UNEMPLOYMENT DURATION, UNEMPLOYMENT INSURANCE AND TEMPORARY LAYOFF IN SPAIN[∗]

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ABSTRACT

In this paper we are concerned with temporary layoff in Spain. We study how rehire of workers by the same firm affects unemployment duration and the relationship between unemployment duration and unemployment insurance. From administrative data, we obtain a large sample of newly unemployed workers in the first semester of 2000. In this data, 37 percent of re-employed workers returned to their previous employer. To investigate the factors that affect unemployment duration, we apply a discrete hazard model where workers can exit unemployment through reemployment with the previous employer or obtaining a new job. Our basic findings indicate that the probability of leaving unemployment both through recall and new job finding increases greatly around the time that unemployment insurance benefits elapse. Interpretations for this sort of behavior are offered both from the demand and the supply side of the labor market. Results suggest that the duration of unemployment insurance benefits may have a strong influence on firm recall policies and workers' new job finding behavior.

JEL Classification Numbers: J21, J24.

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1. Introduction

Workers in temporary layoff are those whose unemployment spells end in re-employment by the previous employer. Numerous studies have concluded that this is an important feature of the labor market in the US and in Canada. Feldstein (1975) and Lilien (1980) found that over 70 percent of workers laid off in U.S. manufacturing in the 1970s were subsequently rehired by their former employers. Also, Katz (1986) found that the layoff-rehire process is widespread outside of manufacturing. A study by Robertson (1989) presents similar figures for Canada.

Regarding other countries, the consensus seems to be that temporary layoffs are generally much less important than in the US (OECD, 2002, pp. 199; Layard et. al., 1991). In particular, in spite of the fact that temporary layoffs have been recognized as an integral part of the Danish and the Austrian labor markets (Jensen and Westergärd-Nielsen, 1989, Winter-Ebmer, 1998), several 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 Podzeck, 1982; for legal restraints on layoff in general, see Emerson, 1988).

However, following the seminal contributions by Feldstein (1976, 1978) and Baily (1977), one might expect an even higher amount of temporary layoff unemployment in Europe, since most European unemployment insurance (UI) systems do not contain any element of "experience rating" for contributions[1]. In particular, the Spanish UI program is not experience rated at all. This may suggest that the system offers an implicit subsidy to firms that make more use of temporary layoff. Layoffs are one way of adjusting to a period of depresses sales. Alternative mechanisms include changes in hours, wages, production, or even more fundamental changes in the organization of work. The latter include changes in job tasks and skills of workers, as well as the degree of work-sharing. It can be argued that Spanish firms may be relying more on temporary layoffs and less on these mechanisms because they can shift part of the cost of adjustment to the public purse through UI.

Gaining a better understanding of how temporary layoffs and recall expectations affect UI use is therefore important for public policy. In this paper, we find that much of the institutional structure of the Spanish labor market supports a significant proportion of temporary layoffs. In particular, considering that the Spanish UI benefit system is nearly fully subsidized —in the terminology of Feldstein— it may offer an implicit subsidy to firms that rely heavily on temporary layoffs and to workers who work only part of the year. This can lead to the possibility that some individuals may be subject to working for the minimum amount of time needed to qualify for benefits (1 year), collecting them for as long as possible (up to 4 months), being recalled to the previous employer, and, then, repeating the cycle. If this were the case, there would exist a tendency for individuals to fall into a trap of repeat use of the unemployment insurance system.

Concerns of this type require an examination of the use of the system at the level of individuals. How prevalent is the use of the UI-system through temporary recalls? In this paper, we examine the relationship between the type of layoff and the way the UI program is used in Spain. For this purpose, we investigate first unemployment spells of workers who entered into unemployment during the first semester of the year 2000 and

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[1] A UI program is said to be *experience rated on the firm side* when the taxes that individual firms pay vary according to the amount of UI benefits they are "responsible for". The tax rate is higher for firms whose workers make greater use of UI. If there is not experience rating or this is imperfect, there is a subsidy element contained in the unemployment benefit system that can lead to high temporary layoff unemployment.

follow them until June of 2002. This data is a representative sample of the Spanish labor force in June 2002, date of the data extraction from Social Security files. We first document that recall outcomes appear to be relevant for an important part of unemployed in Spain. We then examine how unemployment outcomes are related to unemployment spell durations. We will use duration models applied to a longitudinal data set on individuals' work history by taking into account the effects of both duration and individual heterogeneity in the hazard rates.

We find that around thirty-seven percent of unemployed are recalled to their previous employer. We also find that employer recall policies are a primary determinant of the duration of unemployment spells of individuals. In particular, the probability of leaving unemployment both through recalls and new job finding increases greatly around the time that UI benefits elapse. These results suggest that the duration of UI benefits may have a strong influence on firm recall policies and workers' new job finding behavior. In particular, it indicates that some firms adjust their reemployment behavior according to the benefit entitlement of their temporarily-laid off employees. In this context, the length of time workers collect benefits seems also to be affected by firms' recall decisions.

The remainder of the paper is organized as follows. In section 2 we give a brief description of the unemployment compensation system in Spain. In section 3 we provide information on the data and the measurement procedures to quantify the importance of temporary layoff unemployment. In section 4 we present some theoretical considerations, a discrete hazard model under competing risks, and discuss the results. Section 5 summarizes the results of our analysis.

2. The unemployment insurance system in Spain

As in other European countries, the Spanish unemployment compensation system is composed of two parts: the insurance (or contributory) system and the assistance (or non-contributory) system. In this section we describe the Spanish UI system as it stood in 2000, which is the starting point for the data set on unemployment duration used in this article[2].

The unemployment compensation system is financed with a payroll tax of about 7 percent, of which approximately 80 percent is charged on the employer and 20 percent on the employee; and it is not experienced rated. Eligible for insurance are workers whose unemployment situation is recognized according to law by the labor authority; i.e., the job was lost involuntarily, including end of a fixed-term contract. Eligibility requires Social Security contributions for a minimum of twelve months during the six years preceding unemployment. Workers who made contributions for 12-17 months are eligible for 4 months of benefits, a contribution of 18-23 months entails 6 months of benefits, and so on to a maximum of 24 months of benefits for those who contributed to Social Security for 72 months or longer (see Table 1). The amount of contributory benefit is determined as a percentage of the average wage in the twelve months preceding unemployment. It is 70 percent during the first six months of unemployment, and 60 percent the remaining period of eligibility. The minimum amount of contributory benefits is 75 percent of the minimum wage if the worker has no dependent children and 100 percent if he or she has dependent children. There is also a cap on benefit set at 170 percent of the minimum wage, which is raised to 195 percent if the unemployed person has a dependent child, and 220 percent if he or she has two or more dependent children.

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[2] The Spanish compensation system was reformed in 1992 in order to increase entitlement requirements and to reduce benefit amounts. The previous change took place in 1984, and a minor change on the assistance system in 1989.

The assistance system is financed through transfers from the public budget. Assistance benefits are granted to unemployed persons whose total income does not exceed the minimum wage and are in one of the following situations: (1) exhausted contributory benefits and have family dependents; (2) aged 45 years or older and received contributory benefits for at least 12 months; (3) did not meet the minimum contribution period for eligibility; (4) returned from foreign migration; (5) was released from prison; (6) an invalidity spell ended by the labor authority declaring the worker able to take a job; (7) aged 52 or older[3]. The amount of assistance is 75 percent of the minimum wage, except for workers aged 45 or older who received contributory benefits for 24 months. Their benefits vary with the number of family dependents: 75 percent of the minimum wage if one or no family dependents, 100 percent if two family dependents, and 125 percent if three or more family dependents. Duration of benefits is conditioned on in which of the above indicated situations the worker is, of being 45 or older, and on having or not family dependents (See Table 1).

One important feature of the unemployment insurance system is that if UI-recipients find a job when they have not yet exhausted their benefits and, some time later, get back into unemployment, then they are offered the possibility to continue with the non-exhausted benefit previous to their taking of such a job. If the job which has expired lasts less than one year, then the renewal of the previous claim implies that the additional period of contribution is not lost: instead, it is accumulated for the calculation of a future UI perception right. If the job lasts one year or more, the individual must choose either to continue with the previous non-exhausted unemployment benefit or to make use of the new right of eligibility for insurance. In any case, actual UI-recipients who renew their claim are workers who are not definitely exiting from the insurance system at the moment of taking up the aforementioned job.

3. Descriptive analysis

3.1. Sample selection

In Spain, there is no official source of information on the number of temporary layoffs[4]. The sample used in this paper has been selected from a wider dataset taken from Social Security records which reflects the socio-economic composition of the active population in Spain in mid-2002[5]. This dataset contains information on all employment (and non-employment) spells of workers in the Spanish labor market over a three-year period (from June 1999 to June 2002). The data provided includes information on age, gender, professional category[6], 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, and the type of contract held by the worker (temporary or permanent).

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[3] Also, special assistant benefits are available to workers of the agricultural sector who have residence in the autonomous communities of Andalucía and Extremadura.

[4] Indeed, cross country evidence on the importance of temporary layoffs is somewhat sketchy —with different measure and types of data used by different studies in different countries.

[5] It is composed of two different random samples for the Spanish labor 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.

[6] It 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 workers with higher education is far below the category that would correspond to his formal education.

The described data was combined with a second data set obtained from the file *Histórico del Sistema Integrado de Prestaciones (HSIPRE)*. This administrative data includes information on the last ten spells of unemployment benefits for each of the individuals included. Thus, we know whether each individual is receiving unemployment benefits when unemployed, the actual level of unemployment benefits, and the type of benefits received (either contributory or assistance benefits).

The advantage of using Social Security records for the analysis of flows in and out of non-employment is threefold[7]: (i) We have information on all jobs held by the individuals during a certain interval of time; (ii) non-employment 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 data limitations that confront studies that use data either from Social Security records or from the HSIPRE only. Studies using only Social Security data —e.g., García-Pérez and Muñoz-Bullón, 2005— are typically unable to distinguish whether or not the individual is receiving unemployment benefits, which is an important determinant of the unemployment hazard. Studies using data sets such as the Integrated Benefits System — e.g., Cebrian et al. (1996) and Jenkins et al. (2004)— are unable to distinguish spells ending through recall from those ending through the finding of a new job, and only have information on months compensated by the UI system. An advantage of our data, on the contrary, is that information is available on the entire spell of non-employment. That is, individuals are not censored when their benefits lapse. This allows behavior beyond the exhaustion point to be examined. The major disadvantage of this dataset is that it contains the complete work history of individuals over a rather short period (from June 1999 to June 2002).

Given the large size of the resulting data set, the present study only focuses on one of the cohorts of individuals. To be included in the analysis, the individuals had to meet some criteria. First, they must have entered unemployment due to involuntary reasons —i.e., dismissals or termination of temporary contracts— during the first semester of the year 2000[8]. We consider only the first transition out of non-employment; that is, we do not study multiple spells. By selecting the sample in the indicated way, we obtain a "flow sample" of non-employed workers in the terminology of Lancaster (1990), pp. 162. Second, the individual must belong to the General System of the Social Security system[9]. Third, complete information on all the variables used in the empirical analysis must exist (see Table A.1. in the Appendix). Four, we eliminate all the non-employment spell lasting less than 31 days, assuming that these workers move from job to job without experiencing unemployment[10].

Selection of valid observations led us to a final sample of 20776 individuals. We follow each of those individuals from the moment where they become non-employed in the first semester of the year 2000 until the month of June, 2002, in order to ascertain when they make a transition to employment. Given that there is a very small number of

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[7] 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 (2005), but they only have data up to the year 1999.

[8] In the database we cannot distinguish between these two different reasons for termination of the spell. Job transitions due to voluntary quits are not considered in this study, given that this is surely affected by different motivations from the ones behind involuntary separations.

[9] Specific regimes like Agriculture or Self-employed have different rules for accessing benefits, different contracts and, hence, they should be analyzed separately.

[10] Table A.2. in the Appendix includes descriptive statistics of individuals with non-employment spells lasting less than 31 days.

observations for long duration (>19 months) and in order to avoid noise in the results, we have considered these observations as artificially right-censored, that is, as non-employment spells that do not finish in the observed period. Main variable definitions and basic descriptive statistics for the sample used in the empirical analysis are given in Table 2.

3.2. The extent of temporary layoff in Spain

In this section we analyze the fraction of non-employed workers who return to their previous employer, that is, which can be considered temporary layoffs. If the UI program increases the number of temporary layoffs, and if this is to be significant for public policy, then at least it must be shown that temporary layoffs represent an important fraction of involuntary separations. We further analyze the relationship between recall outcomes and the duration of UI benefits.

Temporary layoff is defined in this study as a situation where the firm's identification numbers of two subsequent employment spells are identical. Since each firm is issued an (anonymous) identification number, which is separately recorded for every single spell of employment, temporary separations can be easily identified. Starting from the first unemployment spell under consideration in the year 2000, the characteristics of both its previous and its subsequent spells of employment were determined.

However, it should be stressed that recall is just a possibility and never a certainty. At the time of laying off workers, a firm may plan to recall an employee. But that may never happen if the expected growth of product demand did not take place. Similarly, a firm could permanently lay off workers who may be recalled if needed. On the side of the worker, recall expectation may reduce the intensity of search, and those whose expectations ultimately prove to be incorrect may spend a very long period unemployed as a consequence. It should be stressed that we only consider *ex post* layoffs —i.e., those ending in recall— but not *ex ante* layoffs —i.e., those that begin with a person expecting to be recalled. We do not have any information on the latter.

Therefore, we acknowledge the fact that our measurement method is unable take into account workers' expectations of being recalled by their previous employer. In fact, if the unemployed were asked at some point during their unemployment spell if they would be recalled by their previous employer, the answer to this question might well be different if each individual were asked at the time of the layoff —in which case they would reflect initial expectations— or after having gained employment —in which case they would reflect actual outcomes. Posing the question at some arbitrary point during the spell leads to a hybrid of these two possibilities because some individuals may have abandoned a recall expectation while others continue to hold an expectation that may ultimately be incorrect. 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 not 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.

Sample characteristics by unemployment spell outcome shown in Table 3 indicate that the recall outcome was relevant for thirty-seven percent of unemployed in the sample. Therefore, a considerable proportion of unemployed who find a job return to an employer where they were previously employed, and only slightly more than sixty percent of the unemployment spells in the sample corresponded to the conventional view of unemployment being associated with the worker losing his old job once and

forever. Therefore, temporary layoffs do constitute, indeed, an important element of unemployment in Spain. This figure is even higher than the one found in other European countries[11].

The importance of recalls, however, varied substantially, depending on whether or not individuals received unemployment insurance benefits. Roughly, thirty-nine percent of unemployed who do not receive unemployment benefits had initial unemployment spells ending in recall as opposed to around twenty-seven percent for unemployment insurance recipients (Table 3).

The sample largely consists of individuals who were previously employed in jobs requiring low or lower-intermediate qualification levels (Table 2). It is precisely in those relatively low qualification levels where the recall outcome is more likely among UI recipients. For instance, the rate of recall among contributory unemployment insurance recipients who were previously employed in jobs requiring the lowest qualification level is thirty-two percent, while the rate of recall among the individuals belonging to the highest qualification group is twenty-eight percent (Table 3).

Even though slightly more than half of the unemployed are men, the recall outcome is relatively more present among women (42.18 percent as opposed to 32 percent, see Table 3). Age appears as a relevant determinant of recall outcome. In particular, differences by age are specially relevant among UI-recipients, since those above 34 years-old are substantially more likely to be recalled than the youngest ones.

Among UI-recipients, individuals entitled to shorter entitlement periods are the most likely to be recalled. In fact, the recall outcome is concentrated on short unemployment periods (Table 3). For instance, among contributory UI-recipients, only 15.21 percent of unemployment spells beyond 1 year end in recalls, as opposed to 31.67 percent for unemployment spells lasting between four and twenty weeks. Unemployment spell durations are substantially larger for UI recipients (Table 2). In any case, the length of time claimants spend collecting UI benefits is apparently not influenced by the type of separation they have suffered, since temporarily laid off claimants consume benefits for a similar period as non-UI recipients (see Table 4). In spite of this, Table 5 indicates that the majority of workers who are recalled fell within the benefit entitlement categories of 120 and 180 days. Note, also (see Table 6) that workers who receive unemployment benefits and exit unemployment through recall are more likely to renew the claim (42.60%) than the ones who exit unemployment through a different employer (37.36%). In addition, the bulk of workers who renew the claim enjoy short non-employment periods (58.53% of them last more than four weeks and less or equal than twenty weeks).

Finally, it is also a fact that the UI program is characterized by a significant amount of repeat participation, as Table 7 shows. This table presents the distribution of individual claimants from January 2000 up to June 2002 for the 20766 newly unemployed individuals in the first semester of 2000, by the total number of different firms used to support those claims. The results are presented for only those individuals who experienced four or fewer claims in this 2.5-year period, who represent more than 90% of the entire sample of claimants in that period. As observed in the table, there were 3567 individuals out of the initial 20766 ones who ever received unemployment contributory benefits from 2000 to 2002[12]. The numbers along the diagonal of the table

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[11] For instance, temporary layoffs are of minor importance in the Swedish labor market (Björklund, 1996; Edebalk and Wadensjö, 1995).

[12] Therefore, 179 (=3567-3388) individuals out of those 3567 correspond to the ones who did not receive unemployment benefits in the first semester of the year 2000, but who received unemployment benefits thereafter.

show the number of claimants supporting each of their claims with employment from a different firm. For example, 54.48 percent of all those claimants with exactly three claims over the period considered supported their claims from three different firms, while 17.20 percent supported their claims from the sample employer. As can be observed, the greater the number of claims over the period, the less likely that at least two claims were not supported from the same employer. Only around 33.09% of individuals with four claims supported them with employment from four different employers. This implies that extensive repeat use of UI program involves, to some degree, a cycling between insured unemployment and employment with the same firm.

4. The duration of unemployment spells

In this section, we examine the duration of unemployment spells from data on first unemployment spells in the year 2000. Our analysis attempts to highlight the individual characteristics most associated with the probability of leaving unemployment and to determine the influence of being recalled to the previous employer on the transition rate from unemployment to employment. Given that some variables associated with the receipt of UI benefits are only available for UI recipients, we develop a two-step analysis. First, we study the determinants of the unemployment spells for the entire sample. Then, we restrict the analysis to UI recipients.

4.1. Theoretical considerations

In this investigation we want to highlight a feature of the Spanish labor market that may be relevant in the relationship between recall outcomes and the re-employment probability. It is the fact that mutual agreements of recall between the employee and the employer can be regulated through implicit contracts which are likely to be significantly influenced by the way the UI system is structured. If workers who expect recall are receiving UI benefits[13], they will be willing to wait as long as the benefits lapse before searching for another job. That is, they are likely to be more selective concerning new job opportunities than those who do not receive UI benefits. The risk that a firm loses laid-off workers to alternative employers will therefore be lower if they are receiving UI benefits. An additional reason for this is the fact that other employers may be unwilling to incur the initial fixed cost of hiring and training workers who have a reasonable prospect of recall. This situation might make a rotating system of layoffs attractive for employers during product demand downturns: firms might firstly recall workers who are close to exhausting their UI benefits in order to avoid losing them to new jobs. At the same time, other workers still eligible for benefits would be laid off in their place.

The construction of the Spanish UI benefit system makes it possible to work just enough to qualify for new periods of benefit before being laid off, in order to be unemployed for the rest of the year. In particular, this is particularly likely in relation to temporary substitutes through interim contracts —i.e., people filling in for workers on sick or parental leave. Those temporary substitutes do not have permanent employment and may very well shift between short-term employment and temporary layoff periods.

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[13] The effect of unemployment compensation on the reemployment probability can be assessed from two points of view. First, the unemployment compensation system provides workers with an insurance against their future unemployment; and, second, unemployment benefits are granted as a subsidy to support unemployed persons while looking for a job. According to the insurance dimension, unemployment compensation can increase the re-employment probability because workers are more willing to accept jobs with higher risk of layoff. From the subsidy point of view, the unemployment compensation can reduce the re-employment probability, because a lower cots of being unemployed entails a lower intensity of search. However, availability of unemployment benefits provides resources that can be used to improve the job search technology. In principle, the net effect is indeterminate and, thus, it becomes an empirical question. In this respect, many studies find that the disincentive effect dominates for the level and duration of unemployment benefits appear to be associated with longer duration in unemployment.

In those cases, possible collusive behavior against the unemployment insurance fund may make implicit contracts of this sort attractive for both workers and firms when facing temporary downturns in production. In addition, short-term employment periods followed by temporary layoffs may also result as firms try to avoid the risk of higher firing costs, which would follow a necessity to fire a permanent employee. With a secure income from UI benefits when unemployed, and a low probability of finding alternative jobs, one could expect a strong impact of the UI system in making temporary layoffs more common.

The prospect of recall directly affects the overall escape rate from unemployment through the recall rate, and indirectly affects it by altering workers' optimal job search strategy. When the possibility of recall is allowed for in job search models, job searchers may eventually be re-employed without searching. However, in spite of the fact that adjustment to depressed sales occurs through layoffs, firms can not 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. Therefore, the individual's search behavior is dependent on the firm's recall policy: as a result, unemployment duration hazards —which decline when treating the re-employment probability as a single risk— will often decline only for recalls when using competing job-exit risks, while duration dependence for new jobs is close to horizontal (Katz, 1986; Katz and Meyer, 1990).

4.2. The distribution of unemployment spell durations

A basic tool for the analysis of duration data is the empirical hazard function. The empirical hazard function if the fraction of spells ongoing at the start of a month which end during the month[14]. Non-parametric hazard functions estimates are presented in this section for the entire sample and for the UI-recipient sub-sample. Duration data are grouped into month intervals in this section for ease of presentation.

Given that any unemployment spell can end through the location of an acceptable new job or through recall to the previous employer, Figure 1 shows the empirical hazard for the entire sample and according to the recall outcome. The recall and new job empirical hazards are defined conditional on spells ending through recall and through the finding of a new job. Given the turnover observed in this sample —with mainly short unemployment spells— we decided not to use unemployment experiences shorter than 31 days. In addition, given that there is a very small number of observations for durations above 19 months and in order to avoid noise in the results, we have considered these observations as artificially right-censored, that is, as unemployment spells that do not finish in the observed period. This is the reason why there are no observations with unemployment durations beyond 19 months.

Both hazard rates decline with time spent unemployed up to the 15th month. From then on, they present a slightly increasing pattern. The evolution of the recall and new job hazards are rather similar except for the fact that the likelihood of being recalled is substantially larger for the first three months, and, at the same time, it is much lower from the 13th month onwards. Therefore, the longer someone is unemployed, the less is the probability of being recalled. Two explanations may be underlying this result: (i)

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[14] Formally, the empirical hazard at month t, H_t, is the number of spells which end during the month, D_t, divided by the size of the risk set at the beginning of the month. The size of the risk set at the beginning of month t, R_t, is just the number of people whose spells have not ended or been censored at the beginning of month t. Algebraically, $H_t = D_t / R_t$. C_t is the number of observations which are censored at the beginning of month t. $C_t = R_{t-1} - D_{t-1} - R_t$.

revised expectations of the recall probability result in increased search activity, which increases the new job hazard rate; (ii) Firms' recall policy: the risk of losing employees on temporary lay-off increases with unemployment duration, which would tend to yield earlier recall by the employer.

The sample hazard functions estimates for UI recipients are shown in Figure 2. As in Figure 1, the recall hazard is above the new job hazard for the first 13 months. From then on, it remains below the new job hazard. Another important feature is that the recall hazard function shows a positive jump at months 6 and 13, while the new job hazard does not. These upward movements were not present in Figure 1. Thus, they are likely to be related to the limited duration of UI benefits in Spain[15]. Given that the new job exit hazard levels out above the recall hazard from the 13th month onwards, no recall before the 12th month in unemployment is likely to be a good signal to the worker that his future recall chances are quite slim. This situation would stimulate an increased new job hazard due to the lower reservation wage and the greater search intensity induced by a drop in perceived recall prospects.

Direct evidence on exhaustion effects is somewhat masked in Figure 2 because of the fair amount of variation in potential durations. Figure 3 provides a direct look at possible effects of finite length of UI benefits on spell durations. The figure presents time until exhaustion empirical hazards analogous to the usual Kaplan-Meier estimations. The time axis is time until benefits lapse rather than time since a spell began. Positive jumps in both the recall hazard and the new job finding rate are found around the point of UI benefits exhaustion. In particular, there is an increase above 50% in the recall hazard from the moment when there is 1 month left for UI exhaustion to the moment when 2 months have passed from UI exhaustion. This spike, though existent, is not so apparent for the new job hazard. This evidence suggests an important role of the potential duration of UI benefits, especially in the timing of recalls.

Finally, Figures 4 and 5 show the empirical transition rates from unemployment into employment either through recall or a new job, for the entire sample and for UI recipients, respectively. The empirical rate from unemployment into re-employment through recall keeps below the rate from unemployment into new job finding. The difference among both empirical rates widens as unemployment duration lengthens. Moreover, it can be observed how in a competing risks framework the recall hazard rate steadily falls with unemployment duration, while the empirical hazard for new jobs is more close to a flatter line.

4.3. Econometric specification: A discrete-time duration model

In this section, we analyze the impact of recall outcomes, individual and job characteristics, and UI system variables on the total, recall and new job exit rates from unemployment both for the entire sample and for the sub-sample of UI recipients.

We use a discrete-time hazard model to study the hazard rate for unemployment spells. In a discrete–time 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 a 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 in 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

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[15] The potential duration of UI benefits is 6 months for workers who have contributed to Social Security between 18 and 23 months, and it is 12 months if the period of contribution is between 36 and 41 months.

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 modeling the transition from unemployment to employment through recall or through a different employer, we define the discrete transition rate. For the *i-th* person, the transition rate into state *j* (*j=1,2*) in period t, P_{itj}, is the conditional probability of a transition to state *j* in this period, given that individual *i* has been unemployed until t^{16}.

$$P_{itj} = \Pr[T_i = t_i, J = j \mid T_i >= t_i, x_{it}] \qquad [1]$$

where x_{it} is a vector of covariates for individual *i*, some of which can be time-variant. Assuming that the competing risks are independent, the hazard rate from unemployment is given by:

$$P_{it} = \sum_{j=1}^{2} P_{itj} \qquad [2]$$

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

$$\Pr[T_i > t_i \mid T_i \geq t_i, .] = 1 - P_{it} \qquad [3]$$

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

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

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

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

To derive the likelihood function for this model, we need to define the following indicator function:

δ_{ij} = 1, if the duration is complete (individual *i* makes a transition to state *j*)
  = 0, if duration is censored.

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

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[16] 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.

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

Substituting [4] and [5] into [6], we can have the sample likelihood function in terms of the transition and hazard rates. We can write:

$$L = \prod_{i=1}^{n} \left[\prod_{j=1}^{2} \left[\frac{P_{itj}}{(1-P_{itj})} \right]^{\delta_{ij}} \left[\prod_{k=1}^{t} (1-P_{ik}) \right] \right]$$ [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 transition rate we choose the logistic specification that, with multiple events, generates the multinomial logit model (Maddala, 1983). It allowed for the three possible states considered: employment through a different employer, employment through recall, and unemployment (which is the base category).

For individual i, the transition rate to state j in period t is given by:

$$P_{itj} = \frac{\exp(\alpha_{jt} + \beta_j' z_{it})}{1 + \sum_{m=1}^{2} \exp(\alpha_{mt} + \beta_m' z_{it})}$$ [8]

where α_{jt} is a vector of coefficients for dummy variables for each month workers remain unemployed, z_{it} is a vector of explanatory variables which may vary with time, β_j is the vector of parameters to be estimated, and by definition, $x_{it=[} \alpha_{jt}, z_{it]}$. Note that α_{jt}, known as the baseline hazard, is a set of constants that describes in a flexible way the time dependency of the transition process. We consider monthly dummies which coefficients for transitions to employment through recall can differ from those for transitions to employment through a different employer.

Note that in the discrete hazard model described above, each discrete time unit for each individual can be treated as a separate observation or unit of analysis. For the data set used in this article, the dependent variable or unit of analysis is the individual's month of unemployment. It takes the value of 1 if a certain event occurred to that worker in that time unit, and zero otherwise.

From the likelihood function [7] one can proceed by substituting the chosen regression model, in our case the logistic, and then maximize log L with respect to α_{jt} and β_j. However, it can be shown that the likelihood function for the discrete model as expressed by equation [7] is equivalent to a multinomial logit model where, assuming independence between the three states, all individual observed time units are pooled (Allison, 1982). Taking logarithm in [7] yields the log-likelihood function:

$$\log L = \sum_{i=1}^{n} \left[\sum_{j=1}^{2} \delta_{ij} \log \left[\frac{P_{itj}}{(1-P_{it})} \right] + \sum_{k=1}^{t} \log(1-P_{ik}) \right]$$ [9]

If we define a dummy variable y_{itj} equal to 1 if person I makes a transition from unemployment to either employment through a different employer or the same employer at time t and zero otherwise, then [9] can be rewritten as:

$$\log L = \sum_{i=1}^{n} \sum_{k=1}^{t} \left[\sum_{j=1}^{2} y_{ikj} \log\left(\frac{P_{ikj}}{1 - P_{ik}} \right) + \log(1 - P_{ik}) \right] \qquad [10]$$

which has the same form as the log-likelihood for a multinomial logit in which all observed time units for all individuals are treated as separate, independent observations. As Allison (1982) points out, it is important to realize that "…unlike the likelihood function for the continuous-time model, the discrete-time likelihood cannot be factored into separate components for each of the *m* kinds of events. Hence, ML [maximum likelihood] estimation must be done simultaneously for all events". (pp. 88). Accepting the model specification, the estimates for α_{jt} and β_j posses the standard properties of the maximum likelihood estimations.

Given the properties of the discrete-time duration model described (Allison, 1982), together with the discrete nature of the data, we estimate a multinomial logit model on pooled individual time-unit observations. An advantage of the competing risks model is that we can obtain a neat result for the re-employment probability because we estimate the discrete-time hazard model simultaneously for the two kinds of exists from unemployment. Therefore, a competing risks model allows us to gain insight into how individual, industry and labor market characteristics influence unemployment spell durations. In any case, we will also include the estimation results of a discrete-time duration model where only the transition from unemployment to employment is considered[17]. This model is a particular case of the multinomial logit model presented above when the number of possible states is equal to 1[18].

4.3. Defined variables

Apart from the variable indicating whether or not the worker is recalled at the end of the unemployment spell, in the vector of covariates we include the following groups of variables:

(i) <u>Demographic characteristics</u>: we control for age at the start of the unemployment spell using a nonlinear specification distinguishing 10 age groups for estimations using the whole sample and 3 age groups for estimations using the UI-recipient subsample. We also control for gender.

(ii) <u>The individual's labor market history</u>: 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. The dataset allows us to obtain some indicators of worker's previous job turnover. First, tenure in the previous job is included through 3 dummy variables (<= 1 year, > 1 year and <= 2 years, >2 years). Second, the qualification level required for the previous job is collected through four levels of the professional category of the worker contribution to

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[17] For the hazard rate of this single risk model, we choose the logistic specification as in other papers (e.g., García-Pérez, 1997, Bover et al., 2002, Jenkins et al., 2004, García-Pérez et al., 2005). It can be shown that the likelihood function for this discrete hazard model (see García-Pérez, 1997) is equivalent to that of a logit model where all individual observations (monthly spells, or months at risk of making a transition to employment) are pooled (Allison, 1982). This model assumes that there is not unobserved heterogeneity in the sample of unemployed workers we use.

[18] Negative duration dependence is common in unemployment duration studies. Usually, the phenomenon persists after controlling for observed heterogeneity. However, when the hazard rate if nonparametric, as in the discrete-time models exposed in this article, various studies have shown that including unobserved heterogeneity does not affect the estimated coefficients much (Meyer, 1990). Therefore, in this paper we have opted for keeping the statistical models as simple as possible.

the Social Security[19]. Third, whether or not the individual was hired in the previous job through a temporary help agency. Fourth, the type of contract held in the previous job: we are able to distinguish whether or not the individual entered into unemployment from a job either with a fixed-term contract, or with a permanent contract or with a permanent per task contract —or *contrato fijo discontinuo*, which was introduced for temporary needs of the firms related to specific works or services. Fifth, given that the database includes the complete employment history of workers from June 1999, we include as a regressor the number of jobs held previous to the one leading to the spell of unemployment under study. This variable gives us a measure of the number of times they suffered unemployment from that date. Sixth, we also control for the industry where the worker was engaged in the previous job.

(iii) <u>Local labor market and household conditions</u>: two variables are used to control for this: on the one hand, dummies for the seventeen Autonomous Communities in the country. On the other hand, dummies for the number of children (either no children, 1 child, 2 children, and 3 or more), though they are only available for the estimations using the UI recipient subsample.

(iv) <u>Dummies for the month of entering unemployment</u>: 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 in the regression.

(v) <u>Unemployment insurance</u>: we use a dummy that equals 1 at each month the worker received unemployment insurance during his unemployment spell, and zero otherwise. Given the importance of claim renewals in the data (see section 3.2. above), we also include a dummy that equals one if workers receiving UI benefits renew the claim, and 0 otherwise. Finally, and only for the estimations using the UI recipient subsample, we also include the replacement ratio by dividing the amount of UI benefits the individual is receiving by the "regulatory base" (i.e., the gross wage in the previous job). This is a time-varying covariate whose impact is allowed to vary depending on whether the individual is still receiving benefits or has exhausted benefits (see Table 1). In addition, the effects of UI on the hazard are also measured using functions of the time until benefits lapse. We included time until benefit exhaustion dummy variables for seven intervals covering months before and after benefits are expired. These variables are designated "UI>18" through "UI>-10". Each of these time-varying exhaustion dummies takes on the value of one in its designated interval and takes on the value of cero in all other periods. For example, "UI12-18" takes on the value one when the individual is 12 to 18 months until exhaustion; "UI –5 to –10" takes on the value one when the individual is 5 to 10 months after benefit exhaustion; "UI1, UI0 and UI-1" takes on the value of one in the month before benefit exhaustion, the month of benefit exhaustion and the month after benefit exhaustion (this is the comparison group, the group corresponding to the omitted dummy variable).

(vi) <u>Unemployment duration dummies</u>: we include nineteen month dummies, one for each month the worker remains unemployed after the first unemployment spell.

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[19] We must underscore that the eleven 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, "peon", 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, 2003a). See Table A.3. in the Appendix.

4.4. Estimation results

Tables 8.1 and 8.2 contain the estimated coefficients with its asymptotic *t*-statistics, and the marginal probabilities for, respectively, the single and the competing risks models for the entire sample[20]. Two different specifications are estimated: Model 1 includes the "renewal" dummy, while Model 2 does not. Tables 9.1. and 9.2 offer analogous results for the UI recipient sub-sample. In what follows, we first provide a general discussion of results associated to the whole sample. We then describe and comment the findings related to the UI-recipient sub-sample.

4.4.1. Results for the entire sample

According to model 1 in Table 8.1, experiencing a recall outcome in the worker's spell of unemployment that we study has a strong significant effect on the hazard. Workers exiting from unemployment through recall to their previous employer have an estimated hazard that is 41% higher than those who exit through the finding of a new job, whatever the duration of the unemployment spell is. This estimated coefficient remains practically the same in Model 2. Note that, as expected, workers who renew the claim are much more likely to exit from unemployment than the remainder ones.

Results obtained by the inclusion of other covariates are worth commenting. As regards demographic characteristics, in the single risk specification (Table 8.1), unemployment is prolonged with age. People under 34 find jobs at a much higher rate than any other group. Therefore, in spite of the fact that unemployment is high among youth, individual unemployment is not necessarily troublesome. This suggests that youth unemployment is mostly due to a high inflow into unemployment. On the contrary, individual unemployment is more problematic for older persons, and, in addition, for women.

Tenure in the previous job shows a significant positive impact on the hazard rate from unemployment, as well as having worked through a temporary help agency (THA). There are several explanations for this result. It is likely that THAs provide workers with a better connection to the labor force and, thus, greater access to information. Moreover, positions covered through THAs are typically "assessment positions" in which performance largely determines future career mobility, since agency workers are being monitored during the assignment at the client firm and then only those with good performance are offered positions at the latter once the temporary assignment has finished (García-Pérez and Muñoz-Bullón, 2005).

As expected, workers holding temporary contracts and/or permanent per task contracts exit from unemployment sooner than the remainder workers who hold permanent contracts (which is also coherent with the estimated result for the variable "number of previous jobs"). The estimated coefficient for the level of qualification only shows significant results for the Medium-Low and Low groups, and workers receiving benefits (either contributory or assistance benefits) are much less likely to exit from unemployment. Finally, note that since many of UI recipients are renewing their claims, and that those workers who renew the claim are characterized by short non-employment spells (Table 6), not including the dummy "renews the claim" substantially understates

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[20] In the competing risks model, for the transition from unemployment to the *j*th situation, the marginal effect of an exogenous variable, *x*, is obtained at the sample means applying the formula:

$$\partial p_j / \partial x = p_j(\beta_j - \sum p_k \beta_k)$$, where k=1,2 and p_j is the average worker transition to state *j*.

the negative impact of the benefit receipt on unemployment duration (Model 2) as opposed to Model 1.

When we move to the competing risks specification (Table 8.2), in general, factors that raise the recall hazard tend to reduce the new job hazard, and vice-versa. As regards demographic characteristics, we find that eldest workers are much more likely to exit from unemployment through recalls than through the finding of a new job. Therefore older individuals who lose a job to which they cannot be recalled, run a much higher risk of suffering long unemployment periods. Age, therefore, has a strong discriminatory power regarding the employment status after unemployment. This result fits quite nicely into a variety of theories suggesting that the accumulation of firm-specific human capital by older workers may serve as an explanation for the observed differences in age-specific transition patterns. Gender has a strong impact on unemployment duration, since men are more likely to reenter sooner into employment. However, it has a different impact depending on whether or not the person is recalled. In particular, men have a lower (higher) recall (new job) hazard than women.

As regards the effect of previous labor market history on the probability of leaving unemployment, having worked through a temporary help agency (THA) in the last employment experience represents a positive impact on the different employer hazard rate. It is the individuals in the lowest qualification groups who are the least likely to exit from unemployment through a different employer, while the ones in the High group are the most likely to exit through recall. Experience in the previous employment position affects the probability of exiting from unemployment through both hazard rates. In addition, and as expected, individuals most accustomed to move jobs exit unemployment earlier. Finally, as expected from the nature of their contract, workers under a permanent per task contract are the most likely to being recalled.

Finally, when not including the dummy "renew the claim" in the specification of Model 2, the negative impact of receiving either contributory or assistance benefits is severely understated (which is coherent with the results from Table 8.1).

As we can conclude from those results, exiting from unemployment into a different employer or being rehired by the same firm clearly implies two different situations. The effects of the estimated coefficients are reflected in Figure 6, where it is shown that the estimated hazard rate from unemployment into a different employer keeps above the estimated recall hazard rate (both of them replicate fairly well the empirical hazards of Figure 4). The difference between both hazards is lower in the first three months of unemployment and keeps relatively constant at approximately 4 percent up to the 14th month; from then onwards, the estimated recall hazard is relatively constant at around 3 percent, while the estimated new job hazard is always above 8 percent. Should we use a single risk model, we would not be able to determine a variable's impacts in spell duration through its effects on recall prospects and on new job finding rates. The differences in the empirical results for the single risk and competing risks models indicate the problems in making inferences about layoff unemployment spell durations from traditional single risk model estimates.

4.4.2. Results for the UI- recipient subsample

Tables 9.1 and 9.2 report the maximum likelihood estimates of the two logistic hazard regression models (the single risk and the competing risks specification) of monthly re-employment probabilities for workers receiving UI at the beginning of the unemployment spell under consideration. As before, Model 2 does not include the dummy which indicates a claim renewal.

As regards our main variable of interest, once again, there are very large differences in re-employment probabilities associated with the recall outcome. In particular, individuals who were UI recipients at the start of the spell and are eventually recalled, have hazards some 41% larger than recipients who are not recalled in Model 1 (Table 9.1). Moreover, and similarly to the results for the entire sample presented before, workers who renew the claim rate are much more likely to re-enter into employment, independently of the type of entry (either through recall or a different employer; see Table 9.2).

As regards gender, it is observed a similar estimated effect as the one obtained for the full sample: men are more likely to exit from unemployment (Table 9.1), but less likely to exit through a different employer than women (Table 9.2). The estimated impact of age in Table 9.1 is as expected —young workers are more likely to exit from unemployment— and differs according to whether or not individuals are recalled to their previous employer (Table 9.2): eldest workers leave unemployment through recall sooner, while the youngest ones are more likely to re-enter into employment through a different employer.

As regards previous labor market history, results regarding qualification slightly differ from the ones obtained in the previous section: among UI recipients at the beginning of the spell of unemployment, higher hazard rates are only marginally associated (if any association exists at all) with higher skill. The type of employment contract that the unemployed person had, presents a very strong association with exit rates from unemployment (Table 9.1). However, in the competing risks specification (Table 9.2) the estimated impact for individuals under permanent per task contracts becomes negative for the different employer hazard rate, while those who entered unemployment from a job with a fixed-term or temporary contract have a larger re-employment hazard than entrants from a job with a permanent contract. Finally, the number of previous jobs held by the individual presents a positive impact on the single hazard rate (Table 9.1), and tenure in the previous job appears only marginally significant for the recall outcome (Table 9.2).

Further insights into the determinants of the probability of leaving unemployment are attained by the inclusion of regressors which are only available for the UI-recipient subsample. For instance, there exists a strong evidence of negative effect of the number of children on the re-employment probability (Table 9.1) and on the different employer hazard rate (Table 9.2.). As expected, a negative relationship is found between the replacement ratio and unemployment duration (both in the single risks and in the competing risks models). And results are also supportive of the implication that both the single hazard rate and the recall and new job finding rates are substantially higher in the period around benefits are exhausted. One explanation for the increase in the recall rate around the time of UI benefits exhaustion and the sharp decline in recalls after benefits exhaustion is an implicit contract type explanation such as in the model of Feldstein (1976). Firms may extensively use the UI system in downturns to the firm's demand through a rotating system of layoffs in which workers who exhaust their UI benefits may be recalled and other workers still eligible for benefits laid-off in their place. Thus, firms expecting recall within a reasonable horizon might recall workers close to when benefits run out rather than potentially lose them to new jobs.

The estimated effects arising from the competing risks model are pictured in Figure 7. Similarly to the results obtained in Figure 4 for the entire sample, UI-recipients are expected to exit sooner through a different employer than through rehire by the same firm. Moreover, the difference between the estimated hazard rates is higher than for the entire sample, and both hazards accurately replicate the empirical hazards in Figure 5.

5. Conclusions

The aim of this article has been to investigate the importance of temporary layoff among the factor that affect unemployment duration and the way the unemployment benefit system relates to it. This issue has not been studied in Spain before due to lack of adequate data. We have used a sample of Spanish newly-unemployed workers and followed their unemployment spells for a maximum period of 19 months. This data set has allowed us to document the extent and nature of temporary layoffs in the Spanish labor market and to study transitions out of unemployment by using a discrete-time duration model.

Roughly 37% of the unemployed who find a job return to employers where they had been previously employed. Given the generosity of the UI system, the extensive use of temporary contacts, and the weight of the tourist sector, this finding is not very surprising. However, it is a new and important fact, since recalls have been previously thought to be quite low.

We have also found evidence suggesting that the UI system may be enlarging the incidence of unemployment among temporary laid-off workers. In particular, from the supply-side of the labor market, the construction of the UI-benefit system makes it possible to work just enough to qualify for new periods of benefit and be unemployed during the rest of the year. This may be an important source of temporary layoffs. On the demand side, the risk that a firm loses laid-off persons, who expect recall, to alternative employers is also lower if the laid-off persons receive unemployment compensation.

One of the most important determinants of the probability of exiting from unemployment through recall is the time until exhaustion of UI benefits. In particular, the chances of leaving unemployment in order to take up a job increase markedly as the exhaustion of benefits approaches. This is due not only to a rise in the chance of finding a new job, but also to the chance of being recalled. However, why should the recall rate display a spike as benefit exhaustion approaches when the recall decision is at the discretion of the firm?

Two potential explanations are due. On the one hand, some UI claimants appear to search more intensively for a new job as benefit exhaustion looms or become more willing to accept any job offer. However, before doing so, they may attempt recall from their previous employer. On the other hand, UI is of benefit to the firm because in reducing the intensity with which temporarily laid-off workers look for new jobs it helps to keep them permanently attached to the firm: the risk of losing training investments the firm has made according to the impending exhaustion of benefits is reduced. Recalls may be timed according to the impending exhaustion of benefits because it implies a discrete increase in the chance that a worker will find a job with another firm.

Certainly, not all instances of rehire by the former employer indicate collusion between the employer and the employee. Even in the absence of any implicit contract extending into the period of unemployment, rehiring may occur thanks to a continuing or occupational match between employee characteristics and the employer's needs. However, this interpretation is less plausible when temporary layoffs become a regular pattern in the work life of the individuals affected by that type of unemployment. In particular, our results suggest that it can be a joint decision of both workers and their employers that determine how the UI program is used; that is, both the supply and demand-sides of the labor market matter in determining the way UI is used.

APPENDIX.

Table A.1. Loss of observations from initial data set

Initial sample size:	**86473**
Observations underlined deleted due to:	
- Missing variables used in the empirical analysis	6979
- No general regime of the Social Security System	4838
- Enter into unemployment due to reasons different from involuntary ones	21610
- Enjoy unemployment benefit different from contributive or assistance ones	8
- Unemployment duration <= 30 days	32272
Final sample size used in the empirical analysis:	**20766**

Table A.2. Main descriptive statistics for unemployment spells of duration <= 30 days.

Variable	Description	Entire sample Mean (S.D.)	Non-UI recipients Mean (S.D.)	Contributory benefits Mean (S.D.)	Assistance benefits Mean (S.D.)
Censored		-	-	-	-
Males	=1 if male	0.607	0.608	0.571	0.397
Recall	=1 if exits from unemployment with recall to previous employer	0.490	0.492	0.380	0.487
Temporary help agency	=1 if previously employed through a THA	0.095	0.096	0.039	0.051
Qualification level					
High	=1 if contribution to Social Security in previous job is 1, 2 or 3.	0.076	0.077	0.082	-
Upper-intermediate	=1 if Social Security contribution in previous job is 4, 5 or 6	0.130	0.130	0.122	0.051
Lower-intermediate	=1 if contribution to Social Security in previous job is 7 or 8	0.349	0.349	0.313	0.346
Low	=1 if contribution to Social Security in previous job is 9 or 10.	0.445	0.444	0.484	0.603
Age	Age in years when entering unemployment				
16-24	=1 if individual age ranges from 16 to 24	0.288	0.288	0.285	0.372
25-34	=1 if individual age ranges from 25to 34	0.376	0.373	0.516	0.474
>34	=1 if individual age above 34 years old	0.336	0.339	0.199	0.154
Employment duration	Tenure in previous job (in weeks)	57.818 (138.985)	57.866 (139.867)	60.669 (93.761)	16.462 (10.907)
<=1	Up to 1 week	0.093	0.095	0.018	0.103
>1 and <=4	Above 1 week and up to 4 weeks	0.077	0.078	0.036	0.090
>4 and <=20	Above 4 weeks and up to 20 weeks	0.260	0.260	0.235	0.410
>20 and <=1 year	Above 20 weeks and up to 1 year	0.315	0.314	0.355	0.397
>1 year	Above 1 year	0.255	0.254	0.355	-
Unemployment duration	Duration in unemployment (in weeks)	1.640 (1.027)	1.617 (1.006)	2.712 (1.372)	2.526 (1.374)
<= 1	Up to 1 week	0.643	0.650	0.288	0.346
>1 & <=4	Above 1 week and up to 2 weeks	0.182	0.183	0.156	0.179
>1 year	Above 2 weeks	0.175	0.167	0.556	0.474
Industry dummies					
Agriculture	=1 if employed in agriculture in previous job	0.003	0.003	0.007	0.026
Industry	=1 if employed in industry in previous job	0.157	0.156	0.232	0.205
Construction	=1 if employed in construction in previous job	0.182	0.183	0.153	0.077
Services	=1 if employed in services in previous job	0.657	0.658	0.609	0.692
Type of contract	Type of contract in previous job				
Permanent	=1 if permanent contract in previous job	0.138	0.138	0.151	0.026
Permanent per task	=1 if permanent per task contract in prev. job	0.013	0.013	0.033	0.026
Temporary	=1 if temporary contract in previous job	0.849	0.849	0.816	0.949
Number of previous jobs	Number of jobs held from June 1999 to actual job	2.555 (3.655)	2.563 (3.680)	2.081 (1.950)	2.756 (3.572)
Number of children					

0	No children	-	-	0.742	0.705
1	1 child	-	-	0.140	0.128
2	2 children	-	-	0.097	0.115
>2	More than 2 children	-	-	0.021	0.051
Replacement ratio	[UI benefits/gross wage in previous job]	-	-	0.733	0.755
				(0.261)	(0.012)
Reason for UI entry					
End of temporary contract	End of temporary contract at previous job	-	-	0.730	0.667
Dismissal	Worker was dismissed from previous job	-	-	0.125	-
Other reasons		-	-	0.122	0.167
Contributory	Holds contrib. benefit at the beginning of spell	1,880	-	100	-
Assistance	Holds assistan. benefit at the beginning of spell	0,240	-	-	100
Without	Without UI benefits at the beginning of spell	97,870	100	-	-
Sample size		**32272**	**31586**	**608**	**78**

Table A.3. *Occupation category groups*

The four category groups are the following:

- High Occupation comprises the three highest levels in the ranking, that is, 1 (*ingenieros and licenciados*), 2 (*ingenieros técnicos, peritos and ayudantes titulados*) and 3 (*jefes administrativos and de taller*).
- Upper-Intermediate Occupation includes levels 4 (*ayudantes no titulados*), 5 (*oficiales administrativos*) and 6 (*subalternos*).
- Lower-Intermediate Occupation is composed of levels 7 (*auxiliares administrativos*) and 8 (*oficiales de primera and segunda*).
- Low Occupation consists of levels 9 (*oficiales de tercera and especialistas*) and 10 (*peones*).

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Table 1. The unemployment Insurance System in Spain after 1992.

1) Contributory Unemployment Insurance System

Duration of benefits		Amount of benefits	
Period of contribution (months)	Duration of benefits (months)	Period of benefits (months)	Amount of benefits (%)
1-11	0	1-6	70
12-17	4	7-24	60
18-23	6		
24-29	8		
30-35	10		
36-41	12		
42-47	14		
48-53	16		
54-49	18		
60-65	20		
66-71	22		
>=72	24		

2) Assistance System for Workers with Dependants: Duration of benefits

Period of contribution (months)		Duration of benefits (months)
1-2		0
3		3
4		4
5		5
6-11	Age< 45	21
	Age>= 45	21
12-17	Age < 45	18
	Age >= 45	24
>=18	Age <45	24
	Age >=45	30

Notes: 1. The period of contribution refers to social security contributions made during the 6 years of employment prior to the legal situation of unemployment, as recognized by the labor authority.

2. The amount is determined as a percentage of the average wage in the previous 12 months of employment. Workers are banded in contribution brackets according to 12 professional categories.

3. The minimum amount for contributory benefits is 75% of the minimum wage (100% with dependants), and the upper bound is 170% of the minimum wage (195% with one dependant, and 220 with two or more dependants).

4. Workers aged 45 years or older, without dependants, who received contributory benefits for 12 months or longer are eligible for 6 months of assistance benefits. Since April 1992, all workers without dependants who made social security contributions for 6 or more months are eligible for 6 months of benefits.

5. Workers aged 45 years or older who received contributory benefits for 24 months qualify for an additional period of 6 months.

6. Workers aged 52 years or older are eligible for benefits until retirement.

7. The amount of assistance benefits is 75% of the minimum wage. Since 1989, the benefit amount varies with the number of dependants for workers aged 45 or older only if they had received contributory benefits for 24 months: 75% of the minimum wage (one or no dependants), 100% (two dependants), and 125% (three or more dependants).

Table 2. Main descriptive statistics for first unemployment spells in 2000

Variable	Description	Entire sample Mean (S.D.)	Non-UI recipients Mean (S.D.)	Contributory benefits Mean (S.D.)	Assistance benefits Mean (S.D.)
Censored		0.048	0.047	0.049	0.068
Males	=1 if male	0.518	0.520	0.531	0.393
Recall*	=1 if exits from unemployment with recall to previous employer	0.368	0.392	0.267	0.286
Temporary help agency	=1 if previously employed through a THA	0.055	0.063	0.019	0.024
Qualification level					
High	=1 if contribution to Social Security in previous job is 1, 2 or 3.	0.070	0.071	0.074	0.037
Upper-intermediate	=1 if Social Security contribution in previous job is 4, 5 or 6	0.110	0.103	0.144	0.107
Lower-intermediate	=1 if contribution to Social Security in previous job is 7 or 8	0.294	0.287	0.326	0.290
Low	=1 if contribution to Social Security in previous job is 9 or 10.	0.526	0.539	0.455	0.565
Age	Age in years when entering unemployment				
16-24	=1 if individual age ranges from 16 to 24	0.301	0.310	0.254	0.312
25-34	=1 if individual age ranges from 25to 34	0.356	0.309	0.551	0.515
>34	=1 if individual age above 34 years old	0.344	0.381	0.195	0.173
Employment duration	Tenure in previous job (in weeks)	30.103 (68.865)	24.151 (64.039)	61.149 (87.325)	20.888 (11.354)
<=1	Up to 1 week	0.098	0.118	0.011	0.034
>1 and <=4	Above 1 week and up to 4 weeks	0.160	0.191	0.023	0.074
>4 and <=20	Above 4 weeks and up to 20 weeks	0.308	0.332	0.184	0.332
>20 and <=1 year	Above 20 weeks and up to 1 year	0.309	0.281	0.397	0.556
>1 year	Above 1 year	0.125	0.077	0.384	0.003
Unemployment duration	Duration in unemployment (in weeks)*	22.632 (18.420)	21.957 (18.305)	25.188 (18.619)	26.646 (18.684)
>4 and <=20	Above 4 weeks and up to 20 weeks	0.615	0.637	0.530	0.484
>20 and <=1 year	Above 20 weeks and up to 1 year	0.292	0.274	0.359	0.394
>1 year	Above 1 year	0.093	0.088	0.110	0.121
Industry dummies					
Agriculture	=1 if employed in agriculture in previous job	0.005	0.005	0.002	0.007
Industry	=1 if employed in industry in previous job	0.134	0.119	0.206	0.150
Construction	=1 if employed in construction in previous job	0.170	0.175	0.148	0.141
Services	=1 if employed in services in previous job	0.691	0.701	0.643	0.701
Type of contract	Type of contract in previous job				
Permanent	=1 if permanent contract in previous job	0.068	0.048	0.179	0.010
Permanent per task	=1 if permanent per task contract in prev. job	0.040	0.042	0.025	0.049
Temporary	=1 if temporary contract in previous job	0.892	0.909	0.796	0.940
Number of previous jobs	Number of jobs held from June 1999 to actual job	2.110 (1.694)	2.192 (1.787)	1.744 (1.155)	1.900 (1.310)
Number of children					
0	No children	-	-	0.735	0.719
1	1 child	-	-	0.145	0.123
2	2 children	-	-	0.101	0.116
>2	More than 2 children	-	-	0.018	0.042
Replacement ratio	[UI benefits/gross wage in previous job]	-	-	0.744 (0.264)	0.750 (0.002)
Reason for UI entry					
Temporary contract	End of temporary contract at previous job	-	-	0.743	0.900
Dismissal	Worker was dismissed from previous job	-	-	0.142	0.013
Other reasons		-	-	0.112	0.085
Contributory benefit	Holds contrib. benefit at the beginning of spell	0.1632	-	1	-
Assistance benefit	Holds assistan. benefit at the beginning of spell	0.0324	-	-	1
Without benefit	Without UI benefits at the beginning of spell	0.8045	1	-	-
Sample size		**20766**	**16706**	**3388**	**672**

*Without taking into account censored observations

*Table 3. Percentage of recall workers according to certain characteristics**

	TOTAL SAMPLE		NON-UI RECIPIENTS		CONTRIBUTORY BENEFITS		ASSISTANCE BENEFITS	
	% Recall	Total	%Recall	Total	% Recall	Total	% Recall	Total
TOTAL	36.86	19773	39.24	15925	26.72	3222	28.59	626
SEX								
Males	32.00	1323	33.78	8342	24.74	1730	22.71	251
Females	42.18	450	45.25	7583	29.02	1492	32.53	375
QUALIFICATION LEVEL								
High	43.30	1404	47.05	1137	28.51	242	16.00	25
Upper-intermediate	32.42	2193	36.06	1661	20.52	463	24.64	69
Lower-Intermediate	32.14	5887	35.01	4662	21.17	1039	21.51	186
Low	39.63	10289	41.15	8465	32.27	1478	34.10	346
AGE								
16-24	27.01	6019	27.89	4983	23.09	836	21.50	200
25-34	34.70	7011	38.11	4930	26.08	1764	29.65	317
>34	47.90	6743	49.57	6012	33.44	622	38.53	109
Unemployment duration *								
Above 4 weeks and up to 20 weeks	40.83	12156	42.73	10145	31.67	1708	28.71	303
Above 20 weeks and up to 1 year	32.27	5776	34.81	4370	22.95	1159	31.17	247
Above 1 year	25.10	1841	27.87	1410	15.21	355	21.43	56

*Without taking into account censored observations

*Table 4. Percentage of recall workers according to benefit consumption**

% of benefit consumption	% Recall	Total
<=25	27.15	383
>25 & <=50	25.34	521
>50 & <=75	25.63	480
> 75 & <100	24.02	487
=100	28.53	1977
TOTAL	27.03	3848

*Without taking into account censored observations

Table 5. Percentage of recall workers according to entitlement period.
Only contributory benefits

Entitlement Period	% Recall	Total
120	30.03	1139
180	30.78	627
240	23.52	421
300	30.43	230
360	28.24	216
420 and 480	21.43	210
540, 600, 660 and 720	13.46	379
TOTAL	26.72	3222

*Without taking into account censored observations

Table 6. Percentage of individuals who renew the claim at least once according to certain characteristics*

	% Renew the claim	Total
Exit from unemployment to:		
Different employer	37.36	2808
Equal employer (recall)	42.60	1040
Unemployment duration (weeks):		
>4 and <=20	58.53	2011
>20 and <=1 year	18.99	1406
>1 year	11.14	431
TOTAL	**48.77**	**3848**

*Without taking into account censored observations

Table 7. Unemployment claims per individual from January 2000 to June 2002 by number of different firms used to sustain such claims. Only contributory benefits

Number of Claims per individual	Number of different firms (row percent)				Total number of individuals
	1	2	3	4	
1	975 (100)				975
2	535 (24.58)	1642 (75.42)			2177
3	48 (17.20)	79 (28.32)	152 (54.48)		279
4	28 (20.59)	28 (20.59)	35 (25.74)	45 (33.09)	136
Total	**1586**	**1749**	**187**	**45**	**3567**

Table 8.1. Determinants of Transition from Unemployment to Employment. Logit Estimates, Asymptotic t-Statistics, and Marginal Probabilities. Entire sample

	MODEL 1			MODEL 2		
	Coeff.	|t|	Mg. Probab.	Coeff.	|t|	Mg. Probab.
Month 1	0.437	9.230	0.065	0.461	9.770	0.070
Month 2	0.476	9.880	0.073	0.491	10.210	0.076
Month 3	0.425	8.570	0.065	0.419	8.490	0.065
Month 4	0.253	4.900	0.037	0.230	4.470	0.034
Month 5	0.088	1.630	0.012	0.075	1.400	0.011
Month 6	0.085	1.520	0.012	0.064	1.160	0.009
Month 7	-0.042	-0.730	-0.006	-0.042	-0.720	-0.006
Month 8	-0.038	-0.630	-0.005	-0.042	-0.700	-0.006
Month 9	-	-	-	-	-	-
Month 10	-0.141	-2.120	-0.018	-0.142	-2.140	-0.019
Month 11	-0.050	-0.740	-0.007	-0.050	-0.740	-0.007
Month 12	-0.040	-0.560	-0.005	-0.043	-0.610	-0.006
Month 13	-0.164	-2.160	-0.021	-0.162	-2.130	-0.021
Month 14	-0.201	-2.500	-0.026	-0.202	-2.520	-0.026
Month 15	-0.210	-2.490	-0.027	-0.208	-2.480	-0.027
Month 16	-0.057	-0.680	-0.008	-0.058	-0.690	-0.008
Month 17	-0.009	-0.110	-0.001	-0.009	-0.100	-0.001
Month 18	-0.142	-1.470	-0.019	-0.145	-1.500	-0.019
Month 19	0.055	0.570	0.008	0.050	0.520	0.007
Recall	0.346	18.770	0.049	0.340	18.590	0.049
Renew the claim	1.445	32.550	0.282	-	-	-
Tenure in previous job:						
<= 1 year	-	-	-	-	-	-
> 1 year and <= 2 years	0.280	13.510	0.040	0.272	13.190	0.040
> 2 years	0.169	5.590	0.024	0.164	5.460	0.024
Gender: males	0.211	12.400	0.029	0.204	12.010	0.028
THA	0.166	4.400	0.024	0.169	4.480	0.025
Qualification level:						
High	0.038	0.950	0.005	0.033	0.850	0.005
Medium-High	-	-	-	-	-	-
Medium-Low	0.071	2.460	0.010	0.053	1.840	0.007
Low	-0.125	-4.450	-0.017	-0.144	-5.140	-0.020
Age at beginning of unemployment spell:						
Age 16-19	0.119	3.070	0.017	0.106	2.730	0.015
Age 20-24	0.239	8.060	0.034	0.207	7.030	0.030
Age 25-29	0.141	4.760	0.020	0.124	4.200	0.018
Age 30-34	0.057	1.810	0.008	0.044	1.400	0.006
Age 35-39	-	-	-	-	-	-
Age 40-44	-0.040	-1.120	-0.005	-0.060	-1.670	-0.008
Age 45-49	-0.038	-0.960	-0.005	-0.059	-1.490	-0.008
Age 50-54	-0.083	-1.850	-0.011	-0.104	-2.340	-0.014
Age 55-59	-0.001	-0.020	0.000	-0.022	-0.380	-0.003
>Age 59	-0.164	-1.440	-0.021	-0.192	-1.680	-0.025
Type of contract:						
Permanent	-	-	-	-	-	-
Permanent per task	0.729	12.760	0.124	0.711	12.560	0.122
Temporary	0.315	8.820	0.040	0.266	7.560	0.034
Number of previous jobs	0.099	17.570	0.014	0.099	17.540	0.014
Receives contributory benefit	-0.979	-27.230	-0.105	-0.420	-15.090	-0.053
Receives assistance benefits	-1.025	-16.580	-0.100	-0.467	-8.380	-0.056

Constant	-2.330	-31.520	-	-2.260	-30.760	-	
Log likelihood		-49883.057			-50415.574		
Number of individuals		20766			20766		
Number of observations		111986			111986		

Note: Regression includes controls for regions, industry and month of entering unemployment.

Table 8.2. Determinants of Transitions from Unemployment to Employment through Recall and to Employment through a Different Employer. Multinomial Logit Estimates, Asymptotic t-Statistics, and Marginal Probabilities. Entire Sample.

	MODEL 1						MODEL 2					
	Different Employer		Recall		Mg. Probab		Different Employer		Recall		Mg. Probab	
	Coeff.	|t|	Coeff.	|t|	Dif. Emp	Recall	Coeff.	|t|	Coeff.	|t|	Dif. Emp	Recall
Month 1	0.348	6.220	0.716	9.030	0.029	0.041	0.374	6.700	0.735	9.290	0.032	0.043
Month 2	0.324	5.650	0.826	10.330	0.025	0.051	0.340	5.950	0.837	10.470	0.027	0.053
Month 3	0.276	4.680	0.753	9.200	0.021	0.047	0.272	4.610	0.746	9.130	0.021	0.047
Month 4	0.235	3.860	0.338	3.890	0.021	0.017	0.212	3.480	0.317	3.640	0.019	0.017
Month 5	0.076	1.200	0.151	1.660	0.006	0.008	0.063	0.990	0.140	1.540	0.005	0.007
Month 6	0.044	0.670	0.196	2.110	0.003	0.010	0.022	0.330	0.179	1.920	0.001	0.010
Month 7	-0.013	-0.190	-0.092	-0.920	-0.001	-0.004	-0.012	-0.170	-0.093	-0.930	-0.001	-0.005
Month 8	-0.094	-1.300	0.086	0.860	-0.009	0.005	-0.098	-1.360	0.081	0.810	-0.009	0.005
Month 9	-	-	-	-	-	-	-	-	-	-	-	-
Month 10	-0.161	-2.050	-0.104	-0.920	-0.013	-0.004	-0.163	-2.070	-0.105	-0.930	-0.014	-0.004
Month 11	-0.096	-1.190	0.034	0.300	-0.009	0.002	-0.096	-1.190	0.034	0.310	-0.009	0.002
Month 12	-0.093	-1.100	0.048	0.410	-0.008	0.003	-0.096	-1.140	0.046	0.390	-0.009	0.003
Month 13	-0.160	-1.790	-0.209	-1.590	-0.013	-0.009	-0.158	-1.760	-0.208	-1.570	-0.013	-0.009
Month 14	-0.003	-0.040	-0.937	-5.190	0.003	-0.032	-0.004	-0.050	-0.937	-5.200	0.003	-0.033
Month 15	-0.153	-1.570	-0.378	-2.480	-0.012	-0.016	-0.151	-1.560	-0.376	-2.470	-0.012	-0.016
Month 16	0.106	1.120	-0.586	-3.370	0.013	-0.023	0.104	1.100	-0.585	-3.370	0.013	-0.024
Month 17	0.083	0.820	-0.270	-1.660	0.009	-0.012	0.083	0.820	-0.269	-1.650	0.009	-0.013
Month 18	-0.011	-0.100	-0.523	-2.760	0.001	-0.021	-0.015	-0.140	-0.524	-2.760	0.001	-0.021
Month 19	0.180	1.640	-0.291	-1.580	0.019	-0.014	0.173	1.590	-0.293	-1.590	0.019	-0.014
Renew the claim	1.436	28.330	1.458	18.870	0.179	0.095	-	-	-	-	-	-
Tenure in previous job:												
<= 1 year	-	-	-	-	-	-	-	-	-	-	-	-
> 1 year and <= 2 years	0.193	7.610	0.414	13.300	0.016	0.022	0.185	7.300	0.407	13.110	0.015	0.022
> 2 years	0.200	5.710	-0.012	-0.230	0.019	-0.002	0.201	5.810	-0.025	-0.480	0.020	-0.002
Gender: males	0.340	16.470	-0.081	-3.080	0.032	-0.006	0.332	16.150	-0.087	-3.280	0.032	-0.006
THA	0.203	4.770	-0.054	-0.820	0.020	-0.004	0.209	4.910	-0.053	-0.800	0.021	-0.004
Qualification level:												
High	-0.042	-0.870	0.238	3.970	-0.005	0.013	-0.052	-1.080	0.241	4.030	-0.006	0.014
Medium-High	-	-	-	-	-	-	-	-	-	-	-	-
Medium-Low	0.064	1.890	0.068	1.430	0.006	0.003	0.042	1.260	0.054	1.140	0.004	0.003
Low	-0.177	-5.290	0.009	0.190	-0.016	0.001	-0.198	-5.980	-0.006	-0.130	-0.019	0.001
Age at beginning of unemployment spell:												
Age 16-19	0.314	6.890	-0.526	-7.890	0.035	-0.023	0.293	6.470	-0.530	-7.960	0.033	-0.023
Age 20-24	0.399	11.050	-0.215	-4.710	0.042	-0.012	0.360	10.040	-0.237	-5.220	0.038	-0.013
Age 25-29	0.255	7.020	-0.163	-3.610	0.026	-0.009	0.233	6.440	-0.173	-3.850	0.024	-0.010
Age 30-34	0.111	2.820	-0.061	-1.300	0.011	-0.004	0.093	2.390	-0.071	-1.530	0.009	-0.004
Age 35-39	-	-	-	-	-	-	-	-	-	-	-	-
Age 40-44	-0.141	-3.010	0.091	1.800	-0.013	0.005	-0.168	-3.600	0.079	1.560	-0.015	0.005
Age 45-49	-0.161	-3.060	0.119	2.140	-0.015	0.007	-0.189	-3.610	0.106	1.900	-0.017	0.007
Age 50-54	-0.189	-3.190	0.066	1.060	-0.016	0.004	-0.218	-3.680	0.052	0.830	-0.019	0.004
Age 55-59	-0.112	-1.450	0.151	1.900	-0.011	0.009	-0.141	-1.820	0.137	1.720	-0.013	0.008
>Age 59	-0.547	-3.170	0.347	2.410	-0.042	0.023	-0.585	-3.390	0.330	2.290	-0.045	0.023
Type of contract:												
Permanent	-	-	-	-	-	-	-	-	-	-	-	-
Permanent per task	-0.353	-3.770	2.017	22.720	-0.047	0.241	-0.364	-3.910	1.999	22.630	-0.049	0.241
Temporary	0.148	3.720	0.983	13.180	0.009	0.035	0.097	2.490	0.938	12.660	0.005	0.035
Number of previous jobs	0.081	12.240	0.132	17.800	0.007	0.006	0.080	12.170	0.131	17.790	0.007	0.006
Contributory benefits	-0.922	-22.070	-1.143	-17.810	-0.063	-0.039	-0.381	-11.660	-0.548	-11.650	-0.030	-0.022

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Assistance benefits	-0.845	-11.830	-1.438	-13.430	-0.054	-0.040	-0.289	-4.460	-0.868	-8.920	-0.021	-0.030
Constant	-2.550	-29.380	-3.921	-30.470			-2.473	-28.650	-3.863	-30.080		
Loglikelihood	-61717.095						-62250.757					
Number if individuals	20766						20766					
Number of observations	111986						111986					

Note: Regression includes controls for regions, industry and month of entering unemployment.

Table 9.1. Determinants of Transition from Unemployment to Employment. Logit Estimates, Asymptotic t-Statistics and Marginal Probabilities. UI recipients

	MODEL 1			MODEL 2		
	Coeff.	|t|	Mg. Probab.	Coeff.	|t|	Mg. Probab.
Month 1	0.434	3.620	0.055	0.534	4.560	0.076
Month 2	0.555	4.620	0.073	0.640	5.460	0.094
Month 3	0.627	5.270	0.085	0.655	5.620	0.098
Month 4	0.679	5.630	0.094	0.594	5.020	0.088
Month 5	0.216	1.770	0.026	0.216	1.780	0.029
Month 6	0.545	4.520	0.073	0.463	3.890	0.067
Month 7	0.022	0.170	0.002	0.038	0.300	0.005
Month 8	0.153	1.160	0.018	0.118	0.910	0.015
Month 9	-	-	-	-	-	-
Month 10	0.148	1.070	0.018	0.131	0.950	0.017
Month 11	-0.207	-1.320	-0.022	-0.182	-1.170	-0.022
Month 12	0.073	0.470	0.008	0.070	0.460	0.009
Month 13	0.076	0.480	0.009	0.115	0.720	0.015
Month 14	0.075	0.440	0.009	0.099	0.580	0.013
Month 15	-0.144	-0.770	-0.016	-0.091	-0.490	-0.011
Month 16	0.045	0.240	0.005	0.079	0.420	0.010
Month 17	0.230	1.130	0.028	0.286	1.420	0.040
Month 18	0.160	0.730	0.019	0.201	0.930	0.027
Month 19	-0.106	-0.430	-0.012	-0.065	-0.270	-0.008
Recall	0.346	7.650	0.042	0.343	7.860	0.046
Renew the claim	1.714	34.830	0.273	-	-	-
Tenure in previous job:						
<= 1 year	-	-	-	-	-	-
> 1 year and <= 2 years	0.078	1.600	0.009	0.061	1.300	0.008
> 2 years	0.124	2.090	0.014	0.052	0.910	0.007
Gender: males	0.280	6.950	0.032	0.223	5.740	0.028
THA	0.101	0.760	0.012	0.117	0.910	0.015
Qualification level:						
High	0.112	1.270	0.013	0.141	1.660	0.018
Medium-High	-	-	-	-	-	-
Medium-Low	0.040	0.670	0.005	-0.028	-0.480	-0.004
Low	-0.052	-0.870	-0.006	-0.090	-1.540	-0.011
Age at beginning of unemployment spell:						
Age<=25	-	-	-	-	-	-
Age 26-30	-0.086	-1.800	-0.010	-0.072	-1.540	-0.009
Age 31-40	-0.105	-2.060	-0.012	-0.049	-0.990	-0.006
Type of contract:						
Permanent	-	-	-	-	-	-
Permanent per task	0.480	3.510	0.064	0.689	5.270	0.108
Temporary	0.214	3.480	0.023	0.201	3.410	0.024
Number of previous jobs	0.041	2.300	0.005	0.051	2.980	0.006
Number of children:						
0	-	-	-	-	-	-
1	-0.178	-3.180	-0.019	-0.168	-3.090	-0.020
2	-0.145	-2.150	-0.016	-0.169	-2.570	-0.020
3 or more	-0.340	-2.570	-0.034	-0.411	-3.180	-0.045
Time until exhaustion (in months)						
UI>18	-1.499	-11.500	-0.104	-0.615	-4.990	-0.063
UI 12 to 18	-1.044	-11.160	-0.087	-0.272	-3.150	-0.032

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UI 5 to 11	-0.784	-10.680	-0.077	-0.177	-2.650	-0.021
UI 2 to 4	-0.400	-5.920	-0.042	-0.057	-0.900	-0.007
UI1, UI0, UI-1	-	-	-	-	-	-
UI –2 to –4	-0.476	-5.280	-0.047	-0.406	-4.580	-0.045
UI –5 to –10	-0.562	-5.270	-0.054	-0.544	-5.150	-0.058
UI > -10	-0.555	-3.150	-0.052	-0.564	-3.220	-0.058
Replacement ratio	-1.852	-15.530	-0.210	-1.429	-12.590	-0.179
(Replacement ratio)^2	0.418	10.680	0.047	0.317	8.580	0.040
Constant	-1.530	-9.400	-	-1.559	-9.810	-
Log likelihood		-9710.888			-10350.952	
Number of individuals		4060			4060	
Number of observations		24663			24633	

Note: Regression includes controls for regions, industry and month of entering unemployment.

Table 9.2. Determinants of Transitions from Unemployment to Employment through Recall and to Employment through a Different Employer. Multinomial Logit Estimates, Asymptotic t-Statistics, and Marginal Probabilities. UI recipients

	MODEL 1						MODEL 2					
	Different Employer		Recall		Mg. Probab		Different Employer		Recall		Mg. Probab	
	Coeff.	|t|	Coeff.	|t|	Dif. Emp	Recall	Coeff.	|t|	Coeff.	|t|	Dif. Emp	Recall
Month 1	0.399	3.010	0.741	3.070	0.036	0.022	0.485	3.730	0.875	3.650	0.048	0.031
Month 2	0.397	2.970	1.136	4.750	0.033	0.042	0.470	3.590	1.249	5.260	0.044	0.053
Month 3	0.548	4.150	0.999	4.200	0.052	0.034	0.565	4.360	1.062	4.500	0.058	0.041
Month 4	0.611	4.570	1.004	4.170	0.059	0.034	0.525	3.990	0.933	3.890	0.054	0.035
Month 5	0.142	1.040	0.547	2.240	0.011	0.017	0.137	1.020	0.565	2.320	0.011	0.020
Month 6	0.470	3.480	0.818	3.490	0.044	0.027	0.386	2.890	0.750	3.210	0.038	0.027
Month 7	0.037	0.260	-0.004	-0.020	0.003	0.000	0.051	0.370	0.022	0.090	0.005	0.000
Month 8	0.149	1.010	0.174	0.670	0.013	0.004	0.114	0.780	0.145	0.560	0.011	0.004
Month 9	-	-	-	-	-	-	-	-	-	-	-	-
Month 10	0.216	1.420	-0.167	-0.540	0.021	-0.004	0.199	1.320	-0.183	-0.590	0.021	-0.005
Month 11	-0.155	-0.910	-0.498	-1.300	-0.012	-0.010	-0.130	-0.770	-0.476	-1.240	-0.011	-0.011
Month 12	0.026	0.150	0.277	0.860	0.001	0.008	0.025	0.150	0.264	0.820	0.002	0.008
Month 13	-0.045	-0.250	0.540	1.700	-0.006	0.018	-0.002	-0.010	0.561	1.760	-0.003	0.021
Month 14	0.170	0.940	-0.677	-1.350	0.017	-0.013	0.198	1.100	-0.675	-1.350	0.022	-0.015
Month 15	-0.127	-0.620	-0.382	-0.830	-0.010	-0.008	-0.068	-0.330	-0.352	-0.770	-0.005	-0.009
Month 16	0.074	0.360	-0.247	-0.540	0.007	-0.006	0.113	0.560	-0.226	-0.490	0.012	-0.006
Month 17	0.310	1.440	-0.588	-1.020	0.032	-0.012	0.370	1.740	-0.552	-0.960	0.043	-0.013
Month 18	0.241	1.050	-0.637	-1.040	0.025	-0.013	0.287	1.260	-0.613	-1.000	0.033	-0.014
Month 19	-0.038	-0.150	-0.824	-1.190	-0.002	-0.015	0.006	0.020	-0.795	-1.150	0.002	-0.016
Renew the claim	1.681	30.090	1.790	20.800	0.200	0.061	-	-	-	-	-	-
Tenure in previous job:												
<= 1 year	-	-	-	-	-	-	-	-	-	-	-	-
> 1 year and <= 2 years	0.012	0.220	0.289	3.450	0.000	0.008	-0.003	-0.060	0.259	3.170	-0.001	0.008
> 2 years	0.109	1.640	0.195	1.810	0.009	0.005	0.050	0.780	0.087	0.830	0.005	0.002
Gender: males	0.346	7.620	0.044	0.600	0.030	0.000	0.292	6.600	-0.007	-0.100	0.028	-0.001
THA	0.175	1.210	-0.366	-1.210	0.017	-0.008	0.216	1.560	-0.416	-1.380	0.024	-0.010
Qualification level:												
High	0.062	0.640	0.270	1.660	0.005	0.007	0.069	0.720	0.363	2.280	0.005	0.012
Medium-High	-	-	-	-	-	-	-	-	-	-	-	-
Medium-Low	0.039	0.590	-0.021	-0.180	0.003	-0.001	-0.035	-0.550	-0.071	-0.590	-0.003	-0.002
Low	-0.137	-2.040	0.185	1.620	-0.012	0.005	-0.179	-2.730	0.163	1.450	-0.018	0.005
Age at beginning of unemployment spell:												
Age<=25	-	-	-	-	-	-	-	-	-	-	-	-
Age 26-30	-0.157	-2.940	0.155	1.740	-0.014	0.004	-0.136	-2.610	0.162	1.840	-0.013	0.005
Age 31-40	-0.221	-3.800	0.243	2.640	-0.019	0.007	-0.157	-2.770	0.275	3.030	-0.016	0.009
Type of contract:												
Permanent	-	-	-	-	-	-	-	-	-	-	-	-
Permanent per task	-0.580	-2.620	2.494	11.410	-0.053	0.220	-0.369	-1.700	2.686	12.580	-0.053	0.279
Temporary	0.068	1.050	1.348	7.870	0.003	0.025	0.060	0.950	1.318	7.810	0.003	0.028
Number of previous jobs	0.026	1.250	0.086	3.070	0.002	0.002	0.034	1.730	0.097	3.640	0.003	0.003
Number of children:												
0	-	-	-	-	-	-	-	-	-	-	-	-
1	-0.237	-3.680	0.079	0.810	-0.020	0.003	-0.232	-3.670	0.099	1.030	-0.021	0.004
2	-0.243	-3.020	0.198	1.810	-0.020	0.006	-0.275	-3.470	0.183	1.690	-0.025	0.007
3 or more	-0.437	-2.690	-0.028	-0.130	-0.032	0.000	-0.495	-3.110	-0.136	-0.660	-0.040	-0.003
Time until exhaustion (in months)												
UI>18	-1.340	-9.590	-2.376	-6.520	-0.072	-0.026	-0.476	-3.610	-1.459	-4.070	-0.037	-0.024

UI 12 to 18	-1.020	-9.710	-1.124	-6.370	-0.063	-0.018	-0.269	-2.770	-0.306	-1.840	-0.023	-0.007
UI 5 to 11	-0.771	-9.260	-0.848	-6.440	-0.056	-0.017	-0.190	-2.490	-0.167	-1.380	-0.017	-0.004
UI 2 to 4	-0.354	-4.590	-0.557	-4.680	-0.028	-0.012	-0.029	-0.400	-0.168	-1.490	-0.002	-0.005
UI1, UI0, UI-1	-	-	-	-	-	-	-	-	-	-	-	-
UI –2 to –4	-0.576	-5.680	-0.145	-0.870	-0.042	-0.002	-0.509	-5.070	-0.063	-0.380	-0.042	0.000
UI –5 to –10	-0.503	-4.340	-0.821	-3.430	-0.036	-0.015	-0.488	-4.250	-0.776	-3.240	-0.039	-0.016
UI > -10	-0.523	-2.770	-0.296	-0.660	-0.037	-0.006	-0.538	-2.870	-0.268	-0.600	-0.042	-0.006
Replacement ratio	-1.912	-14.080	-1.675	-8.250	-0.163	-0.038	-1.480	-11.360	-1.275	-6.540	-0.139	-0.032
(Replacement ratio)^2	0.417	9.000	0.407	7.520	0.035	0.009	0.310	6.740	0.318	6.170	0.029	0.008
Constant	-1.527	-8.450	-4.435	-13.090			-1.566	-8.840	-4.456	-13.290		
Loglikelihood	-11699.515						-12338.384					
Number if individuals	4060						4060					
Number of observations	24633						24633					

Note: Regression includes controls for regions, industry and month of entering unemployment.
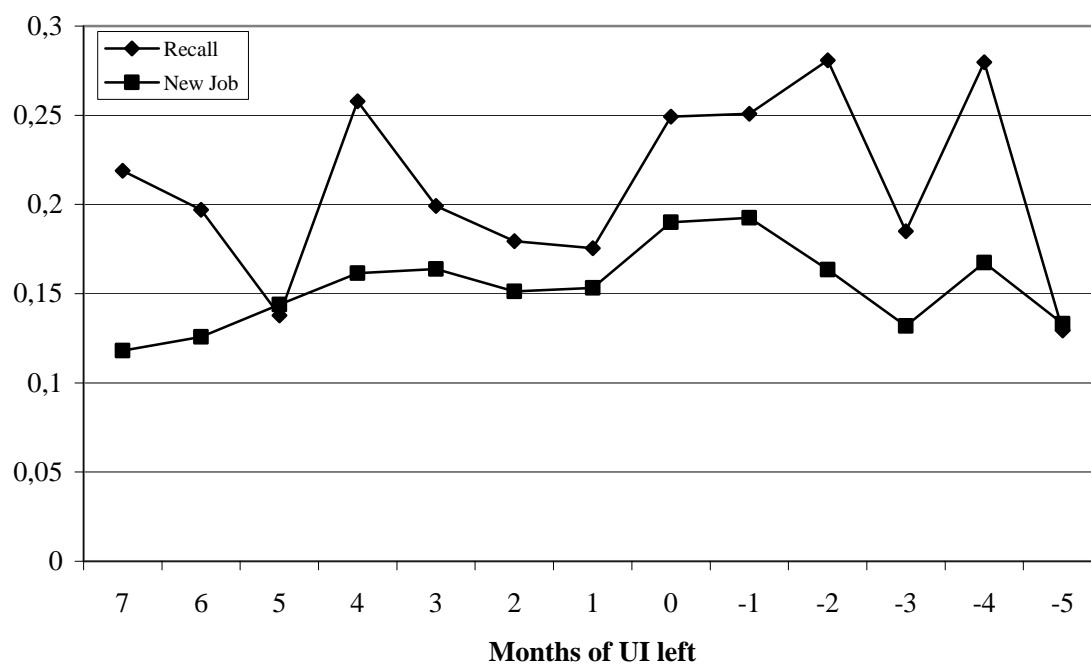
*Figure 1. Kaplan-Meier Estimates of the Unemployment Hazard Rate. Entire sample*
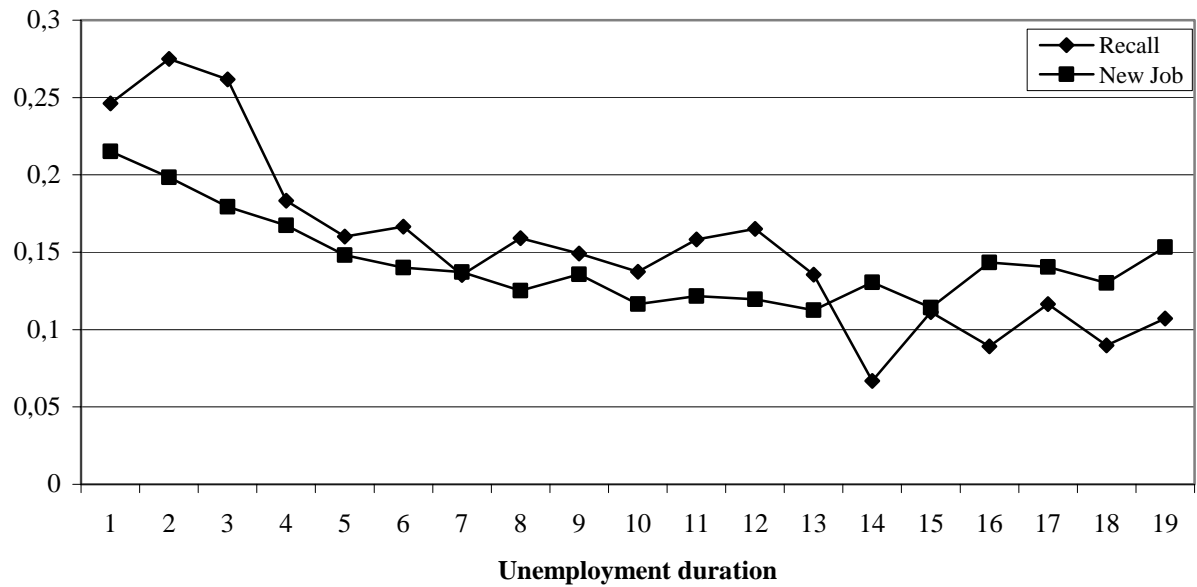
*Figure 2. Kaplan-Meier Estimates of the Unemployment Hazard Rate. UI recipients.*

### *Figure 3. Time until exhaustion empirical hazard. UI recipients*

Months of UI left

Figure 4. Empirical transition rates from unemployment into recall or different employer. Entire sample

Unemployment duration
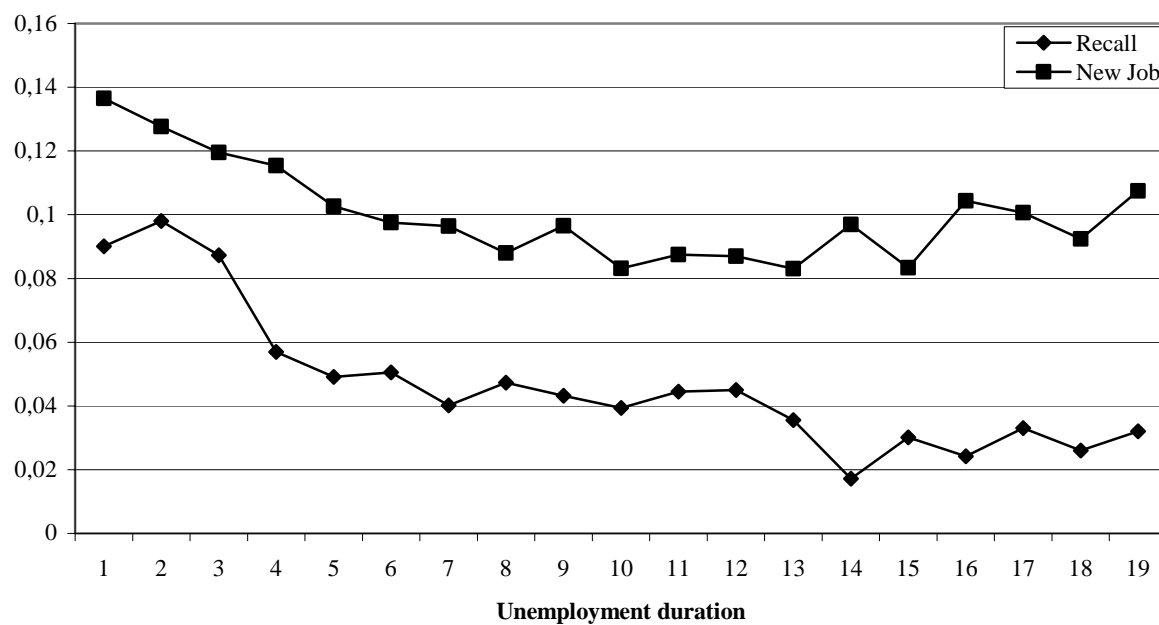
Figure 5. Empirical transition rates from unemployment into recall or different employer. UI recipients
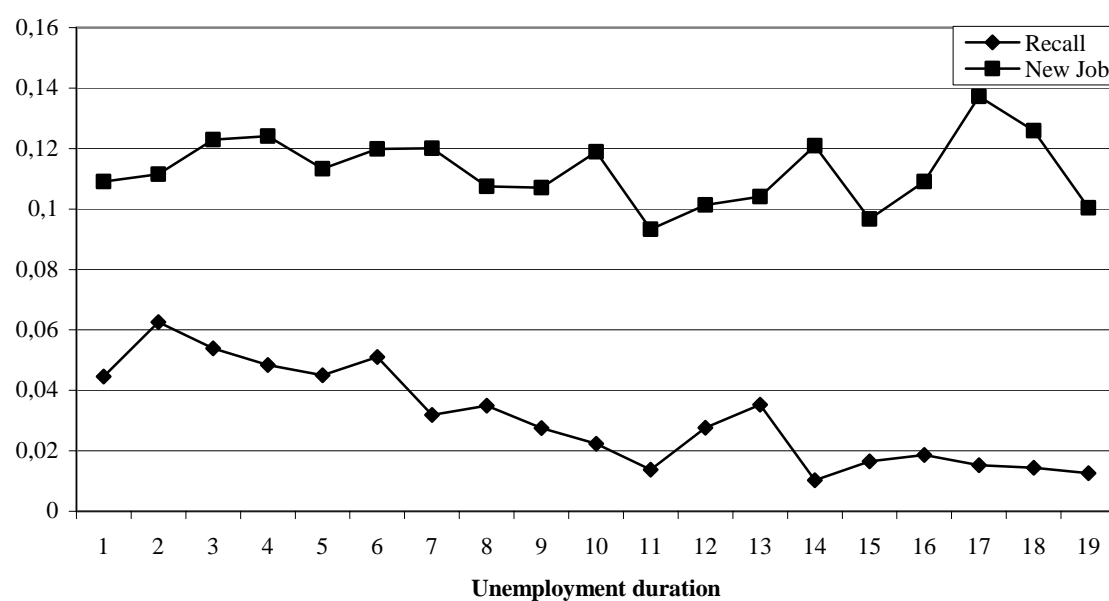
Figure 6. Predicted Transition rates. Multinomial estimates. Entire sample
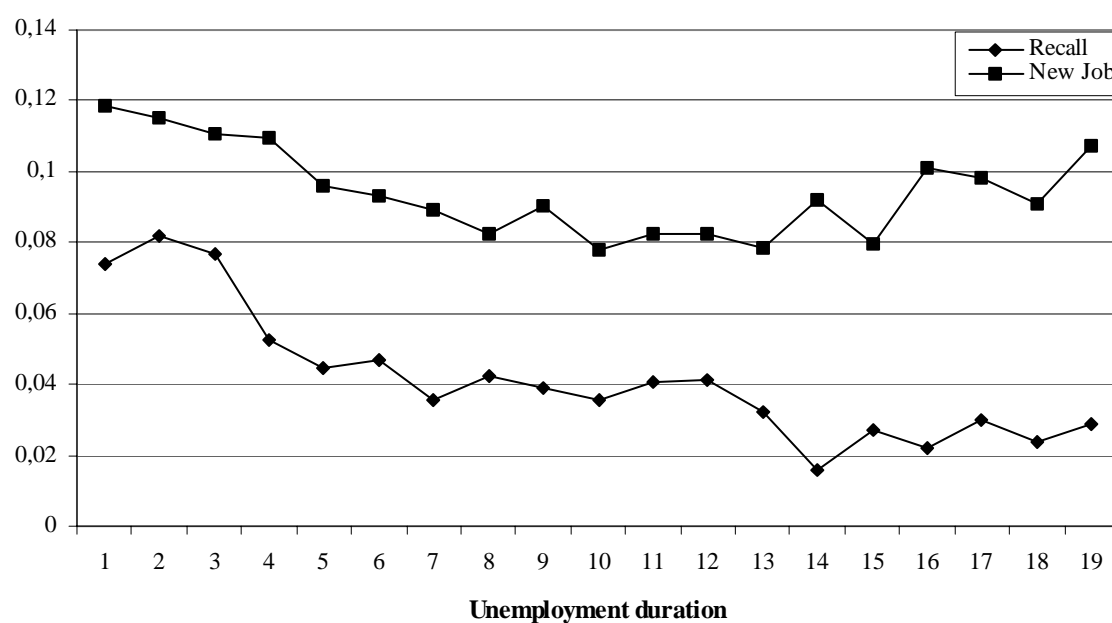
Note: This figure has been worked out according to estimation results from Table 8.2., Model 1.

Figure 7. Predicted Transition rates. Multinomial estimates. UI recipients.

Note: This figure has been worked out according to estimation results from Table 9.2., Model 1.