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Determinants of Unemployment Duration for Men and Women in Turkey

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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, controlling for the unobserved heterogeneity. 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 crisis. 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 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

[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 ISKUR, 2003).

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 the provinces with high levels of unemployment.

This paper is organized as follows. Section 2 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 3. Estimation results are provided in Section 4. Policy implications and conclusions appear in Section 5.

2. The Data and Unemployment Definitions

2.1. 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.

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). Approximately, half of the individuals surveyed in the first quarter of 2000 are re-interviewed in the second quarter of 2000. 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 minimum two times in two subsequent quarters or one year apart. We restrict the sample to individuals between 15-65 years of age.

2.2. 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). 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 the 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". The unemployment rates computed with the alternative definitions using the HLFS data for 2000 and 2001 are provided in Table 1. The rates are computed as percentages of individuals in each group.

We observe in Table 1 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, women experience higher unemployment rates than 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) [3]. 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. For the individuals who found job during

[3] 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.

the period of observation (for instance, between the first and second interviews) we have no information when they become employed. We only know that they found a job between the two interviews. The number of individuals who found a job between the periods of observations is 1089 and 1555, under ILO and broad definitions of unemployment, respectively. 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 2 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.

Table 3 shows the percentage distribution of unemployment duration by age group. We observe that when ILO definition is used, 10.45 percent of all unemployed people had been so for more than one year, which is called the long term unemployed. This percentage increases to 15.88 percent when the broad definition of unemployment is used. The percentage of the long-term unemployed is higher than the average for the age groups above 45 years. For instance, for the age age group 55plus this percentage is 17 according to ILO definition and increases to 22 when the broad definition is used.

Table 4 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. 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 data 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 survey were conducted in 2000 and 2001.

3. 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 t*he 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). 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) and Sueyoshi (1995). In this paper we take grouped nature of the unemployment duration data we have explicitly into account. We now briefly describe the alternative specifications about the hazard rate 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 traditional 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. The two other alternatives are log-logistic interval hazards and log-normal interval hazards model. 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 model that for a standard binary-logit regression model (Jenkins, 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).

3.4 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 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 (or gamma) 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.

4. ESTIMATION RESULTS

4.1. 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 readout or interval censored data. Figure 1 and 2 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 the women have longer unemployment durations than men. The survivor function for men declines more steeply than 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[4] 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 rural unemployed the same percentages are 71.66 and 71.6.

Figures 3 and 4 give the plots of the hazard function under ILO and broad definition of unemployment. As can be seen from the graphs for all data, the hazard rate

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

initially increases until about the 10th month, then starts to decrease until about the end of the 6th year (about 70th month) under each definitions. The hazard rate stays always below 2.5 percent for the ILO definition and below 1.5 percent for the broad definition of unemployment. If we look at the results for male and female samples separately, we observe that the hazard is always is larger for men than that for women. For both men and women under both the ILO and the broad definitions and the hazard rate first increases until about the 10th month then decreases until about 70th 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 5 gives the log-rank test results for different labor force groupings. We observe from the table that the equality of the survivor functions for men 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.

4.2. PARAMETRIC ESTIMATION

Tables 8 and 9 present the estimates of the PHM, Log-Logistic and Log-Normal grouped duration specifications for ILO and broad definitions of unemployment respectively. We have estimated the models with and without unobserved heterogeneity and tested for the inclusion of unobserved heterogeneity with LR tests since the models are nested. We found that in each case the inclusion of unobserved heterogeneity is rejected. Therefore, the Tables 8 and 9 report the results without

unobserved heterogeneity. The insignificance of unobserved heterogeneity is a common finding in studies that adopt the grouped duration data models (e.g. Carling *et al*., 1996; Boheim and Taylor, 2000). Grogan and van den Berg (2001) also find that unobserved heterogeneity is of no significant importance with the Russian data. 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 that are included are as follows in the order they appear in Tables 8 and 9. "Urban" is a dummy variable indicating an urban location for the unemployed individual where urban is defined as that location with population over 20.000 inhabitants. "Female" and "Married" are dummy variables indicating sex and the marital status of the individuals. "FemMar" is an interaction dummy variable indicating the married females. The next set of six dummy variables indicate various geographical regions of Turkey where the reference region is Central Anatolia. The next set of dummy variables indicate the levels of educational achievement of the unemployed individuals. The reference educational level includes those who are illiterate plus those who are literate but did not graduate from a school. "Prim" indicates graduates of primary school. "Mid" indicates graduates of middle school, "High" indicates graduates of high school, "VocHigh" indicates graduates of vocational high school, "TwoYear" indicates two years of college education and finally, "FourYearOver" indicates those with four years of college degree and over. The next set of dummy variables are five different age groups. The reference

category is Age 15-19. “Unemprate” is the provincial unemployment rate reflecting local labor market conditions. The next set of dummy variables indicate various occupations. The reference occupation includes those who are professionals and related workers. “Occup2” indicate administrative and managerial workers. “Occup3” indicate clerical and related workers. “Occup4” is sales workers. “Occup5” is service workers. “Occup6” is agricultural workers. “Occup7” is non-agricultural workers. Finally, “Occup8” indicates those workers not classified by occupation. “Firsttime” is a dummy variable indicating those unemployed individuals who are looking for a job for the first-time. h’s are period specific constants that measures the duration dependence. “Wald Chi2” is the Wald Chi-squared test statistic for the overall significance of the model. “AIC” is the Akaike’s Information Criterion. “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.

4.2.1 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 since the models are nested. The two test 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. PHM is the unrestricted model. The calculated LR test statistic that the baseline hazards are the same over the intervals are reported in

Tables 6 and 7 using the ILO and the broad definitions of unemployment. 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 models. 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 6 and 7 using the ILO and broad definitions of unemployment. 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 8 and 9. However, the AIC values for various models are very similar to each other rendering a very close choice. We have reported all the estimation results for each of the alternative definitions of unemployment[5]. 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,

$$AIC = \frac{-2 * \text{loglikelihood} + 2M}{n}$$

where, M is the number of covariates and n is the number of observations (see Hardin and Hilbe, 2001, p.45).

[5] In the Tables 8 and 9, the bold columns show the best estimation results among the alternative distributions.

4.2.2 The Covariate Effects:

We now turn to Tables 8 and 9 and interpret and compare the 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 increase 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 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. 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 while 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 those who are only the group of clerical and related workers (occup3) have significantly lower exit rates from unemployment than the professionals and related workers. 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.

4.2.3 Predicted Hazard Rates

Table 10 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 8 and 9. 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. 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 then for the 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 ILO definition and for four year university or higher graduates under 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 11 gives the predicted hazard rates for non-married urban men and women while Table 12 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.

4.2.4 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 2 and 3 under the 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, while 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. Essentially, we can talk about a slight U-shaped hazard for men and a constant hazard for women. This implies that for men, the probability of finding a job initially decreases with staying in unemployment then increases. The constant hazard for women implies that probability of finding a job does not change with elapsed duration in unemployment.

The 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. The duration non-dependence observed for women implies that the probability of getting 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. However, family support is widespread in Turkey. Active labor market policies were limited in scope and only in some geographical regions. However, 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 may mean that women may be waiting in unemployment for good jobs while being supported by their family. Negative duration dependence is a well established result in the OECD countries.

5. 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 finding 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.

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. Living in an urban area increased the probability of leaving unemployment which 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. 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 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 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. This implies that an important target group is the first-time job-seekers who could be supported with counseling and job search strategies.

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 the provinces with high levels of local unemployment rate.

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TABLE 1: Unemployment Rates Under Alternative Definitions, Turkey, 2000 and 2001					
		2000		2001	
		ILO-Definition	Broad-Definition	ILO-Definition	Broad-Definition
All	Total	7.78	11.59	8.45	11.56
	Male	7.29	10.58	8.06	10.84
	Female	9.36	14.78	9.70	13.80
Urban	Total	9.24	13.41	10.16	13.77
	Male	8.05	11.37	8.88	11.92
	Female	13.93	21.09	15.37	21.04
Rural	Total	4.07	6.88	4.43	6.24
	Male	5.02	8.23	5.68	7.68
	Female	2.04	3.97	2.04	3.45

Source: Computed by the authors using HLFS 2000 and 2001, first and second quarters.
Notes: Broad Unemployment is obtained by dropping the criterion of seeking work.

Table 2: 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: See Table 1.
Notes: See Table 1.

Table 3: 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 1.
Notes: See Table 1.

Table 4: 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 1.
Notes: See Table 1.

Table 5: 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 and Probability>Chi-squared			Calculated $X^2(1)$ Statistic and Probability>Chi-squared		
	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 6: 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 7: 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 8: 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 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 9: 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 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 10: 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
Under Primary Sch.	6.10	6.02	5.08	5.22	3.60	12.78	13.71	10.66	9.46	5.68	1.31	1.29	1.09	1.12	0.77	2.65	2.84	2.21	1.96	1.18
Primary School	17.53	17.28	14.58	14.99	10.33	13.00	13.95	10.85	9.62	5.78	3.77	3.71	3.13	3.22	2.22	2.70	2.89	2.25	2.00	1.20
Middle Sc.	15.54	15.31	12.93	13.29	9.16	11.13	11.94	9.28	8.24	4.95	3.34	3.29	2.78	2.86	1.97	2.31	2.48	1.93	1.71	1.03
High Sc.	15.11	14.89	12.57	12.92	8.91	12.09	12.97	10.08	8.95	5.38	3.25	3.20	2.70	2.78	1.92	2.51	2.69	2.09	1.86	1.12
Voc. High Sc.	18.41	18.14	15.31	15.74	10.85	11.51	12.34	9.60	8.51	5.12	3.96	3.90	3.29	3.38	2.33	2.39	2.56	1.99	1.77	1.06
Two-Years Univ.	38.71	38.15	32.20	33.10	22.82	19.00	20.38	15.84	14.06	8.45	8.32	8.20	6.92	7.12	4.91	3.94	4.23	3.29	2.92	1.75
Four Years Univ.	29.20	28.78	24.29	24.96	17.21	20.97	22.49	17.49	15.52	9.32	6.28	6.19	5.22	5.37	3.70	4.35	4.67	3.63	3.22	1.93
Log-Logistic	Age1519	Age2024	Age2534	Age3544	Age4554	Age1519	Age2024	Age2534	Age3544	Age4554	Age1519	Age2024	Age2534	Age3544	Age4554	Age1519	Age2024	Age2534	Age3544	Age4554
Under Primary Sch.	6.55	6.54	5.36	5.47	3.63	14.16	15.31	11.62	10.20	5.84	1.27	1.27	1.04	1.06	0.70	2.67	2.89	2.20	1.93	1.10
Primary School	19.81	19.77	16.23	16.56	10.98	14.42	15.60	11.84	10.38	5.95	3.84	3.84	3.15	3.21	2.13	2.72	2.95	2.24	1.96	1.12
Middle Sc.	17.39	17.35	14.24	14.53	9.63	12.16	13.15	9.98	8.76	5.01	3.37	3.37	2.76	2.82	1.87	2.30	2.49	1.89	1.65	0.95
High Sc.	17.09	17.05	13.99	14.28	9.47	13.37	14.46	10.97	9.63	5.51	3.31	3.31	2.71	2.77	1.84	2.53	2.73	2.07	1.82	1.04
Voc. High Sc.	20.97	20.93	17.18	17.53	11.62	12.82	13.86	10.52	9.23	5.28	4.07	4.06	3.33	3.40	2.25	2.42	2.62	1.99	1.74	1.00
Two-Years Univ.	46.58	46.48	38.15	38.93	25.81	21.49	23.25	17.65	15.48	8.86	9.04	9.02	7.40	7.55	5.01	4.06	4.39	3.33	2.93	1.67
Four Years Univ.	35.88	35.80	29.38	29.98	19.88	24.72	26.74	20.29	17.80	10.19	6.96	6.95	5.70	5.82	3.86	4.67	5.05	3.83	3.36	1.93
Log-Normal	Age1519	Age2024	Age2534	Age3544	Age4554	Age1519	Age2024	Age2534	Age3544	Age4554	Age1519	Age2024	Age2534	Age3544	Age4554	Age1519	Age2024	Age2534	Age3544	Age4554
Under Primary Sch.	22.99	23.12	20.68	20.65	16.57	32.93	34.36	29.54	27.47	20.52	10.13	10.19	9.11	9.10	7.30	14.57	15.20	13.07	12.15	9.08
Primary School	38.95	39.16	35.03	34.97	28.06	33.21	28.58	26.58	27.70	20.69	17.16	17.26	15.44	15.41	12.37	14.69	12.65	13.18	12.25	9.16
Middle Sc.	36.41	36.61	32.75	32.69	26.23	30.41	31.73	27.27	25.36	18.95	16.05	16.14	14.43	14.41	11.56	13.45	14.04	12.07	11.22	8.38
High Sc.	36.63	36.83	32.94	32.89	26.39	32.07	33.46	28.77	26.75	19.99	16.14	16.23	14.52	14.50	11.63	14.19	14.81	12.73	11.84	8.84
Voc. High Sc.	40.27	40.49	36.22	36.16	29.01	31.87	33.25	28.58	26.58	19.86	17.75	17.84	15.96	15.94	12.79	14.10	14.71	12.65	11.76	8.79
Two-Years Univ.	60.31	60.64	54.24	54.15	43.45	40.68	42.44	36.49	33.93	25.35	26.58	26.72	23.90	23.87	19.15	18.00	18.78	16.14	15.01	11.22
Four Years Univ.	54.60	54.91	49.11	49.03	39.34	44.84	46.79	40.22	37.40	27.95	24.07	24.20	21.64	21.61	17.34	19.84	20.70	17.80	16.55	12.36

Table 11: The Predicted Hazard Rates for the Non-Married Individuals with Selected Characteristics

	ILO Definiton -Non-Married-						Broad Definiton -Non-Married-					
	Proportional		Log-Logistic		Log-Normal		Proportional		Log-Logistic		Log-Normal	
Education Level	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Under Primary Sch.	3.38	2.00	3.41	1.98	16.08	12.54	6.78	3.66	7.08	3.70	22.60	16.62
Primary	9.70	5.76	10.31	6.00	27.24	21.24	6.90	3.72	7.21	3.77	22.79	16.75
Mid	8.60	5.10	9.05	5.26	25.47	19.85	5.91	3.18	6.08	3.18	20.87	15.34
High	8.36	4.96	8.89	5.17	25.62	19.97	6.42	3.46	6.68	3.49	22.01	16.18
VocHigh	10.19	6.05	10.92	6.35	28.17	21.96	6.11	3.29	6.41	3.35	21.87	16.08
Two-Years	21.43	12.71	24.24	14.10	42.18	32.88	10.08	5.43	10.75	5.61	27.92	20.52
FourYears	16.16	9.59	18.67	10.86	38.20	29.77	11.13	6.00	12.36	6.46	30.78	22.62

Table 12: The Predicted Hazard Rates for the Rural Resident Individuals with Selected Characteristics

	ILO Definiton -Rural-						Broad Definiton -Rural-					
	Proportional		Log-Logistic		Log-Normal		Proportional		Log-Logistic		Log-Normal	
Education Level	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Under Primary Sch.	1.53	0.91	1.44	0.84	10.26	8.00	3.35	1.80	3.34	1.74	15.58	11.45
Primary	8.06	4.78	8.28	4.82	23.90	18.63	5.63	3.04	5.73	2.99	19.97	14.68
Mid	7.15	4.24	7.27	4.23	22.34	17.42	4.82	2.60	4.83	2.52	18.29	13.45
High	6.95	4.12	7.14	4.15	22.48	17.52	5.24	2.82	5.31	2.77	19.29	14.18
VocHigh	8.47	5.02	8.77	5.10	24.71	19.26	4.98	2.69	5.09	2.66	19.17	14.09
Two-Years	17.80	10.56	19.47	11.33	37.01	28.85	8.23	4.44	8.54	4.46	24.47	17.99
FourYears	13.43	7.97	15.00	8.72	33.51	26.12	9.08	4.90	9.82	5.13	26.97	19.83

Figure 1:Turnbull's Survival Function under ILO-Definiton

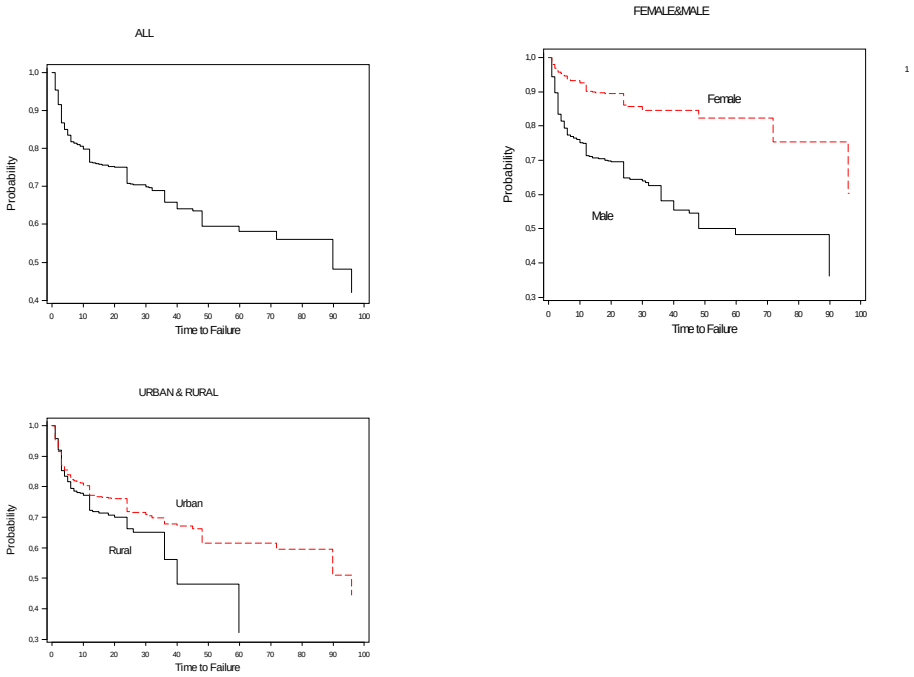


Figure 2:Turnbull's Survival Function under Broad-Definiton

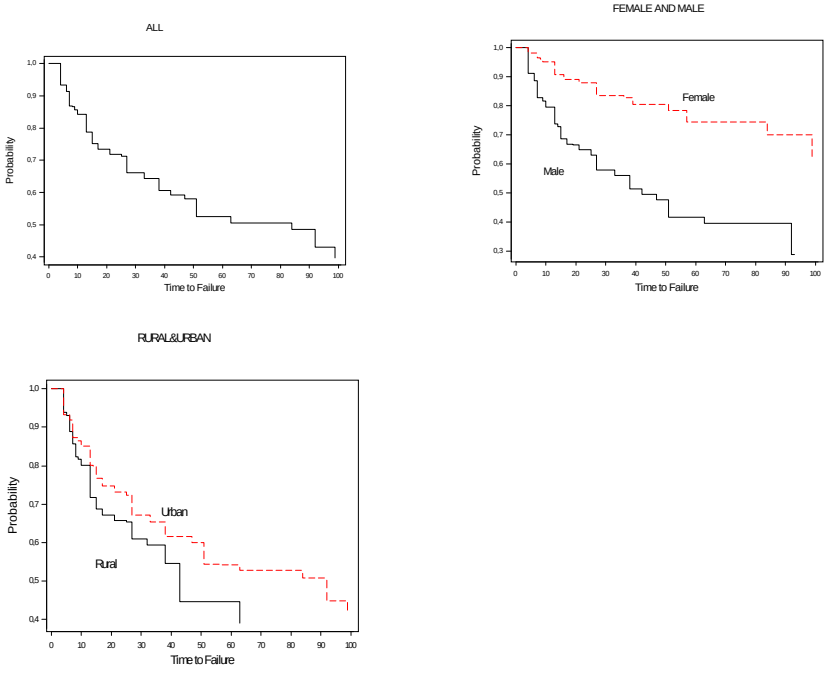


Figure 3: Smoothed Hazard Function under ILO Definition

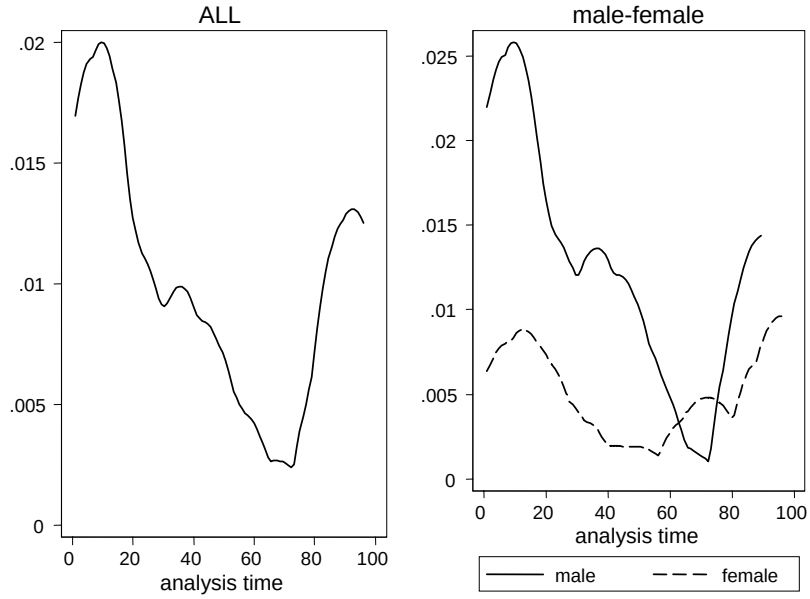


Figure 4: Smoothed Hazard Function under Broad Definition

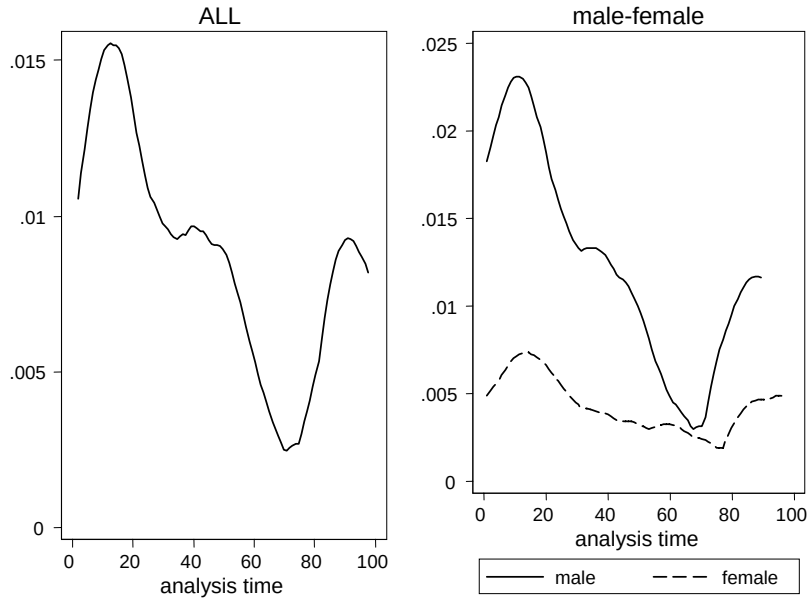
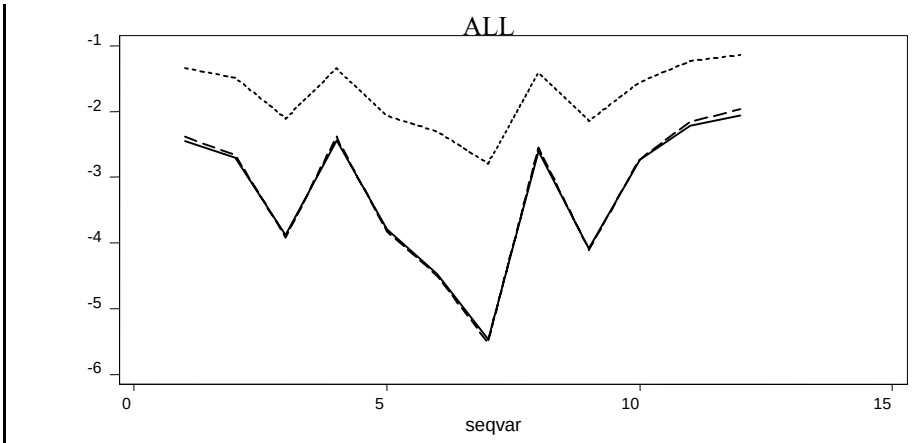
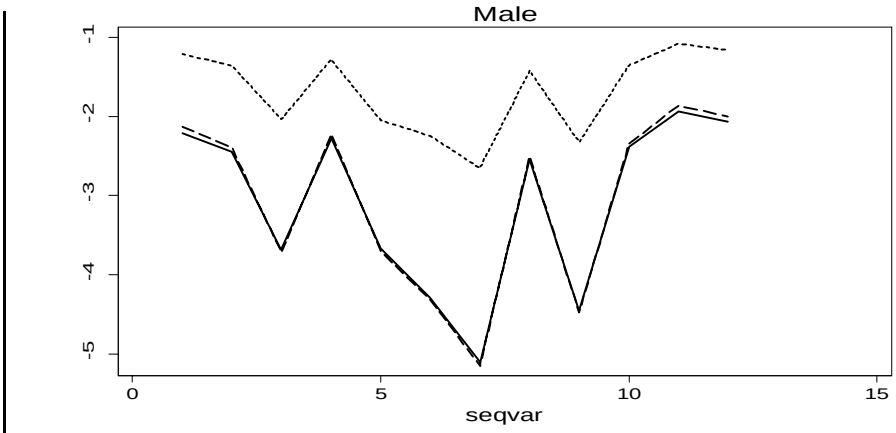


Figure 5: Baseline Hazard under ILO Definition:
All Data-Male-Female





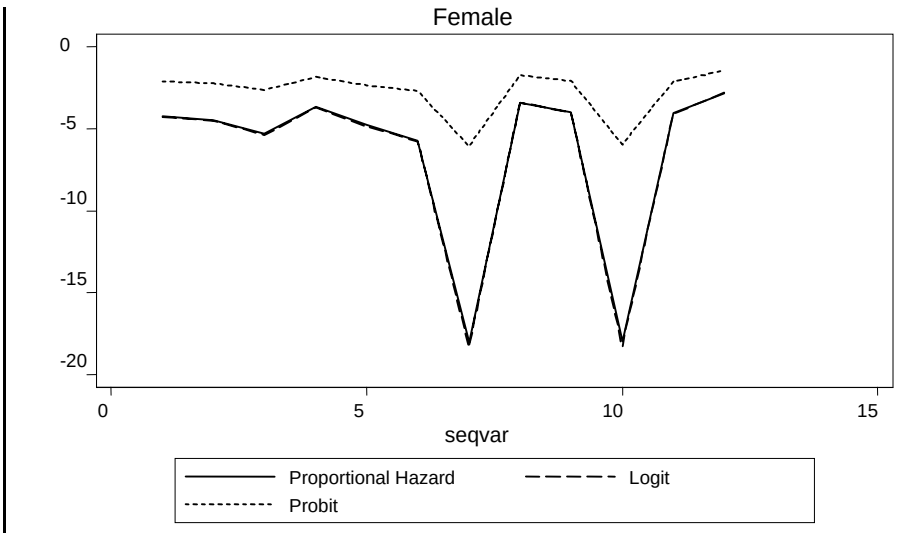


Figure 6:Baseline Hazard under Broad Definition
All-Male-Female