DETERMINANTS OF UNEMPLOYMENT DURATION FOR MEN AND WOMEN IN TURKEY[1]:

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ABSTRACT

There are few studies on unemployment duration in developing countries. This is the first study on duration aspect of unemployment in Turkey. We use the results of the Household Labor Force Surveys of 2000 and 2001 to construct a cross-section of durations of unemployment spells. We analyze the determinants of probability of leaving unemployment or the hazard rate. The effects of the personal and household characteristics and the local labor market conditions are examined. Non-Parametric and parametric estimation methods are used. Unobserved heterogeneity were not significant. Two alternative definitions of unemployment are considered. The analyses are carried out for men and women separately. Our results indicate that women are experiencing higher unemployment durations then men. Age has a negative and education has a positive effect on the hazard rate. The effect of the local unemployment rate is large and negative. Duration dependence of the exit rate from unemployment is different for men and women. For men, there is slight U-shaped duration dependence, while for women there is no duration dependence.

Keywords: Unemployment Duration, Duration Analysis, Gender, Turkey

JEL Classification: J64, C41, J16

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1. Introduction

Unemployment duration analysis has mainly focused on developed countries. There are a number of applications of the by now familiar reduced-form duration model framework in the OECD countries ranging from France (van den Berg and van Ours, 1999) to Portugal (Portugal and Addison, 2003). Some of the recent studies concentrated on transition economies (Grogan and van den Berg, 2001; Lubyova and van Ours, 1997 and Foley,1997). There are only two studies for developing countries (Tunali and Assaad, 1992 and Serneels, 2001). This is the first study on the duration aspect of unemployment in Turkey although the incidence of unemployment was considered by earlier studies (Şenses, 1994 and Bulutay, 1995).

The estimated official unemployment rate in Turkey was 10.41 in 2002. It is generally agreed that the official unemployment rate understates the extent of the problem in Turkey (Özel and Mehran, 1992). Therefore a more realistic measure would be obtained by combining the unemployment and underemployment rates[2]. This gives a combined figure of 15.82 percent in 2002. The unemployment rates were around 8 percent in the early 1990s. Recently, Turkey experienced a series of economic and financial crises. One was in 1994 and the others were in 1999, November 2000 and February 2001. During the 2001 crisis, the per capita GNP declined by 9.6 percent which was the largest contraction ever in the history of the

[2] The following groups of people are considered as underemployed in the SIS definition. The first group covers involuntary part-time workers. It includes who work less than 40 hours but are able to work more. The second group includes individuals who do not receive adequate income in their current employment or their current job does not match their skills (see Tunali, 2003).

Republic. Unemployment rates increased during those crises and remained high since then. The numbers of unemployed stood at about 2,464 million people in 2002 (See SIS, 2004). Further, there are significant differences in the unemployment rates between men and women, between young and the mature by rural and urban divide. Therefore, in Turkey, unemployment remains as a serious problem in the agenda of the policy makers.

This study uses 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 in a hazard function framework. Two different definitions of unemployment are employed. Personal, household and local labor market characteristics are considered. 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 men and women separately, in order to identify the differences in the labor market experiences of men and women. One of the most important results is that women have lower exit rates from unemployment than men. The groups of individuals which should be targeted for help include married women, unmarried men, first-time job seekers, individuals with low levels of education and those in the older age groups and who live in the provinces with high levels of unemployment.

This paper is organized as follows. Section 2 gives an overview of the labor market and unemployment problem in Turkey. Section 3 introduces the HLFS data

used and discusses the construction of unemployment durations with two alternative definitions of unemployment. 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. Labor Market and Unemployment in Turkey

The Turkish labor market is characterized by strong supply side pressures attributable to rapid population growth, declining participation rates, widespread employment in small scale establishments, segmentation of wages and high rates of unemployment.

Labor force participation rates have been declining over time. Rapid urbanization and increasing school enrollment rates account for this decline. Urban male participation rate was about 69 percent in 2003. Urban female participation rate was about 19 percent during the same year which is remarkably low by international standards. Approximately three-fifths of the urban labor force are wage earners, while self-employment and unpaid family work are prevalent in the rural labor force. Employment is mostly in small scale establishments. Establishments with less than four workers account about two-fifths of the urban employment. Although the statistics on the size of the informal sector vary, it is believed to be large.

Unemployment is especially high in the urban markets partly because of high rates of rural to urban migration. Unemployment rate is generally believed to be

higher than the indication of the official figures. Currently, it is considered one of the major social and economic problems of Turkey.

Table 1 shows the distribution of unemployment rate and the mean unemployment duration by gender, age and education. Women have somewhat lower unemployment rates than men. Mean unemployment duration is longer for women than for men. Youth (15-24 age group) unemployment is especially high. However, mean unemployment duration for the young is remarkably lower than for the other age groups. Lowest unemployment rates and durations are observed for the category of non-graduates (which include illiterates and literates without a diploma). Highest unemployment rates and durations are for the high school and vocational high school graduates.

Figure 1 shows the rural and urban unemployment rate by gender for the period 1988-2003. We observe that urban rates are higher than the rural rates and the highest rates are for urban women throughout the period. The declining trend has been reversed in 2000 and there have been significant increases in all rates after this year. This increase is attributed to the severe economic and financial crisis of November 2000 and February 2001. In the rural areas women engaged in agriculture can combine agricultural activities with the household work. However, when they migrate to the cities it is not easy to combine home and market work and they concern themselves with household responsibilities. Their low levels of education and cultural values against their employment are the other reasons for their high unemployment rates.

Table 2 provides unemployment rates for selected OECD countries. For men, in 2002 highest unemployment rate was observed in Turkey with about 11 percent and the lowest unemployment rate was for Switzerland. Unemployment rates for women are in general higher than for men. For women, in 2002 the highest unemployment rate was observed for Spain with about 16 percent while the rate for Turkey was about 10 percent and the lowest rate was observed again for Switzerland.

Figure 2 gives the average values of the proportion of the long-term unemployed (those who are looking for a job for more than one year) for youth and prime aged individuals in selected OECD countries. In general, the incidence of long-term unemployment among the prime aged individuals is higher than among the young. Highest proportions of long-term unemployed are observed in Belgium and Italy. The lowest proportions are observed for Canada and the USA. For Turkey the proportions are close to the OECD average.

3. The Data and Unemployment Definitions

3.1. The Household Labor Force Survey

The HLFS, which contains rich information about the Turkish labor market, was conducted by the State Institute of Statistics bi-annually in April and October during the 1988-1999. Since 2000, application frequency, sample size, questionnaire design and estimation dimension are changed. The survey is applied quarterly and a panel feature is introduced. 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 quarter in

2000, and similarly in 2001. We restrict the sample to individuals between 15-65 years of age.

Sampling design of the 2000 Household Labor Force Survey allows us to observe the changes between the successive quarters and years (see SIS, 2001b; p. 17). The sampling strategy was such that approximately, half of the individuals surveyed in the first quarter of 2000 are re-interviewed in the second quarter of 2000 in such a way that the sample is still representative of the country. This allows us to follow the labor force status of individuals, i.e. whether the unemployed individuals find a job or not. The subgroups that we use to construct unemployment durations are interviewed a minimum of two times in two subsequent quarters or one year apart. There are those 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. Especially, if they have moved to take up a job this would imply that the unemployed are over-represented in the panel data set and this would bias the results. In our data set the sample attrition was about 7 percent between the first and second quarters of 2000. In order to address the potential problem of self-selection we performed a series of robustness analysis by comparing the results from the total number of observations where attrition is not taken into account with those from the sample obtained by dropping the observations due to attrition (see Footnote 8 in Section 5.2). The results did not differ qualitatively. Therefore, we concluded that the potential problem of self-selection was not significant. For brevity we only presented the results obtained from the total number of observations. The other results are available from the authors upon request.

3.2. Two Unemployment Definitions and Their Incidence

The State Institute of Statistics of (SIS) Turkey uses International Labor Organization (ILO)'s definition of unemployment. 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)[3]. This is the first-definition of unemployment we consider and it is labeled as "ILO unemployment". In the early 1980s ILO advocated relaxing the job search requirement in the definition of unemployment for developing countries. In developing countries, the conventional job-search channels may not be very relevant in the urban labor markets where labor absorption is low, and in the rural labor markets where self-employment and unpaid family work (especially for women) are prevalent (see Hussmanns et al., 1990). These conditions are largely observed in Turkey. Therefore, we drop the requirement of searching for a job. Byrne and Strobl (2004) also argued for dropping the job-search requirement in developing countries. This gives the second definition of unemployment we use and label as "broad unemployment"[4]. The purpose of the broad unemployment rate is to include those unemployed who are willing to work but do not actively look for a job. Those who are out of the labor force are excluded from our

[3] One may wonder whether it is possible for people to declare themselves to be unemployed but get income from informal work. According to the questionnaire design it is highly unlikely for this to happen. Because, in the survey, persons economically active during the reference period for at least one hour as a regular employee, casual employee, employer, self employed or unpaid family worker are considered employed. This employment includes formal and informal types. In fact, there are several control questions to decide if the people are employed and derive income from a formal or informal source alike.

[4] The broad measure of unemployment extends the ILO definition in the sense that we now include those who did not use one of the search channels during the past three months but may have used earlier and available to start a job within 15 days. For this reason, the question "how long have you been seeking a job?" is answered by every unemployed who stated that they have been looking for a job.

ILO definition and broad definition both. Naturally, if they are included, both unemployment rates would increase. For instance, the rate of unemployment with the broad definition increased from 9.4 to 10.9 percent in 2000 when we included those who stated that they are not searching for a job but are available to start working within 15 days. The unemployment rates computed with the alternative definitions using the HLFS data for 2000 and 2001 are provided in Table 3. The rates are computed as percentages of individuals in each group.

We observe in Table 3 that employing the broad definition increases the rate of unemployment significantly particularly in the urban locations. In urban locations, including all non-searchers who would like to work increases unemployment rate by about four percentage points in each of 2000 and 2001. Kingdon and Knight (2000) found for South Africa that unemployment rate increased by 15 percentage points in 1997 when the broad definition of unemployment is used. Byrne and Strobl (2004) found for Trinidad and Tobago that unemployment rate increased by about 3.6 percentage points for men and by about 7.2 percentage points for women when they move from the ILO definition to the broad definition of unemployment. The increase is largest for the women in the urban locations by about seven percentage points implying that urban women may be unemployed but not seek work. Regardless of the definition of unemployment used we further observe the following. First, the unemployment rates are higher in 2001 than in 2000 for all groups. This increase was due to the severe economic and financial crisis of February 2001. Second, the unemployment rates in urban locations are higher than those in rural locations. Third, urban women experience higher unemployment rates than urban men and highest rates are observed for urban women. Tansel (2001) found very high levels of

hidden unemployment among urban women in Turkey. Hence is the need to study unemployment duration of women separately.

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: p.3)[5]. The unemployment duration is calculated from the response to this question. The data set that we have includes total of 4834 and 6983 unemployed individuals for 2000 and 2001 combined under ILO and broad definitions of unemployment, respectively. The computed unemployment durations consist of two cases. One is the elapsed (backward) unemployment durations in months in the stocks of unemployed at each interview date for the individuals who are still unemployed. These define the right-censored spell durations. The second is defined as follows. If an individual in one wave leaves unemployment for a job before the next interview all that is known is that unemployment ended between the two interviews. In this situation there is an unobserved period. It is not possible to decide exactly how much of the unobserved period is actually spent in unemployment. Following the literature we ignore the possibility that several short unobserved unemployment spells may happen during the unobserved periods. These define the interval-censored spell durations. There were 1089 and 1555 interval-censored observations under ILO and broad definitions of unemployment, respectively.

[5] 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 ILO unemployed individuals are registered at the Office. The same number for the broad definition was about 6.4 percent.

In order to deal with interval-censored observations we initially applied some rules of thumb 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. We carried out extensive sensitivity analysis by experimenting with these rules in the context of continuous time framework. 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 discrete time framework recognizing the discrete 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. See section 4 for more on this. The average truncated (or right censored) duration of unemployment for all individuals is 6.79 and 8.77 months under the ILO and broad definitions, in that order.

Table 4 gives the percentage distribution of unemployment duration by gender. The figures indicate that the percentage of the long-term unemployed is higher among women than men. These percentages are about 8.9 and 13.66 for men according to ILO and broad definitions of unemployment respectively, while they are about 14.68 and 21.31 for women. Hence, women are less likely to have searched for a job than men. An alternative explanation is that they get less job offers.

Table 5 shows the percentage distribution of unemployment duration by age group. We observe that when ILO definition is used, about 10 percent of all unemployed people had been so for more than one year, which is called the long term unemployed. This percentage increases to about 16 percent when the broad definition of unemployment is used. The percentage of the long-term unemployed is higher than the average for the older age groups. For instance, for the age group of 55plus this percentage is 17 according to ILO definition and increases to 22 when the broad definition is used.

Table 6 gives the percentage distribution of unemployment duration by education level. We observe that the percentage of the long-term unemployed is very high among the high school graduates. This percentage is about 16 when ILO definition is used and increases to about 21 according to the broad definition. These results indicate that the long term unemployment is concentrated among the high skilled except the university graduates. The percentage of the long-term unemployed is somewhat less among the university graduates of four years or more. This percentage is about 6 and 10 according to the ILO and broad definitions of unemployment respectively.

We note that the HLFSs of 2000 and 2001 did not collect information on earnings or unearned incomes of the individuals. Therefore, such information could not be included in our analysis. It has been popular to investigate the effect of unemployment insurance on unemployment duration. Such analysis was carried out recently by 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 surveys were conducted in 2000 and 2001.

4. MODEL

4.1. The Duration Model

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 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, variables that change over time and allow 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 discrete 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 discrete time hazard rate 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[6]. In this paper we analyze 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).

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, six month intervals until the end of the third year, twelve-month intervals until the end of the fourth year. The final group includes the unemployment durations more than four years. This gives a total of twelve 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

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

observations take the values of 0, 0, 1. In this grouping we reached from 4,834 individual observations to 11,544 person period observations under ILO definition and from 6,983 individual observations to 19,672 person-period observations under broad definition. Experimenting with alternative groupings did not change the overall estimation results of the models. 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).

4.2 Unobserved Heterogeneity:

Unobserved heterogeneity arises if there remain some differences in the hazards after including all relevant observed factors. Motivation and ability are examples of the 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. This test is carried out and discussed in Section 5.2.

5. ESTIMATION RESULTS

5.1. NON-PARAMETRIC DURATION ANALYSIS

In the non-parametric approach to the duration analysis we provide the estimates of the Turnbull's survivor function. It is the generalization of the Kaplan-Meier survivor function for the interval censored data. Figures 3 and 4 give the plots of the Turnbull's survivor functions using the ILO and broad definitions of unemployment respectively. The survivor function shows the proportion of people who survive unemployment as time proceeds. The graphs imply that women have longer unemployment durations than men. The survivor function for men declines more steeply than that for women implying that unemployed men find jobs sooner than unemployed women. The figures also imply that for women the probability of surviving beyond 12 months is approximately 89.7 and 90.6 percent under the ILO and broad definitions of unemployment respectively, while for men the same percentages are 70.98 and 73.6. The survivor functions also show that unemployed in urban[7] locations have longer unemployment durations than those in rural locations. The probability of surviving beyond 12 months is about 77.02 and 80.1 percent for the unemployed in urban locations under the ILO and broad definitions of unemployment, respectively while for the rural unemployed the same percentages are 71.66 and 71.6. Figures 5 and 6 give the plots of the hazard function under ILO and broad definitions of unemployment, respectively. The graphs for all data show that the hazard rate initially increases until about the 10^{th} month, then starts to decrease until about the end of the 6^{th} year (about 70^{th} month) under each

[7] A location is defined as urban if its population is over 20, 000.

definition of unemployment. The hazard rate stays always below 2.0 percent for the ILO definition and below 1.5 percent for the broad definition of unemployment. The graphs for male and female samples show that the hazard is always larger for men than for women. For both men and women, under both the ILO and the broad definitions the hazard rate first increases until about the 10^{th} month then decreases until about 70^{th} month. The decrease is steeper for men than for women.

The log-rank test allows for testing for the equality of two or more survivor functions. Table 7 gives the log-rank test results for different labor force groupings. The table shows that the equality of the survivor functions for men and women is rejected under both definitions of unemployment. Further the equality of survivor functions for different age groups, and married versus other groups are also rejected. However, the equality of survivor functions for university graduates versus other levels of education is not rejected.

5.2. SEMI-PARAMETRIC ESTIMATION

Tables 11 and 12 present the estimates of the PHM, Log-Logistic and Log-Normal grouped duration specifications for ILO and broad definitions of unemployment respectively[8,9]. We have estimated the models with and without

[8] There is a potential problem of self-selection since those who are not re-interviewed may have moved to another area to take up a job. We addressed this problem by performing three kinds of robustness analysis. In the first approach we dropped from the sample those who are not re-interviewed and re-estimated the models. The results were very similar to the estimates reported in Tables 11 and 12. These results are not reported for brevity but are available from the authors upon request.

In the second approach to the robustness analysis we included in the sample those for whom there is repeated data and re-estimated the models. The results were very similar to the estimates reported in Tables 11 and 12 with the following exceptions. Under the ILO definition in the full sample and the male sample the coefficient estimates on East Anatolia become statistically significant;

unobserved heterogeneity and tested for the inclusion of unobserved heterogeneity with LR tests since the models are nested. The test results are presented in Tables 9 and 10. The inclusion of unobserved heterogeneity is rejected in all of the models for both definitions of unemployment. The models estimated with and without unobserved heterogeneity are very close to each other and the plot of the baseline hazards are exactly the same. Therefore, the Tables 11 and 12 report the results without unobserved heterogeneity. In the empirical studies that implement the grouped duration data models, the insignificance of unobserved heterogeneity is a frequent finding such as Arulampalam and Stewart (1995), Carling et al. (1996), Böheim (1999), Böheim and Taylor (2000), and Jenkins and Serrano (2004) . In a piece-wise constant hazard framework, Grogan and van den Berg (2001) also find that unobserved heterogeneity is of no significant importance with the Russian data.

Among the education coefficient estimates in the full sample only two-year and four-year university education are statistically significant, in the male sample, primary, two-year and four-year university education are statistically significant while in the female sample none-of the education coefficients are statistically significant. Under the broad definition, in the male sample the coefficient estimates on East Anatolia and on the four-year and over education level became statistically significant. These results are not reported for brevity but are available from the authors upon request.

In the third approach to the robustness analysis we included only fresh samples which are brought in at each round of the survey. By definition fresh samples are not influenced by attrition (Tunali and Baltacı, 2004). Again, the results were very similar to the estimates reported in Tables 11 and 12 with the following exceptions. Under both the ILO and the broad definitions in the full sample and the male sample, the coefficient estimates on East Anatolia become statistically significant. Among the education coefficient estimates for the full sample under the ILO definition only the four-year university education and under the broad definition only the two- and four-year university education are statistically significant. In the male sample, under the ILO and broad definitions only the two- and four-year university education are statistically significant. In the female sample under ILO definition none of the education coefficients are statistically significant while under the broad definition only the four-year university education is statistically significant. Again, these results are not reported for brevity but are available from the authors upon request.

[9] We also considered the timing of the unemployment spell. This could indeed be important given the severe financial crises the Turkish economy suffered in November 2000 and February 2001. Therefore we performed a robustness analysis by splitting the sample into two. One sample referred to the no-crisis quarters of 2000 and the other sample referred to the crisis quarters of 2000 and 2001. The results from the two samples were qualitatively similar. Therefore they are not reported for brevity. The reason for this finding is that, the year 2000 was already a year of stagnant economy and we use data only for the first two quarters of 2001 during which the full effect of the February 2001 crisis on unemployment was not felt. The quarterly unemployment rates for the four quarters of 2000 were 8.3, 6.2, 5.6, and 6.2 respectively. The same rates for the four quarters of 2001 were 8.5, 6.7, 7.8 and 10.4. Therefore, the unemployment effect of the crisis was felt only during the latter part of the 2001 and continued in 2002 and 2003.

In the estimation of the alternative specifications (PHM, Log-Logistic and Log-Normal) duration dependence is built into the specification through a period-specific constant (see Sueyoshi, 1995).

For ease in interpreting the parameters we measured the explanatory variables as deviations from means as suggested by Kiefer (1988) and Sueyoshi (1995). The variables are presented in Table 10 in the order they appear in Tables 11 and 12. In these tables, "Wald Chi2" is the Wald Chi-squared test statistic for the overall significance of the model. "AIC" is the Akaike's Information Criterion. "LR of Occupation" tests the joint statistical significance of the occupation dummy variables. The test results indicate that in each case, occupation dummy variables are jointly statistically significant. "LR of theta" tests for the inclusion of unobserved heterogeneity term and the test results indicate no unobserved heterogeneity.

5.2.1 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 can be tested by estimating the restricted and the unrestricted models and the LR test statistic since the models are nested. Two tests are explained in Kiefer (1988). 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 and PHM is the unrestricted model. The calculated LR test statistic that the baseline hazards are the same over the intervals are reported in Tables 8 and 9 using the ILO and the broad definitions of unemployment, respectively. 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. The restricted model is the PHM. The LR test statistics are reported in Table 8 and 9 using the ILO and broad definitions of unemployment, respectively. The test results indicate that PHM is rejected for the pooled sample under both definitions of unemployment and for the male sample under the ILO definition of unemployment. As an alternative to the PHM, two non-proportional models namely Log-Logistic and Log-Normal are estimated. Since the last two models are non-nested, the models are compared by using AIC which are reported in Tables 11 and 12. However, the AIC values for various models are very similar to each other rendering a very close choice[10]. In order to find the best fitting model we will compare the proportional hazard, logistic and log-normal interval hazard specifications by using Akaikie's Information Criterion (AIC) (see Klein and Moeschberger (1997). AIC is given by, ***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).

5.2.2 The Covariate Effects:

We now turn to Tables 11 and 12 where we present the estimation results of the transitions from unemployment to employment[11]. We interpret and compare the

[10] In the Tables 11 and 12, the bold columns show the best estimation results among the alternative distributions.

[11] We also analyzed the transitions from unemployment to the out-of-the-labor-force by treating the transitions to the other labor market states as right censored. These results are not reported for brevity but are available from the authors upon request. The main results are as follows. Women in particular married women have higher probabilities of exiting to out-of-the-labor-force form unemployment

coefficients for the male and female samples. The coefficient estimates on living in an urban location are mostly insignificant for women with ILO definition of unemployment while highly significant for both men and women with the broad definition of unemployment. The positive sign indicates that living in urban areas increases the probability of leaving unemployment as compared to living in rural areas. This result also implies that duration of unemployment is lower in the urban areas as compared to rural areas which may be a factor behind the high rates of rural-urban migration.

In the pooled sample the coefficient estimates on the female dummy variable are highly significant with a negative sign indicating that women have significantly higher unemployment durations than men. This is in contrast to what Grogan and van den Berg (2001) found with the Russian data. Further the coefficient estimates on the interaction dummy married female indicate that married women experience significantly higher unemployment durations than non-married women.

The effects of the marital status on the hazard rate are opposite of each other in the male and female samples. In the male sample being married increases the probability of exiting unemployment, a result similar to those in OECD countries. In the female sample, being married reduces the same probability under both definitions of

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with both the ILO and the broad definitions of unemployment. In contrast, men in particular, married men have lower probabilities of exiting to out-of-the-labor-force from unemployment. There are no significant regional differences for men while for women living in the Aegean region decreases the probability of exiting to out-of-the-labor-force. Different levels of education did not significantly influence the probability of exiting to out-of-the-labor-force for men. For women this probability is lower at the university level of education under the broad definition of unemployment. The age effects have a U-shape as expected for both men and women with both definitions of unemployment implying that the elderly exit to out-of-the-labor-force with greater probability. First-time job-seeking did not significantly influence the probability of exiting to out-of-the-labor-force for both men and women. The shape of the baseline hazard was more or less a horizontal line with no-clear indication of an increase or decrease in the hazard rate with both definitions of unemployment.

unemployment unlike what we observe in the OECD countries. Apparently for men being married implies family responsibilities inducing greater labor market attachment but not for women.

Examining the coefficient estimates for the regional dummy variables in the male sample under both definitions of unemployment we observe that each of the regions are not statistically significantly different from the Central Anatolia except the Southeast Anatolia which indicate significantly higher probability of exiting unemployment as compared to Central Anatolia. This is somewhat surprising since Southeast Anatolia is one of the poorest regions of the country. In the female sample, we observe that in each of the regions the probability of exiting unemployment is not significantly different from that in Central Anatolia.

Next, we examine the coefficient estimates of the dummy variables for different levels of education. With ILO definition of unemployment we observe that in both the male and female samples all coefficient estimates are highly significant and positive indicating that each of level of education increases the probability of exiting unemployment as compared to an illiterate or non-graduate individual. We further note that the effect of education increases with the level of education and that the educational effects are much larger for women than for men. However, when we consider the broad definition of unemployment we observe that in the male sample none of the coefficient estimates for education are statistically significant. This may suggest that the unemployed who are mostly high skilled are waiting for a good job rather than searching actively. In the female sample only the individuals with four or more years of university education have significantly higher exit

probabilities than the illiterates. This indicates the importance of a university education for women.

The coefficient estimates of the age dummy variables indicate that in both male and female samples when ILO definition of unemployment is used those individuals who are 45 and over have lower probability of exiting unemployment as compared to those who are in the age group of 15-19. The effects are larger for women than for men at those older age groups. Lower hazard rate at older ages is also found by Serneels (2001) in Ethiopia, and in the OECD countries. The age effects in the male sample with broad definition of unemployment are similar to those with the ILO definition. While in the female sample the effect of age on the hazard rate becomes significant after age 35 and the category of age 55 and over looses its significance.

The coefficient estimate of the local unemployment rate is statistically significant and negative in all the samples using both definitions of unemployment. Thus for the individuals who live in provinces with high unemployment rates the probability of leaving unemployment is lower. The coefficient estimates are larger for females than for males indicating that local labor market conditions are more important for females.

The Occupational dummy variables indicate the following. In the male sample under the ILO definition, administrative and managerial workers (occup2) sales workers (occup4), service workers (occup5), agricultural workers (occup6) and nonagricultural workers (occup7) all have higher exit rates from unemployment than the professionals and related workers. However, the clerical and related workers

(occup3) have significantly lower exit rates from unemployment than the same base category. This may possibly suggest that the unemployed clerical and related workers may be queuing for a public sector job. In Turkey, public sector jobs have higher job security, higher benefits and higher pay than comparable private sector jobs (Tansel, 2005). Thus, unemployed may prefer to wait for job openings in the public sector. For women with the ILO definition of unemployment, the exit probabilities from unemployment for the administrative and managerial workers and clerical and related workers are not significantly different from those of the professional and related workers. All other occupational categories have significantly higher exit probabilities than the base category of the professionals and related workers. The results are about the same under the broad definition of unemployment.

The exit rate from unemployment for the first-time job seeker men is not significantly different from those of the non-first-timers under the ILO definition but it is significantly lower for the first timers than for the non-first-timers under the broad definition. The probability of leaving unemployment for the first-time job seeker women is significantly lower than those for the non-first-timers under both definitions.

5.2.3 Predicted Hazard Rates

Table 13 provides the predicted hazard rates (the predicted probability of finding a job) in the first three months of unemployment under ILO and broad definitions using the estimation results in Tables 11 and 12. We consider a married urban

resident at various age and education levels with all other characteristics set at their mean values. Under the proportional hazard assumption we observe that the predicted probabilities of finding a job are higher for urban married man than for urban married women at all age and education levels. Böheim and Taylor (2000) find the opposite result with the British data where women have higher exit rates to employment than men. There is a declining tendency in the predicted probabilities of finding a job over the age groups except the slight increase in the age group 35-44. The age group of 20-24 have the highest and the age group 45-54 have the lowest predicted hazard rate. For urban married men the predicted hazard is lowest for the least educated individuals and than for high school graduates under the ILO definition and for middle school graduates under the broad definition. The same is true for urban married women. For urban married men the predicted hazard is highest for two-year university graduates under the ILO definition and for four-year university or higher graduates under the broad definition of unemployment. The same is true for married women. We also observe that the predicted hazard rates for vocational high school graduates are higher than for general high school graduates under ILO definition and they are about the same under the broad definition for both urban, married men and women.

Table 14 gives the predicted hazard rates for non-married urban men and women while Table 15 gives the same for rural married men and women for the median age group 25-34 by education level with all other characteristics set at their mean values. We observe that, urban married men have higher predicted hazard than urban non-married men while urban married women have lower predicted hazard than the urban non-married women at the median age under both definitions of unemployment.

Further we observe that predicted hazard is lower for rural married men than for urban married men but, higher for rural married women than for urban married women.

5.2.4 Duration Dependence

The graphs of the baseline hazards evaluated at the means of the variables for different distributions by gender are shown in the Figures 7 and 8 under ILO and broad definitions of unemployment, respectively. For men, under the ILO definition the baseline hazard shows a declining trend about until the end of the second year (i.e. between 18 and 21 months) and then shows somewhat an increasing trend. The broad definition of unemployment shows a constant hazard with a dip in the 9-10th group which corresponds to the end of the third year. For women under the ILO definition there are dips at the end of second and third year in the baseline hazard but basically it remains constant, while the broad definition shows a constant trend with a dip in the 9-10th group corresponding to the end of the third year. The U-shape hazard implies that for men, the probability of finding a job initially decreases with staying in unemployment then increases. Under ILO definition for men the observation of initial negative duration dependence is considered to be a result of employers using unemployment duration as a signal about the potential productivity of the worker whereby people loose valuable skills in unemployment. The subsequent positive duration dependence is harder to explain. Such U-shaped duration dependence is also observed by Moffit (1985) for men benefit recipients in the US; by Ham and Rea (1987) for men in Canada and by van den Berg and Klaauw (2000) for men in France. Negative duration dependence is a well established result in the OECD countries.

The constant hazard implies the probability of finding a job does not change with time elapsed in unemployment. Such duration non-dependence is also observed by Meghir, Ioannides and Pissarides (1988) for men in Greece, by van den Berg and van Ours (1999) in France and by Alba-Ramirez (1998) for young women in Spain. Seernels (2001) finds in Ethiopia non-negative duration dependence for young men.

The finiteness of the unemployment benefits, the presence of active labor market policies, segmentation of the labor market and the business cycle effects are often used to explain non-decreasing duration dependence (Serneels, 2001). Unemployment benefits are not relevant for the data period used in this study. Active labor market policies were limited in scope and only in some geographical regions. However, family support is widespread in Turkey. The labor market in Turkey could be considered segmented between the formal sector (with good jobs) and the informal sector (with bad jobs) (Tansel 2000). Intuitively, duration non-dependence for women under ILO and broad definitions may mean that women may be waiting in unemployment for good jobs while being supported by their family. Similarly, the duration non-dependence observed for men under the broad definition of unemployment may imply that men may be queuing for a good job while being supported by their family but unwilling to take the bad jobs.

6. Conclusions

This paper examines the determinants of the probability of leaving unemployment in Turkey using the 2000-2001 Household Labor Force Surveys of the State Institute of Statistics. The hazard rates are estimated for men and women separately. Analysis

is carried out using two alternative definitions of unemployment namely the ILO definition and the broad definition which included those not seeking a job among the unemployed. Proportional Hazard Model, Log-Logistic and Log-Normal specifications are estimated taking into account grouped duration nature of the data. Inclusion of unobserved heterogeneity with Gaussian distribution is rejected by the data.

The results are broadly similar across various specifications and unemployment definitions. One of the main findings is that the probability of leaving unemployment for women is substantially lower than for men. This may indicate that women may have a high shadow value of home production activities and thus a high reservation wage. It may also be an indication of discrimination against women in the labor market so that they get less job offers.

The effects of the various covariates on the probability of leaving unemployment were similar across men and women except for the marital status. For men being married increased the hazard rate while for women being married decreased the hazard rate. Although, the unemployment rate is higher in urban Turkey than in the rural areas, living in an urban area increased the probability of leaving unemployment. This may be a factor behind the high rates of rural-urban migration in Turkey. The regional differences in the probability of leaving unemployment were not statistically significant except that men who live in the Southeast Anatolia had significantly higher exit rates than individuals in the other regions. This may indicate that unemployment is higher among those who can afford it. The probability of leaving unemployment increased with the level of education and decreased with age

as it is also observed in the OECD countries. The hazard rate is lower for men over 45 and for women over 35 compared to the young. This indicates men over 45 and women over 35 should be targeted for help. Further, re-schooling or training of the less educated youth may be an appropriate policy for increasing their hazard rate. The hazard rate was lower for the first-time job-seekers than for those who are not first-time job-seekers First-time job-seekers make use of the family support while waiting for the right job opening but those who had a job and lost it would be less likely to indulge in such a behavior. First-time job-seekers could be supported with counseling and job search strategies. Alternatively, policy makers could make the market more transparent to increase the probabilities on a good match.

The local labor market conditions were represented by the provincial unemployment rate. The probability of leaving unemployment was lower for those individuals who live in provinces with high rates of unemployment. Further, local labor market conditions were more important for females. This suggests that public programs could concentrate on those provinces with high rates of unemployment. Further increasing labor mobility between provinces could increase the hazard rate. Finally, there are differences in the shape of the baseline hazard between men and women. Baseline hazard for men shows a slight U-shape with initial negative duration dependence while for women we observe no duration dependence. This implies that behavior of men or their environment may be changing over the course of unemployment while that of women remains the same. The analysis suggest that policy makers should focus on women especially the married woman, unmarried men, individuals with low levels of education, individuals in their later years of

working lives, first-time job-seekers and the provinces with high levels of local unemployment rate.

From a broader perspective, there are a number of indications that unemployment in Turkey has characteristics of unemployment in a developing country. Several authors wrote about the unemployment in developing countries. Glewwe (1987) and Manning and Junankar (1998) in Indonesia, Rama (1998) in Tunisia, and Rama (2003) in Sri Lanka document that unemployment in developing countries is mostly an urban phenomenon; there is a queuing process for a good job; unemployment is often (but not always) concentrated among the better off and the first-time job-seekers. In this study several findings suggest these broad conclusions. Although the duration of unemployment is lower in urban areas the incidence of unemployment is significantly higher in urban areas. Long-term unemployment is concentrated among the high skilled (high school and two-year university training) in contrast with other OECD countries. Several results discussed suggest queuing process for a good job. First, when using the broad definition for men the coefficients on education are insignificant which suggests that the unemployed who are mostly high skilled are waiting for a good job rather than searching actively. Second, the broad definition of unemployment shows a constant hazard for both men and women. This too may suggest queuing. Third, the lower exit rates for clerical and related workers may imply their queuing for a public sector job. Although, the first-time job-seekers are about thirty percent of the total unemployed the hazard rate is lower for them. Southeast Anatolia which is one of the poorest regions has higher exit rate from unemployment. This may suggest that unemployment is higher among those who can

afford it. These findings point in the same direction as the broad conclusion for the developing countries.

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APPENDİX

Table 1: Individual Characteristics and Unemployment 2000-2003								
	Rate of Unemployment				Mean Unemployment Duration			
Category	2000	2001	2002	2003	2000	2001	2002	2003
Gender								
Male	6.6	8.8	10.9	10.7	6.9	6.8	8.7	8
Female	6.5	7.9	9.9	10.1	9.3	9.2	10.5	10.2
Age Group								
15-19	10.8	15.1	17	17.7	6.1	6.1	7.3	6
20-24	14.7	17.2	20.7	21.7	7.4	7.3	8.4	7.8
25-34	6.4	8.3	10.8	11.1	8	7.6	9.4	9.2
35-54	3.6	4.8	6.6	6	7.6	8	10.2	9.5
55 and over	1.2	1.5	2.3	2.1	11.1	9.3	12.1	12.1
Level of Education								
Non-graduate	4.4	4.3	5.9	8.3	5.9	6	7.8	6.9
Primary School	4.8	6.8	8.3	8.8	6.5	6.6	8.4	7.4
Middle School	10.3	14.6	14.9	14.6	7.3	7.8	9.7	9.4
High School	12.7	15.7	18.1	15.7	9.8	8.9	10.5	10.5
Voc. High School	12.7	16.2	18.4	15.5	8.9	7.9	9.4	10.1
University	7.4	8.2	11.9	12	7.5	8.2	10.3	9.7
Overall	6.6	8.3	10.4	10.4	7.5	7.4	9.1	8.6

Source: The rates and the durations are computed by the authors from the State Institute of Statistics (SIS) database on the web.

Notes: The data on the mean unemployment duration are obtained from the SIS database on the web. On the website the duration values are reported for the following month groups: 1-2, 3-5, 6-8, 9-11, 12-23, 24-35, and 36+.The group means are set at the following values 1.5, 4, 7, 14, 25 and 52 as was done by Tunali (2003).

Table 2: Unemployment Rates in Selected OECD Counries by Gender 1998-2002										
	Male					Female				
Country	**1998**	**1999**	**2000**	**2001**	**2002**	**1998**	**1999**	**2000**	**2001**	**2002**
Australia	8.4	7.3	6.6	6.9	6.3	7.3	6.7	5.9	6.3	5.9
Austria	4	3.7	3.4	3.5		4.6	3.9	3.9	3.8	
Canada	8.7	7.9	7	7.6	8.2	8	7.3	6.7	6.8	7.2
Czech Republic	5	7.3	7.4	6.8	5.9	8.2	10.5	10.6	9.9	9.1
Finland	11.1	9.8	9.2	8.7	9.1	12.1	10.8	10.6	9.7	9.1
France	10.2	10.2	8.5	7.1	7.9	13.8	13.6	11.9	10.8	10.1
Germany	8.8	8.1	7.6	7.9	8.8	9.9	8.9	8.1	8	8.4
Italy	9.1	8.8	8.2	7.4	7	16.4	15.8	14.6	13.1	12.3
Japan	4.3	5	5.1	5.4	5.8	4.2	4.7	4.7	5.1	5.4
New Zealand	7.7	7.1	6.2	5.5	5.1	7.5	6.6	5.9	5.3	5.4
Norway	3.2	3.4	3.6	3.6	4.2	3.3	3	3.2	3.4	3.7
Portugal	4.2	4.1	3.3	3.4	4.5	6.5	5.3	5.2	5.4	6.5
Spain	13.6	11	9.6	7.5	8.1	26.7	23.2	20.6	15.3	16.4
Sweden	8.8	7.5	6.3	5.4	5.7	8	6.7	5.4	4.7	4.7
Switzerland	3.2	2.7	2.3	1.7	2.9	4.2	3.6	3.2	3.5	3.1
Turkey	6.8	7.7	6.6	8.8	10.9	6.8	7.5	6.5	7.8	9.9
UK	6.9	6.8	6.1	5.3	5.7	5.3	5.1	4.8	4.2	4.4
USA	4.5	4.1	3.9	4.9	6	4.7	4.4	4.1	4.7	5.7
OECD Av.	6.4	6.2	5.8	6	6.7	7.6	7.3	6.9	6.7	7.2

Source: OECD Database.

TABLE 3: Unemployment Rates Under Alternative Definitions, Turkey, 2000-2001 (%)					
		2000		2001	
		ILO-Definition	Broad-Definition	ILO-Definition	Broad-Definition
All	Total	6.60	9.46	8.50	11.43
	Male	6.63	9.29	8.78	11.61
	Female	6.49	9.85	7.86	11.15
Urban	Total	8.80	12.39	11.50	15.36
	Male	7.77	10.70	10.27	13.54
	Female	13.00	19.40	16.76	23.15
Rural	Total	4.00	5.96	4.80	6.54
	Male	4.92	7.27	6.46	8.64
	Female	2.11	3.27	1.79	2.81

Source: Computed by the authors using HLFS 2000 and 2001

Notes: Broad Unemployment is obtained by dropping the criterion of seeking work.

Table 4: Unemployment Duration by Gender-, Turkey 2000-2001 (%)							
		N	<=3 month(%)	4-6 month	7-9 month (%)	10-12 months (%)	More than 12 months (%)
ILO definition	Male	3532	56.94	20.55	4.39	9.23	8,9
	Female	1302	44.09	20.28	4.22	16.74	14,6
Broad definition	Male	4956	41.53	24.64	6.72	13.46	13,66
	Female	2027	29.26	21.81	6.27	21.36	21,3

Source: Computed by the authors using the raw data from HLFS 2000 and 2001, first and second quarters.

Notes: See Table 3.

Table 5: Distribution of Unemployment Duration by Age, Turkey 2000-2001, (%).

ILO definition

	N	<=3 months (%)	4-6 months (%)	7-9 month	10-12 months (%)	More than 12 months
	4834	53.48	20.48	4.34	11.25	10.45
Age1519	843	54.33	21.95	5.1	11.51	7.13
Age2024	1208	52.9	18.63	5.13	11.67	11.67
Age2534	1345	53.23	20.07	4.31	11.23	11.15
Age3544	855	57.43	20.23	3.16	9.71	9.47
Age4554	444	50.0	23.2	2.7	13.06	11.03
Age55pl	139	42.45	24.46	5.76	10.07	17.27

Broad definition

	N	<=3 months (%)	4-6 months (%)	7-9 month	10-12 months (%)	More than 12 months
Total	6983	37.96	23.81	6.59	15.75	15.88
Age1519	1254	37.48	25.68	8.37	17.38	11.08
Age2024	1794	36.62	22.24	7.19	16.39	17.56
Age2534	1925	38.29	23.38	6.18	14.34	17.82
Age3544	1162	43.2	24.35	4.99	13.34	14.11
Age4554	650	34.77	24.77	5.69	18.77	16.00
Age55pl	198	29.8	24.24	6.06	17.68	22.23

Source: See Table 3.
Notes: See Table 3.

Table 6: Distribution of Unemployment Duration by Education. Turkey 2000-2001. (%).

ILO definition

	N	<=3 months (%)	4-6 months (%)	7-9 month	10-12 months (%)	More than 12 months
Total	4834	53.48	20.48	4.34	11.25	10.45
Under Primary	280	53.93	24.64	3.57	9.29	8.57
Primary	2303	57.27	20.1	3.43	10.64	8.55
Middle School	670	54.18	21.79	4.33	9.7	10.00
High School	807	46.1	19.33	6.2	12.76	15.62
Voc.High Sc.	414	50.0	20.53	4.35	10.87	14.25
Two Year University	137	43.07	17.52	8.03	17.52	13.87
Four Years Univ. and over	223	51.12	21.08	5.83	16.14	5.82

Broad Definition

	N	<=3 months (%)	4-6 months (%)	7-9 month	10-12 months (%)	More than 12 months
Total	6983	37.96	23.81	6.59	15.75	15.88
Under Primary	402	39.3	29.85	5.72	12.44	12.69
Primary	3138	42.73	23.77	5.96	13.93	13.6
Middle School	968	38.53	24.38	5.99	15.39	15.70
High School	1352	28.4	23.37	7.47	19.6	21.14
Voc.High Sc.	629	34.34	20.83	7	17.81	20.03
Two Year University	196	31.12	21.94	10.2	18.37	18.36
Four Years Univ. and over	298	39.6	23.83	9.06	17.11	10.41

Source: See Table 3.
Notes: See Table 3.

Table 7: Log Rank Test of Differences in Hazard Rates of Selected Labor Market Groups Under ILO and Broad Definitions of Unemployment

	Calculated $X^2(1)$ Statistic			*Calculated $X^2(1)$ Statistic*		
	ILO DEFINITION			**BROAD DEFINITION**		
LABOR FORCE GROUPS	ALL	MALE	FEMALE	ALL	MALE	FEMALE
Male/Female	214.6***	-	-	321.6***	-	-
Age Group	29.15***	26.32***	4.16	31.55***	33.32***	3.81
First-time/Others	109.9***	42.04***	11.89***	137.86***	46.64***	13.99***
Married/Others	74.2***	44.25***	5.42**	83.8***	49.40***	5.85**
Graduated from University/Others	2.44	2.67*	9.22***	0.34	1.50	17.39***
Lives in Urban Areas/Others	6.54***	1.26	0.44	20.63***	10.22***	0.12

*** Significant at 1 % ; ** Significant at 5 % ; * Significant at 10 %

Note: Age groups are: age 15-19, 20-24, 25-34, 35-44, 45-54, above 55

Table 8: Testing For Proportionality -ILO Definition-					
Proportional Hazard Model and Exponential Model					
	Proportional Hazard Model	Exponential Model	**LR test PH& Exponential**	Critical Value	**Decision**
All	-3057,11	-3179,21	244,21	19,7	**Accept PH**
Male	-2553,39	-2664,62	222,46	19,7	**Accept PH**
Female	-454,98	-474,50	39,05	19,7	**Accept PH**
Proportional Hazard Model & Unrestricted Model with time varying Coefficients					
	PH Model	Non-PH	LR test Non-PH and PH	Critical Value	**Decision**
All	-3057,11	-2848,09	418,04	373,08	***Reject PH***
Male	-2553,39	-2371,99	362,78	349,65	***Reject PH***
Female	-454,98	-339,37	231,20	349,65	**Accept PH**

Table 9: Testing For Proportionality -Broad Definition-					
Proportional Hazard Model and Exponential Model					
	Proportional Hazard Model	Exponential Model	**LR test PH& Exponential**	Critical Value	**Decision**
All	-4700,47	-4826,17	251,41	19,7	**Accept PH**
Male	-3888,43	-3986,63	196,41	19,7	**Accept PH**
Female	-765,94	-803,08	74,27	19,7	**Accept PH**
Proportional Hazard Model & Unrestricted Model with time varying Coefficients					
	PH Model	Non-PH	LR test Non-PH and PH	Critical Value	**Decision**
All	-4700,47	-4516,00	368,94	373,08	***Reject PH***
Male	-3888,43	-3731,16	314,53	349,65	**Accept PH**
Female	-765,94	-627,20	277,48	349,65	**Accept PH**

Table 10: Definition of the Variables Used in the Estimation of the Models:

1. "Urban" is a dummy variable taking value 1 if the man or women 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. Region of residence is a set of seven dummies:
   Central Anatolia (base category)
   Marmara
   Aegean
   Mediterranean
   Black Sea
   East Anatolia
   South East Anatolia

6. Education consists of a set of six dummies: The reference category includes those who are illiterate plus those who are literate but did not graduate from a school.
   "Prim": Primary School
   "Mid": Middle School
   "High": High School
   "VocHigh": Vocational High School
   "TwoYear": Two Years University
   "FourYearOver": Four Years University and over

7. Age is a set of six dummies:
   "age1519": Age 15-19 (base category)
   "age2024": Age 20-24
   "age2534": Age 25-34
   "age3544": Age 35-44
   "age4554": Age 45-54
   "age55pl":Age 55 and over.

8. "unemprate" is the local unemployment rate.

9. 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
10. "firstime" is a dummy variable taking value 1 for the first-time job-seekers, zero otherwise.
11. h's are period specific constants that measure the duration dependence.

Table 11: Group Duration Approach Under ILO Definition of Unemployment									
Variables	**ALL**			**MALE**			**FEMALE**		
	Proportional	**Log-log**	Log-Normal	Proportional	Log-log	**Log-Normal**	Proportional	**Log-log**	Log-Normal
urban	0.185**	**0.219****	0.131**	0.161*	0.191*	**0.115****	0.589	**0.623**	0.301*
	[0.090]	**[0.101]**	[0.053]	[0.094]	[0.105]	**[0.056]**	[0.419]	**[0.430]**	[0.182]
female	-0.522***	**-0.542*****	-0.249***						
	[0.118]	**[0.125]**	[0.061]						
married	0.407***	**0.453*****	0.251***	0.395***	0.442***	**0.242*****	-0.478*	**-0.530****	-0.282**
	[0.089]	**[0.100]**	[0.054]	[0.093]	[0.105]	**[0.058]**	[0.252]	**[0.256]**	[0.117]
FemMar	-1.015***	**-1.098*****	-0.570***						
	[0.230]	**[0.239]**	[0.111]						
Marmarra	0.061	**0.063**	0.038	0.042	0.041	**0.025**	0.253	**0.278**	0.136
	[0.107]	**[0.118]**	[0.061]	[0.114]	[0.126]	**[0.067]**	[0.386]	**[0.399]**	[0.172]
Aegean	0.030	**0.034**	0.029	0.010	0.007	**0.009**	0.223	**0.273**	0.158
	[0.121]	**[0.133]**	[0.070]	[0.128]	[0.143]	**[0.077]**	[0.426]	**[0.433]**	[0.184]
Mediterrian	0.110	**0.120**	0.068	0.086	0.087	**0.053**	0.337	**0.370**	0.157
	[0.119]	**[0.131]**	[0.068]	[0.126]	[0.140]	**[0.074]**	[0.425]	**[0.433]**	[0.182]
BlackSea	-0.132	**-0.156**	-0.093	-0.077	-0.094	**-0.056**	-0.345	**-0.348**	-0.172
	[0.130]	**[0.142]**	[0.074]	[0.139]	[0.153]	**[0.082]**	[0.444]	**[0.453]**	[0.193]
EastAnatolia	0.223	**0.235**	0.119	0.217	0.225	**0.115**	-0.079	**-0.099**	-0.108
	[0.137]	**[0.154]**	[0.083]	[0.140]	[0.159]	**[0.086]**	[1.067]	**[1.070]**	[0.456]
SouthEastAnatolia	0.469***	**0.513*****	0.271***	0.531***	0.597***	**0.327*****	-1.639	**-1.659**	-0.614
	[0.128]	**[0.145]**	[0.078]	[0.132]	[0.151]	**[0.083]**	[1.085]	**[1.127]**	[0.451]
Prim	1.055***	**1.107*****	0.527***	0.969***	1.006***	**0.494*****	2.647***	**2.886*****	1.010**
	[0.194]	**[0.214]**	[0.101]	[0.196]	[0.208]	**[0.100]**	[0.774]	**[0.991]**	[0.509]
Mid	0.934***	**0.976*****	0.460***	0.816***	0.833***	**0.395*****	3.278***	**3.538*****	1.289**
	[0.201]	**[0.221]**	[0.107]	[0.204]	[0.218]	**[0.108]**	[0.886]	**[1.091]**	[0.541]
High	0.906***	**0.959*****	0.466***	0.693***	0.706***	**0.336*****	3.637***	**3.919*****	1.468***
	[0.209]	**[0.232]**	[0.111]	[0.215]	[0.232]	**[0.114]**	[0.853]	**[1.073]**	[0.537]
VocHigh	1.104***	**1.164*****	0.560***	0.977***	1.012***	**0.497*****	3.140***	**3.422*****	1.276**
	[0.225]	**[0.247]**	[0.119]	[0.230]	[0.246]	**[0.122]**	[0.824]	**[1.036]**	[0.527]
TwoYear	1.847***	**1.962*****	0.964***	1.587***	1.670***	**0.830*****	4.447***	**4.799*****	1.930***
	[0.256]	**[0.283]**	[0.141]	[0.287]	[0.312]	**[0.162]**	[0.803]	**[1.030]**	[0.529]
FourYearOver	1.565***	**1.701*****	0.865***	1.008***	1.068***	**0.541*****	4.943***	**5.338*****	2.141***
	[0.272]	**[0.301]**	[0.145]	[0.319]	[0.345]	**[0.172]**	[0.905]	**[1.139]**	[0.569]
age2024	-0.015	**-0.002**	0.005	0.010	0.024	**0.025**	-0.522**	**-0.527***	-0.239*
	[0.112]	**[0.122]**	[0.063]	[0.125]	[0.138]	**[0.073]**	[0.266]	**[0.276]**	[0.127]
age2534	-0.184	**-0.200**	-0.106	-0.144	-0.157	**-0.080**	-0.616**	**-0.636****	-0.296**
	[0.116]	**[0.127]**	[0.066]	[0.129]	[0.143]	**[0.077]**	[0.284]	**[0.293]**	[0.132]
age3544	-0.157	**-0.179**	-0.108	-0.079	-0.091	**-0.048**	-0.976**	**-0.999****	-0.471**
	[0.130]	**[0.143]**	[0.076]	[0.143]	[0.160]	**[0.087]**	[0.418]	**[0.432]**	[0.189]
age4554	-0.528***	**-0.590*****	-0.328***	-0.456***	-0.514***	**-0.286*****	-1.226**	**-1.269****	-0.484*
	[0.154]	**[0.169]**	[0.089]	[0.166]	[0.183]	**[0.099]**	[0.564]	**[0.594]**	[0.275]
age55pl	-0.807***	**-0.889*****	-0.474***	-0.712***	-0.789***	**-0.415*****	-14.413***	**-14.772*****	-4.276***
	[0.225]	**[0.244]**	[0.125]	[0.231]	[0.253]	**[0.132]**	[0.515]	**[0.532]**	[0.228]
unemprate	-4.141***	**-4.586*****	-2.510***	-3.687***	-4.096***	**-2.286*****	-8.691***	**-9.323*****	-4.390***
	[0.780]	**[0.843]**	[0.428]	[0.814]	[0.887]	**[0.464]**	[2.720]	**[2.798]**	[1.183]
occup2	0.866***	**0.973*****	0.527***	0.957***	1.087***	**0.612*****	0.522	**0.520**	0.187
	[0.330]	**[0.367]**	[0.190]	[0.356]	[0.401]	**[0.213]**	[1.095]	**[1.116]**	[0.486]
occup3	-0.412*	**-0.393***	-0.155	-0.765***	-0.764**	**-0.338****	0.067	**0.075**	0.025
	[0.215]	**[0.224]**	[0.102]	[0.290]	[0.300]	**[0.138]**	[0.385]	**[0.386]**	[0.169]
occup4	1.073***	**1.161*****	0.598***	1.015***	1.106***	**0.593*****	1.095***	**1.177*****	0.551***
	[0.188]	**[0.202]**	[0.100]	[0.219]	[0.235]	**[0.120]**	[0.407]	**[0.432]**	[0.201]
occup5	0.500***	**0.553*****	0.299***	0.316	0.348	**0.196***	1.662***	**1.771*****	0.803***
	[0.193]	**[0.206]**	[0.100]	[0.223]	[0.237]	**[0.119]**	[0.413]	**[0.436]**	[0.206]
occup6	1.938***	**2.221*****	1.229***	1.805***	2.087***	**1.181*****	2.698***	**2.873*****	1.374***
	[0.191]	**[0.214]**	[0.110]	[0.219]	[0.243]	**[0.127]**	[0.576]	**[0.609]**	[0.292]
occup7	0.908***	**0.984*****	0.514***	0.770***	0.832***	**0.443*****	1.480***	**1.572*****	0.713***
	[0.177]	**[0.188]**	[0.091]	[0.206]	[0.220]	**[0.110]**	[0.376]	**[0.397]**	[0.184]
occup8	-0.272	**-0.254**	-0.083	-0.879	-0.894	**-0.395**	1.957***	**2.134*****	1.020***
	[0.418]	**[0.434]**	[0.201]	[0.542]	[0.556]	**[0.247]**	[0.714]	**[0.787]**	[0.378]
firsttime	-0.298***	**-0.334*****	-0.179***	-0.167	-0.187	**-0.097**	-0.876***	**-0.915*****	-0.414***
	[0.092]	**[0.099]**	[0.050]	[0.104]	[0.115]	**[0.061]**	[0.205]	**[0.213]**	[0.096]
h1	-2.370***	**-2.297*****	-1.295***	-2.127***	-2.040***	**-1.167*****	-4.129***	**-4.137*****	-2.051***
	[0.051]	**[0.054]**	[0.027]	[0.059]	[0.063]	**[0.031]**	[0.207]	**[0.215]**	[0.091]
h2	-2.615***	**-2.571*****	-1.441***	-2.361***	-2.303***	**-1.311*****	-4.348***	**-4.370*****	-2.166***
	[0.074]	**[0.080]**	[0.040]	[0.082]	[0.089]	**[0.046]**	[0.267]	**[0.279]**	[0.121]
h3	-3.800***	**-3.828*****	-2.063***	-3.599***	-3.628***	**-1.991*****	-5.177***	**-5.265*****	-2.574***
	[0.168]	**[0.174]**	[0.080]	[0.184]	[0.191]	**[0.088]**	[0.406]	**[0.416]**	[0.177]
h4	-2.355***	**-2.298*****	-1.300***	-2.191***	-2.136***	**-1.234*****	-3.552***	**-3.547*****	-1.786***
	[0.097]	**[0.106]**	[0.056]	[0.109]	[0.120]	**[0.065]**	[0.244]	**[0.255]**	[0.118]
h5	-3.706***	**-3.735*****	-2.020***	-3.582***	-3.617***	**-2.004*****	-4.659***	**-4.727*****	-2.287***
	[0.265]	**[0.269]**	[0.126]	[0.298]	[0.301]	**[0.139]**	[0.571]	**[0.589]**	[0.260]
h6	-4.394***	**-4.413*****	-2.261***	-4.207***	-4.227***	**-2.203*****	-5.599***	**-5.632*****	-2.633***
	[0.412]	**[0.421]**	[0.178]	[0.452]	[0.462]	**[0.194]**	[0.999]	**[1.011]**	[0.383]
h7	-5.387***	**-5.426*****	-2.746***	-5.023***	-5.065***	**-2.610*****	-17.862***	**-18.187*****	-5.996***
	[0.705]	**[0.706]**	[0.261]	[0.706]	[0.708]	**[0.270]**	[0.167]	**[0.171]**	[0.078]
h8	-2.524***	**-2.461*****	-1.367***	-2.463***	-2.416***	**-1.376*****	-3.286***	**-3.259*****	-1.671***
	[0.188]	**[0.204]**	[0.105]	[0.217]	[0.233]	**[0.122]**	[0.383]	**[0.400]**	[0.184]
h9	-4.007***	**-4.016*****	-2.099***	-4.364***	-4.390***	**-2.281*****	-3.871***	**-3.899*****	-2.024***
	[0.508]	**[0.526]**	[0.229]	[0.712]	[0.727]	**[0.303]**	[0.721]	**[0.721]**	[0.313]
h10	-2.651***	**-2.639*****	-1.509***	-2.300***	-2.259***	**-1.309*****	-17.831***	**-18.157*****	-5.897***
	[0.280]	**[0.296]**	[0.151]	[0.284]	[0.308]	**[0.165]**	[0.228]	**[0.229]**	[0.078]
h11	-2.135***	**-2.068*****	-1.189***	-1.851***	-1.772***	**-1.036*****	-3.919***	**-3.960*****	-2.055***
	[0.315]	**[0.346]**	[0.185]	[0.330]	[0.369]	**[0.207]**	[0.976]	**[0.968]**	[0.425]
h12	-1.976***	**-1.877*****	-1.095***	-1.986***	-1.913***	**-1.115*****	-2.729***	**-2.678*****	-1.394***
	[0.455]	**[0.502]**	[0.264]	[0.578]	[0.632]	**[0.346]**	[0.725]	**[0.765]**	[0.387]
Wald chi2	4500.699	**3801.386**	5154.559	3259.381	2651.756	**3509.326**	37615.296	**38736.722**	52575.548
Prob>chi2	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	**0.000**	0.000
AIC	0.537	**0.537**	0.537	0.664	0.663	**0.663**	0.266	**0.265**	0.267
Log-Likelihood	**-3057.11**	**-3056.556**	**-3057.178**	**-2553.385**	**-2552.768**	**-2551.883**	**-454.975**	**-454.575**	**-456.758**
Log-Likelihood (No-Occup)	-3187.891	**-3190.129**	-3194.473	-2672.061	-2673.891	**-2676.319**	-481.286	**-481.132**	-483.168
LR of Theta	0	**0**	0	0	0	**0**	0	**0**	0
Decision about unobserved het.	Reject	Reject	Reject	Reject	Reject	Reject	Reject	Reject	Reject
LR of Occupation	261.562	**267.146**	274.59	237.352	242.246	**248.872**	52.622	**53.114**	52.82
Prob>chi2 (p(7)=14.07)	0	**0**	0	0	0	**0**	0	**0**	0
Observations (person period)	11544	**11544**	11544	7816	7816	**7816**	3728	**3728**	3728

Standard errors in brackets

*** significant at 10%; ** significant at 5%; *** significant at 1%**

Table 12: Group Duration Approach Under Broad Definition of Unemployment

Variables	ALL			MALE			FEMALE		
	Proportional	Log-log	**Log-Normal**	Proportional	Log-log	**Log-Normal**	Proportional	Log-log	**Log-Normal**
urban	0.203***	0.230***	**0.132*** **	0.152**	0.170**	**0.097** **	0.812***	0.872***	**0.404*** **
	[0.072]	[0.079]	**[0.040]**	[0.076]	[0.083]	**[0.043]**	[0.271]	[0.293]	**[0.133]**
female	-0.618***	-0.649***	**-0.308*** **						
	[0.095]	[0.099]	**[0.047]**						
married	0.452***	0.496***	**0.268*** **	0.430***	0.473***	**0.253*** **	-0.431**	-0.461**	**-0.218** **
	[0.075]	[0.082]	**[0.043]**	[0.078]	[0.085]	**[0.046]**	[0.199]	[0.204]	**[0.089]**
FemMar	-0.955***	-1.017***	**-0.508*** **						
	[0.178]	[0.185]	**[0.085]**						
Marmarra	0.049	0.049	**0.027**	-0.000	-0.003	**-0.001**	0.332	0.343	**0.147**
	[0.088]	[0.096]	**[0.049]**	[0.094]	[0.102]	**[0.054]**	[0.282]	[0.291]	**[0.127]**
Aegean	0.027	0.029	**0.020**	0.034	0.037	**0.029**	0.076	0.082	**0.024**
	[0.103]	[0.113]	**[0.058]**	[0.110]	[0.121]	**[0.064]**	[0.314]	[0.323]	**[0.141]**
Mediterrian	0.013	0.013	**0.004**	-0.014	-0.019	**-0.010**	0.259	0.261	**0.085**
	[0.098]	[0.106]	**[0.054]**	[0.105]	[0.114]	**[0.059]**	[0.301]	[0.308]	**[0.131]**
BlackSea	-0.203*	-0.239**	**-0.142** **	-0.130	-0.157	**-0.093**	-0.455	-0.495	**-0.262***
	[0.105]	[0.113]	**[0.057]**	[0.112]	[0.121]	**[0.064]**	[0.312]	[0.320]	**[0.138]**
EastAnatolia	0.136	0.134	**0.060**	0.158	0.164	**0.085**	-0.696	-0.740	**-0.353**
	[0.108]	[0.118]	**[0.062]**	[0.111]	[0.123]	**[0.066]**	[0.546]	[0.553]	**[0.237]**
SouthEastAnatolia	0.214**	0.222*	**0.106***	0.254**	0.274**	**0.145** **	-0.696	-0.744	**-0.386***
	[0.104]	[0.115]	**[0.061]**	[0.108]	[0.120]	**[0.065]**	[0.508]	[0.522]	**[0.229]**
Prim	0.017	0.018	**0.008**	0.070	0.078	**0.045**	-0.536*	-0.555*	**-0.228***
	[0.093]	[0.099]	**[0.049]**	[0.099]	[0.105]	**[0.053]**	[0.298]	[0.309]	**[0.136]**
Mid	-0.138	-0.152	**-0.080**	-0.126	-0.140	**-0.074**	-0.171	-0.180	**-0.078**
	[0.108]	[0.114]	**[0.057]**	[0.114]	[0.121]	**[0.061]**	[0.337]	[0.350]	**[0.153]**
High	-0.056	-0.057	**-0.027**	-0.097	-0.103	**-0.050**	0.156	0.152	**0.055**
	[0.111]	[0.118]	**[0.058]**	[0.121]	[0.129]	**[0.065]**	[0.281]	[0.293]	**[0.129]**
VocHigh	-0.105	-0.099	**-0.033**	-0.173	-0.172	**-0.065**	0.193	0.190	**0.076**
	[0.136]	[0.144]	**[0.069]**	[0.153]	[0.162]	**[0.080]**	[0.319]	[0.330]	**[0.145]**
TwoYear	0.396**	0.418**	**0.211** **	0.362	0.395	**0.222***	0.436	0.454	**0.228**
	[0.194]	[0.207]	**[0.103]**	[0.235]	[0.255]	**[0.132]**	[0.376]	[0.398]	**[0.182]**
FourYearOver	0.495***	0.557***	**0.309*** **	0.209	0.244	**0.158**	1.252***	1.290***	**0.578*** **
	[0.180]	[0.195]	**[0.096]**	[0.218]	[0.237]	**[0.121]**	[0.356]	[0.375]	**[0.171]**
age2024	0.070	0.079	**0.042**	0.078	0.088	**0.054**	-0.155	-0.146	**-0.060**
	[0.090]	[0.097]	**[0.049]**	[0.100]	[0.109]	**[0.056]**	[0.208]	[0.217]	**[0.099]**
age2534	-0.182*	-0.197*	**-0.109** **	-0.133	-0.147	**-0.077**	-0.456**	-0.462**	**-0.214** **
	[0.096]	[0.103]	**[0.052]**	[0.107]	[0.117]	**[0.061]**	[0.226]	[0.236]	**[0.106]**
age3544	-0.301***	-0.328***	**-0.181*** **	-0.222*	-0.242*	**-0.128***	-0.909***	-0.935***	**-0.437*** **
	[0.109]	[0.118]	**[0.061]**	[0.121]	[0.132]	**[0.070]**	[0.345]	[0.356]	**[0.154]**
age4554	-0.811***	-0.886***	**-0.473*** **	-0.728***	-0.799***	**-0.425*** **	-1.123**	-1.155**	**-0.521** **
	[0.130]	[0.140]	**[0.072]**	[0.140]	[0.151]	**[0.079]**	[0.465]	[0.480]	**[0.210]**
age55pl	-1.245***	-1.356***	**-0.726*** **	-1.161***	-1.263***	**-0.672*** **	-0.379	-0.444	**-0.290**
	[0.195]	[0.206]	**[0.102]**	[0.203]	[0.214]	**[0.107]**	[1.016]	[0.998]	**[0.450]**
unemprate	-5.045***	-5.453***	**-2.806*** **	-4.839***	-5.258***	**-2.773*** **	-7.173***	-7.454***	**-3.499*** **
	[0.629]	[0.669]	**[0.330]**	[0.668]	[0.713]	**[0.361]**	[1.873]	[1.915]	**[0.811]**
occup2	0.588**	0.640**	**0.334** **	0.629**	0.694**	**0.375** **	0.048	0.071	**0.046**
	[0.258]	[0.283]	**[0.148]**	[0.276]	[0.305]	**[0.163]**	[1.069]	[1.117]	**[0.481]**
occup3	-1.082***	-1.096***	**-0.476*** **	-1.380***	-1.413***	**-0.641*** **	-0.710***	-0.723***	**-0.314*** **
	[0.170]	[0.176]	**[0.078]**	[0.229]	[0.237]	**[0.107]**	[0.268]	[0.276]	**[0.118]**
occup4	0.692***	0.735***	**0.371*** **	0.671***	0.721***	**0.379*** **	0.598*	0.627*	**0.279***
	[0.143]	[0.152]	**[0.075]**	[0.167]	[0.178]	**[0.091]**	[0.316]	[0.333]	**[0.150]**
occup5	0.075	0.088	**0.056**	-0.050	-0.048	**-0.014**	0.782**	0.809**	**0.344** **
	[0.149]	[0.157]	**[0.075]**	[0.171]	[0.181]	**[0.090]**	[0.325]	[0.337]	**[0.150]**
occup6	1.457***	1.636***	**0.905*** **	1.297***	1.463***	**0.823*** **	2.627***	2.773***	**1.319*** **
	[0.148]	[0.163]	**[0.083]**	[0.168]	[0.185]	**[0.097]**	[0.366]	[0.398]	**[0.196]**
occup7	0.453***	0.480***	**0.244*** **	0.362**	0.384**	**0.198** **	0.791***	0.815***	**0.348** **
	[0.134]	[0.141]	**[0.068]**	[0.155]	[0.165]	**[0.083]**	[0.294]	[0.307]	**[0.137]**
occup8	-0.395	-0.400	**-0.169**	-0.931**	-0.965**	**-0.455** **	1.512***	1.636***	**0.763*** **
	[0.322]	[0.337]	**[0.158]**	[0.411]	[0.424]	**[0.192]**	[0.558]	[0.610]	**[0.290]**
firsttime	-0.295***	-0.324***	**-0.179*** **	-0.196**	-0.213**	**-0.118** **	-0.531***	-0.565***	**-0.275*** **
	[0.073]	[0.079]	**[0.039]**	[0.082]	[0.090]	**[0.047]**	[0.159]	[0.164]	**[0.072]**
h1	-2.673***	-2.622***	**-1.460*** **	-2.432***	-2.367***	**-1.336*** **	-3.921***	-3.906***	**-2.043*** **
	[0.047]	[0.049]	**[0.024]**	[0.055]	[0.057]	**[0.028]**	[0.175]	[0.178]	**[0.075]**
h2	-2.673***	-2.627***	**-1.465*** **	-2.422***	-2.360***	**-1.333*** **	-3.916***	-3.923***	**-2.068*** **
	[0.056]	[0.060]	**[0.030]**	[0.064]	[0.068]	**[0.034]**	[0.188]	[0.195]	**[0.086]**
h3	-3.606***	-3.615***	**-1.957*** **	-3.351***	-3.354***	**-1.843*** **	-4.821***	-4.854***	**-2.475*** **
	[0.109]	[0.112]	**[0.052]**	[0.118]	[0.122]	**[0.058]**	[0.322]	[0.325]	**[0.133]**
h4	-2.314***	-2.239***	**-1.267*** **	-2.147***	-2.068***	**-1.185*** **	-3.005***	-2.990***	**-1.655*** **
	[0.069]	[0.074]	**[0.038]**	[0.079]	[0.086]	**[0.045]**	[0.167]	[0.173]	**[0.081]**
h5	-2.665***	-2.619***	**-1.458*** **	-2.471***	-2.421***	**-1.369*** **	-3.415***	-3.400***	**-1.847*** **
	[0.114]	[0.122]	**[0.061]**	[0.126]	[0.135]	**[0.070]**	[0.291]	[0.298]	**[0.130]**
h6	-3.487***	-3.479***	**-1.867*** **	-3.242***	-3.228***	**-1.760*** **	-4.514***	-4.518***	**-2.277*** **
	[0.220]	[0.228]	**[0.104]**	[0.239]	[0.249]	**[0.117]**	[0.591]	[0.602]	**[0.235]**
h7	-4.552***	-4.567***	**-2.333*** **	-4.337***	-4.353***	**-2.270*** **	-5.404***	-5.419***	**-2.621*** **
	[0.409]	[0.414]	**[0.170]**	[0.448]	[0.454]	**[0.188]**	[1.005]	[1.013]	**[0.359]**
h8	-2.189***	-2.081***	**-1.156*** **	-2.120***	-2.026***	**-1.150*** **	-2.549***	-2.477***	**-1.396*** **
	[0.145]	[0.161]	**[0.084]**	[0.171]	[0.189]	**[0.101]**	[0.287]	[0.304]	**[0.141]**
h9	-18.509***	-19.018***	**-6.079*** **	-18.625***	-18.460***	**-5.851*** **	-17.138***	-18.330***	**-5.589*** **
	[0.087]	[0.083]	**[0.028]**	[0.112]	[0.119]	**[0.055]**	[0.175]	[0.166]	**[0.062]**
h10	-18.509***	-19.018***	**-6.079*** **	-18.625***	-18.460***	**-5.851*** **	-17.138***	-18.330***	**-5.589*** **
	[0.087]	[0.083]	**[0.028]**	[0.112]	[0.119]	**[0.055]**	[0.175]	[0.166]	**[0.062]**
h11	-2.151***	-2.073***	**-1.176*** **	-1.902***	-1.813***	**-1.045*** **	-3.062***	-3.041***	**-1.689*** **
	[0.229]	[0.252]	**[0.134]**	[0.249]	[0.277]	**[0.155]**	[0.585]	[0.602]	**[0.272]**
h12	-2.263***	-2.176***	**-1.238*** **	-2.265***	-2.193***	**-1.248*** **	-2.384***	-2.377***	**-1.422*** **
	[0.359]	[0.389]	**[0.197]**	[0.451]	[0.485]	**[0.253]**	[0.564]	[0.569]	**[0.281]**
Wald chi2	105288.740	127194.340	**165284.660**	64225.820	55968.746	**34276.947**	32713.691	48105.307	**48423.164**
Prob>chi2	0	0	**0**	0	0	**0**	0	0	**0**
AIC	**0.482**	**0.482**	**0.481**	**0.610**	**0.610**	**0.609**	**0.237**	**0.237**	**0.237**
Log-Likelihood	**-4700.467**	**-4697.832**	**-4693.231**	**-3888.426**	**-3886.942**	**-3884.593**	**-765.944**	**-765.767**	**-764.824**
Log-Likelihood (No-Occup)	-4907.32	-4906.176	**-4903.736**	-4064.397	-4064.068	**-4063.319**	-816.988	-816.785	**-815.887**
LR of Theta	0	**0**	0	0	0	**0**	0	**0**	0
Decision about unobserved het.	Reject	Reject	Reject	Reject	Reject	Reject	Reject	Reject	Reject
LR of Occupation	413.706	416.688	**421.01**	351.942	354.252	**357.452**	102.088	102.036	**102.126**
Prob>chi2 (p(7)=14.07)	0	0	**0**	0	0	**0**	0	0	**0**
Observations (person period)	19672	19672	**19672**	12883	12883	**12883**	6789	6789	**6789**

Standard errors in brackets

*** significant at 10%; ** significant at 5%; *** significant at 1%**

Table 13: The Predicted Hazard Rates for the Individuals with Selected Characteristics

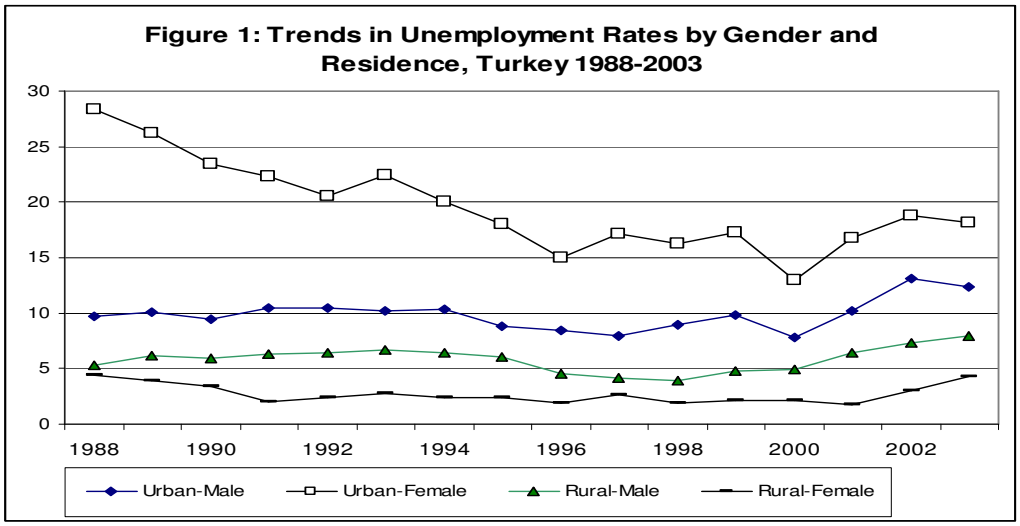
	MALE										FEMALE									
	ILO					Broad					ILO					Broad				
Proportional Hazard	Age1519	Age2024	Age2534	Age3544	Age4554	Age1519	Age2024	Age2534	Age3544	Age4554	Age1519	Age2024	Age2534	Age3544	Age4554	age1519	Age2024	Age2534	Age3544	Age4554
Non-graduate	11,32	11,31	9,26	9,34	6,23	10,95	11,65	9,10	8,13	4,96	2,34	2,33	1,91	1,93	1,29	2,29	2,44	1,90	1,70	1,04
Primary School	17,14	17,12	14,02	14,14	9,42	12,80	13,62	10,65	9,51	5,80	3,54	3,53	2,89	2,92	1,95	2,68	2,85	2,23	1,99	1,21
Middle Sc.	17,02	17,00	13,92	14,04	9,36	11,24	11,95	9,34	8,35	5,09	3,51	3,51	2,87	2,90	1,93	2,35	2,50	1,95	1,75	1,06
High Sc.	16,20	16,18	13,25	13,36	8,91	11,96	12,73	9,94	8,88	5,41	3,34	3,34	2,74	2,76	1,84	2,50	2,66	2,08	1,86	1,13
Voc. High Sc.	19,52	19,50	15,97	16,10	10,73	13,20	14,04	10,97	9,80	5,97	4,03	4,02	3,30	3,32	2,22	2,76	2,94	2,30	2,05	1,25
Two-Years Univ.	41,48	41,44	33,94	34,22	22,81	19,53	20,78	16,24	14,51	8,84	8,56	8,55	7,01	7,06	4,71	4,08	4,35	3,40	3,03	1,85
Four Years Univ.	NA	36,39	29,80	30,05	20,03	NA	22,30	17,43	15,57	9,49	NA	7,51	6,15	6,20	4,14	4,38	4,67	3,65	3,26	1,98
Log-Logistic	Age1519	Age2024	Age2534	Age3544	Age4554	Age1519	Age2024	Age2534	Age3544	Age4554	Age1519	Age2024	Age2534	Age3544	Age4554	age1519	Age2024	Age2534	Age3544	Age4554
Non-graduate	12,23	12,32	9,81	9,81	6,26	11,95	12,82	9,80	8,65	5,03	2,27	2,29	1,82	1,82	1,16	2,28	2,44	1,87	1,65	0,96
Primary School	19,37	19,52	15,53	15,53	9,91	14,16	15,19	11,60	10,25	5,96	3,60	3,63	2,89	2,89	1,84	2,70	2,90	2,21	1,95	1,14
Middle Sc.	19,28	19,43	15,46	15,46	9,86	12,29	13,18	10,07	8,90	5,17	3,58	3,61	2,87	2,88	1,83	2,34	2,51	1,92	1,70	0,99
High Sc.	18,39	18,53	14,75	14,75	9,41	13,21	14,17	10,82	9,56	5,56	3,42	3,45	2,74	2,74	1,75	2,52	2,70	2,06	1,82	1,06
Voc. High Sc.	22,60	22,78	18,13	18,13	11,56	14,76	15,83	12,10	10,69	6,21	4,20	4,23	3,37	3,37	2,15	2,81	3,02	2,31	2,04	1,18
Two-Years Univ.	51,15	51,54	41,02	41,03	26,17	22,14	23,75	18,15	16,03	9,32	9,51	9,58	7,63	7,63	4,87	4,22	4,53	3,46	3,06	1,78
Four Years Univ.	NA	46,93	37,35	37,36	23,83	NA	26,49	20,24	17,88	10,40	NA	8,73	6,95	6,95	4,43	4,71	5,05	3,86	3,41	1,98
Log-Normal	Age1519	Age2024	Age2534	Age3544	Age4554	Age1519	Age2024	Age2534	Age3544	Age4554	Age1519	Age2024	Age2534	Age3544	Age4554	age1519	Age2024	Age2534	Age3544	Age4554
Non-graduate	30,41	30,62	26,92	26,66	20,90	30,24	31,42	27,12	25,30	19,05	13,20	13,30	11,69	11,57	9,07	13,43	13,96	12,05	11,24	8,46
Primary School	38,56	38,83	34,14	33,80	26,50	32,87	34,15	29,48	27,50	20,71	16,74	16,86	14,82	14,68	11,51	14,60	15,17	13,10	12,22	9,20
Middle Sc.	38,52	38,79	34,10	33,77	26,47	30,55	31,75	27,40	25,57	19,25	16,72	16,84	14,81	14,66	11,49	13,57	14,10	12,18	11,36	8,55
High Sc.	38,13	38,40	33,76	33,43	26,21	31,91	33,15	28,62	26,70	20,11	16,55	16,67	14,66	14,51	11,38	14,18	14,73	12,72	11,86	8,93
Voc. High Sc.	42,25	42,55	37,41	37,04	29,04	33,99	35,32	30,49	28,44	21,42	18,34	18,47	16,24	16,08	12,61	15,10	15,69	13,54	12,64	9,52
Two-Years Univ.	63,64	64,10	56,35	55,79	43,74	41,34	42,96	37,08	34,60	26,05	27,63	27,83	24,46	24,22	18,99	18,37	19,09	16,48	15,37	11,57
Four Years Univ.	NA	62,78	55,20	54,65	42,84	NA	46,58	40,21	37,51	28,25	NA	27,26	23,96	23,73	18,60	19,92	20,69	17,86	16,67	12,55

Table 14: The Predicted Hazard Rates for the Non-Married Individuals with Selected Characteristics

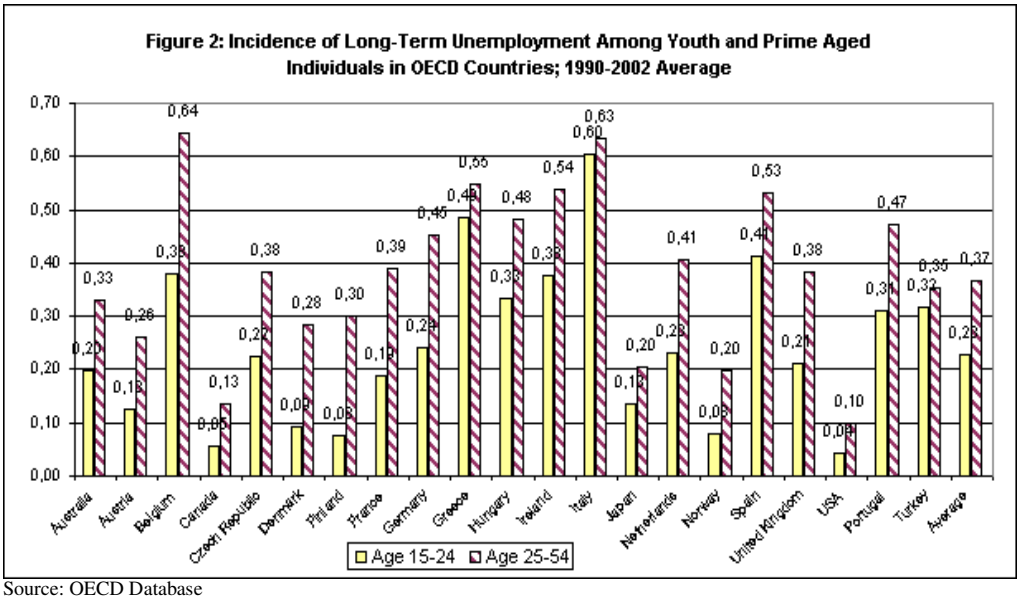
	ILO Definiton: Non-married&age 25-34						Broad Definiton: Non-Married& age 25-34					
	Proportional		Log-Logistic		Log-Normal		Proportional		Log-Logistic		Log-Normal	
Education Level	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Non-graduate	5,98	3,49	6,02	3,44	20,54	15,89	5,76	3,13	5,93	3,13	20,70	15,29
Primary	9,05	5,28	9,53	5,44	26,05	20,15	6,74	3,66	7,03	3,71	22,51	16,62
Mid	8,99	5,24	9,49	5,42	26,02	20,13	5,91	3,21	6,10	3,22	20,92	15,45
High	8,56	4,99	9,05	5,17	25,76	19,93	6,29	3,42	6,56	3,46	21,85	16,14
VocHigh	10,31	6,01	11,12	6,35	28,55	22,08	6,94	3,78	7,33	3,86	23,27	17,19
Two-Years	21,92	12,77	25,17	14,37	43,00	33,26	10,27	5,59	10,99	5,80	28,31	20,91
FourYears	19,25	11,22	22,92	13,09	42,12	32,58	11,03	6,00	12,26	6,46	30,69	22,67

Table 15: The Predicted Hazard Rates for the Rural Resident Individuals with Selected Characteristics

	ILO Definiton: Rural age 25-34						Broad Definiton: Rural age 25-34					
	Proportional		Log-Logistic		Log-Normal		Proportional		Log-Logistic		Log-Normal	
Education Level	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Non-graduate	7,61	1,57	7,76	1,44	23,46	10,19	7,48	1,56	7,83	1,49	23,84	10,59
Primary	11,52	2,38	12,29	2,29	29,75	12,92	8,74	1,83	9,28	1,77	25,92	11,52
Mid	11,44	2,36	12,23	2,27	29,72	12,90	7,67	1,60	8,05	1,54	24,09	10,70
High	10,89	2,25	11,67	2,17	29,42	12,77	8,17	1,71	8,65	1,65	25,16	11,18
VocHigh	13,13	2,71	14,34	2,67	32,60	14,15	9,01	1,89	9,67	1,84	26,80	11,91
Two-Years	27,90	5,76	32,46	6,04	49,10	21,32	13,33	2,79	14,51	2,77	32,60	14,48
FourYears	24,50	5,06	29,56	5,50	48,10	20,88	14,32	2,99	16,18	3,09	35,35	15,71



Source: SIS Database.



Source: OECD Database
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.
5) For the USA average value for the youth was calculated for 16 to 24 years of old

Figure 3:Turnbull's Survival Function under ILO-Definiton

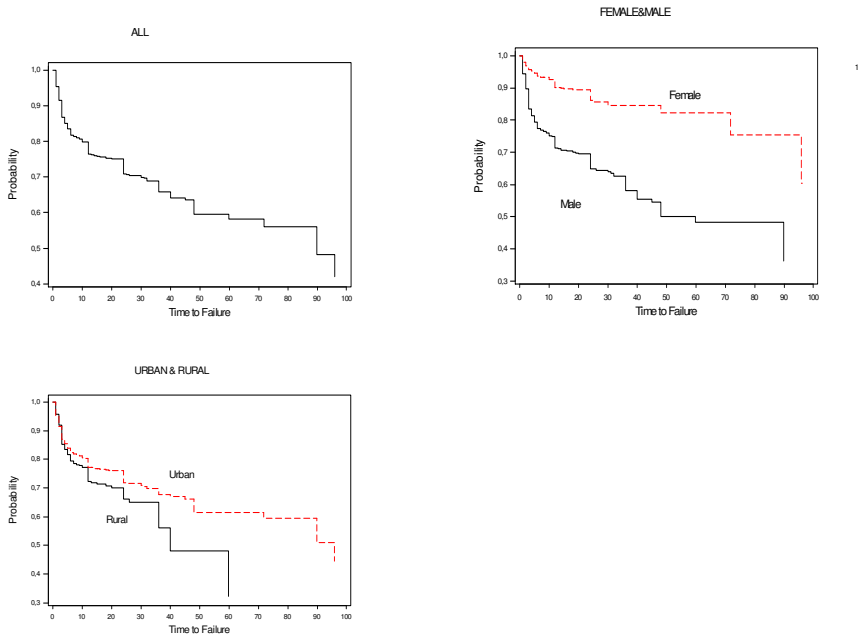


Figure 4:Turnbull's Survival Function under Broad-Definiton

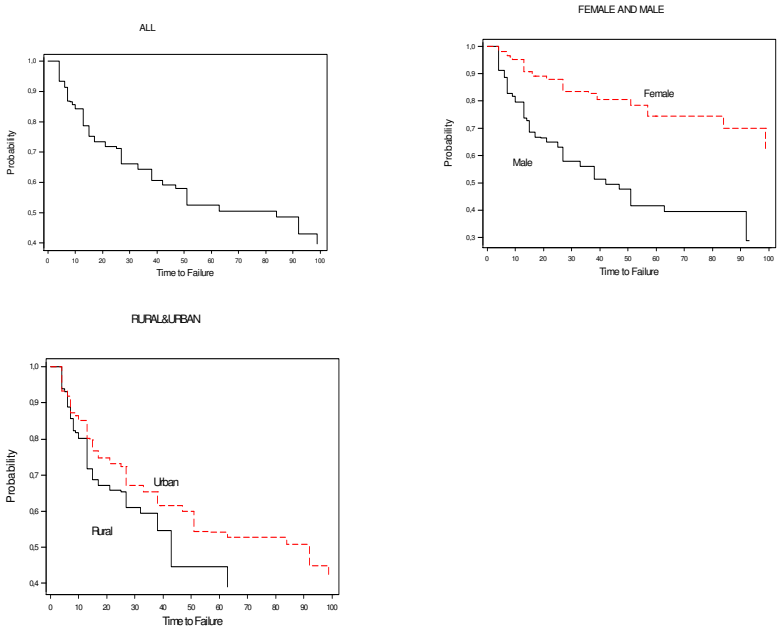


Figure 5: Smoothed Hazard Function under ILO Definition

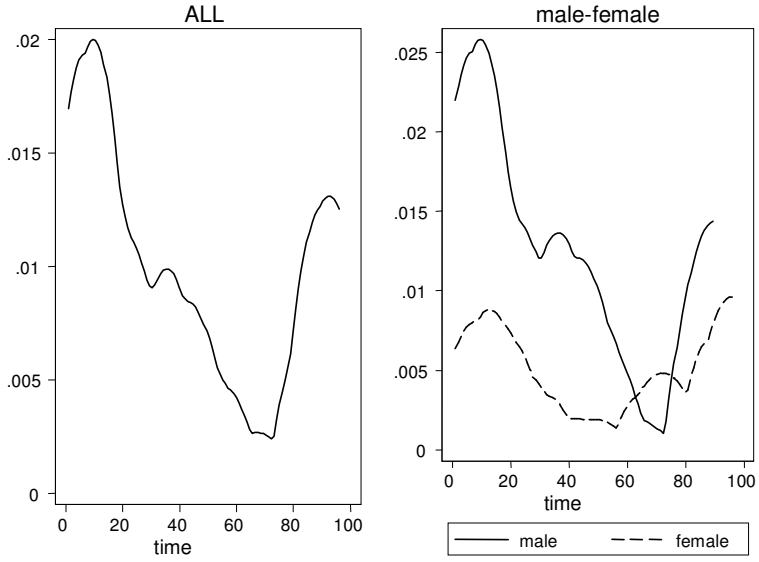


Figure 6: Smoothed Hazard Function under Broad Definition

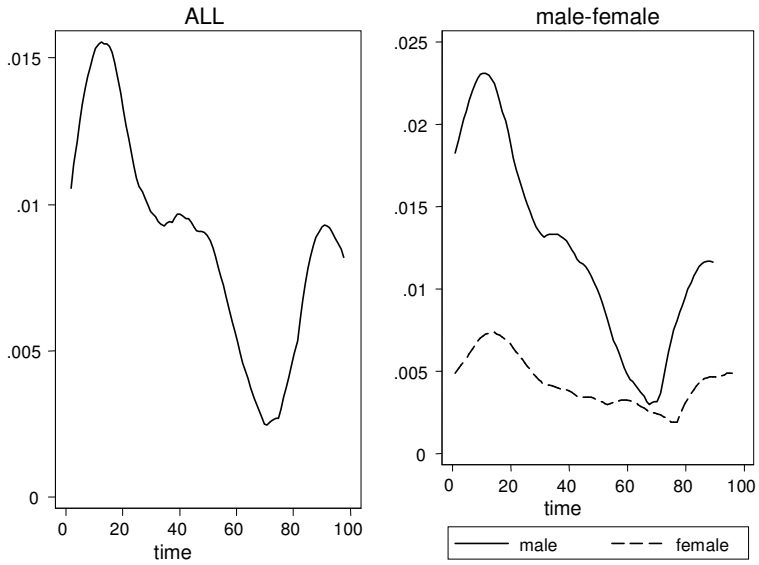


Figure 7: Baseline Hazard under ILO Definition: All-Male-Female

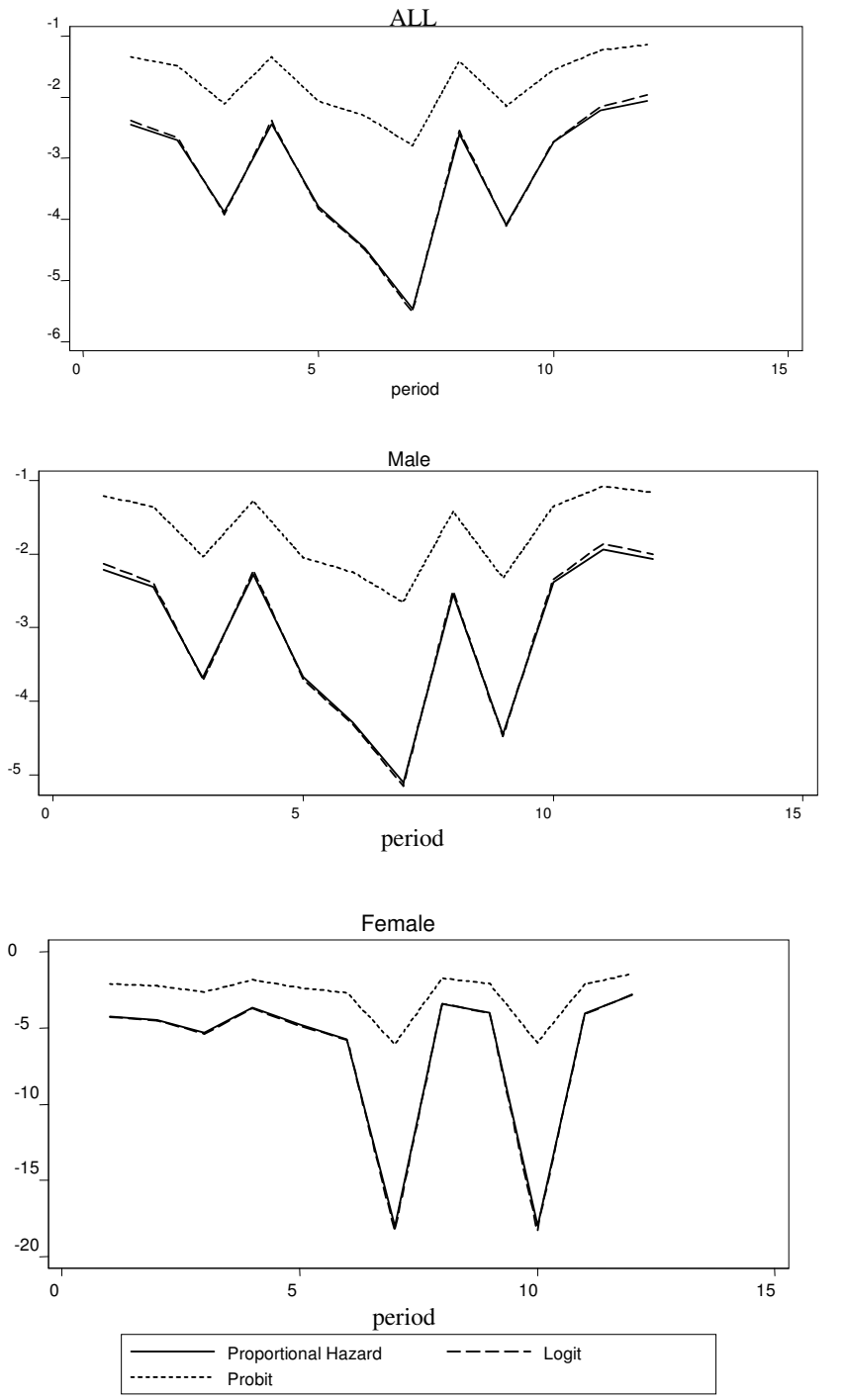


Figure 8:Baseline Hazard under Broad Definition
All-Male-Female