Working Paper 98-05
Economics Series 01
March, 1998

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THE EFFECT OF UNEMPLOYMENT COMPENSATION ON THE RE-EMPLOYMENT PROBABILITY IN SPAIN

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Abstract

In this article we use a discrete-time duration model to study the effect of unemployment compensation on the re-employment probability in Spain. The data set used is composed of a sample of newly-unemployed men and women obtained from the first wave of the Household Panel of the European Union. Using three alternative measures for unemployment benefit receipt, we obtain that the predicted hazard rate among workers who do not receive benefits is double or higher than that for workers who receive benefits. The negative effect of benefit receipt on the re-employment probability is less significant for women than for men. The predicted hazard is quite flat for men and exhibits moderate positive duration dependence for women.

JEL Classification: J64

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I thank Namkee Anh, Manuel Arellano, Carlos García, Julio Segura, Luis Toharia and seminar participants at Fundación Argentaria and Bank of Spain for suggestions. I am also grateful to Fundación Agentaria for financial help.

I. Introduction

In their survey of the effect of unemployment compensation on labor market transitions, Atkinson and Micklewright (1991) concluded that "...the findings are far from robust." We take this as an invitation to do further work on the issue, to add new results to those of many studies which have found that benefit level or benefit duration have a negative, though moderate, impact on the re-employment probability.[1] A second motivation for this article is that, apart from the studies for the United Kingdom, research dealing with the effects of unemployment benefits on unemployment duration is much scarcer in Europe than in North America.[2] However, the importance of the generosity of the unemployment compensation system has been stressed for European countries, where rising unemployment appears to be chiefly caused by longer duration of unemployment (Bean (1994) and Alogoskoufis et al. (1995)). Despite scant evidence on the desincentive effect of unemployment benefits in Europe, a number of countries have recently carried out reforms of their unemployment compensation systems, aimed at tightening eligibility rules and curtailing benefits. For instance, Spain in 1992, where the reform was partly based on budgetary reasons.

Research on the effects of unemployment compensation in Spain has met with deficient data. A survey --*Encuesta de Condiciones de Vida y Trabajo (ECVT)*-- carried out by the Ministry of Economics and Finance in 1985, containing retrospective questions, allowed to reconstruct employment history with imputed benefit entitlement for a large sample of workers. Using this data set Alba-Ramírez and Freeman (1990)

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[1] The literature is particularly extensive for the United States and the United Kingdom. Atkinson and Micklewright (1991) provide a survey.

[2] Appropriate data are harder to come by in Continental Europe. For instance, the comparatively larger number of studies for Germany have been favored by availability of the Socioeconomic Panel. See Hunt (1995) and references therein.

provided some primary results for Spain; in particular, that unemployment insurance eligibility was associated with longer duration of unemployment. Other Studies, using the same data set, have obtained similar results (Andrés and García (1993), Ahn and Ugidos (1995), and Blanco (1995)). A different approach was taken by Cebrián et al. (1995) by using data on registered unemployed people who received benefits. They found that longer benefit entitlement tends to delay exit from unemployment, and that the replacement rate has little or no effect on the re-employment probability.

Matched files from the Active Population Survey (EPA), recently made available, have permitted longitudinal analysis of labor market transitions. The EPA's panel structure allows to follow unemployed workers for a maximum o six quarters. This data set, used by Bover et al. (1997) and Alba-Ramírez (1997b) for example, exhibits three main limitations for studying the effect of unemployment compensation on the re-employment probability: (1) It only provides information on whether or not workers currently receive unemployment benefits. Each quarter in the sample, unemployed workers are asked to indicate their situation with respect to the employment office: registered receiving benefits, registered without benefits, and not registered. (2) Because labor force status and other time-variant variables are provided quarterly, many short employment and unemployment spells are likely to be missed. This is important for Spain, where labor turnover has increased as a result of fixed-term contracts (see below). (3) For reasons that are not clear, the answers to the question of benefit status are found to be quite inconsistent over time when EPA matched files are used to follow workers' unemployment spells. This makes it hard to obtain clean results on the relationship between the re-employment probability and receipt of unemployment benefits. To deal with the problem, Bover et al. (1997) assumed that benefits are received throughout, up to the

last time the individual declares to be receiving them. Based on this, and using a discrete-time duration model, they obtain a strong coefficient for the dummy "receipt of unemployment benefits".[3]

In this paper, we use a newly-released data set, the Household Panel of the European Union (HPEU). Unlike the EPA, the HPEU provides monthly labor market status, and distinguishes between receipt of insurance benefits and receipt of assistance benefits. In addition, workers are asked to indicate the monthly average amount of benefit received. Using the first wave of the HPEU, we obtained a sample of men and women who experienced unemployment at some point during 1993, and study the effect of these various measures of unemployment compensation on the re-employment probability. Given the discrete nature of the data, we apply a discrete-time duration model (Allison (1982)). We find that receipt of unemployment compensation significantly reduces the re-employment probability. Such effect is found to be stronger for men than for women. For a reference man who receives unemployment benefits, the predicted hazard rate in a given month is almost three times as high as that for a reference man who do not receive benefits. This

[3] Bover et al. (1997) claim that the inconsistencies in unemployment benefit status along the unemployment spell are due to measurement error arising from administrative delay in payment of benefits. Accepting this, one can adjust the raw data by assuming that workers who do not receive benefits in the beginning of their unemployment spell and report to be doing so later are indeed recipients from the moment they became unemployed. However, this adjustment does not account for those unemployed workers who were affected by the delay (were unemployed and eligible for unemployment compensation but did not receive benefits in the first quarter(s) of their unemployment spell), and exited unemployment before benefits were ever received. Moreover, an attentive examination of the matched files reveales that changes in benefit status do not follow a consistent pattern. For example, the flow of individuals who change from not recipients to recipients continues beyond the second quarter of the unemployment spell, which casts doubts over belated receipt of benefits due to administrative reasons. At any rate, the type of assumption made by Bover et al. (1997) is likely to cause upward bias on the negative effect of benefit receipt on the re-employment probability, simply because the adjustment is made only for those who remain unemployed. See Alba-Ramírez (1997b) for a detailed analysis of EPA matched files and shortcomings of the variable "unemployment benefit receipt".

differential remains quite constant along unemployment duration; and the probability of leaving unemployment increases moderately as the unemployment spell lengthens.

The negative effect of unemployment compensation on the re-employment probability can be interpreted in the light of the standard job search model, which predicts a higher reservation wage among workers eligible for unemployment benefits. Moreover, in the Spanish economy where fixed-term contracts are pervasive, a higher hazard among non recipients of benefits can be favored by on-the-job search. As temporary workers are less likely to qualify for unemployment compensation than workers separated from permanent jobs, and the end of a fixed-term contract can be anticipated, liquidity constraints (or a higher opportunity cost of unemployment) can foster on-the-job search among temporary workers.

The remaining part of the article is organized as follows. In the next section we provide basic notions concerning the Spanish unemployment compensation system; in section III we present an empirical model for studying the re-employment probability; in section IV we refer to the data, indicate the criteria for sample selection, and show descriptive statistics; in section V we present the specifications, discuss the results, and give some interpretations. Finally, the last section contains a summary and the conclusion.

II. **Unemployment Compensation System in Spain**

In this section we describe the unemployment compensation system as it stood in 1993, which is the reference year for the data set on

unemployment duration used in this article.[4] 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. The first 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. The assistance system is financed through transfers from the public budget. 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 month 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 A1).

The amount of contributory benefit is determined as a percentage of the average wage in the twelve months preceding unemployment.[5] 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 if he or she has two or more dependent

[4] As indicated earlier, 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 small change on the assistance system in 1989.

[5] For both, calculating the tax base and to determine the benefit amount, workers are banded in contribution brackets according to twelve professional categories.

children.

On the other hand, the assistance benefits are granted to unemployed persons whose total income does not exceed the minumum 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.[6] 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, on being 45 or older, and on having or not family dependents (see Table A1 and Toharia (1994)). Only since 1994, contributory and assistance benefits are subject to the income tax, and some Social Security contributions are deducted from benefits. Family dependents can be the spouse, children, and siblings up to the second degree. Their existence is relevant for benefit entitlement when total hosehold income devided by the number of members in the household does not exceed the minumum wage.

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

III. An Empirical Model for the Re-Employment Probability

1. Theoretical considerations

In a simple version of the standard job search model (Lippman and MacCall (1976)) with a constant reservation wage, the re-employment probability is the result of two probabilities, the rate at which offers arrive (which depends on the search intensity) times the probability that a random offer is accepted (based on the reservation wage rule). In this theoretical framework, the effect of unemployment compensation on the re-employment 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, unemployment compensation can reduce the re-employment probability, because a lower cost 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 desintentive effect dominates for the level and duration of unemployment benefits appear to be associated with longer duration of unemployment.

In this investigation we want to highlight a feature of the Spanish labor market that can be relevant in the relationship between unemployment compensation and the re-employment probability. It is the duality between indefinite and fixed-term contracts, given that a one-third of wage and salary workers held the latter type of employment in 1993. Because the indefinite contract entails high dismissal costs,

firms predominantly use fixed-term contracts to hire new employees; which implies that most employment offers received by job seekers are for temporary jobs. Workers know that accepting a fixed-term contract hastens their future unemployment, except for the fact that the fixed-term contract can be renewed. However, very few of workers holding fixed-term contracts are likely to become permanent employees (Alba-Ramírez (1997a)).

Because of the high risk of experiencing unemployment associated with accepting a fixed-term contract, workers have an incentive to wait for an indefinite-contract offer to arrive. If the worker considers that this is very unlikely to occur, waiting will still be worth it to maximize the duration of the subsequent employment spell. However, the worker is in a better position to wait for a "better" offer if unemployment compensation is received. In this context, one can think of two types of unemployed workers: (1) those whose fixed-term contract ended, and (2) those who were laid-off from a permanent job. The latter are likely to be eligible for unemployment compensation for the maximum duration and, in their quest for another permanent job, are in a better position to search for long time. The former, by the contrary, having lost a short-duration job, are likely to return to work as soon as possible in order to accumulate tenure that provides for unemployment insurance entitlement.[7] Given the high proportion of wage and salary workers who hold fixed-term contracts in Spain, labor turnover is high. The higher the job turnover the shorter the employment spells and more need to return to work to assure availability of unemployment benefits in the future. By moving quickly from job to job (i.e. searching while employed), fixed-term contract holders can approach the maximum

[7] The maximum potential duration of unemployment insurance (24 months) can be yielded by a tenure of 6 years in the job prior to unemployment. These 6 years form the maximum period in which eligibility can be built by those who hold short-term jobs.

duration of eligibility for unemployment insurance and thus be more protected against the costs of unemployment.[8]

One can think of a linkage between building eligibility for unemployment compensation and labor turnover. Because some individuals are more prone to change jobs frequently, a measure for each worker's previous employment experience can be important in explaining the re-employment probability. At first, it is unclear how controlling for this will affect the estimated impact of unemployment compensation on the probability of leaving unemployment. In part this is so because of the way entitlement to unemployment compensation can be generated.[9]

2. A Discrete-Time Duration Model

In this section we describe a discrete-time hazard model that fits the nature of the data used. 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 a some natural starting point t = 1. In the data used in the paper, such point is the month when the worker becomes unemployed. Each observation continues until time t, at which point an event occurs --the unemployment spell ends as the worker becomes

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[8] This implies that temporary workers are more likely to search on the job than permanent employees. For example, in the Labor Force Survey (EPA) of the second quarter of 1993, 5.17 percent of people with a fixed-term contract were looking for another job, compared with 0.65 percent of persons who had a indefinite employment relationship. Of course, the former figure is likely to be much higher for workers approaching the end of their contracts. See Pissarides & Wadsworth (1994) for U.K. evidence regarding on-the-job search.

[9] Consider, for example, a worker whose 6 months contract is about to finish and has not accumulated elegibility from previous employment. If the contract ends without an alternative job, the worker can apply for assistance benefits that can be granted for 6 months if he does not have family dependents or 21 months if he has family dependents. On the other hand, the worker can accept whatever job is available in order to accumulate employment tenure to become eligible for unemployment insurance. This latter option can be taken as a way to assure a less liquidity-constrained job search in the future.

employed, T = t-- or the observation is censored. The observation is censored when the surviving individual is observed at month t but not at month t+1. Spells ending in exit from the labor force are also taken as censored. 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.

For modelling the transition from unemployment to employment, we define the discrete hazard rate. For the i-th person the hazard rate to employment in interval t, $h_i(t_i)$, is the conditional probability of becoming employed in this interval, given that individual i has been unemployed until t.

$$(1) \quad h_i(t_i|x_i(t_i)) = Pr[T_i = t_i | T_i \geq t_i,\ x_i(t_i)]$$

where $x_i(t_i)$ is a vector of covariates for individual i, some of which can be time-variant. On the other hand, the conditional probability that individual i remains unemployed in period t is given by

$$(2) \quad Pr[T_i > t_i | T_i \geq t_i, .] = 1 - h_i(t_i|.) \ .$$

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

$$(3) \quad Pr[T_i > t_i|.] \equiv S(t_i|.) = \prod_{\tau=1}^{t} (1 - h_i(\tau_i|.))$$

where τ indicates the longest observed duration. For individual i, the

transition to employment can be expressed in terms of the respective hazard rate and the survivor function as

$$(4) \quad Pr[T_i=t_i|.]=h_i(t_i|.)\prod_{\tau=1}^{t-1}(1-h_i(\tau|.)) \quad .$$

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

δ_i = 1, if individual i makes a transition to employment

= 0, otherwise

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

$$(5) \quad L = \prod_{i=1}^{n} [Pr(T_i=t_i|.)]^{\delta_i} [Pr(T_i>t_i|.)]^{1-\delta_i} \quad .$$

Substituting (3) and (4) into (5), we can write the likelihood function in terms of the hazard rate,

$$(6) \quad L = \prod_{i=1}^{n} [\frac{h_i(t_i|.)}{(1-h_i(t_i|.)}]^{\delta_i} [\prod_{\tau=1}^{t}(1-h_i(\tau|.))] \quad .$$

We now just need to specify the hazard rate and plug its expression into the likelihood function in order to estimate the coefficients. For the hazard rate we chose the logistic specification.[10] For individual i, the hazard rate to employment in period t is given by

$$(7) \quad h_i(t_i|\alpha(t_i),z_i(t_i)) = \frac{1}{1+\exp(-\alpha(t_i)-\beta' z_i(t_i))}$$

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[10] In this specification the hazard rates need not be proportional, making it unnecessary to assume that absolute differences in covariates imply proportionate differences in hazard rates (the covariates act multiplicatively on the hazard function). See Kalbfleisch and Prentice (1980) p. 32.

where $\alpha(t_i)$ is a vector of dummy variables for each period (month) workers remain unemployed, $z_i(t_i)$ is a vector of explanatory variables which may vary with time, β is the vector of parameters to be estimated, and by definition, $x_i(t_i) = [\alpha(t_i), z_i(t_i)]$. Note that $\alpha(t_i)$, known as the baseline hazard, describes in a flexible way the time dependency of the transition process. We specify it by monthly dummies.

The discrete hazard model described in this section can be understood as a sequence of binomial-choice equations defined on the surviving population at each time[11] (months in our data). Furthermore, it can be shown that the likelihood function for the discrete hazard model as expressed by equation (6) 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). To see this, we can take logarithm in (6) to obtain the log-likelihood function,

$$(8) \quad \log L = \sum_{i=1}^{n} [\delta_i \log[\frac{h_i(t_i|.)}{(1-h_i(t_i|.)}] + [\sum_{\tau=1}^{t} \log(1-h_i(\tau|.))]] \ .$$

If we define a dummy variable $y_i(t_i)$ equal to 1 if person i makes a transition to employment at time t_i and zero otherwise, equation (9) can be witten as

$$(9) \quad \log L = \sum_{i=1}^{n} \sum_{\tau=1}^{t} [y_i(\tau) \log[\frac{h_i(\tau|.)}{(1-h_i(\tau|.)}] + \log(1-h_i(\tau|.))] \ .$$

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[11] See Allison (1982), Narendranathan and Stewart (1993), and Jenkins (1995).

A further manipulation of (9) pemits to write the log-likelihood function as

$$(9) \quad \log L = \sum_{i=1}^{n} \sum_{\tau=1}^{t} [y_i(\tau) \log h_i(\tau|.) + (1-y_i(\tau)) \log(1-h_i(\tau|.))] \ ,$$

where the two sources of contribution to the likelihood function can be distinguished: the first term is the contribution of persons who exit to employment and the second term is the contribution of persons who remain unemployed when she was last observed. Accepting the model specification given by (7), the estimates for α and β posses the standard properties of the maximum likelihood estimations.

IV. **Data and Descriptive Analysis**

1. Sample Selection

The data used in this article are obtained from the Household Panel of the European Union (HPEU). Only the first wave, carried out in 1994, has so far been provided by the Spanish Institute of Statistics (INE). A nation-wide representative sample of 7,206 households constitutes the first wave. To select the sample used in this paper we consider the following question: "Was there any change in your main activity during 1993?" The possible answers are "yes" and "no". We retain workers aged 16-64 who said yes because they are subsequently asked to indicate their main activity (labor force status) in each month of 1993. Then we select those workers who were employed in January and unemployed in February, or employed in February and unemployed in March, or employed

in March and unemployed in April.[12]

As we know the workers' labor force status in every month of 1993, it is possible to follow each individual until he or she makes a transition to employment or to inactivity. We consider only the first transition out of unemployment, that is, we do not study multiple spells. By selecting the sample the indicated way, we obtain a "flow sample" of unemployed workers in the terminology of Lancaster (1990), p. 162. To give each cohort of unemployed persons the same maximum time span to measure labor market transitions, we follow the first cohort until October, the second cohort until November, and the third cohort until December. Therefore, spells of unemployed workers who have not made a transition by the ninth month of unemployment are censored --the censoring is imposed for the first and second cohorts regardless of what happens in the remaining observed period. The resulting sample is composed of 239 individuals (33.5 percent of women), which generate 1,426 monthly spells of unemployment.

In order to elicit information on unemployment compensation, the HPEU asks workers about receipt of unemployment benefits during 1993. Those who respond "yes" are subsequently asked about the type of benefits (contributory or assistance), and the number of months of receipt together with the average monthly amount for each type of compensation.[13] This retrospective information is used to reconstruct the benefit history of each unemployed worker during his or her 1993

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[12] From workers employed in March and unemployed in April we excluded those who were employed in January and unemployed in February to avoid repeated spells in the sample. Because 1993 was a recession year in the Spanish economy, the flow out of employment was particularly high.

[13] There is also information about other types of benefits received by the worker during 1993; but they are not clearly linked to the period of unemployment. However, there is not information about redundancy payments.

unemployment spell. For the workers who experienced unemployment more than once in 1993, we adopted the rule that benefit receipt took place during the first spell of unemployment following the month in which they are observed employed. This spell is the one we consider for the analysis in this article.[14] At the start of the unemployment spell, 66 percent of the sample received unemployment compensation (44 percent insurance and 22 percent assistance). Based on the available information, we observed only 6 individuals who exhausted unemployment insurance and subsequently received unemployment assistance.

2. Descriptive Statistics

Table A2 presents sample means and proportions for individual observations and for monthly spells. At the beginning of the unemployment spell 65.4 of men and 67.5 of women received unemployment compensation. The proportion of insurance recipients was higher among men than women, which translates into a lower benefit amount for the latter. Table 1 and Graph 1 show the probability of remaining unemployed (survival rates) for the total sample, and also according to unemployment compensation status at the first month of the unemployed spell. For the total sample, 48.1 percent of individuals remained unemployed at the ninth month. This percentage varies by receipt of unemployment benefits: 60 percent for workers who received insurance benefit, 58.5 for assistance benefit recipients, and 25 percent for workers who did not receive insurance nor assistance. Moreover, Graph 1 shows that for the first five months, the survival rate of assistance recipients is higher that for insurance recipients.

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[14] In order to reduce the possible error associated with the indicated procedure, we tried some exceptions to the rule. For example, if the first spell was shorter than any of the others, and benefit duration was longer than the duration of the first spell, we considered that the workers did not receive benefits during the first (relevant) spell of unemployment. Because there were few cases and results were not affected, we simply applied the general rule.

However, after the fifth month, workers receiving assistance benefits leave unemployment at higher rates, closing the gap between the survival rates of recipients of each type of benefits. All in all, these figures provide the first indication of a positive relationship between unemployment compensation and the re-employment probability in Spain.

A further look at the data can be carried out by obtaining the empirical hazard rates (Kaplan-Meier estimates) for the total sample, and according to benefit status at each month of the unemployment spell. Table 2 presents the results of this exercise. Numbers between parenthesis next to "exit" numbers refer to number of individuals leaving the labor force. Given that only 5 persons moved from unemployment to out of the labor force, we consider unnecessary to estimate a competing risks model, and take the corresponding durations as censored. Numbers in brackets next to "at risk" numbers in columns of benefit recipients indicate the number of workers who changed benefit status; the sign + means that they lost benefits and the sign - that they gained assistance benefits. In the column of non recipients we show the balance resulting from adding workers who lost benefits and subtracting those who started receiving assistance after loosing insurance benefits.

Table 2 corroborates what has already been shown with the survival curves, namely, that workers receiving benefits exit unemployment at lower rate than non-recipients. Also, it is note worthy that the empirical hazard for the whole sample does not appear to exhibit duration dependence. Considering the total sample of men and women, the hazard rate is quite stable at around 9 percent, except for the low exit rate of the fourth month. For women, however, the empirical hazard tends to increase slightly as the unemployment spell

lengthens (results not shown). More on this below, when predicted hazards are calculated.

V. **Specification and Results**

1. *Specification*

As explained earlier, to estimate the discrete-time hazard model described in section III we need to specify the hazard rate, which in this article is assumed to follow a logistic distribution. Then, as shown in the previous section, one can use an easy method to estimate the discrete-time hazard model, which consists of running a logit regression on the pooled set of monthly spells of unemployment experienced by the selected sample of 239 men and women. A clear advantage of this method is that estimates of the baseline hazard result directly from the estimation of the logit model. Equation (7) can also be written as

$$\log\left(\frac{h_{it}}{1-h_{it}}\right) = \alpha(t_i) + \beta' z_i(t_i)$$

where, as indicated earlier, h_{it} is the hazard rate from unemployment to employment of individual i at time t; β is a vector of coefficients to be estimated; and $\alpha(t)$, the baseline hazard, is a vector of coefficients for monthly dummies, one for each month workers are at "risk" of becoming employed. This model assumes that there is not unobserved heterogeneity in the sample of unemployed workers we use.[15]

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[15] When the hazard rate is nonparametric, as in the continuous-time Cox model or as in the discrete-time model exposed in this article, various studies have shown that including unobserved heterogeneity does not affect the estimated coefficients much (Meyer (1990)).

In the vector of covariates we include the following groups of variables:

(i) *Demographic characteristics*. Gender for estimations using the whole sample, marital status, age groups, and levels of education.

(ii) *The individual's labor market history*. In principle, according to discussion in section III, the worker's previous employment history (i.e. job turnover) should be an important explanatory factor of the re-employment probability in Spain. The HPEU allows to obtain some indicators of job turnover. Workers are asked to indicate if they have been unemployed in the last five years; and, if the answer is "yes", they are subsequently asked to report the number of times they suffered unemployment during that period of time, as well as if any of those unemployment spells lasted 12 or more months. Moreover, workers are asked whether or not they experienced unemployment for at least a month before taking the first job. All this information can be used to create dummies referred to the worker's previous unemployment experience. Unfortunately, we do not know the type of job held by the worker before becoming unemployed.

(iii) *Household and local labor market conditions*. Two variables are used to control for this: the number of children aged less than 3, and the unemployment rate in each of the seventeen Autonomous Communities in the country.

(iv) *Dummies for the month of entering unemployment*. Given that the sample that we use is composed of persons who entered unemployment in February (sample 1), March (sample 2), and May (sample 3) of 1993, we control for this with the corresponding dummies in the regression.

(v) *Seasonal dummies*. To include calendar time in the regression, we define the following three dummies that are equal to one for the months in which the unemployment spell is observed, and zero otherwise: "Spring" (Februrary, March, or May); "Summer" (June, July, or August); and "Autumn" (September, October, or Decembèr).

(vi) *Unemployment compensation*. There are three alternative ways for us to specify the relationship between unemployment compensation and the re-employment probability. First, we use a dummy equals 1 at each month the worker received unemployment insurance or unemployment assistance during his unemployment spell;[16] and zero otherwise. Second, given that we can distinguish between contributory and assistance compensation, we use two dummies that equal to 1 at each month of the unemployment spell the worker received unemployment insurance or unemployment assistance, respectively; and zero otherwise. Finally, we include in the regression the monthly average amount of benefits received by the worker during the time of the unemployment spell she was receiving benefits from either type of unemployment compensation; and zero otherwise. Although this variable is constant during the period the worker is receiving benefits[17], being receiving it or not is time-dependent, as the other two variables just described.

2. *Estimation results*

As explained, in this article we use three alternative procedures for investigating the relationship between unemployment compensation and the re-employment probability, which are different one another in the

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[16] Notice that an unemployed worker can be elegible for unemployment compensation and he may choose not to claim it. One reason for this behavior could be that he has good employment prospects and wants to preserve entitlement for the future.

[17] Unfortunately we do not know the wage prior to unemployment and, therefore, we cannot calculate the replacement ratio to use it instead of the unemployment income.

measure for benefit receipt used. The estimation results are presented for the whole sample, for men, and for women in Tables 3, 4 and 5, respectively. Predicted hazard rates are contained in Table 6. In what follows, we first provide a general discussion of results associated with other regressors different from the unemployment compensation variable; second we describe and comment the findings related to the effect of unemployment compensation on the re-employment probability; third we gauge the magnitude of the effects by calculating the predicted hazard rates; and fourth we give some interpretations of the results.

General Results

Initially, to study the relationship between unemployment compensation and the re-employment probability in Spain, we make an effort to take into account the workers' unemployment history. This is advisable because individuals more accustomed to move jobs are supposedly more "employable", and thus are expected to leave unemployment earlier. We can control for this by including among the regressors dummies intended to reflect the worker's previous job turnover. The HPUE survey provides some information on the issue. There is the following question: "Did you experience unemployment in the last five years?" If the answer is "yes" the worker is further asked about the number of times he or she had been unemployed during the indicated period of time. However, given that the interviews took place in November and December of 1994, the information provided through these questions is contaminated by the fact that it includes job changes posterior to the worker's spell of unemployment we study. As those who became employed earlier had more time to change jobs, we may get a spurious correlation between job turnover and the re-employment probability. Indeed, we included a set of dummies obtained from the answers to the indicated question and found that the re-employment probability increases with job turnover.

This results was more apparent for men than for women (results not shown). Because of the indicated problems with this measure of job turnover, we do not use it in the main specification. However, we report the estimated results for the whole sample in Table A3 of the Appendix.

An alternative measure for job turnover can be obtained from another question posed to workers who reported to have been unemployed at least once in the five-year period:[18] "Did any of those unemployment spells last for 12 months or longer?" About 40 percent responded "yes". By including the corresponding dummy, it obtained a negative and very significant coefficient (Table A4). However, we suspect that this variable is also affected by the same problem as the job turnover indicator, and we do not use it in the main specification. Finally, there are a third, less interesting variable which we retain in the main specification. It is based on the following question "Where you unemployed at least for a month before starting to work in your first job?" About 23 percent responded "yes". The corresponding dummy always obtained an insignificant coefficient.

Results obtained by inclusion of other covariates in the estimated model are worth commenting. When there are children younger than 3 in the household, exit from unemployment is higher among men (Table 4), and lower among women (Table 5). Men who have completed secondary education appear to be more likely to become employed. As compared with middle-age women, women aged 16-29 leave unemployment

[18] All workers except 4 indicated to have been unemployed at least once in the previous five years. In principle, those 4 persons' answer is inconsistent because their labor force status changed in 1993 and this is the reason why they are in our sample. In the set of dummies for job turnover we created a separated dummy for this four persons, and interestingly obtained a positive and significant coefficient (Table A3).

earlier; but, as the unemployment spell lengthens, their higher re-employment probability diminishes significantly. The negative duration dependence for younger women can be related to a reduced search intensity with unemployment duration if their time tends to be diverted to family commiments.

To pick up local labor market conditions, we also included in the regression the unemployment rate in 17 Autonomous Communities, which obtained a negative and significant coefficient for the whole sample only when the level of benefit is included in the regression. Such coefficient is zero for men; and negative and significant for women, regardless of the unemployment compensation variable used. The re-employment probability is higher for women who lost their job in February, as compared to those who became unemployed in March or April. And, also, women are more likely to leave unemployment in the autumn, rather than in the Spring or Summer. Notice, that failing to control for calendar time can generate positive duration dependence among women.[19]

As explained above, the discrete-time duration model estimated in this article has the advantage of providing a direct estimation of the baseline hazard rate. This is accomplished by including monthly dummies in the regression. Tables 3, 4, and 5 contain the coefficients obtained by those dummies for the whole sample, men, and women, respectively. The coefficients obtained for the monthly dummies indicate that, for workers with the omitted characteristics, the baseline hazard does not vary significantly as unemployment spells lengthen. Thus, in principle the model does not exhibit significant

[19] We tried quarterly rate of growth of the GDP to take into account the effect of this macroeconomic variable, and found it insignificant, presumably due to its low variability. Measured as the variation over the same quarter of the previous year, GDP declined in each of the four quarters of 1993, at about one percent on average.

duration dependence. We need to assess duration dependence further by looking at the predicted hazard rates which, for a worker with given characteristics, depend on the coefficients for the monthly dummies as well as on coefficients for covariates interacted with log of unemployment duration.

The Effect of Unemployment Compensation

As shown in Table 3, the dummy equals to 1 for each month the worker indicated to be receiving contributory or assistance benefits obtains a negative and significant coefficient for the whole sample; as well as for men and women, separately. When the unemployment compensation variable is the amount of benefits received by the worker, it always obtains a negative and significant coefficient. By distinguishing between unemployment insurance (the contributory part of the unemployment compensation system) and unemployment assistance (the non contributory part), both dummies obtain negative and significant coefficients. Notice, however, that the t-statistics associated with the unemployment compensation variables are much higher for men than for women. In the estimated equations, we included interaction terms between the unemployment compensation variables and log of unemployment duration without noticeable results.[20]

It is important to note that despite their significance, the inclusion of the job turnover variables does not affect much the estimated value of the coefficients for the unemployment compensation variables (see Tables A3 and A4). We realize that receipt of unemployment compensation itself is a good proxy for job turnover

[20] Some authors have investigated how the effect of unemployment compensation on the re-employment probability varies along the unemployment spell. For example, using a sample of male benefit recipients for the United Kingdom, Narendranathan and Stewart (1993) found that the negative effect of unemployment income diminishes as unemployment spells lengthen.

because entitlement for benefits is based on employment history during the previous six years, except for the possibility that eligibility can be achieved by accumulating several employment spells. All in all, the three indicated measures for unemployment compensation point to the same result: That receipt of unemployment benefits is associated with lower exit rates from unemployment.

Predicted Hazard Rates

To provide an indication of the magnitude of unemployment compensation effect on the re-employment probability, we present in Table 6 the predicted hazard rates for a reference person. Hazards are calculated according to each type of unemployment compensation variable used in the regressions (Tables 3, 4, and 5). The hazard for not recipients of benefits is that generated from the specification with a dummy for benefit receipt. For the whole sample, the reference person[21] exits unemployment at a slightly increasing rate if she does not receive unemployment compensation. The average hazard rate for the first four months of the unemployment spell is 11.7 percent, and for the last four months is 17.5 percent. For the reference person who receives unemployment compensation, the hazard is much lower and is also slightly increasing, at 4.4 percent in the first four months and 7 percent in the remaining duration of unemployment. If the level of benefit is used instead of the benefit receipt the hazard for the reference worker who receives benefits becomes moderately higher.

Regarding the distinction between contributory and assistance benefits, the predicted hazards for the reference worker using the

[21] The reference person is a man (for the whole sample), married, aged 30-44 years, living in a household where there are no children younger than 3, possesses less than secondary education, experienced unemployed before obtaining the first job, became unemployed in April 1993, the reference season is the summer, and lives in an autonomous community with an unemployment rate of 22 percent.

whole sample are virtually identical, in correspondence with the similarity between the coefficients for the respective dummies obtained (Table 3).[22]

Predicted hazards from estimates obtained by using separate samples for men and women are presented in the lower parts of Table 6. For men, using the dummy for receipt of unemployment compensation, the hazard rate among workers with the reference characteristics without benefits is three times (about twice if benefit level is used) as large as that for workers who receive benefits. This differential is quite constant along the unemployment spell, as is the hazard itself. By distinguishing receipt of insurance from receipt of assistance, we obtain that the latter produces a lower hazard.

For the reference women without benefits the hazard rate is about twice that for the reference women who do not receive benefits. However, among women the time pattern of the hazard rate is more erratic. It is particularly high in the third and sixth months of unemployment. Among non recipients, the hazard jumps to 16 percent in the third month from 5 percent in the previous month, it descends to about 4 percent in the two subsequent months, and becomes 21 percent in the sixth month. The pattern of the hazard is similar for benefit recipients. Thus, among middle-aged women with the other reference charactaristics (see note 21), moderate positive duration dependence is apparent.

Interpretation of the results

The impact of unemployment compensation found in this investigation is

[22] Inclusion of an interaction term between the benefit assistance dummy and log of duration allowed for more variation in the hazard of assistance recipients but the coefficient was measured with high error.

somewhat surprinsily high. This result has to be assessed against the background of two contrasting facts. On the one hand, that the Spanish unemployment compensation system was reformed in 1992 to make it more stringent. And, on the orther hand, that the workers in the sample analyzed in this article experienced unemployment in 1993, year in which the Spanish economy went through a deep recession. Although one is tempted to interprete this finding as strong evidence of a negative effect of unemployment compensation on the re-employment probability in Spain, some qualifications are in order. When the economy is destroying employment at high speed, as was the case in the period 1992-93,[23] job opportunities are drasticaly reduced. Unless the reservation wage falls consequently, unemployment duration tends to increase in recessions.

In the framework of the standard job search model with liquidity constrainsts (Mortensen (1986, pp. 859-61)), receipt of unemployment compensation can have a bigger negative impact on the re-employment probability in sluguish labor markets. Workers not elegible for unemployment compensation are likely to suffer more severe liquidity constraints in recessions because alternative sources of income, like that from work of other members of the family, are negatively affected.

In addition, the high proportion of temporary employment in Spain can have some relevant implications in a period of labor shedding. As many laid-off workers, particularly those with more atractive contracts, may expect to be recalled by the same firm after the recession, they are likely to remain on unemployment compensation for long time. By contrast, workers in less promissing, short-term jobs

[23] According to the labor force survey (EPA), in about two years, the level of employment declined by almost a million persons. The employment ratio diminished by 3 percentage points, and the unemployment rate increased by 7 percentage points.

have higher motivation to search while employed. At the same time, they benefit from less job competition by benefit recipients (reference...).

In general, search on the job is likely to be more frequent among workers who can anticipate their employment termination and are not entitled to receive unemployment compensation. Because these workers hold fixed-term contracts, they presumably receive lower wages than similar workers in more stable jobs, due to accumulation of human capital. Apart from increasing the movements from job to job without involving unemployment, search on the job can shorten the unemployment spell. It is reasonable to presume that workers who have not built enough employment tenure to be eligible for unemployment compensation, and know the almost certain end of their employment relationship, make greater effort to find another job while still employed. Even if search on the job does not provide an acceptable offer that prevents unemployment, it will improve employment prospects simply because it is a way of tapping future job opportunities.[24]

VI. Summary and Conclusion

The aim of this article has been to add new evidence to the relationship between unemployment compensation and the re-employment probability. We used a sample of Spanish newly-unemployed workers and followed their unemployment spells for a maximum period of 9 months. This data set permitted us to study transitions out of unemployment by using a discrete-time duration model. To estimate the effect of unemployment benefits on the probability of leaving unemployment we used three alternative measures for unemployment compensation receipt.

[24] The earlier the worker start search the more he can learn about the job market. This, in turn, can reduce the reservation wage and increase the exit from unemployment (Burdett and Wishwanath (1988)).

Three main results of this article are the following: (1) All measures for benefit receipt show a negative effect on exits from unemployment. The effect is strong, because the hazard for workers who do not receive benefits is double or higher than that for benefit recipients. (2) The predicted hazard exhibits moderate positive duration dependence for the whole sample. When men and women samples are separated, the reference man obtains a over-time flat hazard, and the reference women a hazard that increases with time unemployed. (3) The inclusion of variables related to the worker's recent unemployment history, intended to pick up job turnover, do not affect the main results of this article. Although, for the reasons given above, we do not use those indicators in the main model specification, we emphasize this result because labor turnover is particularly relevant in the Spanish institutional context.

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Table 1. Unemployment Survival Rates According to Receipt of Unemployment Compensation at the First Month of the Unemployment Spell

Unemployment duration in months	All Unemployed	Receive U. Insurance	Receive U. Assistance	Non Recipients
1	1.00	1.00	1.00	1.00
2	.904	.933	.981	.812
3	.828	.838	.943	.737
4	.749	.774	.924	.612
5	.715	.752	.887	.562
6	.648	.714	.773	.487
7	.582	.667	.679	.412
8	.540	.638	.679	.325
9	.481	.600	.585	.250

Source: First wave of the Household Panel of the European Union, 1994.

Table 2. Employment Transitions According to Receipt of Unemployment Compensation at Each Monthly Spell

Month 1	All Unemployed	Receive U. Insurance	Receive U. Assistance	Non Recipients
At risk	239	105	53	81
Exit	23	7	1	15
Hazard rate	9.6	6.7	1.9	18.5
Month 2				
At risk	216	95[+3]	51[+1]	70=66+3+1
Exit	18	9	2	7
Hazard rate	8.3	9.5	3.9	10.0
Month 3				
At risk	198	82[+4]	50[-1]	66=63+4-1
Exit	17(2)	5(1)	1	11(1)
Hazard rate	8.6	6.1	2.0	16.7
Month 4				
At risk	179	73[+3]	49[+2-2]	57=54+3+2-2
Exit	7(1)	2	2	3(1)
Hazard rate	3.9	2.7	4.1	5.3
Month 5				
At risk	171	65[+6]	50[-3]	56=53+6-3
Exit	15(1)	2	6	7(1)
Hazard rate	8.8	3.1	12.0	12.5
Month 6				
At risk	155	63	44	48
Exit	16	4	4	8
Hazard rate	10.3	6.3	9.1	17.7
Month 7				
At risk	139	57[+2]	35[+5]	47=40+2+5
Exit	9(1)	3	0	6(1)
Hazard rate	6.5	5.3	0.0	12.8
Month 8				
At risk	129	54	34[+1]	41=40+1
Exit	14	4	4	6
Hazard rate	10.8	7.4	11.8	14.6

Source: First wave of the Household Panel of the European Union, 1994.

Table 3. Maximum Likelihood Estimates of the Logistic Hazard Model for Re-employment Probabilities. Men and Women

	Coeff.	t	Coeff.	t	Coeff.	t
Women	-.5930	2.45	-.5941	2.46	-.6385	2.67
Married	.0677	0.26	.0663	0.26	.0460	0.18
Age 16-29	-.1527	0.35	-.1579	0.36	-.0882	0.20
Age 30-44						
Age 45-64	-.8698	1.33	-.8735	1.33	-.7947	1.22
A16-29*log dur	-.2368	0.78	-.2362	0.78	-.2548	0.84
A45-65*log dur	.3667	0.86	.3680	0.86	.3347	0.79
Children < 3	.4974	1.80	.5002	1.81	.4520	1.63
University	.0601	0.14	.0628	0.14	-.0570	0.13
Upper secondary	.6932	1.46	.6987	1.46	.5419	1.14
Lower secondary	.3190	1.29	.3185	1.28	.2282	0.92
Primary						
Benefit receipt	-1.0499	4.88				
U. Insurance			-1.0371	4.37		
U. Assistance			-1.0762	3.58		
Benefit amount					-.0143	4.35
First unemploy.	.0103	0.03	.0096	0.03	.0761	0.28
Sample 1	.3140	1.00	.3135	1.00	.2899	0.92
Sample 2	-.0451	0.17	-.0438	0.16	-.1213	0.46
Sample 3						
Sprint	.4738	0.92	.4748	0.92	.4644	0.91
Summer						
Autonne	.4009	0.77	.4021	0.77	.3875	0.74
Month 1						
Month 2	-.0392	0.11	-.0392	0.11	-.0391	0.11
Month 3	.2335	0.54	.2341	0.54	.2343	0.54
Month 4	-.4526	0.73	-.4510	0.72	-.4636	0.75
Month 5	.5770	0.85	.5793	0.85	.5615	0.82
Month 6	.6274	0.81	.6284	0.82	.6272	0.82
Month 7	-.0523	0.05	-.0526	0.05	-.0251	0.02
Month 8	.4679	0.49	.4673	0.49	.4899	0.52
Reg. un. rate	-.0169	0.95	-.0162	0.87	-.0338	1.89
Constant	-1.6746	2.32	-1.6909	2.31	-1.2887	1.77
Number of monthly spells			1426			
Log likelihood	-378.74		-378.73		-380.36	

Source: First wave of the Household Panel of the European Union, 1994.

Table 4. Maximum Likelihood Estimates of the Logistic Hazard Model for Re-employment Probabilities. Men

	Coeff.	t	Coeff.	t	Coeff.	t
Married	.0248	0.08	.0224	0.07	-.0010	0.00
Age 16-29	-.7535	1.51	-.8045	1.59	-.5647	1.14
Age 30-44						
Age 45-64	-1.0971	1.50	-1.1285	1.53	-1.0059	1.37
A16-29*log dur	.0523	0.14	.0625	0.17	.0204	0.05
A45-65*log dur	.5670	1.15	.5737	1.16	.5637	1.14
Children < 3	.7842	2.57	.8098	2.64	.7607	2.50
University	.1921	0.34	.2528	0.44	.0003	0.00
Upper secondary	1.1376	1.84	1.2276	1.96	.7919	1.29
Lower secondary	.5978	2.06	.5982	2.07	.4698	1.65
Primary						
Benefit receipt	-1.2341	4.68				
U. insurance			-1.1560	4.08		
U. assistance			-1.4306	3.67		
Benefit amount					-.0146	3.85
First unemploy.	.2391	0.72	.2439	0.73	.2548	0.76
Sample 1	.0142	0.03	.0095	0.02	.0519	0.13
Sample 2	.1352	0.43	.1405	0.45	.0335	0.10
Sample 3						
Sprint	.5849	0.95	.5960	0.96	.5758	0.94
Summer						
Autonne	-.3854	0.54	-.3789	0.53	-.4248	0.60
Month 1						
Month 2	-.1175	0.29	-.1164	0.29	-.1312	0.33
Month 3	-.1482	0.29	-.1403	0.27	-.1626	0.32
Month 4	-.5113	0.72	-.4944	0.70	-.5456	0.78
Month 5	.6930	0.87	.7182	0.90	.6461	0.81
Month 6	.2811	0.30	.2988	0.32	.2505	0.27
Month 7	.1013	0.09	.1102	0.10	.1111	0.10
Month 8	.9047	0.77	.9106	0.77	.9112	0.77
Reg. un. rate	.0006	0.03	.0058	0.26	-.0168	0.81
Constant	-1.9227	2.24	-2.0518	2.34	-1.6141	1.87
Number of monthly spells			885			
Log likelihood	-258.21		-257.96		-261.25	

Source: First wave of the Household Panel of the European Union, 1994.

Table 5. Maximum Likelihood Estimates of the Logistic Hazard Model for Re-employment Probabilities. Women

	Coeff.	t	Coeff.	t	Coeff.	t
Married	.1137	0.21	.1170	0.22	.0780	0.14
Age 16-29	2.1998	1.75	2.2063	1.75	2.1429	1.70
Age 30-44						
Age 45-64	.5462	0.31	.5321	0.31	.4708	0.27
A16-29*log dur	-1.6070	2.07	-1.6057	2.06	-1.5838	2.03
A45-65*log dur	-.6660	0.63	-.6605	0.63	-.6686	0.64
Children < 3	-1.1781	1.33	-1.1651	1.31	-1.1082	1.23
University	-.4935	0.66	-.4468	0.57	-.4225	0.55
Upper secondary	.2993	0.31	.3136	0.32	.2531	0.25
Lower secondary	.1140	0.18	.1137	0.18	.0469	0.07
Primary						
Benefit receipt	-.8892	1.78				
U. insurance			-.9517	1.58		
U. assistance			-.8276	1.39		
Benefit amount					-.0163	1.73
First unemploy.	-.4424	0.89	-.4485	0.90	-.3908	0.79
Sample 1	1.4164	1.96	1.4464	1.96	1.3795	1.92
Sample 2	-.0807	0.13	-.0864	0.14	-.1135	0.18
Sample 3						
Sprint	.2269	0.23	.2280	0.23	.2313	0.23
Summer						
Autonne	1.5034	1.64	1.4938	1.63	1.4874	1.62
Month 1						
Month 2	1.0343	1.00	1.0390	1.01	1.0448	1.01
Month 3	2.3364	1.94	2.3379	1.94	2.3409	1.93
Month 4	.7719	0.46	.7738	0.46	.7717	0.45
Month 5	.9846	0.52	.9847	0.52	.9801	0.52
Month 6	2.6987	1.51	2.7045	1.51	2.7062	1.50
Month 7	1.6275	0.82	1.6398	0.82	1.6595	0.83
Month 8	1.9516	0.94	1.9621	0.95	1.9709	0.95
Reg. un. rate	-.0861	2.19	-.0877	2.17	-.1007	2.49
Constant	-2.2401	1.23	-2.2077	1.21	-1.8584	1.01
Number of monthly spells			541			
Log likelihood		-100.85		-100.83		-100.42

Source: First wave of the Household Panel of the European Union, 1994.

Table 6. Predicted Hazard Rates

Men & Women	Non recipients	Benefit receipt	Benefit amount	U. insurance	U. assistance
Month 1	12.13	4.60	5.55	4.65	4.48
Month 2	11.71	4.43	5.35	4.48	4.32
Month 3	14.84	5.75	6.91	5.81	5.60
Month 4	8.07	2.98	3.56	3.01	2.90
Month 5	19.73	7.92	9.34	8.01	7.73
Month 6	20.54	8.29	9.91	8.38	8.09
Month 7	11.58	4.38	5.42	4.42	4.26
Month 8	18.06	7.16	8.75	7.23	6.97

Men	Non recipients	Benefit receipt	Benefit amount	U. insurance	U. assistance
Month 1	13.19	4.23	5.45	4.49	3.45
Month 2	11.90	3.78	4.81	4.02	3.08
Month 3	11.59	3.67	4.67	3.93	3.01
Month 4	8.35	2.58	3.23	2.79	2.13
Month 5	23.31	8.13	9.91	8.80	6.83
Month 6	16.76	5.53	6.90	5.97	4.60
Month 7	14.40	4.66	6.05	4.99	3.84
Month 8	27.31	9.85	12.54	10.48	8.16

Women	Non recipients	Benefit receipt	Benefit amount	U. insurance	U. assistance
Month 1	1.75	0.73	0.69	0.68	0.77
Month 2	4.79	2.02	1.95	1.91	2.16
Month 3	15.63	7.07	6.79	6.69	7.51
Month 4	3.73	1.56	1.49	1.47	1.67
Month 5	4.57	1.93	1.83	1.81	2.05
Month 6	21.02	9.86	9.50	9.37	0.48
Month 7	8.35	3.61	3.55	3.44	3.88
Month 8	11.19	4.92	4.79	4.69	5.28

Note: Predicted hazard rates are based on results presented in Tables 3, 4, and 5.

Appendix 1

Table A1. Duration of Unemployment Compensation in Spain (since April 1992) in Months

Period of contribution	Insurance	Assistance for unemployed with dependants	
		Younger than 45	45 and older
0-2	-	-	-
3	-	3	3
4	-	4	4
5	-	5	5
6-11	-	21	21
12-17	2 x integer{period of contribution / 6}	18	24
18-72		24	30

Notes:

1. Workers aged 45 years or older, without dependents, who received contributory benefits for 12 months or longer are eligible for 6 months of assistance benefits. Since April 1992, workers without dependents who made social security contributions for 6-11 months are eligible for 6 months of assistance benefits.

2. All workers aged 45 years or older who received contributory benefits for 24 months qualify for an special period of 6 months of assistance.

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

4. Workers who returned from foreing migration, were relieved from prisson, or were declared able to work after an invalidity spell, are elegible for 18 months of assistance.

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

Table A2. Maximum Likelihood Estimates of the Logistic Hazard Model for Re-employment Probabilities. Men and Women
(Inclusion of indicator for job turnover)

	Coeff.	t	Coeff.	t	Coeff.	t
Women	-.7345	2.94	-.7634	3.03	-.7527	3.04
Married	.0373	0.14	.0264	0.10	-.0236	0.09
Age 16-29	-.0730	0.17	-.1393	0.32	-.0166	0.03
Age 30-44						
Age 45-64	-.7107	1.07	-.7681	1.14	-.6660	1.01
A16-29*log dur	-.3351	1.08	-.3426	1.10	-.3316	1.07
A45-65*log dur	.2703	0.62	.2830	0.65	.2615	0.61
Children < 3	.5407	1.91	.5753	2.04	.5041	1.78
University	.2752	0.64	.3504	0.81	.0671	0.15
Upper secondary	.5359	1.06	.6080	1.21	.3714	0.74
Lower secondary	.3077	1.21	.2835	1.11	.2078	0.82
Primary						
Benefit receipt	-1.0927	4.93				
U. insurance			-.9046	3.70		
U. assistance			-1.4426	4.56		
Benefit amount					-.0133	3.83
First unemploy.	-.0899	0.32	-.1109	0.40	-.0014	0.00
Job turnover=0	2.0495	2.96	2.2987	3.20	1.8225	2.67
Job turnover=1						
Job turnover=2	-.0292	0.08	.0206	0.05	-.1083	0.29
Job turnover=3	.6539	1.75	.7809	2.06	.5114	1.37
Job turnover=4	.3705	0.87	.3915	0.93	.3258	0.76
Job turnover=5	.7437	2.20	.8367	2.45	.5636	1.65
Job turnover>=6	1.2460	3.37	1.4290	3.69	1.0167	2.74
Sample 1	.3832	1.19	.3645	1.13	.3785	1.18
Sample 2	-.0865	0.32	-.0914	0.33	-.1119	0.41
Sample 3						
Sprint	.4622	0.89	.4744	0.91	.4585	0.89
Summer						
Autonne	.3742	0.71	.3794	0.72	.3618	0.69
Month 1						
Month 2	.0281	0.07	.0407	0.11	.0155	0.04
Month 3	.3285	0.74	.3572	0.81	.3078	0.70
Month 4	-.3349	0.53	-.2878	0.45	-.3701	0.59
Month 5	.7402	1.07	.8035	1.16	.6896	1.00
Month 6	.8471	1.08	.9044	1.15	.8001	1.03
Month 7	.2092	0.23	.2534	0.27	.1936	0.21
Month 8	.7565	0.79	.8019	0.83	.7260	0.76
Reg. un. rate	-.0260	1.36	-.0182	0.93	-.0415	2.17
Constant	-1.9626	2.60	-2.2178	2.89	-1.5415	2.02
Number of monthly spells			1426			
Log likelihood		-367.56		-366.19		-371.94

Source: First wave of the Household Panel of the European Union, 1994.

Table A3. Maximum Likelihood Estimates of the Logistic Hazard Model for Re-employment Probabilities. Men and Women
(Inclusion of indicator for job turnover)

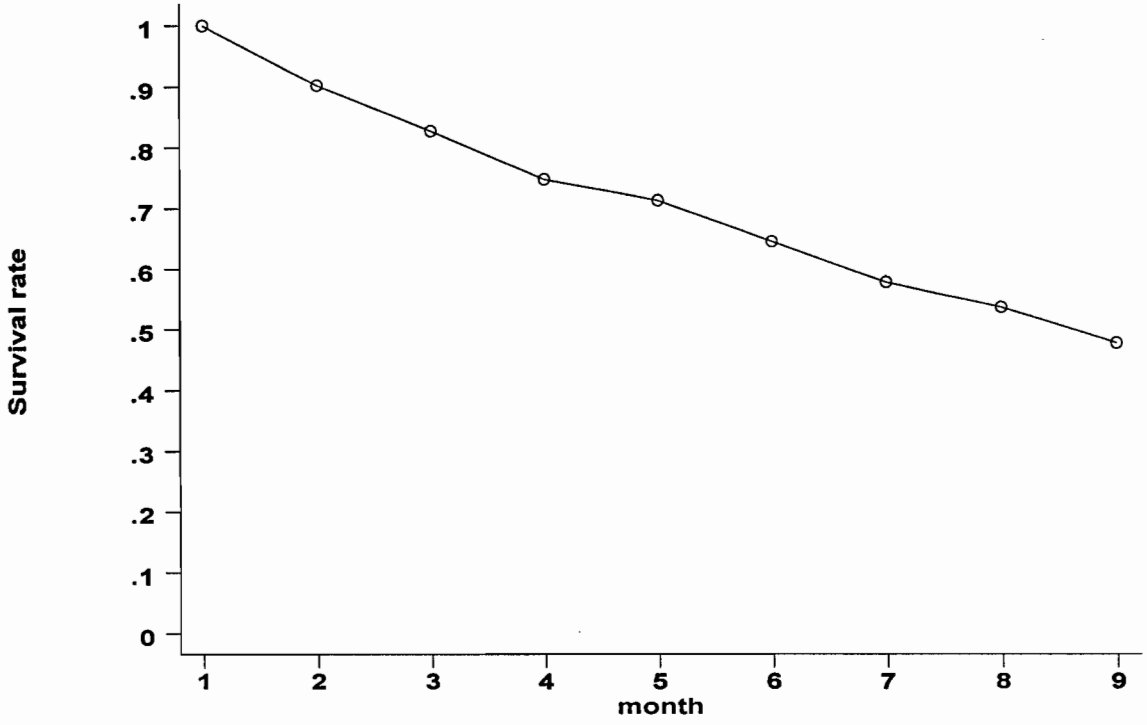
	Coeff.	t	Coeff.	t	Coeff.	t
Women	-.6878	2.73	-.6911	2.73	-.7138	2.86
Married	-.0185	0.06	-.0322	0.11	-.0400	0.14
Age 16-29	-.2634	0.58	-.3103	0.68	-.2078	0.46
Age 30-44						
Age 45-64	-.8723	1.31	-.8931	1.34	-.8172	1.23
A16-29*log dur	-.2304	0.73	-.2328	0.73	-.2208	0.70
A45-65*log dur	.2419	0.55	.2446	0.56	.2282	0.53
Children < 3	.3906	1.34	.4124	1.42	.3430	1.18
University	-.0248	0.05	.0259	0.05	-.2374	0.53
Upper secondary	.3972	0.77	.4669	0.90	.2379	0.46
Lower secondary	.3083	1.17	.3090	1.17	.2226	0.85
Primary						
Benefit receipt	-.8563	3.79				
U. insurance			-.7704	3.12		
U. assistance			-1.0369	3.22		
Benefit amount					-.0102	2.94
First unemploy.	.3259	1.15	.3196	1.13	.4002	1.43
Once long-term	-1.9072	6.99	-1.9241	7.02	-1.8902	6.90
Sample 1	.3078	0.93	.2963	0.89	.3177	0.96
Sample 2	-.1162	0.43	-.1138	0.42	-.1715	0.64
Sample 3						
Sprint	.4586	0.87	.4620	0.88	.4609	0.88
Summer						
Autonne	.4428	0.82	.4491	0.83	.4099	0.76
Month 1						
Month 2	.0339	0.09	.0395	0.10	.0178	0.04
Month 3	.3801	0.84	.3919	0.87	.3654	0.81
Month 4	-.2977	0.46	-.2786	0.43	-.3256	0.51
Month 5	.8461	1.20	.8687	1.23	.8200	1.17
Month 6	.9464	1.19	.9611	1.20	.9368	1.18
Month 7	.3125	0.33	.3161	0.34	.3433	0.37
Month 8	.9825	1.00	.9895	1.01	.9911	1.02
Reg. un. rate	-.0491	2.65	-.0446	2.32	-.0644	3.48
Constant	-.4007	0.52	-.4925	0.64	-.1078	0.14
Number of monthly spells			1426			
Log likelihood	-346.82		-346.49		-349.49	

Source: First wave of the Household Panel of the European Union, 1994.

Table A4. Sample Means and Proportions

	Individuals observations			Monthly spells		
	All	Men	Women	All	Men	Women
Re-employment	.0962	.1257	.0375	.0834	.0983	.0591
Women	.3347			.3793		
Married	.6234	.5911	.6875	.6535	.6203	.7079
Age 16-29	.4058	.4088	.4000	.3842	.3864	.3807
Age 30-44	.3765	.3584	.4125	.3688	.3367	.4214
Age 45-64	.2175	.2327	.1875	.2468	.2768	.1977
Children < 3	.1422	.1509	.1250	.1157	.1039	.1349
University	.0753	.0566	.1125	.0806	.0610	.1127
Upper secondary	.0460	.0377	.0625	.0350	.0259	.0499
Lower secondary	.2552	.2955	.1750	.2335	.2689	.1756
Primary	.6234	.6100	.6500	.6507	.6440	.6617
Benefit receipt	.6610	.6540	.6750	.6746	.6915	.6469
U. insurance	.4393	.4716	.3750	.4165	.4621	.3419
U. assistance	.2217	.1823	.3000	.2580	.2293	.3049
Benefit amount	40.0851	43.3268	33.6421	39.5903	44.6931	31.2430
First unemploy.	.2301	.1698	.3500	.2201	.1468	.3401
Job turnover=0	.0167	.0125	.0250	.0112	.0045	.0221
Job turnover=1	.1715	.1886	.1375	.1802	.2169	.1201
Job turnover=2	.1966	.2201	.1500	.2117	.2451	.1571
Job turnover=3	.1380	.1509	.1125	.1297	.1378	.1164
Job turnover=4	.0753	.0880	.0500	.0736	.0892	.0480
Job turnover=5	.2259	.1509	.3750	.2531	.1570	.4103
Job turnover>=6	.1338	.1383	.1250	.0981	.0994	.0961
Once long-term	.4016	.4150	.3750	.4810	.5186	.4195
Sample 1	.1841	.2012	.1500	.1704	.2000	.1219
Sample 2	.3723	.3522	.4125	.3842	.3548	.4325
Sample 3	.4518	.4528	.4500	.4467	.4463	.4473
Sprint				.4186	.4418	.3807
Summer				.3583	.3502	.3715
Autonne				.2230	.2079	.2476
Month 1				.1676	.1796	.1478
Month 2				.1514	.1570	.1423
Month 3				.1388	.1401	.1367
Month 4				.1255	.1254	.1256
Month 5				.1199	.1175	.1238
Month 6				.1086	.1005	.1219
Month 7				.0974	.0926	.1053
Month 8				.0904	.0870	.0961
Reg. un. rate	25.4313	24.5769	27.1294	25.9723	24.8805	27.7584

Source: First wave of the Household Panel of the European Union, 1994.



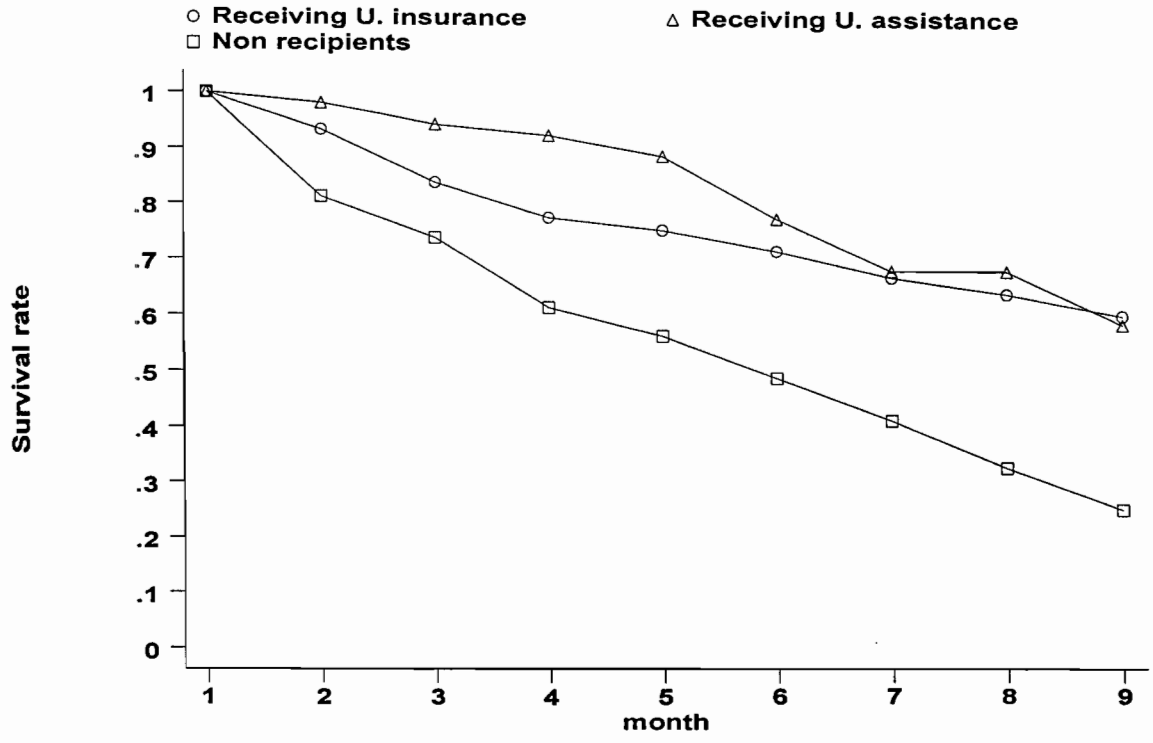


Figure 1. Unemployment Survival Rates for the Whole Sample and by Unemployment Compensation Status at the Start of Unemployment