# EXITS FROM UNEMPLOYMENT: RECALL OR NEW JOB [*]

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## Abstract

This paper studies transitions out of unemployment in Spain distinguishing between recall to the same employer and reemployment in a new job. We use a large sample of newly unemployed workers obtained from Social Security records for Spain. These data contain information about each individual's employer identity before and after the unemployment spell. A discrete-time duration model with competing risks of exits serves us to investigate the factors that influence the probabilities of leaving unemployment to return to the same employer or to find a new job with a different employer. We find that the route to exit unemployment is determinant to understand the influence of individual and job characteristics on the hazard rate, as well as the latter dependence on unemployment duration. The recall hazard rate exhibits positive duration dependence during the first months and negative duration dependence thereafter (it is larger for females), while the new-job hazard presents positive duration dependence (it is larger for males).

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## 1. Introduction

Workers who lose their jobs can become re-employed either by being recalled to their previous employers of by finding new jobs. Temporary layoff unemployment can be defined as unemployment in spells that ended with the unemployed person being rehired by the same employer. This issue has been studied from a two-fold theoretical perspective. On the one hand, following the *implicit contract theory* (Feldstein, 1976, 1978; Baily, 1977), firm's incentives play a key role in the timing of recalls, since they tend to layoff workers on temporary bases due to a decline in product demand. Temporary layoffs result from product demand fluctuations and reflect high attachment between workers and firms[1]. On the other hand, *temporary layoff search theory* stresses the supply of labour —in contrast with the *implicit contract theory* that assumes temporary layoff durations to be exogenous to worker behaviour (determined by product demand). In this venue, search effort is predicted to be smaller for workers on temporary layoffs than for completely unattached workers, so the reservation wage of an attached worker on temporary layoff is larger than that of an equally qualified but unattached worker (Mortensen, 1990). Moreover, worker's productivity decreases with unemployment duration and search strategies are revised towards less recall waiting and more search for a new job as unemployment lengthens. This behaviour justifies the finding of significant differences between the effects of the explanatory variables on the recall hazard rate and the new job hazard rate (Katz, 1986; Jensen and Westergärd-Nielsen, 1990; Corak, 1996; Jensen and Nielsen, 1999; Røed and Nordberg, 2003; Rosholm and Svarer, 2001).

National data (mainly administrative) suggest that one-third of unemployed workers are on temporary layoff in the United States and Canada (OECD, 2002, pp. 218). As regards Europe,[2] temporary layoff unemployment has been recognised as an integral part of the Danish (Jensen and Westergärd-Nielsen, 1990), the Austrian (Winter-Ebmer, 1998), the German (Mavromaras and Orme, 2004), and the Norwegian labour markets (Røed and Nordberg, 2003).

The goal of this paper is to document that recall outcomes are relevant for an important part of the unemployed in Spain and to study the determinants of exits from unemployment through recall and a new job as distinct alternatives. This will allow us to characterise possible differences and to provide new insights into the causal mechanism that determines the transitions from unemployment to employment through recall or a different employer. This issue has so far never been studied in Spain, in part due to lack of adequate data. We use data from Social Security records that contain information on all employment (and unemployment) spells of workers in the Spanish labour market over a three-year period (from June 1999 to June 2002). We focus in particular in the unemployment spells caused by involuntary reasons. Job transitions due to quits are not considered in our analysis, given that they are worker-initiated rather than firm-initiated separations.

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[1] There are many other conditions that provide incentives for firms to layoff workers temporarily: 1) an imperfectly experience-rated unemployment insurance system; 2) workers' possession of specific human capital and its high cost of acquisition; 3) the difficulties and cost associated with recruitment in the open market; 4) uncertainties about the quality of the job match that will be achieved with newly recruited employees, etc.

[2] Some observers have suggested that tighter regulatory impediments to the recruitment and dismissal of employees are responsible for the lower incidence of temporary layoff in Europe (e.g., Moy and Sorrentino, 1981; Gutierrez-Rieger and Podzeczeck, 1981; for legal restraints on layoff in general, see Emerson, 1988). For instance, as Layard et al. (1991), remark, "… in other countries, the system of temporary layoffs barely exists and almost none of the unemployed return to the same firm." (pp. 114).

The rest of this paper is organised as follows. Section two describes the data and the sample. In section 3, we specify a discrete hazard model under competing risks for modelling the transitions from unemployment to employment through recall or a different employer. Section 4 provides the results. Finally, some concluding remarks follow in section five. This paper contains several contributions to the literature. First, we obtain that more than a third of unemployed who find a job return to the previous employer. Second, we present new evidence showing that recall and new job outcomes are governed by completely different individual and job characteristics. Third, the recall hazard rates show positive duration dependence during the first months and negative duration dependence thereafter (larger for females), while the longer the unemployment duration, the higher the probability of entering into a new job is (larger for males).

## 2. The data and sample

This paper uses data from Social Security records that contain information on all employment (and non-employment) spells of workers in the Spanish labour market over a three-year period (from June 1999 to June 2002). The data set includes information on age, gender, qualification level[3], dates of start and end of employment spells, reason for termination of the spell (voluntary/involuntary or retirement), province of residence of the worker, an identifier of whether each employment spell is accomplished through a temporary help agency (THA) or not, the type of contract held by the worker (temporary or permanent), and firm size. These data set was matched with HSIPRE (*Histórico del Sistema Integrado de Prestaciones),* another administrative data set, that provides information[4] on the last ten spells of unemployment benefits received by each worker. Thus, we know whether each individual was receiving unemployment benefits when out of work, the type of benefits received (of contributory or assistance type), the number of days granted for benefit and the number of days of benefit receipt.

The advantage of using Social Security records for the analysis of flows in and out of unemployment is threefold: (i) The availability of information on all jobs held by the individual during a certain interval of time; (ii) unemployment duration is very accurate and detailed; (iii) it is possible to distinguish spells ending through recall from those ending through the finding of a new job. In addition, the combination with data from the unemployment benefits receipt allows us to overcome many of the limitations of studies that use data from either Social Security records or the HSIPRE.[5] An advantage of the data use is that information is available on the entire spell of non-employment, and a limitation is that it contains the complete work history of individuals over a rather short period (from June 1999 to June 2002).

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[3] The qualification level indicates a position in a ranking determined by the worker's contribution to the Social Security system. It is somewhat related to the individual's qualification level, since it reflects the worker's professional category and salary. It could happen, however, that a worker with higher education is far below the category that would correspond to his formal education (see appendix Table A.1).

[4] Therefore, our data is composed of two different random samples for the Spanish labour market: (i) 2.5% of individuals who were either employed or receiving unemployment insurance benefits in June of 2002; (ii) 2.5% of individuals who were registered at the employment office in June of 2002 without receiving any unemployment benefits. This second sample was extracted in order not to exclude from our analysis the individuals who did not appear at the time of selecting the sample (June of 2002) from Social Security records.

[5] A different extraction from Social Security records was previously used to study employment and unemployment spells through the use of duration models in García-Fontes and Hopenhayn (1996), García-Pérez (1997), and García-Pérez and Muñoz-Bullón (2005a, 2005b), but they only have data up to the year 1999. On the other hand, Cebrián et al. (1996), Arranz and Muro(2004) and Jenkins and García-Serrano (2004) have used HSIPRE.

Since each firm in the database is issued an (anonymous) identification number — which is separately recorded for every single spell of employment— temporary separations are identified by whether or not each firm's identification numbers of two subsequent employment spells are equal. It is noteworthy to underlie that we only refer to temporary layoffs in an *ex post* sense —i.e., job separations ending in recall. We have no information on *ex ante* temporary layoffs —i.e., those that begin with a person expecting to be recalled. Thus, the *ex post* measure is likely to underestimate the total amount of unemployment affected by recall prospects, since it does not include the unemployment of those who initially waited for recall but were not recalled. In any case, this *ex post* concept gives the proportion of unemployment from spells involving no job change (Feldstein, 1975; Clark and Summers, 1979), and it is not ambiguous in the sense that it is not based on whether individuals decided what is a new employer and what is not[6].

The data contains an initial sample of 79,267 representative cases drawn from workers who were subject to Social Security contributions and become jobless at some point in time during the first semester of 2000. We drop individuals who do not meet all the following criteria: 1) Entered unemployment due to involuntary reasons —i.e., dismissals or termination of temporary contracts[7]. As we consider only the first spell of unemployment occurring in the indicated period, we obtain a "flow sample" of unemployed workers in the terminology of Lancaster (1990), pp. 162; 2) In the previous job, the individual was registered with the General System of Social Security[8]; 3) We have complete information on all the variables used in the empirical analysis; 4) Workers must remain out of work for more than 30 days. We eliminate workers with unemployment spells lasting 30 days or less because they experiment straight movements from job to job without experiencing unemployment. Finally, we limit our sample to workers aged between 16 and 52 (to avoid complications associated with early retirement).

After applying the indicated sample selections, we obtain a final sample of 23,035 individuals. Table A.2 of the appendix shows the loss of observations from the initial dataset. In the sample, each of those individuals has been followed from the time when they become unemployed in the first semester of the year 2000 until their re-employment occurs. Those still without a job in June 2002 have been treated as right-censored observations[9]. Main variable definitions and basic descriptive statistics for the sample used in the empirical analysis are given in Table 1.

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[6] The wide use of temporary employment in the Spanish labour market advises us against the use of the term "temporary layoff" in connection with recall activity by firms. For this reason, we analyse unemployment duration paying more attention on how the unemployment spell ends than on how it was initiated. More specifically, a great majority of workers in Spain become unemployed because of end of their contracts. We understand that end of contract is not exactly the same thing as layoff. By contracting with fixed-term contracts, firms have no need for temporary layoffs. Workers with permanent contracts are expensive to dismiss, so when they are laid-off they are unlikely to come back or to be called back. Because of these considerations, when we use the term layoff it has to be understood that separations because of expiration of contracts are also included.

[7] We cannot distinguish between these two reasons for job termination. Workers who quit their jobs (end their employment for voluntary reasons) are not considered in this study because we do not know why this happens and these workers are likely to leave the labour force (see García-Pérez and Muñoz-Bullón, 2005b).

[8] Because specific regimes like Farming and Self-employment have different rules for accessing benefits and the peculiarities of their employment relationships, they should be object of separate analysis.

[9] We have created an artificial right censoring for observations of workers whose unemployment spell duration extend beyond 19 months because there is a small number of workers for whom re-employment does not occur.

As it is shown in this table, thirty-six percent of unemployed who find a job return to an employer where they were previously employed (8,277 over 23,035 individuals). Therefore, recalls do constitute, indeed, an important element of unemployment in Spain. This figure is even higher than the one found in other European countries[10]. We also see that recall is more concentrated on certain individuals. In particular, males are less likely to return to their previous employer when exiting from unemployment (66 percent of recalled individuals are women as opposed to 44 percent among non-recalled individuals). Moreover, age appears as another relevant determinant of being recalled: the recall outcome is slightly more important for individuals under 35 years old. And individuals in possession of either low or low-intermediate qualification levels tend to experiment a relatively higher recall outcome. Moreover, on average, recalls seem to be more concentrated on workers with shorter unemployment spells, shorter employment duration and slightly higher number of previous jobs[11].

According to the results from a multivariate *logit* model[12] (not shown) the probability that a given unemployed becomes recalled to his or her previous employer, rather than becoming in a new job, is more likely to be associated with the following characteristics: women, older than 39 — a fact which is consistent with the view of firms trying to maintain their eldest employees' specific human capital — either high or low skilled — although this effect of qualification only remains for men—, held a non permanent contract[13], worked in a relatively short period of time in firms with more than 200 employees, spent less time unemployed, received unemployment benefits of shorter duration and experienced more job changes.


## 3. Econometric approach: A competing risks duration analysis

For the empirical analysis, we specify a discrete time competing risks duration model following the formulations proposed by Allison (1982), Jenkins (1995), Lauer (2003) and D'Addio and Rosholm (2005) This type of models is common in the analysis of temporary layoffs where all the unemployed are subject to the competing risks of a recall and a new job (Katz, 1986; Røed and Nordberg, 2003, among others)[14].

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[10] For instance, recent evidence indicates that temporary layoffs have been common in Sweden: about 45 % of all transitions from unemployment were recalls to the previous employer (Jansson, 2002) and of minor importance in the German labour market (Mavroramas and Orme, 2004) with 26%.

[11] In addition, cross tabulations of various individual characteristics with these data —not shown, but available from the authors upon request— clearly show that exit from unemployment through recall is particularly high for low skilled women (48.2 %) and for women 55 and older (70.8 %). Unemployment duration is negatively related to recall intensity: 21.5% of women unemployed for more than a year as compared with 48.3% of women unemployed for less than 20 weeks are recalled. Finally, recall tends to be more common among individuals in the tails of the qualification distribution.

[12] We performed a *logit* regression for the entire sample and by gender with several personal characteristics as independent variables. The dependent variable included people who found a job, and it was dichotomised as 1 if recalled and 0 if new employer. The personal characteristics used as independent variables were gender, age, qualification level, the type of contract in the previous job, the number of employees in the previous employer, tenure in the previous job, unemployment duration, whether or not the previous employer was a temporary help agency, whether or not the individual holds benefits (either contributory or assistance ones), the number of previous jobs, and, finally, the regional unemployment rate.

[13] The impact of the type of contract held in the previous job must be underlined: individuals who have held in the previous job a permanent per task contract are an almost 50% more likely to being recalled compared to those holding any other type of permanent contract.

[14] A problem when estimating single risk duration models is the potential aggregations bias. Unemployed typically leave unemployment for different reasons (competing risks). Restricting the estimated coefficients for the baseline hazard and the covariates to be the same for all destination states might therefore be a very restrictive assumption. Therefore, the econometric model for the sequence of discrete choice models is a multinomial logit model or competing risks model; in each spell, the unemployed can

In a discrete–time competing risks model, an individual's unemployment spell is represented by a random variable *T*, which can take on positive integer values only. We observe a total of *n* independent individuals (*I=1,…,n*) beginning at some natural starting point t=1. In the data used in the paper, such point is the month when the worker becomes unemployed for the first time during the first semester of the year 2000. Each observation continues until time *t*, at which point an event occurs or the observation is censored. The unemployment spell can end, *T=t*, in any of *j* states: *j=1* (re-employment through a different employer from the immediately previous one) or *j=2* (re-employment though the same employer as the immediately previous one; i.e., a recall takes place). The observation is censored when the surviving individual is observed at month *t* but not at month *t+1*. It is assumed that the time of censoring is independent of the hazard rate for the occurrence of events, at least after controlling for other factors. Also, it is assumed that the set of two states at which unemployment spells end is absorbing and equal for each person.

For modelling the transition from unemployment to employment through recall or through a different employer, we define the discrete hazard rate. For the *i-th* person, the hazard rate into state *j* (*j=1,2*) in period *t*, $h_{ij}(t)$, is the conditional probability of a transition to state *j* in this period, given that individual *i* has been unemployed until $t$[15].

$$h_{ij}(t) = \Pr[T_i = t_i, J = j \mid T_i \geq t_i] \qquad [1]$$

Assuming that the competing risks are independent, the hazard rate from unemployment is given by:

$$h_i(t) = \sum_{j=1}^{2} h_{ij}(t) \qquad [2]$$

The conditional probability that individual *i* remains unemployed in period *t* is given by:

$$\Pr[T_i > t_i / T_i \geq t_i] = 1 - h_i(t) \qquad [3]$$

And not conditioning on the individual's previous employment history, the survivor function up to period *t* is:

$$\Pr[T_i > t_i] = \prod_{k=1}^{t_i} (1 - h_{ik}) \qquad [4]$$

Then, the transition into state *j* in period t can be expressed in terms of the respective hazard rate and the survivor function as:

$$\Pr[T_i = t_i, J = j] = h_{ij}(t) \prod_{k=1}^{t_i - 1} (1 - h_{ik}) \qquad [5]$$

Assuming independence of all observations, the likelihood function is given by:

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either stay in unemployment (the reference category), be re-employed though a different employer or be re-employed though the same employer.

[15] According to the simple job search model (Lippman and MacCall, 1976), given a stationary reservation wage, the re-employment probability is the result of two probabilities: the rate at which offers arrive times the probability that a random offer is accepted. In our competing risks model, unemployed workers can either obtain a job through a different employer from the immediately previous one or be re-employed through recall to the previous employer.

$$L = \prod_{i=1}^{n}\left[ \prod_{j=1}^{2}\left[\Pr(T_i = t_i, J = j)\right]^{\delta_{ij}} \left[\Pr(T_i > t_i)\right]^{1-\delta_{ij}} \right] \qquad [6]$$

where $\delta_{ij}$ equal 1 if a transition occurred at time $t_i$ and otherwise set it at zero (censored). Substituting [4] and [5] into [6], we can have the likelihood function in terms of the transition and hazard rates. We can write:

$$L = \prod_{i=1}^{n}\left[ \prod_{j=1}^{2}\left[ \frac{h_{ij}(t)}{(1-h_{ij}(t))} \right]^{\delta_{ij}} \left[ \prod_{k=1}^{t}(1-h_{ik}) \right] \right] \qquad [7]$$

Given that [7] is in function of the transition rates, we just need specify the dependence of the latter on the explanatory variables. For the hazard rate we choose the logistic specification that, with multiple events, generates the multinomial *logit* model (Maddala, 1983). It allows for the three possible states considered: employment through a different employer, employment through recall, and remaining unemployed (which is the base category). For individual *i,* the transition rate to state *j* in period *t* specified as a multinomial logit may now be written as:

$$h_j(t \mid z(t), \varepsilon_j) = \frac{\exp(D'(t)\alpha_j + Z'(t)\beta'_j + \varepsilon_j)}{1 + \sum_{m=1}^{2} \exp(D'(t)\alpha_m + Z'(t)\beta_m + \varepsilon_m)} \qquad [8]$$

where $Z(t)$ is a vector of explanatory variables which may vary with time; $\beta$ is the vector of parameters to be estimated; the terms $\alpha$ stands for the baseline hazard which captures the duration dependence. The specification of the baseline hazard is very important. A common but restrictive approach consists of specifying a parametric form for the baseline hazard. This approach is very strong because the assumptions over the form are difficult to justify from an economic point of view, and provokes a misspecification problem. Instead, we choose a semi-parametric approach (piecewise constant hazard) by specifying monthly dummies $D(t)$ which coefficients for transitions to employment through recall can differ from those for transitions to employment through a different employer. This method presents the advantage of being flexible and assumes that the duration dependence pattern may vary among the states. Finally, $\varepsilon$ accounts for unobserved heterogeneity characteristics in the model such as motivation, ability, efforts, family pressure, etc. We assume that the unobserved heterogeneity effect is destination state specific, time constant, and independent of the observed characteristics.

The contribution to the likelihood function for a single individual is equal to:

$$L(\beta, \alpha \mid \varepsilon) = \prod_{k=1}^{t} \frac{\exp\left[ (D'_k\alpha_1 + Z'_k\beta_1 + \varepsilon_1)\, c_{1k} + (D'_k\alpha_2 + Z'_k\beta_2 + \varepsilon_2)c_{2k} \right]}{1 + \sum_{m=1}^{2} \exp(D'_k\alpha_m + Z'_k\beta_m + \varepsilon_m)} \qquad [9]$$

where $c_{jk}$ are indicators for making the transition to each of the possible destination states at time k; re-employment through a different employer from the immediately previous one (j=1), or re-employment though the same employer as the immediately previous one (j=2). In [9] a common procedure is to specify a parametric distribution for the unobserved heterogeneity such as a normal, gamma distribution, etc. However,

Heckman and Singer (1984) have criticised this approach, showing that parametric form assumptions for unobserved heterogeneity might affect the parameter estimates. For this reason, we assume that unobserved heterogeneity is discretely distributed with unknown support points. Those points can be interpreted as latent individual's types. Then, the likelihood function for an individual may be obtained integrating the following conditional likelihood distribution:

$$L(\beta, \alpha, \varepsilon, \pi) = \prod_{s=1}^{2} L(\beta, \alpha \mid \varepsilon = s)\pi(s) \qquad [10]$$

Where ε are the location points (that can be interpreted as intercept for the baseline hazard function), π the probability associated to them, and *s* the number of support points. In the following section we estimate this likelihood function by maximum likelihood to know how individual, industry and labour market characteristics influence unemployment spell durations via recall or a new job.

### 3.1 Specification tests

In table 2, we have performed tests for the assumption of 'independence of irrelevant alternatives' (IIA) through the Hausman test (Hausman and McFadden, 1984, HM) and Small Hsiao test (Small and Hsiao, 1985, SH). Those popular tests for testing the validity of IIA consist of partitioning the choice set of alternatives into subsets and therefore comparing the coefficients (HM) or the likelihood functions (SH) from the complete model and from the restricted model obtained by leaving out one or more alternatives. In both tests, the null hypothesis of IIA is accepted; therefore, the multinomial logit specification seems to be appropriate for each departure state.

In addition, a Wald test and a LR test are reported in Table 2 in order to examine the null hypothesis that the coefficients of two categories do not differ significantly from each other, for all the possible combinations. In other words, that some of the alternatives might be combined or aggregated into a simple category, in which case the specification should be binomial rather than a multinomial. In both tests the rejection of the null hypothesis means that it is adequate to distinguish between exits into a different employment and a recall job; therefore, the multinomial specification seems to be appropriate, since none of the categories should be combined.

### 4. Empirical analysis

### 4.1 Variables

To investigate the determinants of recall among unemployed workers, we estimate a discrete duration model with competing risks of exits out of unemployment.

The dependent variable is the probability of becoming employed at some point of their unemployment spell via recall or a new job. This estimation strategy boils down to estimating a multinomial *logit* on the expanded sample. The alternative choice for comparison is remaining unemployed. In addition to the parameters (defined over each month-year interval) that account for duration dependence, the explanatory variables used in the analysis are the following:

   *(I)      Demographic characteristics:*
              -   Gender (1 if the unemployed is male, 0 female).
              -   A set of ten age group indicators (age 35-39 is the reference group).

*(II)*     *The individual's labour market history:*
- Tenure in the previous job is included through five dummy variables ( <= 4 weeks (reference category), >4 weeks and <=20 weeks, > 20 weeks and <= 1 year, >1 year and <= 2 years, >2 years)[16].
- The qualification level required for the previous job is collected through four levels of the professional category of the worker contribution to the Social Security[17]: High qualification, medium-high qualification (reference category), medium qualification and low qualification. See appendix Table A.1.
- Whether or not (reference category) the individual was hired in the previous job through a temporary help agency.
- The type of contract held in the previous job: permanent contract (reference category), permanent per task, temporary and other type of contracts[18].
- The number of jobs held previous to the one leading to the spell of unemployment under study.
- The type of sector where the worker was engaged at in the previous job: agriculture, construction, services and industry (reference category).
- Firm size is included through five dummy variables: <=10 workers (reference category), >10 and <=50 workers, >50 and <=200 workers, >200 and <=1000 workers and >1000 workers.

(III)   *The regional unemployment rate* (obtained from the Spanish Labour Force Survey, EPA).

(IV)    *Regions of residence* (seventeen dummies for the Autonomous Communities of Spain). Madrid is the reference category.

(V)     *Dummies for the month of entering unemployment*: given that the sample that we use is composed of individuals who entered unemployment in the first semester of the year 2000, we control for this with the dummies indicating whether such months were January-February, March-April, or May-June (reference category).

*(VI) Unemployment Compensation System*: Dummy equals 1 at each month the worker received unemployment insurance or assistance benefits during his unemployment spell, and zero otherwise. We have also included in the model an interaction variable between contributory benefits and months of unemployment.

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[16] The worker's previous employment history (i.e., job turnover) should be an important explanatory factor of the reemployment probability, since individuals more accustomed to move from jobs are supposedly more "employable", and thus are expected to leave unemployment earlier.

[17] We must underscore that the ten professional categories of worker contribution to Social Security in the database do not reveal the workers' level of qualification, but rather the required level of qualification for the job. For instance, an individual working in the lowest category, "labourers", may well be in possession of an academic degree. As in previous studies using data from the Social Security records, we group those eleven categories into four groups (see García Pérez and Muñoz Bullón, 2005a; 2005b), see appendix Table A.1.

[18] Workers under this latter type of contract enjoy a strong relationship with their previous employer during the lay-off: this relationship is much stronger than with other types of contracts, since individuals retain seniority and other employment-related benefits (for instance, they have the privilege of being requested first by their previous employer on their availability to re-enter their payroll). In short, the workers with such contracts are treated as if they had maintained their employment relationship. Thus, they usually do not engage in job-seeking activities because they regard themselves as employed and they are virtually certain to return to their jobs at the end of the layoff period.

## 4.2 Results

Table 3 provides the determinants of exits from unemployment through recall or through a new job for the entire sample. Tables 4 and 5 show results by gender. Two single risk estimations have been obtained based on the likelihood function (10) by the maximum likelihood estimator. The first column reports estimated coefficients for exits from unemployment to a new job and the second column reports those from unemployment to recall. Note that the exponential function of a parameter attached to a dummy measures the hazard rate for an unemployed with the dummy equal to one relative to a reference person.

While men have a significantly 7.7 per cent lower probability of exiting unemployment into a recall job than women, the former have a 44.8 per cent higher hazard rate of finding a new job than the latter. This means that women enjoy shorter unemployment duration than men when they return to the previous employer. However, it takes women longer when they enter a new job. As regards age, the 35-39 age interval marks the difference: the youngest workers are more likely to find a new job while the eldest workers are more likely to being recalled.

Our dataset does not provide variables related to the individual's educational attainment and occupation. However, we know the required level of qualification for the job (see appendix Table A.1). Estimations results show that if an involuntary interruption occurs, those workers holding higher qualification levels are more likely to being recalled by their previous employer and lower qualified workers suffer the greatest difficulties in finding a new job.

There are several variables that provide interesting insights into the way workers exit from unemployment in Spain: whether or not the individual has been employed through a Temporary Help Agency (THA), firm size, sector, type of contract and tenure in the previous job. We appreciate that having worked via a THA enhances 50.4 per cent the probability of finding a new job, while the recall hazard is not affected by agency work. We also obtain that the probability of recall increases monotonically with firm size, if the individual has held a permanent per task contract in the former job, if he has worked in the industry sector, and when tenure in that former job ranged —in particular— from 20 weeks to one year (in addition, from 4 weeks to two years). However, the higher the relative job stability experienced by workers in the previous job, the higher the exit rate from unemployment into a different employer is; this effect is higher for workers in the agriculture sector, and lower for workers with a previous permanent per task contract.

The effect of unemployment compensation has the expected effects for both the recall and the "ordinary" unemployed (i.e., unemployed who entered a new job): Non-claimants exit from unemployment faster than claimants do. Results also suggest that the probability of leaving unemployment does not appear significantly different according to the route taken back to work. While the disincentive effect of contributory and assistance benefits is similar in magnitude for unemployed who entered into a new job, the impact of benefits on the recall outcome differ in magnitude for those who were recalled. The probability of exiting from unemployment through recall is strongly negatively influenced by assistance benefits (which is typically received by workers with low worker-firm attachment), but it is relatively weakly influenced by holding contributory benefits (which is typically received by workers with high worker-firm attachment). The non-existence of an estimated positive recall effect for the latter does not support the implicit contract hypothesis and suggests that search explanations may be more appropriate.

Regarding the effect of regional labour market characteristics on unemployment duration, estimations also include dummies to take account of the existence of regional differences (not reported) and a continuous variable on the regional (quarterly) unemployment rate (as a time varying covariate). Compared to Madrid (regional reference category), workers in almost every other region are more likely to being recalled (except for Navarra, La Rioja, Balearic Islands and Aragon, whose effect is null, and negative in Catalonian). This effect is especially stronger in regions such as Andalucia and Extremadura (i.e. regions with unemployment rates above the national average). The opposite pattern of exiting from unemployment into a new job is observed in the same regions. Concerning the quarterly regional unemployment rate as a measure of demand side factors, we find that it is negatively correlated with the hazard rate from unemployment to a job (via recall or a new job).

Concerning unobserved heterogeneity, we notice that two support points are highly significant. The estimated support points are -4.908 and -3.021 with probability masses 0.095 and 0.904, respectively. This means that exit rates from unemployment to a new or a recall job are affected not only by measured individual and job characteristics of the unemployed, but also by their unobserved characteristics[19].

In relation to the pattern of duration dependence (the way the hazard rate depends on process time), Figure 1 shows the predicted hazard rate (after controlling for unobserved heterogeneity) at mean of covariates for the entire sample. As can be observed, the hazard rate from unemployment into re-employment through recall keeps below the rate from unemployment into new job finding. The difference between both predicted hazard rates widens as unemployment duration lengthens. Moreover, it can be observed how in a competing risks framework the recall hazard rate steadily exhibits positive duration dependence during the first months (up to the second one) and negative duration dependence thereafter, while the predicted hazard for new jobs presents positive duration dependence (similar to a Weibull distribution).

In essence, this picture lets us confirm different predictions about contract and search temporary layoff models[20]. At short unemployment durations (up to the third month), predictions are rather similar for both types of exits; however, for long unemployment durations, predictions differ because recall workers do no search while they are only waiting (contract models), and those who enter into a new job (search models) do a lot of search and little waiting. In other words, the longer someone is unemployed, the less is the probability of being recalled and the more likely it is to enter into a new job.

Two explanations may be underlying this result. On the one hand, firms cannot immediately determine whether downturns are transitory or permanent: the longer a low demand state lasts, the more likely it will become a "permanent" low demand state. As a consequence, the longer a worker remains on layoff, the lower his perceived instantaneous recall probability. This will induce a declining reservation wage. Thus,

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[19] When comparing estimations with and without (not reported) unobserved heterogeneity, the estimated coefficients and the value of the log-likelihood are influenced by the inclusion of the unobserved heterogeneity. On the one hand, the unobserved heterogeneity component increases the log-likelihood values in the estimations, therefore improving the fits of the models. On the other hand, there are some differences in the coefficients for some variables (for example in variables such as firm size, type of sector, tenure in previous job and in some age groups) that increase the magnitude (in absolute value) of the parameters of the exit rates from unemployment to recall or a new job. Moreover, the likelihood ratio test of a model with unobserved heterogeneity against that without also supports the same conclusion that unobserved heterogeneity is significant.

[20] A description of contract and search theories can be found in Mavroramas and Orme (2004).

revised expectations of the recall probability result in increased search activity, which increases the new job hazard rate. On the other hand, the risk of losing employees on temporary layoff increases with unemployment duration, which would tend to yield earlier recall by the employer. This result is coherent with the ones found by Katz (1986) and Katz and Meyer (1990): unemployment duration hazards —which decline when treating the re-employment probability as a single risk— will often decline only for recalls when using competing risks model, while the hazard rate is increasing for new jobs.

Tables 4 and 5 show some differences in the determinants of exits from unemployment between men and women, respectively. As regards age, women follow a pattern similar to the entire sample; i.e., the youngest women are more likely to find a new job, while the eldest are more likely to being recalled. The youngest men also tend to find a new job more easily than the reference category. However, the eldest men are not significantly more likely to being recalled.

Both men and women experiment a positive impact on the likelihood of being recalled from the fact of holding a high qualification level, but only the latter suffer a negative impact on finding a new job from holding a low qualification level.

Estimated results by gender as regards the remainder explanatory variables (type of contract, tenure in the previous job, firm size, job through a THA, unemployment benefit status and number of previous jobs) do not basically differ from those obtained for the entire sample.

Finally, Figure 2 shows the pattern of duration dependence by gender (after controlling for unobserved heterogeneity) at mean of covariates. As previously discussed for the entire sample, the hazard rate from unemployment into a new job keeps over the hazard rate from unemployment through recall. Furthermore, the recall hazard rate steadily exhibits positive duration dependence during the first months and negative duration dependence thereafter (higher in females), while the empirical hazard for new jobs presents positive duration dependence (higher in males).

## 5. Conclusions

This paper examines transitions out of unemployment in Spain towards two distinct types of employment: recall to the same employer or reemployment in a new job. This issue has so far never been studied in Spain. We have used data from Social Security records combined with data produced by the Spanish Employment Office where we have information about worker and job characteristics before and after unemployment, in addition to information about the duration of the unemployment. To study transitions out of unemployment, we estimate a discrete time competing risks duration model of exits to a recall or new job where duration dependence is accounted for through the use of a semi-parametric piecewise constant hazard estimation. We also control for unobserved and observed heterogeneity.

The effects of individuals characteristics suggest that the hazard of being recalled to the same employer is more likely for women, for older individuals (above 40 years-old) and for higher qualified workers (with, presumably, larger specific human capital). Concerning job characteristics, the fact of holding a previous permanent per task contract or of experiencing previous job tenure ranging between 20 weeks and 1 year enhances the recall hazard. At the same time, temporary layoffs generated in an implicit contract framework are relatively more prevalent in the industry sector and in the largest firms, since their unemployed workers are more likely to being recalled. On the

contrary, working through a temporary help agency does not affect the recall hazard rate.

In contrast with these effects, we obtain that men, young workers (above 35 years-old) and those working via a temporary help agency enjoy a higher likelihood of exiting from unemployment into a new job. We also find a positive influence of previous employment experiences on future new jobs: the longer the job stability experienced by workers in previous employment engagements, the higher the exit rate from unemployment into a new job.

Another important finding is that not only do individuals and job characteristics influence the hazard rates differently, but also that the duration dependence is different. Different processes are governing the recall and new-job hazards, since the recall hazard rate presents positive duration dependence until the second month and negative duration thereafter (larger for females), while the new-job hazard exhibits positive duration dependence (larger for males).

As regards the effect of contributory and assistance benefits, non- claimants exit from unemployment faster than claimants do. Nevertheless, while the disincentive effect of the two types of benefits is similar in magnitude for the unemployed who entered into a new job, the negative effect for recall workers is stronger for those holding assistance benefits rather than contributory benefits.

The empirical findings for Spain in this paper establish that recall to the former employer and, therefore, temporary job separations constitute an important feature of Spanish labour market. Firm specific human capital, as well as efficient risk sharing and, last but not least, possibly collusive behaviour for taking advantage of the unemployment compensation system may make implicit contracts of this sort attractive for both workers and firms when facing downturns in product demand. These issues remain open for further research.

# *APPENDIX*

### *Table A.1 Occupation category groups*

| Occupation category groups | National job category levels |
|---|---|
| *High Occupation* | 1. Engineers and bachelors. <br> 2. Technical engineers, experts and qualified assistants. <br> 3. Administrative chiefs and of workshop. |
| *Upper-Intermediate Occupation* | 4. Not qualified assistants. <br> 5. Administrative officials. <br> 6. Secondary (Minor). |
| *Lower-Intermediate Occupation* | 7. Administrative assistants. <br> 8. Officials of the first and the second. |
| *Low Occupation* | 9. Officials of third and specialists. <br> 10. Labourers. |

*Table A.2 Loss of observations from initial data set*

| | |
|---|---|
| **Initial sample size:** | **79,267** |
| Observations <u>deleted</u> due to: | |
|     - Enter into unemployment due to reasons different from involuntary ones | 21,702 |
|     -   Missing variables used in the empirical analysis: | |
|         -   Sex | 13 |
|         -   Sector of activity | 17 |
|         -   Qualification | 1 |
|         -   Age | 5 |
|         -   Reason for benefits | 6 |
|         -   Replacement ratio | 5 |
|     - Enjoy unemployment benefit different from contributive or assistance ones | 19 |
|     - Unemployment duration <= 30 days | 34,464 |
| **Final sample size used in the empirical analysis:** | **23,035** |

**REFERENCES**

Allison, P.A. (1982). "Discrete-Time Methods for the Analysis of Event Histories", in Leinhardt, S. (ed.), *Sociological Methodology*. San Francisco: Jossey-Bass Publishers, pp. 61-98.

Arranz, J.Mª and Muro, J. (2004). "Recurrent Unemployment, Welfare Benefits and Heterogeneity", *International Review of Applied Economics*, vol. 18, no. 4, pp.423-441.

Baily, M.N. (1977). "On the Theory of Layoffs and Unemployment", *Econometrica*, vol. 45, pp. 1043-63.

Cebrián, I., García, C., Muro, J., Toharia, L. and Villagómez, E. (1996). "The Influence of Unemployment Benefits on Unemployment Duration: Evidence from Spain", *Labour*, 10, pp. 239-267.

Clark, Kim B. and Summers, L.H. (1979). "Labor Market Dynamics and Unemployment: A Reconsideration", *Brookings Papers on Economic Activity*, 1, pp. 30-60.

Corak, M. (1996). "Unemployment Insurance, Temporary Layoffs and Recall Expectations", *Canadian Economic Observer*, Statistics Canada, no. 11, May, pp. 3.1-3.15.

D' Addio, A.C. and Rosholm, M. (2005). "Exits from Temporary Jobs in Europe: A competing risks Analysis, *Labour Economics*, 12, pp.. 449-468.

Emerson, M. (1988). "Regulation or Deregulation of the Labor Market," *European Economic Review*, Vol 32(4), pp. 775-817.

Feldstein, M.S. (1975). "The Importance of Temporary Layoffs: An Empirical Analysis," *Brookings Papers on Economic Activity*, 3, pp. 725-44.

Feldstein, M.S. (1976). "Temporary Layoffs in the Theory of Unemployment", *Journal of Political Economy*, 84, pp. 937-57.

Feldstein, M.S. (1978). "The Effect of Unemployment Insurance on Temporary Layoff Unemployment", *The American Economic Review*, 65, pp. 834-846.

García-Fontes, W. and Hopenhayn, H. (1996). "Flexibilización y Volatilidad del Empleo", *Moneda y Crédito*, 202, pp. 205-227.

García-Pérez, J.I. (1997). "Las Tasas de Salida del Empleo y el Desempleo en España (1978-1993), *Investigaciones Económicas*, vol. 21, pp. 29-53.

García-Pérez, J.I. and F. Muñoz-Bullón (2005a). "Are Temporary Help Agencies Changing Mobility Patterns in the Spanish Labour Market?", *Spanish Economic Review* 7 (1), pp. 43-65.

García-Pérez, J.I. and F. Muñoz-Bullón (2005b). "Temporary Help Agencies and Occupational Mobility", *Oxford Bulletin of Economics and Statistics*, 67, pp. 163-180

Gutierrez-Rieger, H. and Podzeczeck, K. (1981). "On the Non-existence of Temporary Layoff Unemployment in Austria", *Empirica*, 2, pp. 277-89.

Hausman, J.A. and D. McFadden (1984). "Specification Tests for the Multinomial Logit Model", *Econometrica*, 52 (2), pp. 1219-1240.

Heckman, J.J. and Singer, B. (1984). "A Method for Minimising the Impact of Distributional Assumptions in Econometric Models for Duration Data", *Econometrica*, 52, pp. 272-320.

Jansson, F. (2002). "Rehires and Unemployment Duration in the Swedish Labour Market – New Evidence of Temporary Layoffs. Labour, 16 (2), pp.311-345.

Jenkins, S.P. and C. García-Serrano (2004). "The Relationship Between Unemployment Benefits and Re-employment Probabilities: Evidence from Spain", *Oxford Bulletin of Economics and Statistics*, 66, 2, pp. 239-260.

Jenkins, S. (1995). "Easy Estimation Methods for Discrete Time Duration Models". *Oxford Bulletin of Economics and Statistics*,57(1 ), pp. 120-138.

Jensen, P. and Nielsen, M.S. (1999). "Short- and Long-Term Unemployment: How Do Temporary Layoffs Affect this Distinction?, Working Paper 99-06, Centre for Labour Market and Social Research, Aarhus.

Jensen P. and Westergård-Nielsen N. (1990). "Temporary Layoffs", in J. Hartog (ed.), *Panel Data and Labor Market Studies,* North-Holland, Amsterdam.

Katz, Lawrence F. (1986). "Layoffs, Recall and the Duration of Unemployment", NBER Working Paper no. 1825, January.

Katz, Lawrence F. and Meyer, B.D. (1990). "The Impact of the Potential Duration of Unemployment Benefits on the Duration of Unemployment", *Journal of Public Economics,* 41, pp. 45-72.

Lancaster, T. (1990). *The Econometric Analysis of Transition Data*, Cambridge: Cambridge University Press.

Lauer, C. (2003)."Education and Unemployment: A French-German Comparison, *Discussion Paper 03-34*, ZEW.

Layard, R., Nickell S. and Jackman, R. (1991). *Unemployment: Macroeconomic Performance and the Labor Market*. Oxford University Press, Oxford.

Lippman, S.A. and J.J. MacCall (1976). "The Economics of Job Search: A Survey", *Economic Inquiry* 14, pp. 155-367.

Maddala, G.S. (1983). *Limited-dependent and qualitative variables in econometrics*, Cambridge University Press, Cambridge.

Mavromaras, K.G. and Orme, C.D. (2004). "Temporary Layoffs and Split Population Models", *Journal of Applied Econometrics*, 19: pp. 49-67.

Mortensen, D.T. (1990)." A Structural Model of Unemployment Insurance Benefit Effects on the Incidence and Duration of Unemployment. In: *Advances in the Theory and Measurement of Unemployment*, Weiss Y, Fishelson G (eds). Macmillan: London.

Moy, J., and Sorrentino, C. (1981). "Unemployment, Labor Force Trends, and Layoff Practices in 10 Countries," *Monthly Labor Review*, December, pp. 3-13.

OECD (2002). *OECD Employment Outlook*, Paris.

Røed, K. and Nordberg, M.(2003). "Temporary Layoffs and the Duration of Unemployment", *Labour Economics*, 10, pp. 381-398.

Rosholm, M. and Svarer, M. (2001). " Structurally Dependent Competing Risks", *Disctussion Paper* No. 265, IZA.

Small, K.A. and C. Hsiao (1985). "Multinomial Logit Specification Tests", *International Economic Review*, 26 (3), pp. 619-627.

Winter-Ebmer R. (1998). "Potential Unemployment Benefit Duration and Spell Length: Lessons from a Quasi-Experiment in Austria", *Oxford Bulletin of Economics and Statistics*, 60, pp. 33-45.

### Table 1. Main descriptive statistics for first unemployment spell in 2000

| Variable | Description | Entire sample Mean (S.D.) | Recall Mean (S.D.) | New Job Mean (S.D.) |
|---|---|---|---|---|
| Gender | =1 if male | 0.517 | 0.436 | 0.562 |
| Age | Age in years when entering unemployment | | | |
| 16-19 | =1 if aged 16 to 19 | 0.071 | 0.043 | 0.087 |
| 20-24 | =1 if aged 20 to 24 | 0.218 | 0.166 | 0.246 |
| 25-29 | =1 if aged 25 to 29 | 0.206 | 0.176 | 0.223 |
| 30-34 | =1 if aged 30 to 34 | 0.152 | 0.158 | 0.149 |
| 35-39 | =1 if aged 35 to 39 | 0.122 | 0.147 | 0.109 |
| 40-44 | =1 if aged 40 to 44 | 0.092 | 0.122 | 0.076 |
| 45-49 | =1 if aged 45 to 49 | 0.064 | 0.086 | 0.052 |
| 50-54 | =1 if aged 50 to 54 | 0.046 | 0.061 | 0.037 |
| 55-59 | =1 if aged 55 to 59 | 0.023 | 0.032 | 0.019 |
| 59-62 | =1 if aged more than 59 years old | 0.005 | 0.009 | 0.003 |
| Qualification level | | | | |
| High | =1 if Social Security bracket for contribution in previous job is 1, 2 or 3. | 0.083 | 0.099 | 0.073 |
| Upper-intermediate | =1 if Social Security bracket for contribution in previous job is 4, 5 or 6 | 0.111 | 0.097 | 0.119 |
| Lower-intermediate | =1 if Social Security bracket for contribution in previous job is 7 or 8 | 0.289 | 0.244 | 0.314 |
| Low | =1 if Social Security bracket for contribution in previous job is 9 or 10. | 0.517 | 0.559 | 0.494 |
| Type of contract | Type of contract in previous job | | | |
| Permanent | =1 if permanent contract | 0.069 | 0.029 | 0.091 |
| Permanent per task | =1 if permanent per task contract | 0.036 | 0.084 | 0.012 |
| Temporary | =1 if temporary contract | 0.849 | 0.825 | 0.863 |
| Other contract type | =1 if other contract type | 0.044 | 0.062 | 0.034 |
| | | | | |
| Temporary help agency | =1 if previously employed through a THA | 0.052 | 0.036 | 0.061 |
| Firm size | | | | |
| <= 10 employees | =1 if number of employees up to 10 | 0.343 | 0.290 | 0.372 |
| >10 and <=50 | =1 if number of employees above 10 and up to 50 | 0.294 | 0.297 | 0.293 |
| >50 & <=200 | =1 if number of employees above 50 and up to 200 | 0.186 | 0.200 | 0.179 |
| >200 & <=1000 | =1 if number of employees above 200 and up to 1000 | 0.120 | 0.135 | 0.111 |
| >1000 | =1 if number of employees above 1000 | 0.057 | 0.077 | 0.045 |
| Tenure in previous job | Tenure in previous job (in weeks) | 32.788 (80.555) | 23.130 (32.611) | 38.154 (97.073) |
| <=4 | =1 if up to 4 weeks | 0.255 | 0.298 | 0.232 |
| >4 and <=20 | =1 if above 4 weeks and up to 20 weeks | 0.308 | 0.273 | 0.327 |
| >20 and <=1 year | =1 if above 20 weeks and up to 1 year | 0.311 | 0.356 | 0.286 |
| >1 and <= 2 years | =1 if above 1 year and up to 2 years | 0.076 | 0.051 | 0.090 |
| > 2 years | =1 if above 2 years | 0.049 | 0.021 | 0.064 |
| Worked in a Temporary Help Agency | =1 if worked in a THA in previous job | 0.052 | 0.036 | 0.061 |
| Unemployment benefit status | | | | |
| Contributory benefit | Proportion collecting contributory benefits at the beginning of spell (=1 for each month worker collects benefits) | 0.2230 | 0.1718 | 0.2515 |
| Assistance benefit | Proportion collecting assistance benefits at the beginning of spell (=1 for each month worker collects benefits) | 0.0538 | 0.0524 | 0.0546 |
| Without benefit | Proportion without benefits at the | 0.7232 | 0.7759 | 0.6939 |

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| | beginning of spell (=1 for each month worker collects no benefits) | | | |
|---|---|---|---|---|
| Number of previous jobs | Number of jobs held from June 1999 to actual job | 2.111 (1.740) | 2.266 (1.860) | 2.026 (1.663) |
| Unemployment duration | Duration in unemployment (in weeks) | 25.853 (22.154) | 22.264 (19.782) | 27.846 (23.129) |
| >4 and <=20 | =1 if Above 4 weeks and up to 20 weeks | 0.577 | 0.652 | 0.535 |
| >20 and <=1 year | =1 if Above 20 weeks and up to 1 year | 0.281 | 0.251 | 0.298 |
| >1 year | =1 if Above 1 year | 0.142 | 0.097 | 0.167 |
| **Sample size** | | **23,035** | **8,227** | **14,808** |

### Table 2. Specification tests.

| Test for IIA<br>Ho: Odds(Outcome-J vs Outcome-K) are independent of other alternatives. | $\chi^2(P>\chi^2)$ |
|---|---|
| **Hausman** | |
| Omitted: Different employment. | 62.652(0.69) |
| Omitted: Recall job. | -18.983(1.00) |
| | |
| **Small-Hsiao** | |
| Omitted: Different employment | 62.661(0.69) |
| Omitted: Recall job. | 62.298(0.70) |
| **Wald and LR test for combining outcomes**<br>Ho: All coefficients except intercepts associated with given pair of outcomes are 0 (i.e., categories can be collapsed). | |
| **Wald test** | |
| Combining different employment and recall job. | 2905.035(0.00) |
| Combining diff. employment and unemployment. | 2632.265(0.00) |
| Combining recall job and unemployment. | 4058.603(0.00) |
| | |
| **LR test** | |
| Combining different employment and recall job. | 3308.793(0.00) |
| Combining diff. employment and unemployment. | 2807.516(0.00) |
| Combining recall job and unemployment. | 4371.359(0.00) |

*Table 3. Estimates and standard error of transitions from unemployment to employment through recall or to employment through a different employer after controlling observed and unobserved heterogeneity (with two support points).*

| | ENTIRE SAMPLE | | | | | |
|---|---|---|---|---|---|---|
| | Dif. Emp | | | Recall | | |
| | Coef, | S.E. | Sign. | Coef, | S.E. | Sign. |
| Gender (male=1) | 0.370 | 0.024 | *** | -0.080 | 0.028 | *** |
| Age at unemployment spell: | | | | | | |
| Age 16-19 | 0.352 | 0.051 | *** | -0.545 | 0.068 | *** |
| Age 20-24 | 0.422 | 0.040 | *** | -0.268 | 0.047 | *** |
| Age 25-29 | 0.271 | 0.039 | *** | -0.212 | 0.046 | *** |
| Age 30-34 | 0.138 | 0.043 | *** | -0.109 | 0.047 | *** |
| Age 35-39 | - | - | - | - | - | - |
| Age 40-44 | -0.060 | 0.049 | | 0.137 | 0.051 | *** |
| Age 45-49 | -0.106 | 0.055 | ** | 0.139 | 0.056 | *** |
| Age 50-54 | -0.098 | 0.062 | | 0.162 | 0.063 | *** |
| Age 55-59 | -0.062 | 0.080 | | 0.151 | 0.081 | |
| Age 59-62 | -0.453 | 0.178 | *** | 0.401 | 0.155 | *** |
| Qualification level: | | | | | | |
| Qual. High | -0.010 | 0.051 | | 0.212 | 0.059 | *** |
| Qual. Med.-High | - | - | | - | - | |
| Qual. Medium-Low | 0.086 | 0.037 | *** | 0.060 | 0.048 | |
| Qual. Low | -0.165 | 0.037 | *** | -0.043 | 0.045 | |
| Type of contract: | | | | | | |
| Permanent contract | - | - | - | - | - | - |
| Permanent per task | -0.306 | 0.094 | *** | 1.692 | 0.086 | *** |
| Temporary | 0.187 | 0.045 | *** | 0.731 | 0.070 | *** |
| Other type | 0.050 | 0.070 | | 0.904 | 0.088 | *** |
| Firm size: | | | | | | |
| <=10 employees | - | - | - | - | - | - |
| > 10 and <=50 employees | 0.054 | 0.027 | ** | 0.192 | 0.033 | *** |
| >50 and <=200 employees | 0.151 | 0.032 | *** | 0.393 | 0.039 | *** |
| >200 and <= 1000 employees | 0.061 | 0.040 | | 0.517 | 0.046 | *** |
| >1000 employees | -0.025 | 0.058 | | 0.804 | 0.060 | *** |
| Tenure in previous job: | | | | | | |
| <= 4 weeks | - | - | - | - | - | - |
| >4 weeks and <=20 weeks | 0.473 | 0.033 | *** | 0.081 | 0.037 | ** |
| > 20 weeks and <= 1 year | 0.602 | 0.039 | *** | 0.552 | 0.041 | *** |
| > 1 year and <= 2 years | 0.611 | 0.050 | *** | 0.134 | 0.066 | ** |
| > 2 years | 0.593 | 0.059 | *** | -0.245 | 0.095 | *** |
| Worked in a Temporary Help Agency | 0.408 | 0.055 | *** | -0.061 | 0.072 | |
| Unemployment benefit status: | | | | | | |
| Receives no benefits | - | - | - | - | - | - |
| Contributory benefits (tvc) | -0.400 | 0.041 | *** | -0.566 | 0.058 | *** |
| Assistance benefits (tvc) | -0.454 | 0.055 | *** | -0.873 | 0.070 | *** |
| Month * Contributory benefits | -0.016 | 0.008 | * | -0.032 | 0.015 | *** |
| Number of previous jobs | 0.102 | 0.007 | *** | 0.125 | 0.007 | *** |
| Regional Unemployment rate (tvc) | -0.023 | 0.009 | *** | -0.062 | 0.010 | *** |
| Sector of activity | | | | | | |
| Industry | - | - | - | - | - | - |
| Agriculture | 0.510 | 0.153 | *** | -0.004 | 0.186 | |
| Construction | 0.056 | 0.041 | | -0.341 | 0.051 | *** |
| Services | 0.009 | 0.034 | | -0.249 | 0.040 | *** |
| Mass points and probability | | | | | | |
| $\varepsilon_1$ (s.e.) | -4.908(0.243)*** | | | | | |
| $\varepsilon_2$ (s.e.) | -3.020(0.125)*** | | | | | |
| $\Pr(\varepsilon_1)$ | 0.096 | | | | | |

| | |
|---|---|
| Pr($\varepsilon_2$) | 0.904 |
| No. Observations | 125,044 |
| No. of individuals | 23,035 |
| Log-likelihood | -68,259 |

**Note:** Regression includes controls for 17 regions, unemployment duration (in months) dummies variables (baseline) and month of entering unemployment. "tvc" means time varying covariate.

*** Indicates significance at 1 per cent; ** indicates significance at 5 per cent.

*Table 4. Men's transitions from unemployment to employment through recall or to different employer with unobserved heterogeneity (two support points).*

| | MEN | | | | | |
|---|---|---|---|---|---|---|
| | **Dif. Emp** | | | **Recall** | | |
| | **Coef,** | **S.E.** | **Sign.** | **Coef,** | **S.E.** | **Sign.** |
| Age at unemployment. spell: | | | | | | |
| Age 16-19 | 0.182 | 0.067 | *** | -0.708 | 0.097 | *** |
| Age 20-24 | 0.332 | 0.056 | *** | -0.212 | 0.070 | *** |
| Age 25-29 | 0.197 | 0.055 | *** | -0.206 | 0.069 | *** |
| Age 30-34 | 0.172 | 0.058 | *** | -0.108 | 0.071 | |
| Age 35-39 | - | - | - | - | - | - |
| Age 40-44 | -0.076 | 0.065 | | 0.034 | 0.076 | |
| Age 45-49 | -0.175 | 0.071 | ** | 0.024 | 0.083 | |
| Age 50-54 | -0.092 | 0.080 | | 0.084 | 0.094 | |
| Age 55-59 | 0.009 | 0.098 | | 0.004 | 0.119 | |
| Age 59-62 | -0.382 | 0.198 | ** | 0.275 | 0.210 | |
| Qualification level: | | | | | | |
| Qual. High | -0.101 | 0.075 | | 0.235 | 0.094 | *** |
| Qual. Med.-High | - | - | | - | - | |
| Qual. Medium-Low | 0.111 | 0.057 | ** | 0.082 | 0.076 | |
| Qual. Low | -0.080 | 0.055 | | -0.108 | 0.073 | |
| Type of contract: | | | | | | |
| Permanent contract | - | - | - | - | - | - |
| Permanent per task | -0.428 | 0.165 | *** | 1.997 | 0.145 | *** |
| Temporary | 0.141 | 0.063 | ** | 0.832 | 0.104 | *** |
| Other type | 0.041 | 0.104 | | 0.750 | 0.144 | *** |
| Firm size: | | | | | | |
| <=10 employees | - | - | - | - | - | - |
| > 10 and <=50 employees | 0.095 | 0.036 | *** | 0.145 | 0.047 | *** |
| >50 and <=200 employees | 0.192 | 0.044 | *** | 0.228 | 0.059 | *** |
| >200 and <= 1000 employees | 0.038 | 0.056 | | 0.392 | 0.070 | *** |
| >1000 employees | -0.043 | 0.089 | | 0.719 | 0.101 | *** |
| Tenure in previous job: | | | | | | |
| <= 4 weeks | - | - | - | - | - | - |
| >4 weeks and <=20 weeks | 0.501 | 0.043 | *** | 0.023 | 0.054 | |
| > 20 weeks and <= 1 year | 0.640 | 0.049 | *** | 0.470 | 0.058 | *** |
| > 1 year and <= 2 years | 0.661 | 0.066 | *** | 0.253 | 0.090 | *** |
| > 2 years | 0.578 | 0.079 | *** | -0.066 | 0.124 | |
| Worked in a Temporary Help Agency | 0.435 | 0.079 | *** | 0.014 | 0.107 | |
| Unemployment benefit status: | | | | | | |
| Receives no benefits | - | - | - | - | - | - |
| Contributory benefits (tvc) | -0.418 | 0.054 | *** | -0.682 | 0.084 | *** |
| Assistance benefits (tvc) | -0.425 | 0.077 | *** | -0.989 | 0.121 | *** |
| Month * Contributory benefits | -0.023 | 0.012 | ** | -0.034 | 0.021 | |
| Number of previous jobs | 0.083 | 0.009 | *** | 0.099 | 0.010 | *** |
| Regional Unemployment rate (tvc) | 0.027 | 0.012 | *** | -0.080 | 0.014 | *** |
| Sector of activity | | | | | | |
| Industry | - | - | - | - | - | - |
| Agriculture | 0.348 | 0.185 | * | 0.049 | 0.257 | |
| Construction | 0.061 | 0.049 | | -0.276 | 0.066 | *** |
| Services | -0.082 | 0.046 | * | -0.246 | 0.059 | *** |
| Mass points and probability | | | | | | |
| $\varepsilon_1$ (s.e.) | -4.575(0.316)*** | | | | | |
| $\varepsilon_2$ (s.e.) | -2.668(0.192)*** | | | | | |
| Pr($\varepsilon_1$) | 0.107 | | | | | |
| Pr($\varepsilon_2$) | 0.893 | | | | | |
| No. Observations | 62,136 | | | | | |

| Log-likelihood | -34,961.853 |
|---|---|

**Note:** See note Table 3.

***Table5. Women's transitions from unemployment to employment through recall or to different employer with unobserved heterogeneity (two support points).***

| | WOMEN | | | | | |
|---|---|---|---|---|---|---|
| | **Dif. Emp** | | | **Recall** | | |
| | **Coef,** | **S.E.** | **Sign.** | **Coef,** | **S.E.** | **Sign.** |
| <u>Age at unemployment. spell:</u> | | | | | | |
| Age 16-19 | 0.568 | 0.084 | *** | -0.368 | 0.100 | *** |
| Age 20-24 | 0.527 | 0.061 | *** | -0.287 | 0.065 | *** |
| Age 25-29 | 0.366 | 0.061 | *** | -0.207 | 0.064 | *** |
| Age 30-34 | 0.124 | 0.067 | * | -0.108 | 0.066 | * |
| Age 35-39 | - | - | - | - | - | - |
| Age 40-44 | -0.036 | 0.081 | | 0.218 | 0.072 | *** |
| Age 45-49 | 0.003 | 0.091 | | 0.211 | 0.081 | *** |
| Age 50-54 | -0.113 | 0.110 | | 0.224 | 0.091 | *** |
| Age 55-59 | -0.263 | 0.156 | * | 0.270 | 0.119 | ** |
| Age 59-62 | -0.831 | 0.462 | * | 0.505 | 0.249 | ** |
| <u>Qualification level:</u> | | | | | | |
| Qual. High | 0.106 | 0.073 | * | 0.206 | 0.079 | *** |
| Qual. Med.-High | - | - | | - | - | |
| Qual. Medium-Low | 0.038 | 0.054 | * | -0.012 | 0.065 | * |
| Qual. Low | -0.220 | 0.054 | *** | -0.046 | 0.060 | * |
| <u>Type of contract:</u> | | | | | | |
| Permanent contract | - | - | - | - | - | - |
| Permanent per task | -0.196 | 0.124 | | 1.463 | 0.114 | *** |
| Temporary | 0.265 | 0.070 | *** | 0.634 | 0.095 | *** |
| Other type | 0.065 | 0.104 | * | 0.877 | 0.117 | *** |
| <u>Firm size:</u> | | | | | | |
| <=10 employees | - | - | - | - | - | - |
| > 10 and <=50 employees | 0.006 | 0.044 | | 0.229 | 0.050 | *** |
| >50 and <=200 employees | 0.103 | 0.049 | ** | 0.512 | 0.054 | *** |
| >200 and <= 1000 employees | 0.081 | 0.058 | | 0.625 | 0.062 | *** |
| >1000 employees | -0.035 | 0.078 | | 0.882 | 0.078 | *** |
| <u>Tenure in previous job:</u> | | | | | | |
| <= 4 weeks | - | - | - | - | - | - |
| >4 weeks and <=20 weeks | 0.423 | 0.048 | *** | 0.103 | 0.052 | ** |
| > 20 weeks and <= 1 year | 0.571 | 0.055 | *** | 0.603 | 0.057 | *** |
| > 1 year and <= 2 years | 0.564 | 0.078 | *** | -0.014 | 0.100 | |
| > 2 years | 0.626 | 0.098 | *** | -0.468 | 0.154 | *** |
| Worked in a Temporary Help Agency | 0.445 | 0.081 | *** | -0.065 | 0.102 | |
| <u>Unemployment benefit status:</u> | | | | | | |
| Receives no benefits | - | - | - | - | - | - |
| Contributory benefits (tvc) | -0.395 | 0.065 | *** | -0.475 | 0.081 | *** |
| Assistance benefits (tvc) | -0.509 | 0.081 | *** | -0.838 | 0.088 | *** |
| Month * Contributory benefits | -0.021 | 0.012 | * | -0.042 | 0.021 | ** |
| Number of previous jobs | 0.145 | 0.012 | *** | 0.173 | 0.012 | *** |
| Regional Unemployment rate (tvc) | 0.030 | 0.013 | ** | -0.049 | 0.014 | *** |
| <u>Sector of activity</u> | | | | | | |
| Industry | - | - | - | - | - | - |
| Agriculture | 0.844 | 0.279 | *** | -0.174 | 0.281 | |
| Construction | -0.453 | 0.105 | *** | -0.677 | 0.102 | *** |
| Services | 0.118 | 0.057 | ** | -0.313 | 0.058 | *** |
| <u>Mass points and probability</u> | | | | | | |
| $\varepsilon_1$ (s.e.) | -4.773(0.209)*** | | | | | |
| $\varepsilon_2$ (s.e.) | -2.918(0.173)*** | | | | | |
| Pr($\varepsilon_1$) | 0.152 | | | | | |
| Pr($\varepsilon_2$) | 0.848 | | | | | |
| No. Observations | 62,136 | | | | | |

| Log-likelihood | -33,047.64 |
| --- | --- |

**Note:** See note Table 3.

***Figure 1. The shape of the predicted hazard rate from unemployment into recall or different employer (after controlling unobserved heterogeneity) at the mean of covariates.***
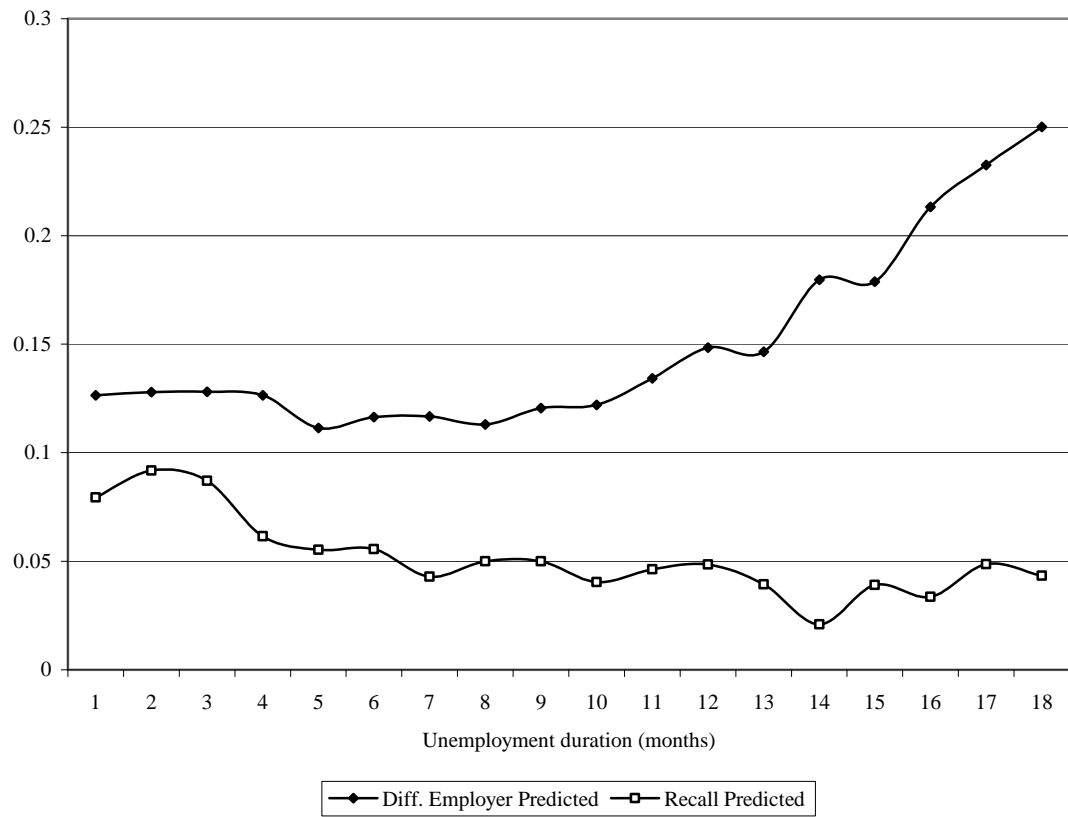
**Figure 2. The shape of the predicted hazard rate from unemployment into recall or different employer (after controlling unobserved heterogeneity) at the mean of covariates, by gender.**