türkiye'de gençlerin işsizlik sürelerini belirleyen etmenler incelenmiştir. Çalışmada 2000 ve 2001 yılı Hanehalkı İşgücü Anketi ham verileri ile hem yarı-parametrik hem de parametrik olmayan yöntemler kullanılmıştır. Yarı-parametrik yöntem olarak gruplandırılmış süre modelleri kestirilmiştir. Çözümlemeler hem genç erkekler hem de genç kadınlar için ayrı ayrı yapılmıştır. Çalışmanın genel bulgularından bazıları şunlardır. Genç kadınlar genç erkeklere göre daha az iş bulma şansına sahiptirler, dolayısıyla onların işsizlik süresi daha uzundur. Ayrıca, kentsel alanlarda yaşayan gençler kırsal alanlara göre daha kolay iş bulabilmektedirler. Çalışmanın göze çarpan bir diğer bulgusu ise Doğu ve Güney Doğu Anadolu bölgesinde yaşayanların diğer bölgelere oranla daha kolay iş bulma şansına sahip olmalarıdır. Bunlara ek olarak, mesleki lise mezunlarının genel lise mezunlarına göre daha fazla iş bulma şansına sahip olmadıkları gözlemlenmiştir. Ayrıca, üniversite mezunu olmak genç erkekler için iş bulma şansını istatistiksel olarak anlamlı derecede artırırken genç kadınlar için aynı etki bulunmamıştır.