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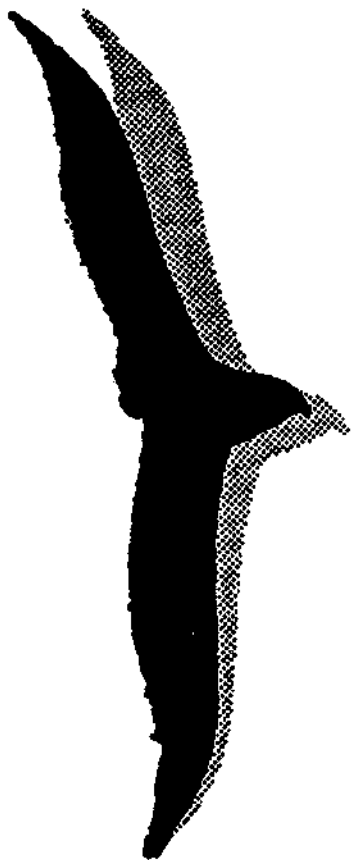
## Serie research memoranda

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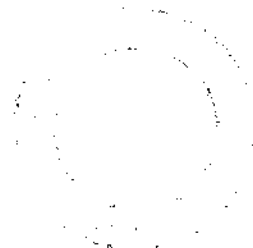




**Gender, Unemployment Duration  
and Social Security: some evidence  
for the UK**

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June 1994





# Gender, Unemployment Duration and Social Security: some evidence for the UK<sup>1</sup>

Elena G. F. Stancanelli

## Abstract

The purpose of this paper is to investigate the impact of gender on the individual probability of leaving unemployment. I compare the job search behaviour of single women with that of single or married men. I estimate a reduced form model of the probability of leaving unemployment. The destination states out of unemployment are modelled using a competing risks specification. I conclude that the gender of the unemployed persons does not affect significantly the individual probability of leaving unemployment. I do, instead, find that marital status has a significant impact on the re-employment probability.

## 1. Introduction

Previous applied studies of the individual probability of leaving unemployment have often found that female unemployed stand lower chances of exiting from unemployment to take up a full-time job, once individual heterogeneity arising from other sources has been controlled for. This issue is interesting for economic policy purposes. Is it for instance the case that unemployed persons are discriminated by potential employers because of their gender?

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<sup>1</sup>I owe many thanks for useful comments to John Mickleright, Siv Gustafsson, Lavan Mahadeva and the participants of seminars given at the women studies groups of the European University Institute and the University of Amsterdam. Patrick Heady of the Office of Population Censuses and Surveys is to be thanked for having made the data available. Göetz Rohwer provided me with a program to analyse the data.

Not much evidence on this issue is available for the UK. Most previous UK studies of unemployment duration have restricted attention to male unemployed on the implicit assumption that the job search behaviour of women is significantly different from that of men. This assumption has, however, not been tested before, at least to my knowledge.

The UK literature has instead looked at the impact of social security benefits on the labour force participation of lone mothers (Blundell, Duncan and Meghir, 1992, Jenkins, 1992). Social security provisions for lone mothers are found to have a disincentive effect on the labour force participation of lone mothers. Other studies have investigated the disincentive effect that the payment of unemployment benefit might have on the labour force participation of women married to unemployed men (Garcia, 1989, Micklewright and Giannelli, 1992). Some authors have looked at the labour force participation of "mothers". For example, Perry (1990) investigates the return to work of women after the birth of their first child.

The aim of the present study is to compare the probability of leaving unemployment of single women with that of single or married men. I use for this purpose a sample drawn from the "Survey of Living Standards during Unemployment" (LSUS). The LSUS contains information only on the single women unemployed. The strategy adopted by the survey planners with respect to the definition of the survey sample was such that married women unemployed were excluded from the sample. However, given the social security rules in force at the time the survey was carried out, not many married women were likely to claim successfully unemployment benefit. Therefore, many unemployed married women would have been excluded anyway from surveys which drew their sample from unemployment benefit registers, such as the present one.

The main drawback of the analysis carried out in this paper is the small sample size of the single people group in the LSUS data.

The structure of the paper is the following. The data are described in the Section 2. The econometric model is illustrated in Section 3. The probability of leaving unemployment is modelled as a conditional probability using the hazard rate. The probability of leaving unemployment to take up a job is distinguished from the probability of exiting from unemployment to enter other non-work states by means of a competing risks specification. The model is estimated both non-parametrically and parametrically. The results

model is estimated both non-parametrically and parametrically. The results of estimation are discussed in Section 4. Conclusions are drawn in Section 5.

## 2. A description of the data

The data I use are the survey of "Living Standards during Unemployment" (LSUS), which was conducted by the Office of Population Censuses and Surveys on behalf of DHS, in 1983–1984. These data are a longitudinal sample of the inflow into unemployment.

One advantage of the LSUS survey over other available datasets is that it relates to a time when the level of unemployment was close to the current levels. In 1983–84, the unemployment rate in the UK was high and rising, averaging out about 12–13%. Most previous UK studies on unemployment duration relate, instead, to the late seventies, when the unemployment rate was much lower and equal to about 5%. A further advantage of the LSUS survey is that it contains detailed information on many individual characteristics. Furthermore these data are largely unexploited for econometric and economic policy analysis notwithstanding the fact that they were released in 1989.

The LSUS is a two stage stratified random sample of the inflow into registered unemployment. The sample is drawn from the population of unemployed that started to register at Great Britain unemployment benefit offices in the summer of 1983. The unemployed with the following characteristics were sampled: married men living with their spouses and children or single people of either gender living on their own or just with their children; persons aged between 20 and 58; persons unemployed for at least about 12 weeks following the start of their sampled unemployment spell. The last characteristic results in left truncation of the sample.

The definition of household heads (first criterion listed above) led to female unemployed being sampled only if they were single people and lived on their own (or at most with their children). As a consequence, a small number of women were included in the sample. Less than 10% of the survey participants are women. Also residents in institutions and single people that shared accommodation with others were excluded from the survey sample as a consequence of the definition of "household head" adopted.

The unemployed sampled were then interviewed twice: the first time



about three months after the date of registration at benefit offices; the second time about a year later, i. e. about 15 months after the start of their unemployment spells, approximately in the Autumn of 1984. According to Heady and Smith (1989) the response rate to the first interview, taking into account non-response to a sift questionnaire that was carried out before the first interview took place, was about 70%. The response rate to the second interview was 79%. Non-participants to the second interview are not considered here since the information on the duration of the unemployment spell is only available for second interview participants<sup>2</sup>. Also, some unemployed that turned out to be already unemployed in the week before they had registered at benefit offices<sup>3</sup> were deleted from the sample. The final sample selected for econometric analysis is made up of 2198 unemployed, of whom 167 are single women, 270 are single men and 1765 are married men.

The number of children of the single people in the sample is shown in in Table 0.1. As one would generally expect, the proportion of lone mothers is much higher than that of lone fathers. However, few of the single women in the sample considered have children, i. e. they are "lone mothers".

Table 0.1: Single people and lone parents

| children number | single man | single woman | total |
|-----------------|------------|--------------|-------|
| 0               | 249        | 116          | 365   |
| 1               | 12         | 34           | 46    |
| 2               | 7          | 10           | 17    |
| 3               | 2          | 3            | 5     |
| total           | 270        | 163          | 433   |

Social security is very important here not only for the alledged negative effect on the re-employment probability but also for the role played in the

<sup>2</sup>Participants in the first interview only could be treated as having right-censored spells at the time of the first interview (about three months into the unemployment spell). However, they should also be treated as having left-truncated spells at the time of the first interview. As a consequence their contribution to the likelihood function for the data would equal 1 and be irrelevant.

<sup>3</sup>This inconsistency in the starting date of the sampled unemployment spells resulted from the information on the economic activity in the week before the start of the sampled unemployment spell, collected retrospectively at the time of the first interview.

definition of unemployment and consequently for the sample coverage of female unemployed. There are two main types of benefits for the unemployed, in the UK: the national insurance Unemployment Benefit (UB), entitlement to which is conditional on the payment of sufficient work contributions and various other conditions; the social assistance benefit, Supplementary Benefit (SB)<sup>4</sup>, which is means-tested and subject to showing availability for work. The payment of UB is limited in time while the payment of SB is unlimited in time. Some unemployed may receive both benefits simultaneously, for instance if their resources including UB fall below their needs.

Up to 1983, married female unemployed were not allowed to claim Supplementary Benefit. To say it with Ogus and Barendt (1982, pag. 8) words:

The model which traditionally dominated social policy thinking was that of the wife doing the housework and rearing the children while the husband was the breadwinner. Thus entitlement to the means-tested benefit, which aggregated the resources and needs of the family or household, was in general restricted to the husband or male partner<sup>5</sup>.

Following an EEC equal opportunity directive of 1979, the U. K. social security law was changed and since 1984 either partner is allowed to claim social assistance benefit. However, the traditional model still dominates. As far as the national insurance contributory unemployment benefit (UB) is concerned, married female workers were given until the eighties the choice of opting out of the national insurance system by not paying any contributions. Also this anomaly was removed since 1984.

Some descriptive statistics of the type of unemployment received by the sample respondents are given in Table 0.2. The benefits received by the stock of the unemployed in Great Britain in 1983 are also shown for comparison purposes. The source for these figures are the yearly published social security statistics of the UK Department of Social Security (DSS). The survey samples only single women. The DSS figures cover instead also married women. However, as discussed above married women were not entitled to SB (in 1983) and they also had the option of opting out of the UB contribution system. The last row of the first column of Table 0.2 relates to the unemployed that

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<sup>4</sup>Since the 1988 reform of social security, this benefit is called Income Support.

<sup>5</sup>Ogus and Barendt, 1982, pag. 8.

Table 0.2: Which benefits for which respondents?

| The benefits received | particip 2nd int. |            | unemployed stock at 1983 |               |
|-----------------------|-------------------|------------|--------------------------|---------------|
|                       | men               | women      | men                      | women         |
| UB only               | 36.2%             | 30.6%      | 21%                      | 35.2 %        |
| UB and SB             | 28.5%             | 9.4%       | 10.7%                    | 3.7%          |
| SB only               | 30.7%             | 53.1%      | 58.2%                    | 43.2%         |
| no UB SB              | 4.7%              | 6.9%       | 10.2%                    | 17.9%         |
| Total no.             | 2035 (100%)       | 163 (100%) | 2163000 (100%)           | 817000 (100%) |

do not receive any benefit. In the LSUS survey, this figure relates mainly to claimants of unemployment benefit that are temporarily suspended from benefit receipt. In the Social Security statistics, this figure includes also those unemployed that made a claim to receive benefit but were denied entitlement to benefit receipt.

From Table 0.2, it emerges that the proportion of unemployed men receiving UB is higher in the survey sample than in the stock of the unemployed. This result is explained by the fact that the stock of the unemployed is more likely to cover longer spells of unemployment than the survey sample (which is an inflow sample). Indeed, UB lasts in principle<sup>6</sup> only for a year. The proportion of unemployed women receiving UB, either on its own or together with SB, is slightly higher in the survey sample (40%) than in the stock of the unemployed (38.9%). The proportion of unemployed men receiving SB is higher among the stock of the unemployed than in the survey sample. This is explained by the same argument as above. Instead, the proportion of women receiving SB is larger in the LSUS sample than in the stock of the unemployed. However, if those unemployed women that are refused entitlement to benefit (about 18% of the stock of unemployed women) are excluded from the stock of the unemployed, the proportion of women that receive SB becomes about 52% of the unemployed stock, which is closer to the figure in the survey sample.

Descriptive statistics of the variables used in the econometric analysis

<sup>6</sup>Once entitlement to UB exhausts, after a year of unemployment, it is necessary to work continuously for a period of 13 weeks in order to gain new entitlement to UB.

are given in Table 0.3. Three groups of the unemployed are considered with respect to gender and marital status: single women, single men and married men. The following explanatory variables have been considered: family composition variables; previous work history; expected earnings from work; amounts and types of unemployment benefit received; some proxy of search intensity; an indicator of the value attributed to leisure as relative to work; a dummy for whether the unemployed person felt financially constrained; the unemployment rate in the geographical area of residence (county)<sup>7</sup>.

Table 0.3: *Descriptive statistics of the economic variables*

| Variable                             | Single women |         | Single men |         | Married men |         |
|--------------------------------------|--------------|---------|------------|---------|-------------|---------|
|                                      | Mean         | SD      | Mean       | SD      | Mean        | SD      |
| Left truncation period               | 13.3374      | 1.1505  | 13.4407    | 1.0745  | 13.4017     | 1.0547  |
| Right-censored observations          | 0.5153       | 0.5013  | 0.5444     | 0.4989  | 0.6023      | 0.4896  |
| Unemployment duration (weeks)        | 45.3313      | 18.3892 | 44.0852    | 18.0249 | 42.7841     | 17.4250 |
| Ever had a full-time job             | 0.8221       | 0.3836  | 0.8963     | 0.3054  | 0.9547      | 0.2081  |
| Professional/Intermediate Occupation | 0.2025       | 0.4031  | 0.1741     | 0.3799  | 0.1728      | 0.3782  |
| Unskilled Occupation                 | 0.0307       | 0.1730  | 0.0389     | 0.2851  | 0.0533      | 0.2246  |
| Age                                  | 40.5890      | 11.9979 | 37.2222    | 11.6022 | 37.9286     | 11.1634 |
| Has any child aged less than 5       | 0.0123       | 0.1104  | 0.0037     | 0.0609  | 0.3926      | 0.4885  |
| Has any child aged between 5 and 11  | 0.0307       | 0.1730  | 0.0111     | 0.1050  | 0.2584      | 0.4379  |
| Married                              | 0.0000       | 0.0000  | 0.0000     | 0.0000  | 1.0000      | 0.0000  |
| Spouse working 1 month before U.     | 0.0000       | 0.0000  | 0.0000     | 0.0000  | 0.9099      | 0.4626  |
| Searches less than before            | 0.2025       | 0.4031  | 0.1333     | 0.3406  | 0.0901      | 0.2864  |
| Values Leisure more than Labour      | 0.2086       | 0.4076  | 0.1296     | 0.3965  | 0.1582      | 0.3453  |
| Experience some shortage of money    | 0.3436       | 0.4764  | 0.4222     | 0.4948  | 0.3983      | 0.4897  |
| House owner outright/with mortgage   | 0.2822       | 0.4515  | 0.2667     | 0.4430  | 0.4142      | 0.4927  |
| County unemployment rate, at Oct. 83 | 13.3086      | 3.1764  | 13.3659    | 3.2409  | 13.6192     | 3.1990  |
| Receives only UB at first interview  | 0.3067       | 0.4626  | 0.3111     | 0.4638  | 0.3694      | 0.4828  |
| UB/SB amount in £, logs              | 3.0115       | 0.8719  | 3.2390     | 0.5575  | 3.5143      | 0.9083  |
| Expected earnings, in £, logs.       | 4.0985       | 0.3847  | 4.3817     | 0.5220  | 4.4585      | 0.5161  |
| Expected earnings not available      | 0.0061       | 0.0783  | 0.0111     | 0.1050  | 0.0113      | 0.1059  |
| Maintenance payments, in £, logs.    | 0.2512       | 0.7645  | 0.0000     | 0.0000  | 0.0000      | 0.0000  |

The single women are 163, the single men are 270, the married men are 1765. The dummy variables take value one if the condition stated for each of them is satisfied. The mean duration is taken over all observations (including the right-censored observations). The logarithms are taken over the non-zero observations. U. stands for the sampled unemployment spell.

<sup>7</sup>The county was the most disaggregated geographical unit available. This variable is not allowed to vary over time since the relative positions of different counties with regards to their level of unemployment did not change substantially in the period of time covered by the survey.

The expected earnings from work were constructed using the fitted earnings from earnings equations<sup>8</sup> to avoid potential endogeneity of the last job earnings (Narendranathan and Nickell, 1985). The level of unemployment benefit is a time varying variable (see Stancanelli, 1993). It is allowed to vary for recipients of the national insurance benefit (UB) at the time of exhaustion of entitlement to UB.

I have constructed a dummy that takes value one if the unemployed reported to “suffer from money shortage” at the time of the first interview. Access to credit or perhaps also wealth is proxied by a dummy for house ownership. This variable might however capture also other unobserved individual characteristics such as the capacity to plan forward or stability. Individual leisure valuation is proxied by a dummy constructed using replies to the following question, asked at the time of the first interview: “*If you were to get enough money to live as comfortably as you would like for the rest of your life, would you want to have a job or would you prefer not to work?*”. Diminished search intensity is measured by a dummy constructed on the basis of the replies given to the following question at the time of the first interview: “*Here is a list of things people do. We would like to know whether you do each thing more or less than you did four or five months ago, before you started/restarted signing on at an unemployment benefit office ... Visiting an unemployment benefit office or a job centre*”. There is evidence that search through job centres or other employment agencies is one of the most widely used method of job search by the unemployed in the UK (Layard et al. , 1991, Wadsworth, 1991). These indicators of the individual valuation of leisure and (diminished) search intensity are not allowed to vary during the course of the unemployment spell. They are measured at the start (or sometime before the start) of the unemployment spell to avoid potential endogeneity problems.

From inspection of Table 0.3, it emerges that married men have on average shorter unemployment durations than single people of either gender. Married men are on average more likely to hold professional qualifications (which correspond normally to a University degree) than single people of either gender. Married men are also more likely to own the house were they live and

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<sup>8</sup>The procedure adopted was slightly more complicated and it involved imputing expected earnings for the unemployed for whom the last earnings information was not available (see Stancanelli, 1993).

Table 0.4: Destination states out of unemployment

| <i>destination state</i> | <i>single woman</i> | <i>single man</i> | <i>married man</i> |
|--------------------------|---------------------|-------------------|--------------------|
| <i>right-censored</i>    | 79                  | 125               | 710                |
| <i>full-time work</i>    | 35                  | 98                | 835                |
| <i>part-time work</i>    | 19                  | 11                | 57                 |
| <i>other states</i>      | 30                  | 36                | 163                |
| <i>total</i>             | 163                 | 270               | 1765               |

*The destination states are defined as the economic states entered upon leaving unemployment. The unemployed that have not exited unemployment by the the end of the observation period are classified as right-censored. The destination other states includes any other state than work, such as: government training scheme, full-time education, sickness, in care of family.*

to have children, which seems quite reasonable. Instead, single women are on average older than single or married men. Single women's unemployment benefit receipts and expected earnings are lower on average than those of men. However, single women are found to have a higher valuation of leisure as relative to labour than men (either single or married).

In Table 0.4, I show the destination states out of unemployment of the three groups of the unemployed. I consider, full-time work, part-time work and "other states". The destination "other states" includes any non-work state such as full-time education, government training scheme, household work, sickness, withdrawal from the labour force and retirement. These different destination states are aggregated together given the small number of observations exiting to each of them. For similar reason, given the small number of observation exiting into part-time work, in the econometric analysis part-time work will be treated in turns together with full-time work or with "other states".

### 3. The econometric model

The individual probability of leaving unemployment is modelled as a conditional probability, using the hazard rate. Let us define the duration of the unemployment spell,  $T$ , as a random variable, with density function  $f(t)$  and distribution function  $F(t)$ . The survivor function is defined as  $G(t) = 1 - F(t)$ . The hazard rate is given by the instantaneous conditional probability of leaving unemployment, which is defined as:

$$\theta(t) = \lim_{dt \rightarrow 0} \frac{P(t \leq T < t + dt | T \geq t)}{dt}. \quad (0.1)$$

This expression describes the probability of leaving unemployment in any instant of time,  $t$ , conditional on being still unemployed an infinitesimal amount of time to the left of  $t$ .

It is possible to express the survivor function in terms of the hazard rate, as follows:

$$G(t) = \exp\left\{-\int_0^t \theta(u) du\right\}, \quad (0.2)$$

and also the density function in terms of the hazard rate:

$$f(t) = \theta(t) \exp\left\{-\int_0^t \theta(u) du\right\}. \quad (0.3)$$

The hazard rate is normally allowed to depend on the elapsing of the time spent in the state of unemployment,  $t$ , and on a vector  $x(t)$  of socio-economic individual characteristics and labour market conditions. The dependency on time of the hazard rate is captured by the so-called *baseline hazard*. I specify an exponential piecewise linear functional form for the hazard rate, as follows:

$$\theta(t) = \exp(a_m) \exp(\beta x_i(t)), \quad (0.4)$$

where  $m$  segments of the baseline hazard rate are defined. The baseline hazard rate is allowed to vary across the  $m$  intervals of time but it is assumed to remain constant within each time interval  $m$ . The advantage of adopting a piecewise linear specification of the hazard rate is that the sign of the dependency on time of the hazard rate is allowed to vary over time.

Multiple destinations out of unemployment are modelled by means of a *competing risks* model. Competing risks specifications model unemployment duration together with the states exited into upon leaving unemployment.

Instead, in a single risk framework exit from unemployment is defined as exit to any destination state. In a competing risks framework, the probability of leaving unemployment at a certain point in time,  $t$ , and of exiting to a specific destination state  $k$ , given the set  $D$  of different possible exit states, can be written as:

$$\theta_k(t) = \lim_{dt \rightarrow 0} \frac{P(t \leq T < t + dt, D = k, |T \geq t)}{dt}, \quad (0.5)$$

which is the so-called *cause-specific* hazard. If the different destinations  $k$  are assumed to be mutually exclusive, as plausible, the overall hazard rate can be rewritten as the sum of the cause-specific hazard rates:

$$\theta(t_i, x_i(t)) = \sum_{k \in D} \theta_k(t_i, x_i(t)), \quad (0.6)$$

where  $D$  is the set of destination states considered. I shall distinguish exit into a job (or alternatively exit into full-time work only) from exit into other states. The piecewise linear competing risks specification of the hazard rate is the following:

$$\theta(t_i, x_i(t)) = \sum_{k \in D} \exp\{a_m^k + \beta^k x_i^k(t)\} \quad (0.7)$$

The model is estimated by maximum likelihood. The contribution of each completed spell of unemployment to the sample likelihood is the density function, the contribution of right-censored spells is the survivor function evaluated at the time of right-censoring. The log-likelihood function for the sample is the following, where " $t_s$ " is the left truncation time:

$$l = \sum_{i \in A} \{(a_m) \beta x_i(t)\} + \sum_i \left\{ - \int_{t_s}^{t_i} [\exp(a_m) \beta x_i(u) du] \right\}, \quad (0.8)$$

The following expression for the competing risks log-likelihood is obtained:

$$l = \sum_{k \in D} \sum_{i \in A_k} \{a_m^k + \beta^k x_i^k(t)\} + \sum_{k \in D} \sum_i \left\{ - \int_{t_s}^{t_i} \exp\{a_m^k + \beta^k x_i^k(u)\} du \right\} \quad (0.9)$$

Unobserved heterogeneity is not allowed for. It would seem to be the case that unobserved heterogeneity is more of a problem when the functional form adopted for the baseline hazard is rather restrictive such as for instance the monotonic Weibull than if a flexible baseline is allowed for. Allowing



for unobserved heterogeneity requires one to make assumptions on its possible correlation across the two cause-specific hazards which are often rather unrealistic<sup>9</sup>. Moreover, for the purpose of the present analysis one should also allow unobserved heterogeneity to differ across the three groups of the unemployed considered: single women, single men, married men. One should then make further assumptions about the possible correlation of the errors across the exit states out of unemployment and the three groups of the unemployed defined. There is no reason to believe that the distortions possibly introduced by these additional assumptions will be less severe than those possibly arising from uncontrolled unobserved heterogeneity. The main finding of previous authors that have allowed for unobserved heterogeneity in a competing risks framework and that have specified a flexible baseline hazard rate is that allowing for unobserved heterogeneity tends to increase the absolute value of the estimated coefficients (Katz and Meyer, 1988).

## 4. Results of estimation

### Kaplan-Meier survivor functions

The survivor function for the three groups —single women, single men, married men— and for different destinations out of unemployment was first estimated by non-parametric Kaplan-Meier method. This method relies on the information contained in the observed frequency of the exits out of unemployment (see for example Kalbfleish and Prentice, 1980, for a description of this method). Non-parametric Kaplan-Meier estimates of the survivor functions are obtained assuming individual homogeneity.

The estimated competing risks survivor functions for single women are plotted in Figure 0.1. The exit states out of unemployment considered are full-time work and other states. Exit into a part-time job is considered together with other states. The graph start at week 12 since the behaviour of the hazard rate before then is not known because of the left truncation of the sample. The two curves follow more or less the same pattern over time except from week 41 onwards. From week 41 onwards the survivor function for exit into other states lies below that for exit into full-time work. This implies that the probability of leaving unemployment to enter states other than full-

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<sup>9</sup>Normally either zero or perfect correlation is assumed.

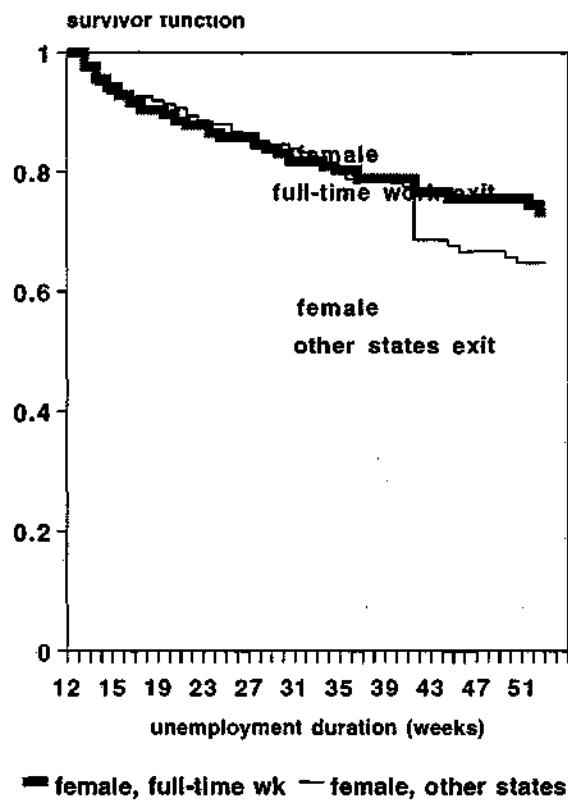


Figure 0.1:

time work is larger than the probability of passing from unemployment into full-time work from week 41 onwards. It is perhaps surprising that before the 40th week of unemployment the two probabilities do not differ much from each other.

The corresponding competing risks survivor functions for single men are plotted in Figure 0.2. The behaviour of the two survivor functions is quite different from that of the corresponding curves for the single female unemployed. The survivor function for exit into full-time work lies below that for exit into other states from the beginning of the observation period. This indicates that the probability of leaving unemployment to take up a full-time job is higher at any point in time than the probability of exiting to other states for single men. Similar behaviour is followed by the two competing risks survivor functions for married men (which are not shown here).

The null hypothesis that the estimated competing risks survivor functions for men and women do not differ significantly from each other was tested using a Log-Rank test (see Kalbfleish and Prentice, 1980, for a description of this test), which is based on the estimated standard errors of the survivor functions. The test statistic is distributed as a " $\chi_k^2$ ", where the number of degrees of freedom of the test,  $k$ , is equal to the number of groups compared. The null hypothesis that the probabilities of leaving unemployment to take up a full-time job (the survivor functions for exit into full-time work) of

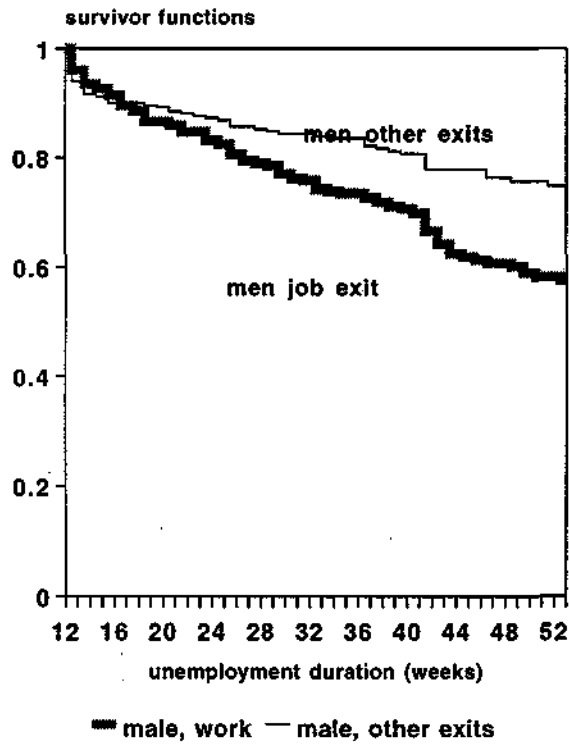


Figure 0.2:

the single women unemployed and the single men unemployed do not differ significantly cannot be rejected on the basis of a Log-Ratio test ( $\chi^2_2 = 8.5$ ). The null hypothesis that the two survivor functions for exit into states other than full-time work do not differ significantly across the two groups cannot be rejected either on the basis of a Log-Ratio test ( $\chi^2_2 = 6.1$ ). The Log-Rank test was also carried out considering a different set of destination states: part-time work was included together with full-time work and, consequently, excluded from the "other states" destination. The null hypothesis that the survivor functions of the two groups did not differ significantly could not be rejected ( $\chi^2_2 = 2.1$ , for exit into full-time or part-time job, and  $\chi^2_2 = 1.2$  for exit into other states).

The same hypotheses were then tested with respect to the two groups of married men unemployed and single women unemployed. In this case, the null hypothesis that the survivor functions for exit into full-time work of single women and married men did not differ significantly could be rejected on the basis of a Log-Ratio test ( $\chi^2_2 = 27.3$ ). Similarly, the null hypothesis that the two survivor function for exit into other states did not differ significantly could be rejected ( $\chi^2_2 = 26.3$ ). If part-time work were considered together with full-time work, the survivor functions for exit into a job resulted to be significantly different on the basis of a Log-Ratio test ( $\chi^2_2 = 13.2$ ). However, the null hypothesis that the survivor functions for the two groups of the

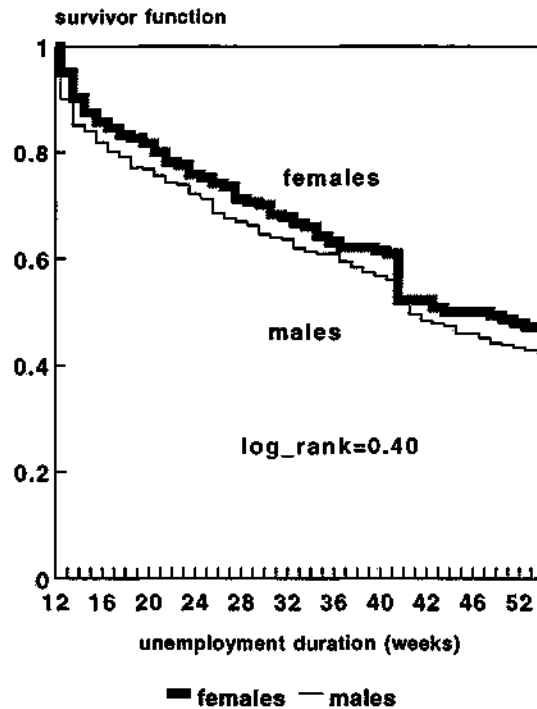


Figure 0.3:

unemployed and for exit into states other than a job did not differ significantly could not be strongly rejected (the Log Ratio test is  $\chi_2^2 = 9.0$ ).

The survivor function for exit from unemployment into any destination state (single risk model) is plotted for the single people of either gender in Figure 0.3. These are 163 female unemployed and 270 male unemployed. The two survivor functions follow a similar behaviour over time. However, the survivor function for the single men unemployed lies above that for single women unemployed at any point in time. A Log-Rank test of the null hypothesis that the survivor functions for the two gender groups are not significantly different from each other —i. e. that the probability of leaving unemployment does not differ significantly for the two gender groups— can not reject the null hypothesis.

The survivor functions for the single women and the married men and for exit into any destination (single risk case) are plotted in Figure 0.4. The two curves follow the same behaviour over time. The survivor function for the female unemployed lies above that for the married male unemployed at any point in time. This indicates that female unemployed stand lower chances than male unemployed to leave unemployment at any point in time. However, the significance of this apparent difference between the two survivor functions is rejected on the basis of a Log-Rank test.

On the basis of this non-parametric evidence, it is then possible to con-

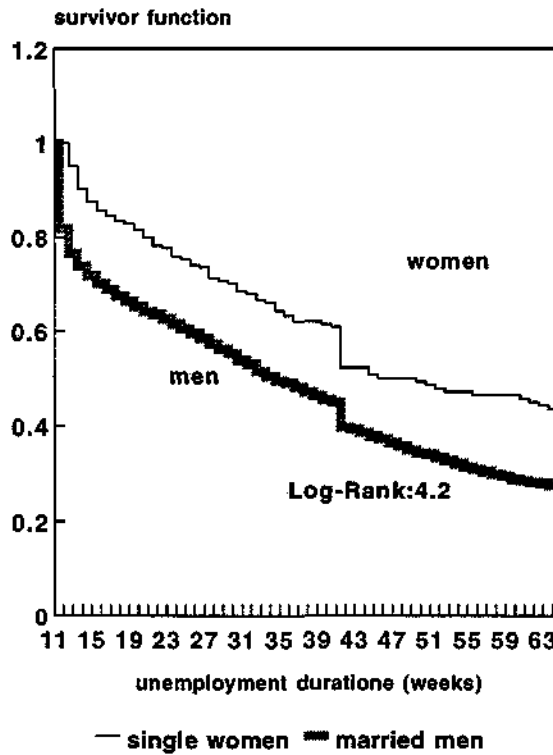


Figure 0.4:

clude that the probability of leaving unemployment to exit to any destination state (single risk model) does not differ significantly across single women and single or married men. However, I find in a non-parametric competing risks framework of analysis that the probability of leaving unemployment to take up a job (either full-time or part-time) differ significantly between single women and married men.

#### Results of estimation of the piecewise linear model

The econometric model specified in Section 3 has been estimated separately for single women, single men and married men. The null hypothesis that the job search behaviour of single women does not differ significantly from that of, respectively, single and married men has been tested by means of likelihood ratio tests. The baseline hazard rate has been allowed to vary every six weeks. The results of estimation are reported below, in Table 0.5.

In the model estimated only for single women, most of the explanatory variables considered are found not to affect significantly the probability of leaving unemployment. This is perhaps due to the small number of women in the sample. The null hypothesis that the job search behaviour of single women does not differ from that of single men cannot be rejected on the basis of a likelihood ratio test ( $LR = 2 * (-1123.0 - (-413.6 - 701.7)) = 15.4 \sim \chi_{21}^2$ ). The null hypothesis that the job search behaviour of single women does not

differ from that of married men cannot be rejected either on the basis of a likelihood ratio test ( $LR = 2 * (-5449.3 - (-413.6 - 5026.2)) = 19.0 \sim \chi_{21}^2$ ).

The model was then estimated for the full sample pooling together the three groups of single women and married or single men. The impact of gender was modelled using a dummy, which took value one if the unemployed person was a single woman. To allow for the impact of marital status (of men) on the probability of leaving unemployment an additional interaction variable was constructed which took value one if the unemployed person was of male gender and married. The base for this dummy is given by the single people of either gender.

Table 0.5: Results of estimation of the probability of leaving unemployment

| Variable label                       | Single women |        | Single men |           | Married men |        |
|--------------------------------------|--------------|--------|------------|-----------|-------------|--------|
|                                      | Coeff        | SE     | Coeff      | SE        | Coeff       | SE     |
| Baseline, week11-22                  | 0.9754       | 3.0938 | 0.7944     | 2.1363    | -2.7460*    | 0.8797 |
| Baseline, week22-34                  | 0.7474       | 3.0987 | 0.6521     | 2.1400    | -2.6904*    | 0.8740 |
| Baseline, week35-46                  | 1.3907       | 3.1064 | 1.0408     | 2.1401    | -2.2610*    | 0.8740 |
| Baseline, week47-58                  | 0.2053       | 3.1300 | 0.3313     | 2.1587    | -2.4046*    | 0.8749 |
| Baseline, week59-65                  | 0.6517       | 3.1379 | 1.0440     | 2.1635    | -2.6748*    | 0.8839 |
| Ever had a full-time job             | -0.0627      | 0.3417 | -0.4039    | 0.2610    | 0.2899      | 0.1691 |
| Professional/Intermediate Occupation | 0.4608       | 0.3777 | 0.1070     | 0.2825    | 0.2167*     | 0.0908 |
| Unskilled Occupation                 | -0.1511      | 0.7702 | -0.1518    | 0.3558    | -0.3931*    | 0.1639 |
| Logarithm of Age                     | -0.5891      | 0.4266 | -1.3462*   | 0.3253    | -0.9839*    | 0.1363 |
| Has any child aged < 5               | 0.3688       | 1.0748 | -15.0517   | 1868.7930 | -0.2320*    | 0.0780 |
| Has any child aged between 5 and 11  | 0.5298       | 0.5436 | 1.3018*    | 0.6632    | -0.0199     | 0.0746 |
| Searches less than before U.         | -0.1322      | 0.3119 | -0.7904*   | 0.3472    | -0.5391*    | 0.1341 |
| Values Leisure more than Labour      | -0.1609      | 0.3239 | -0.2477    | 0.3079    | -0.1548     | 0.0989 |
| Experience money shortage            | 0.1202       | 0.2489 | 0.0294     | 0.1752    | 0.0638      | 0.0643 |
| House owner                          | 0.0035       | 0.2965 | 0.4677*    | 0.2139    | 0.3365*     | 0.0675 |
| County unemployment rate             | -0.0483      | 0.0386 | -0.0381    | 0.0286    | -0.0194*    | 0.0098 |
| Receives only UB at 1st interview    | 0.7249*      | 0.2673 | 0.4484*    | 0.2022    | 0.7097*     | 0.0737 |
| Amount of UB/SB received £ logs.     | -0.2339      | 0.1272 | -0.2549    | 0.1685    | -0.1409*    | 0.0328 |
| Expected earnings £ logs.            | -0.4463      | 0.7254 | 0.3305     | 0.4864    | 0.5372*     | 0.1940 |
| Expected earnings not available      | 1.0358       | 3.1635 | 2.0957     | 2.2914    | 2.4190*     | 0.9191 |

*U. stands for the observed unemployment spell. Single women max. log-lik. -413.6 ; single men max. log-lik. -701.7 ; married men max. log-lik. -5026.2. Descriptive statistics of the explanatory variables are provided in Table 0.3 in the data section. A \* indicates statistical significance at the two-sided 5% level. The estimated baseline coefficients are not shown. Maximum log-likelihood for the same model estimated for single women and single men pooled together, with the same explanatory variables as above, -1123.0. Maximum log-likelihood for the same model estimated for single women and married men pooled together, with the same explanatory variables as above, -5449.3.*

This model was estimated under two different competing risks specification. In the first model (1), full-time exit is distinguished from exit into any other state. In the second specification, model (2), exit into full-time or part-time work is distinguished from exit into any other non-work state. Results of estimation are shown in Table 0.6.

Table 0.6: Results of estimation of the probability of leaving unemployment

| Variable label               | Competing risks (1) |        |             |          | Competing risks (2)  |        |             |          |
|------------------------------|---------------------|--------|-------------|----------|----------------------|--------|-------------|----------|
|                              | Full-time exit      |        | Other exits |          | Full-time, part-time |        | Other exits |          |
|                              | Coeff               | SE     | Coeff       | SE       | Coeff                | SE     | Coeff       | SE       |
| Baseline, week11-16          | -3.1679*            | 0.8717 | -1.0602     | 1.5234   | -2.3618*             | 0.8308 | -3.2621     | 1.8325   |
| Baseline, week17-22          | -3.2738*            | 0.8701 | -2.0570     | 1.5281   | -2.5396*             | 0.8296 | -4.3279*    | 1.8397   |
| Baseline, week23-28          | -3.3001*            | 0.8711 | -1.5925     | 1.5256   | -2.5490*             | 0.8306 | -3.7279*    | 1.8345   |
| Baseline, week29-34          | -3.0870*            | 0.8709 | -1.6065     | 1.5273   | -2.3934*             | 0.8306 | -3.5133     | 1.8343   |
| Baseline, week35-40          | -3.3450*            | 0.8732 | -1.5534     | 1.5290   | -2.5830*             | 0.8326 | -3.7076*    | 1.8387   |
| Baseline, week41-46          | -2.3427*            | 0.8700 | -0.0213     | 1.5204   | -1.5696              | 0.8294 | -2.0311     | 1.8277   |
| Baseline, week47-52          | -3.0462*            | 0.8756 | -0.8992     | 1.5299   | -2.2730*             | 0.8348 | -2.9635     | 1.8390   |
| Baseline, week53-58          | -3.1110*            | 0.8778 | -1.1229     | 1.5360   | -2.3400*             | 0.8369 | -3.2425     | 1.8476   |
| Baseline, week59-64          | -3.2949*            | 0.8826 | -0.8814     | 1.5345   | -2.4901*             | 0.8410 | -2.9525     | 1.8446   |
| Baseline, week65-71          | -2.8986*            | 0.9587 | -19.6639    | 417.5207 | -2.2205*             | 0.9222 | -15.8255    | 510.9135 |
| Ever had a full-time job     | 0.1526              | 0.1513 | -0.1973     | 0.2297   | 0.0834               | 0.1397 | -0.0686     | 0.2908   |
| Profes. /Interm. Occ.        | 0.1691              | 0.0966 | 0.2462*     | 0.1661   | 0.2054*              | 0.0920 | 0.2091      | 0.2003   |
| Unskilled Occupation         | -0.4018*            | 0.1699 | -0.2228     | 0.2794   | -0.3961*             | 0.1634 | -0.2202     | 0.3159   |
| Logarithm of Age             | -1.3955*            | 0.1387 | -0.1602     | 0.2320   | -1.2396*             | 0.1316 | -0.0252     | 0.2790   |
| Female Person                | -0.2102             | 0.2076 | 0.1966      | 0.2357   | 0.0388               | 0.1777 | 0.0431      | 0.2853   |
| Male and Married person      | 0.3035*             | 0.1151 | -0.1932     | 0.1751   | 0.2795*              | 0.1094 | -0.2524     | 0.2014   |
| Has any child aged < 5       | -0.2942*            | 0.0830 | -0.2370     | 0.1692   | -0.2693*             | 0.0804 | -0.2814     | 0.1988   |
| Has any child aged < 11      | -0.0137             | 0.0818 | 0.0799      | 0.1642   | -0.0355              | 0.0798 | 0.2547      | 0.1838   |
| Searches less than before    | -0.8903*            | 0.1627 | -0.0620     | 0.1699   | -0.9220*             | 0.1540 | 0.2253      | 0.1865   |
| Values Leisure more          | -0.2842*            | 0.1112 | 0.1343      | 0.1524   | -0.2399*             | 0.1040 | 0.1429      | 0.1777   |
| Experience money shortage    | 0.1285              | 0.0663 | -0.1716     | 0.1240   | 0.1125               | 0.0637 | -0.2050     | 0.1478   |
| House owner                  | 0.3651*             | 0.0711 | 0.2187      | 0.1285   | 0.3754*              | 0.0682 | 0.1425      | 0.1506   |
| County unemployment rate     | -0.0241*            | 0.0103 | -0.0128     | 0.0180   | -0.0244*             | 0.0098 | -0.0050     | 0.0211   |
| Receives only UB at 1st int. | 0.7748*             | 0.0779 | 1.0226*     | 0.1434   | 0.7761*              | 0.0747 | 1.0397*     | 0.1686   |
| UB/SB level £logs.           | -0.0714             | 0.0391 | -0.2996*    | 0.0530   | -0.1203*             | 0.0353 | -0.2302*    | 0.0661   |
| Expected earn. £logs.        | 0.8050*             | 0.1989 | -0.5464     | 0.3456   | 0.6331*              | 0.1897 | -0.3468     | 0.4132   |
| Exp. earn. not available     | 3.6196*             | 0.9450 | -2.0108     | 1.6204   | 2.9080*              | 0.8992 | -1.2136     | 1.9439   |

Competing risk (1) max. log-lik. -6729.2 ; Competing risk (2) max. log-lik. -6637.7 . Descriptive statistics of the explanatory variables are provided in Table 0.3 in the data section. A \* indicates statistical significance at the two-sided 5% level.

The results of estimation of the two models (1) and (2) (shown in Table 0.6) suggest that the gender of the unemployed person does not affect significantly the individual chances of leaving unemployment. Marital status is instead found to influence significantly the individual re-employment probability. Married men are found to be 35% more likely to leave unemployment to take up a job (either full-time or part-time) than single people of either gender. Single people of either gender are, instead, found to stand equal chances of leaving unemployment, other things staying equal.

## 5. Conclusions

The analysis carried out in this paper leads to the conclusion that the job search behaviour of single women does not differ significantly from that of single men. I find, instead, that the job search behaviour of single people of either gender differ significantly from that of married men. Married men are found to have significantly higher re-employment probabilities than single people of either gender.

Future work should be aimed at gathering evidence on the probability of leaving unemployment of married women. The duration of unemployment of married women should be compared with that of married men and of single people of either gender.

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