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# Duration and Recurrence of Unemployment Benefits

José M. Arranz · Carlos García-Serrano

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**Abstract** Using administrative data for the period 2005–2010, we test for the existence of segmentation in the pool of the unemployed receiving benefits and investigate the factors associated with the duration and recurrence of the receipt of unemployment benefits in Spain. The results suggest the existence of (at least) three groups of individuals, each with different combinations of covered unemployment duration and recurrence. We also find that the impact of the employment crisis has been an increase in the average length of time spent receiving unemployment benefits and the recurrence. Our findings support the hypothesis that not only the heterogeneity but also the previous experience of receipt increase the expected duration of subsequent benefit periods.

**Keywords** Unemployment benefits · Recurrence · Duration model · Administrative data

## Introduction

In examining individual joblessness, most studies have focused solely on unemployment duration. However, the duration of a spell of unemployment might be considered a poor indicator of the joblessness experience in a period of time. This implies that recurrence (the re-incidence of individuals' unemployment over time) should be considered as well, since it is possible that a non-negligible portion of the unemployment volume is accounted for by a relatively large group of workers with several spells in a given time interval (Clark and Summers, 1979; Winter-Ebmer and Zweimüller, 1992).

Although seasonal variations are one potential explanation for repeated unemployment, it can be approached theoretically from different perspectives. Job search theory looks at workers' mobility and at any intervening spell of unemployment as a

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productivity activity, giving special weight to the provision of unemployment benefits. This theory can explain part of the “frictional” unemployment as productive time spent searching for an optimal job offer but is less successful in explaining the incidence of multiple spells of unemployment (Pissarides, 1985). In dual labour market theories, two segments with different employment and wage conditions exist, with competition being possible within but not between segments; in particular, workers in the secondary labour market move across jobs that do not define ascending chains, suffering from unstable working conditions (Piore, 1971). Finally, state dependence implies that past unemployment experiences may determine future employment prospects (Heckman and Borjas, 1980), so workers with higher mobility and multiple unemployment incidences may be offered less secure jobs because they lose valuable work experience while unemployed or because employers use unemployment experience as a signal of low productivity, reducing the workers’ future probability of obtaining a job.

How important is recurrent unemployment? How important is long-term unemployment? Is the pool of the unemployed composed of (at least) two groups characterized differently in terms of duration and recurrence? Do they exhibit divergent attributes? This paper examines these issues using the Spanish labour market as a case study. According to the Labour Force Survey (LFS), the number of unemployed individuals in Spain increased from about 1.8 million in 2007 to nearly 6 million in 2012, leading the unemployment rate from 8 % to 25 %; about half of this rate corresponds to long-term unemployment (12 months and more), when 6 years previously this share was less than 20 %.<sup>1</sup> Therefore, it seems that long-term unemployment has increased, reflecting a rise in the unemployment duration. At the same time, worker turnover is important in the Spanish labour market. The volume of contracts signed monthly is in the range of 1.0–1.5 million and well above 14 million annually (depending on the year: 14.7 million in 2003, 18.6 million in 2007 and 14.2 million in 2012). To put these figures into perspective, they are quite similar to the average number of wage and salary workers in each of those years. Moreover, about 90 % of all the signed contracts are temporary and nearly one-third have an initial declared duration of one month or less (another 10–12 % are between one and three months).<sup>2</sup> Therefore, it seems that recurrent unemployment might be relevant in the Spanish case, given the existence of a high degree of turnover.

It is this context in which our work should be understood. The aim of the paper is threefold. First, we deal carefully with the problem of consistent data organization concerning unemployment duration and repeated spells of unemployment. Second, we test for the existence of segmentation in the pool of the unemployed receiving benefits,

<sup>1</sup> The information from the registers of the Public Employment Service (PES) shows that the number of registered unemployed persons increased from about 2 million in 2007 to nearly 5 million at the end of 2012; not all of them were entitled to receive unemployment benefits, the number of these ranging from less than 1.5 million in a given month of 2007 to about 3 million in a given month of 2012. All these figures were obtained for different years from the website of the Spanish Public Employment Office ([http://www.sepe.es/contenido/mercado\\_trabajo/](http://www.sepe.es/contenido/mercado_trabajo/)).

<sup>2</sup> Considering stocks, the share of temporary employment, which increased rapidly during the 1980s, reached about one-third of the wage and salary workers in the early 1990s (remaining at that level until the beginning of the current crisis). Moreover, the yearly inflows into the unemployment compensation system (UCS) were comparatively larger than the stock: the entries increased from 2.8 million in 2001 to 4 million in 2007 and to 10.5 million in 2012 (thus, the entries into the UCS are 2.5–3.5 times the average number of recipients). These figures were obtained from the website of the Ministry of Employment (<http://www.empleo.gob.es/estadisticas/ANUARIO2012/PRD/index.htm>).

with the aim of examining whether unemployment may be characterized by the existence of at least two groups of workers: one with long durations of the receipt of benefits and the other showing more recurrences of compensated unemployment and shorter durations. Third, we investigate the factors associated with the duration and recurrence of the receipt of unemployment benefits, looking at the characteristics of the different groups of the pool of unemployed people.

We use an administrative database that provides information based on the Social Security records, select an inflow sample of newly unemployed recipients and define observation windows of equal length for two periods: one for expansion years (2005–2007) and the other for recession years (2008–2010). In particular, we select the individuals who start receiving unemployment benefit (after the loss of a job) at any time during the first quarter of 2005 and the first quarter of 2008, respectively, and follow them until the end of the observation window on 31 December 2007 and 31 December 2010, respectively.

When considering recurrent unemployment, a simple, operative definition should be followed for the sake of interpretability and econometric usefulness. We refer to three dimensions: repetition (there is a repeat case if the unemployed individual returned to the UCS during a fixed period of time), degree of repetition (whether the individual has returned more than once) and duration (how long the individual was out of employment). Therefore, to test for the existence of segmentation, we estimate a competing risk duration model with three different exits: exit to employment forever (i.e. to a job without returning to the UCS during the observation window), exit to employment with recurrent unemployment (i.e. to a job then returning to the UCS) and exit to uncovered unemployment forever (i.e. to non-employment after exhausting the benefits).

The paper is organized as follows. Section 2 provides a description of the data set and the sample used and undertakes a detailed descriptive analysis in order to determine the characterization of unemployment benefit according to recurrence and duration. Section 3 presents the econometric modelling strategy, while section 4 offers the empirical results. Finally, we summarize our findings in section 5.

## Data, Sample and Descriptive Analysis

### Data set and Sample

We use the “Continuous Sample of Working Life” (*Muestra Continua de Vidas Laborales*, MCVL hereinafter). The MCVL provides information every year since 2004 based on the records of the Spanish Social Security, combined with personal data from the Continuous Municipal Register and, in some versions, tax data from the National Revenue Agency. The population of reference in the MCVL includes both employed workers who are registered with the Social Security and recipients of contributory and non-contributory pensions and unemployment benefits.<sup>3</sup> Of this

<sup>3</sup> Jobseekers not receiving benefits and the inactive population (as distinct from pensioners) are not included. The same applies to workers with a social welfare system other than the Social Security (civil servants receiving pensions) and those with none (such as those working in the informal economy or carrying out some marginal activities).

population, 4 % are selected by means of a simple random sampling system.<sup>4</sup> The resulting database thus provides annual information on more than one million people who have had any kind of relationship with the Social Security in a given year.

This administrative data set includes information on individual, job and employer attributes. It also provides information on the unemployment benefits received by each worker in the event that they he/she was separated from his/her job and eligible to receive them: whether each individual was receiving unemployment benefits when out of work, the type of benefits received (unemployment insurance, UI, or unemployment assistance, UA) and the number of days of benefit receipt.

Furthermore, the MCVL has a longitudinal design. From 2004 onwards, an individual who is present in an edition of the sample and subsequently remains registered with the Social Security stays as a sample member. The sample is refreshed with new sample members, remaining representative of the population in each edition. Therefore, its longitudinal nature makes it possible to know the labour market status of a given individual after a job separation has taken place: recipient of unemployment benefits, non-recipient and other situation. Unfortunately, the database does not contain information on the entitlement period (however, it does include the previous employment duration, a proxy variable for entitlement duration).

The duration of covered unemployment is calculated by adding up the duration of consecutive spells of the same individual. For instance, if a person has a spell of UI starting in 2008 followed by a spell of UA (after the exhaustion of UI), we consider that they make up one incidence of covered unemployment of the same person (in this case, with two spells of consecutive benefits, so the durations of the two are totalled). The same procedure is applied when a person links two consecutive spells of UA (without an intermediate employment spell).<sup>5</sup>

In order to make the sample homogeneous, we select an inflow sample of individuals aged between 16 and 59 years (in the year of the first incidence) starting their spells of receiving unemployment benefits due to the ending of a labour relationship (essentially because of a layoff or the end of a temporary contract) in a period of time (the first quarter of 2005 and 2008) and then follow them through time (for about three years, until the end of 2007 and 2010, respectively), which implies the need to define equal periods of observation characterized by distinct economic conditions: an upswing (2005–2007) and a downswing (2008–2010).<sup>6</sup> This procedure will allow us to ascertain how many people exhibit only one incidence of entry into the UCS within the window of observation and how many exhibit several incidences, with successive spells of employment and benefits.

<sup>4</sup> Simple random sampling is used to generate the MCVL (without any kind of stratification), selecting people from the annual reference population whose personal identification code contains randomly selected figures in a determined order. These figures are identical every year. This method guarantees that the same people are selected, as long as they continue to be registered with the Social Security system, and also ensures that new entrants are representative of the registered population.

<sup>5</sup> Arranz and García-Serrano (2013) show that the magnitude of the duration of unemployment benefit reciprocity varies considerably when one uses either spells' or individuals' data. They demonstrate empirically that the exit hazard rates from covered unemployment using spells' data are overestimated when compared with the rates using individuals' data. Therefore, the expected duration of reciprocity is underestimated.

<sup>6</sup> We consider a sample of recipients aged no more than 60 to avoid the high incidence of early retirement and indeed the incidence of unemployment spells as a preceding step towards a retirement transition (García-Pérez et al., 2013).

## Descriptive Analysis

Table 1 provides the mean and the distribution of durations for individuals starting a spell of benefits in the first quarter of 2005 and the first quarter of 2008 after the loss of a job. The information refers to the duration of covered unemployment of persons corresponding to the first incidence of covered unemployment within the year. The average duration is computed as the sum of the first incidence (the sum of one or more consecutive spells of unemployment benefits) divided by the total number of persons having this first incidence.

The number of individuals starting a spell of benefits at any moment in the first quarter of 2005 and the first quarter of 2008 was 497,075 and 689,975, respectively. The change in the business and labour market context has brought about important effects on the duration of covered unemployment. The mean and median durations were lower before the crisis than once the crisis had begun: 159 days vs. 198 days (mean) and 99 days vs. 108 days (median). These differences are emphasized when we focus on long-term covered unemployment: 10 % of the individuals starting to receive benefits in 2005 (2008) and followed until the end of 2007 (2010) remained in covered unemployment for more than 400 days (584 days).

Furthermore, Table 2 contains the number of incidences in the UCS of job losers who started receiving unemployment benefit in the first quarter of 2005 and the first quarter of 2008. The recurrence we obtain is relatively high: 43.6 % of individuals accessing the UCS from employment in 2005 entered only once and did not return to the UCS during the rest of the period (three years), while 56.4 % re-entered (10.7 % exhibited five or more incidences in the UCS). The recurrence of the receipt of unemployment benefits increased in 2008–2010: 64.8 % of individuals entered and came back to the UCS (15.4 % had five or more incidences). Obviously, the duration of covered unemployment periods may vary depending on the number of entries of individuals into the UCS. The results (not reported) confirm the expectation that the

**Table 1** Mean and distribution of duration of unemployment benefits (after a job loss) starting in the first quarter of 2005 or 2008 (first incidence of individuals). Spain (MCVL, 2005–2010)

	Starting in 2005 (2005–2007 period)	Starting in 2008 (2008–2010 period)
Mean duration (S.D.)	159 (186)	198 (247)
Percentile (%)		
1	2	3
5	9	10
10	16	18
25	38	42
50	99	108
75	184	226
90	400	584
95	609	820
99	892	1,039
Individuals	497,075	689,975

S.D. stands for standard deviation

**Table 2** Number of incidences of individuals in the UCS. Spain (MCVL, 2005–2010)

Number of incidences	Years 2005–2007			Years 2008–2010		
	Observ.	%	% acc.	Observ.	%	% acc.
1	216,500	43.6	43.6	242,500	35.2	35.2
2	122,450	24.6	68.2	165,475	24.0	59.1
3	66,775	13.4	81.6	108,450	15.7	74.9
4	37,575	7.6	89.2	67,575	9.8	84.6
5	20,050	4.0	93.2	37,225	5.4	90.0
6	10,750	2.2	95.4	22,050	3.2	93.2
7	6,075	1.2	96.6	13,400	1.9	95.2
8	3,550	0.7	97.3	8,225	1.2	96.4
9	2,625	0.5	97.8	4,900	0.7	97.1
10	1,675	0.3	98.2	3,175	0.5	97.5
+10	9,050	1.8	100	17,000	2.5	100
Individuals	497,075			689,975		

average (and median) durations of covered unemployment diminish with the number of incidences, being longer during the downswing.

Since there are individuals who entered the UCS and did not return during the period of observation while others re-entered, the duration of their covered unemployment periods may be different. This fact may affect the average duration of the first incidence, since we include all the individuals in its computation. To avoid this bias, Table 3 provides the distribution of the duration of the first incidence of the individuals starting benefits in the first quarter of 2005 and 2008 after the loss of a job, distinguishing between those who came back and those who did not come back to the UCS.

The mean duration of the covered unemployment periods of the individuals who did not return to the UCS is longer than that of those who did: 225 days vs. 109 days in 2005. These durations were longer for the spells of benefit starting in 2008: 341 days vs. 121 days. The medians are substantially lower than the means. Moreover, 10 % of the individuals who did not come back to the UCS exhibit durations longer than 609 days if they entered in 2005 and longer than 919 days if they entered in 2008.

These extremely long durations of the group of workers who only appear once in the UCS in the time frame stem from the individuals who did not return to employment and either their status after the receipt of benefits is unknown (it could be uncovered unemployment or inactivity) or they remained in the UCS at the end of the period of observation: their mean durations were 475 days in 2005 and 600 days in 2008. This result underlines the existence of a relatively large group of workers (representing 5.8 % of the individuals accessing the UCS from employment in 2005 and 11.4 % in 2008) with long durations of joblessness, a portion of them being hardly considered unemployed. Obviously, the durations are much shorter in the case of the individuals who only appear once and return to employment after receiving benefits: 186 days in 2005 and 216 days in 2008. The share of this latter group was 37.8 % in 2005 and 23.8 % in 2008.

**Table 3** Unemployment benefits distribution (in days) of first incidence of individuals who either return or do not return to the UCS, Spain (MCVL, 2005–2010)

	Years 2005–2007				Years 2008–2010			
	Do not return to UCS (1st incidence)		Return to UCS (+1 incid.)		Do not return to UCS (1st incidence)		Return to UCS (+1 incid.)	
	All	Find a job	Do not find a job	All	All	Find a job	Do not find a job	All
Mean (S.D.)	225 (229)	186 (185)	475 (318)	109 (123)	341 (325)	216 (220)	600 (354)	121 (142)
Percentile (%)								
1	6	5	10	2	6	5	21	2
5	16	15	58	7	19	15	94	8
10	26	24	120	12	35	26	121	14
25	66	58	181	29	99	67	241	32
50	125	120	440	72	184	123	668	77
75	303	242	730	137	556.5	268.5	966	149
90	609	459	973	243	919.5	577	1,032	280
95	730	638	1,048	360	1,016	729	1,057	426
99	1,011	732	1,095	638	1,067	933	1,087	719
Individuals	216,500	187,825	28,675	280,575	242,500	163,900	78,600	447,475

S.D. stands for standard deviation



Do these groups of unemployed persons exhibit different sets of attributes? To answer this question, we can examine the basic descriptive statistics reported in Table A.1 of the Appendix and the estimate results of a multinomial logistic regression provided in Table 4. The reference category in the model comprises those individuals who did not find a job and remained in uncovered unemployment after the exhaustion of the benefits. In this group, the relative presence of women, older workers (aged over 45), individuals holding permanent contracts and individuals working in small firms (1–9 employees) and in certain sectors (trade; construction—during the recession) in their previous job is higher than in the other two groups. The probability that a given unemployed person will find a job and not return to the UCS is less likely to be associated with being female, foreign-born and older, having worked in blue-collar medium- and low-skilled occupations (in manual jobs and in non-manual low-skilled jobs during the recession years) and having worked for a relatively longer period of time in a small firm, in the construction sector (during the recession) and in a region with an unemployment rate above the average. At the same time, younger individuals, workers in manual jobs and those who have worked in the health sector, with a non-permanent contract and in large firms (in particular during the expansion), are more likely to find a job and return repeatedly to the UCS.

### Econometric Approach: A Competing Risk Duration Model

The econometric model chosen to examine the determinants of the duration of benefit reciprocity of individuals who enter the UCS is a competing risks hazard model. This type of model has been previously used by Røed and Nordberg (2003) and D'Addio and Rosholm (2005), among others. In this section, we follow the notation used by the latter.

Let us assume that individuals enter a given state at time  $T=0$ , where  $T$  is a positive discrete random variable associated with the duration of the state. The probability that an individual exits the state in period  $t$ , given that he/she has been in it up to time  $t$ , is the hazard function:

$$h(t) = \Pr[T = t | T > t-1] \quad (1)$$

The overall survival function in terms of the interval-specific function can be expressed as:

$$\gamma_t = S(t | T > t-1) = \Pr[T > t | T > t-1] \quad (2)$$

where the survival function at  $t$  is  $S(t) = \prod_{j=1}^t \gamma_j$ .

We suppose that an individual can exit to more than one destination state. For instance, individuals receiving unemployment benefits can end their spell by finding a job and not returning to the UCS in the observation window, by finding a job and returning to the UCS again (in fact, several times) or by exhausting the benefits and moving to uncovered unemployment or inactivity. Each destination state has an associated duration. We observe only the shortest of the three durations.

**Table 4** Estimate results of a multinomial logistic regression (individuals who (1) find a job and do not return to the UCS and (2) find a job and have multiples incidences in the UCS). Spain (MCVL, 2005–2010)

	Years 2005–2007						Years 2008–2010					
	Find a job and do not return to UCS			Find a job and return to UCS (multiple incidences)			Find a job and do not return UCS			Find a job and return to UCS (multiple incidences)		
	Coeff.	S.E.	Sig.	Coeff.	S.E.	Sig.	Coeff.	S.E.	Sig.	Coeff.	S.E.	Sig.
Gender (men)	0.872	0.08	***	0.678	0.08	***	0.364	0.05	***	0.321	0.05	***
Citizenship (Spanish)	0.371	0.12	***	0.122	0.12		0.202	0.07	***	0.054	0.06	
Age groups												
16–5 years old	–			–			–			–		
25–4 years old	–0.611	0.14	***	–0.563	0.14	***	–0.375	0.09	***	–0.244	0.08	***
35–5 years old	–0.921	0.15	***	–0.813	0.15	***	–0.752	0.09	***	–0.577	0.09	***
46–59 years old	–1.561	0.15	***	–1.339	0.15	***	–1.386	0.10	***	–1.113	0.09	***
Job category												
WCHS	–			–			–			–		
WCMS	0.128	0.22		0.512	0.22	**	–0.254	0.16		–0.139	0.16	
WCLS	–0.123	0.15		0.097	0.16		–0.660	0.13	***	–0.418	0.12	***
BCHS	–0.207	0.17		0.374	0.17	**	–0.752	0.13	***	–0.046	0.13	
BCMS	–0.347	0.17	**	0.228	0.17		–0.859	0.13	***	–0.237	0.13	
BCLS	–0.437	0.16	***	0.305	0.16		–0.920	0.13	***	–0.284	0.12	**
Industry												
Agriculture, fish.	–0.359	0.26		0.192	0.25		0.742	0.19	***	0.743	0.18	***
Manufact., energy	0.089	0.14		0.189	0.14		0.341	0.09	***	0.291	0.08	***
Construction	–			–			–			–		

Table 4 (continued)

	Years 2005–2007						Years 2008–2010					
	Find a job and do not return to UCS			Find a job and return to UCS (multiple incidences)			Find a job and do not return UCS			Find a job and return to UCS (multiple incidences)		
	Coeff.	S.E.	Sig.	Coeff.	S.E.	Sig.	Coeff.	S.E.	Sig.	Coeff.	S.E.	Sig.
Trade	−0.061	0.14		0.024	0.14		0.258	0.09	***	0.090	0.08	
Hotels & restaurants	0.093	0.16		0.331	0.16	**	0.462	0.11	***	0.549	0.09	***
Transport	0.396	0.20	**	0.436	0.20	**	0.587	0.12	***	0.478	0.11	***
Business act., financial interm., real state, renting	0.081	0.14		0.156	0.13		0.332	0.08	***	0.437	0.07	***
Public administr.	−0.369	0.17	**	−0.168	0.17		0.543	0.13	***	0.489	0.12	***
Education	−0.248	0.28		0.112	0.28		0.337	0.20	***	0.362	0.19	
Health	0.091	0.22		0.690	0.21	***	0.520	0.15	***	0.602	0.14	***
Other serv., personal serv. & housing	−0.100	0.19		−0.012	0.18		0.352	0.13	***	0.191	0.12	
Firm size												
0	0.332	0.09	***	0.376	0.09	***	0.133	0.06	**	0.167	0.05	***
1–9 workers	–	–	–	–	–	–	–	–	–	–	–	–
10–19 workers	0.035	0.13		0.180	0.13		0.193	0.09	**	0.250	0.08	***
20–49 workers	−0.076	0.12		0.180	0.12		0.211	0.08	***	0.236	0.08	***
50–249 workers	0.159	0.11		0.357	0.11	***	0.208	0.08	***	0.301	0.07	***
250+ workers	0.114	0.12		0.442	0.12	***	0.200	0.08	**	0.314	0.08	***
Contract in previous job												
Open-ended	–	–	–	–	–	–	–	–	–	–	–	–
Temp. per task	0.477	0.10	***	0.617	0.10	***	0.038	0.07		0.358	0.06	***

Table 4 (continued)

	Years 2005–2007				Years 2008–2010			
	Find a job and do not return to UCS		Find a job and return to UCS (multiple incidences)		Find a job and do not return UCS		Find a job and return to UCS (multiple incidences)	
	Coeff.	S.E.	Sig.	Coeff.	S.E.	Sig.	Coeff.	S.E.
Casual	0.346	0.09	***	0.369	0.09	***	0.220	0.06
Other fixed-term	0.670	0.14	***	0.793	0.14	***	0.730	0.11
Regions & unemployment rate								
Above average	—	—	—	—	—	—	—	—
Average	0.206	0.10	**	0.024	0.10		0.055	0.07
Below average	0.316	0.07	***	0.118	0.07	***	0.300	0.05
Prev. job duration (months)	−0.004	0.00	***	−0.013	0.00	***	−0.003	0.00
Lagged accum. UB duration (months)	−0.002	0.00	***	−0.005	0.00	***	−0.006	0.00
Constant	1.470	0.28	***	0.994	0.28	***	0.999	0.19
Observations	497,075						689,975	
Log-likelihood	−15,933.393						−22,511.027	

The reference category comprises those individuals who do not find a job and remain in uncovered unemployment after the exhaustion of the benefits

‘Job category’ is classified as: White-collar high-skilled occupations, WCHS (managers, workers with university degree, technical engineers and qualified assistants); White-collar medium-skilled occupations, WCMS (clerical and workshop heads and assistants); White-collar low-skilled occupations, WCLS (administrative officials and other clerical workers); Blue-collar high-skilled occupations, BCHS (first and second class officials); Blue-collar medium-skilled occupations, BCMs (third class officials and specialists); and Blue-collar low-skilled occupations, BCLS (labourers)

Let us assume that the discrete interval-specific hazard is a multinomial logistic model. Then, the multinomial logit specification can be expressed as a proportional odds hazard model in a competing risks framework with discrete duration data, where  $h_m(t)$  is the hazard rate for exits into state  $m$ , with  $m=1$  (finding a job and not returning to the UCS),  $m=2$  (finding a job and returning to the UCS) and  $m=3$  (remaining in uncovered unemployment after the exhaustion of the benefits-reference category).

The probability that an individual will make a transition into state  $m$  at time  $t$ ,  $P_m(t)$ , is the product of the conditional probability of making a transition to state  $m$  at time  $t$  and the survival probability until time  $t$ :

$$P_m(t) = h_m(t)S(t-1) = \frac{\exp(Z_m(t))}{\sum_{j=1}^3 \exp(Z_j(t))} S(t-1), \quad m = 1, 2, 3 \quad (3)$$

$Z_m(t)$  is defined as  $Z_m(t) = D_t' \gamma^m + X_t' \beta^m + \alpha^m$ , where  $X_t$  is the observed vector of explanatory variables at time  $t$ ; the term  $D_t$  is the so-called baseline hazard, which represents the pattern of duration dependence (we specify a two-order polynomial, the coefficients of which can differ among transitions to each of the different states);  $\alpha^m$  is the unobserved individual effect<sup>7</sup>; and  $\beta^m$  and  $\gamma^m$  are the covariate and duration dependence parameters to be estimated.

The destination-specific hazard function may be expressed as:

$$h_m(t|X_t, \alpha^m) = \frac{\exp(D_t' \gamma^m + X_t' \beta^m + \alpha^m)}{\sum_{j=1}^3 \exp(D_t' \gamma^j + X_t' \beta^j + \alpha^j)} \quad (4)$$

Then, the likelihood contribution of an unemployment spell, conditional on the unobserved variables, is equal to<sup>8</sup>:

$$L(\beta, \gamma | \alpha) = \prod_{k=1}^t \frac{\exp[(D_k' \gamma^1 + X_k' \beta^1 + \alpha^1) c_k^1 + (D_k' \gamma^2 + X_k' \beta^2 + \alpha^2) c_k^2]}{1 + \sum_{j=1}^2 \exp(D_k' \gamma^j + X_k' \beta^j + \alpha^j)} \quad (5)$$

where  $c_k^1, c_k^2$  are indicators of the transitions to each possible destination state at time  $k$ —finding a job and not returning to the UCS ( $m=1$ ) or returning to the UCS ( $m=2$ ). Spells of unemployment that are still in progress at the end of our observation period (that is, no transition out of unemployment is observed) are treated as right-censored observations. Following Heckman and Singer (1984), we assume that the unobserved heterogeneity in Equation 5 is discretely distributed with unknown support points, so

<sup>7</sup> We assume that the unobserved heterogeneity effect is constant over time and independent of the observed characteristics. This is a standard assumption in duration models (Steiner, 2001; D'Addio and Rosholm, 2005).

<sup>8</sup> To remove the indeterminacy and to be able to identify the parameters in the model in Equation 4, the parameter vector is measured relative to the departure state; i.e.  $\theta_3 = (\beta^3, \gamma^3, \alpha^3)$  is normalized to 0, and this justifies the denominator as  $1 + \sum_{j=1}^2 \exp(D_k' \gamma^j + X_k' \beta^j + \alpha^j)$ , which leaves “remaining in unemployment” as the reference category.

the likelihood function for an individual may be obtained by integrating the following conditional likelihood distribution:

$$L(\beta, \gamma, \alpha, p) = \sum_{s=1}^S L(\beta, \gamma | \alpha_s) p_s \quad (6)$$

where  $\alpha$  stands for the location points,  $p$  for the probability associated with them and  $s$  for the number of support points.

Before proceeding with the estimation, we performed some tests of the assumption of “independence of irrelevant alternatives” (IIA) through the Hausman test (Hausman and McFadden, 1984, HM) and Small-Hsiao test (Small and Hsiao, 1985, SH). These tests for assessing the validity of IIA consist of partitioning the choice set of alternatives into subsets and therefore comparing the coefficients (HM) or the likelihood functions (SH) from the complete model and from the restricted model obtained by leaving out one or more alternatives. In both tests, the results in Table 5 show that the null hypothesis of IIA is accepted. Therefore, the multinomial logit specification seems to be appropriate for each departure state.

In addition, the results of a Wald test and an LR test are reported in Table 5, in order to examine the null hypothesis that the coefficients of the two categories do not differ significantly from each other, for all the possible combinations. In other words, some of the alternatives might be combined or aggregated into a simple category, in which case the specification should be binomial rather than multinomial. In both tests, the rejection of the null hypothesis means that it is adequate to distinguish between the three groups of unemployed individuals. Thus, the multinomial specification for the model seems to be appropriate, since none of the categories should be combined.<sup>9</sup>

## Empirical Results

Here we present the estimate results obtained after applying the econometric model described in the previous section to our sample. Table 6 provides the results regarding the impact of individual, job and firm characteristics on exits from covered unemployment. Separate estimations for expansion years (2005–2007) and recession years (2008–2010) are provided. The first and third columns report the estimated coefficients for the exit labelled “Find a job and do not return to the UCS”, while the second and fourth columns report those for the exit labelled “Find a job and return to the UCS”. In both models, the reference category is “Exit to uncovered unemployment (after the exhaustion of benefits)”. It is worth noting that a negative (positive) coefficient implies a decrease (increase) in the hazard rate for a unit increase in the corresponding independent variable and, therefore, an increase (decrease) in the expected duration of covered unemployment.

<sup>9</sup> In order to check whether the number of mass points found to be optimal is robust to the specification with unobservables in the competing risk duration model, we used three alternative information criteria: the Akaike information criterion (AIC), Hannan-Quinn information criterion (HIQ) and Schwarz information criterion (SIC). All the information criteria lead to the same conclusion: accounting for individual unobserved heterogeneity by distinguishing two mass points improves the fit of the models, which means that the best model should include unobserved heterogeneity. We considered an alternative estimation with three support points; however, in this case, one of these points converged to 0 and the model fit was not improved. Therefore, the distribution function of two support points appears to fit our data adequately.

**Table 5** Specification tests

	Years 2005–2007	Years 2008–2010
Test for IIA	$\chi^2(P>\chi^2)$	$\chi^2(P>\chi^2)$
Ho: Odds (Outcome-J vs Outcome-K) are independent of other alternatives		
Hausman		
Omitted: “Find a job and do not return UCS”	14.491 (1.00)	10.350 (1.00)
Omitted: “Find a job and return UCS”	8.307 (1.00)	4.810 (1.00)
Small-Hsiao		
Omitted: “Find a job and do not return UCS”	47.615 (0.162)	22.931 (0.98)
Omitted: “Find a job and return UCS”	45.849 (0.21)	47.430 (0.17)
Wald and LR test for combining outcomes		
Ho: All coefficients except intercepts associated with given pair of outcomes are 0 (i.e., categories can be collapsed)		
Wald test		
Combining “Find a job and do not return UCS” and “Find a job and return UCS”	1,527.355 (0.00)	1,712.584 (0.00)
Combining “Find a job and do not return UCS” and “Do not find a job and do not return UCS”	489.341 (0.00)	503.056 (0.00)
Combining “Find a job and return UCS” and “Do not find a job and do not return UCS”	911.357 (0.00)	1,381.283 (0.00)
LR test		
Combining “Find a job and do not return UCS” and “Find a job and return UCS”	1,702.685 (0.00)	1,847.035 (0.00)
Combining “Find a job and do not return UCS” and “Do not find a job and do not return UCS”	504.957 (0.00)	539.374 (0.00)
Combining “Find a job and return UCS” and “Do not find a job and do not return UCS”	922.435 (0.00)	1,436.013 (0.00)

As independent variables we use a set of personal characteristics (gender, age, citizenship) and job and employer attributes in the previous match (job category, type of contract, job tenure, industry affiliation, firm size). Moreover, two forms of state dependence are accounted for: one is lagged duration dependence (i.e. the cumulative duration of all the past spells of unemployment benefit) and the other is the duration of the previous employment spell.

We first comment on the estimate results for individuals who found a job and did not return to the UCS within the period of observation. Later, we focus our attention on the results of the model concerning individuals who found a job and returned to the UCS and, therefore, exhibit multiple incidences of covered unemployment.

Regarding the effect of lagged benefit duration on the unemployed, there is evidence of negative lagged duration dependence in transitions from covered unemployment to employment for recipients who found a job and did not return to the UCS in both periods. We find that the longer the cumulative unemployment benefit duration, the longer the current duration of the receipt of benefits (which is also longer in the recession than in the boom). This result is in accord with the scarring theory: employers may use previous

**Table 6** Estimate results of a competing risk duration model (individuals who (1) find a job and do not return to the UCS and (2) find a job and have multiples incidences in the UCS), Spain (MCVL, 2005–2010)

	Years 2005–2007						Years 2008–2010					
	Find a job and do not return to UCS			Find a job and return to UCS (multiple incidences)			Find a job and do not return UCS			Find a job and return to UCS (multiple incidences)		
	Coeff.	S.E.	Sig.	Coeff.	S.E.	Sig.	Coeff.	S.E.	Sig.	Coeff.	S.E.	Sig.
Duration												
t	0.071	0.014	***	-0.032	0.012	***	0.079	0.014	***	-0.042	0.010	***
t <sup>2</sup>	0.006	0.001	***	0.006	0.001	***	0.006	0.001	***	0.007	0.001	***
Gender (men)	0.486	0.033	***	0.193	0.028	***	0.290	0.035	***	0.203	0.025	***
Citizenship (Spanish)	-0.130	0.057	**	-0.200	0.051	***	-0.151	0.045	***	-0.082	0.034	**
Age groups												
16–25 years old	–	–	–	–	–	–	–	–	–	–	–	–
26–34 years old	-0.423	0.049	***	-0.192	0.046	***	-0.450	0.051	***	-0.070	0.041	–
35–45 years old	-0.593	0.056	***	-0.248	0.051	***	-0.634	0.063	***	-0.123	0.049	***
46–59 years old	-0.861	0.064	***	-0.310	0.055	***	-1.031	0.073	***	-0.319	0.056	***
Job category												
WCHS	–	–	–	–	–	–	–	–	–	–	–	–
WCMS	-0.312	0.095	***	0.138	0.088	–	-0.334	0.095	***	0.042	0.080	–
WCLS	-0.254	0.066	***	0.021	0.064	–	-0.580	0.070	***	-0.062	0.061	–
BCHS	-0.312	0.071	***	0.309	0.068	***	-0.777	0.075	***	0.206	0.063	***
BCMS	-0.407	0.073	***	0.212	0.069	***	-0.868	0.077	***	0.040	0.065	–
BCLS	-0.593	0.068	***	0.172	0.064	***	-0.935	0.071	***	-0.002	0.061	–



Table 6 (continued)

	Years 2005–2007				Years 2008–2010			
	Find a job and do not return to UCS		Find a job and return to UCS (multiple incidences)		Find a job and do not return UCS		Find a job and return to UCS (multiple incidences)	
	Coeff.	S.E.	Sig.	Coeff.	S.E.	Sig.	Coeff.	S.E.
Industry								
Agriculture, fish.	-0.269	0.121	**	0.269	0.090	***	0.165	0.112
Manufact., energy	0.012	0.058		0.171	0.050	***	0.057	0.063
Construction	—	—	—	—	—	—	—	—
Trade	-0.100	0.060		0.004	0.053		-0.037	0.062
Hotels & restaurants	-0.015	0.069		0.231	0.058	***	0.133	0.071
Transport	0.221	0.078	***	0.262	0.070	***	0.205	0.078
Business act., financial interm., real state, renting	-0.019	0.053		0.072	0.046		-0.086	0.052
Public administr.	-0.547	0.079	***	-0.296	0.062	***	-0.134	0.085
Education	-0.217	0.125		0.121	0.109		0.076	0.127
Health	-0.044	0.089		0.563	0.073	***	0.285	0.089
Other serv., personal serv. & housing	-0.124	0.085		-0.007	0.075		0.100	0.089
Firm size								
0	0.067	0.041		0.122	0.037	***	0.040	0.043
1–9 workers	—	—	—	—	—	—	—	—
10–19 workers	-0.075	0.063		0.069	0.053		0.055	0.061
20–49 workers	-0.003	0.058		0.245	0.049	***	0.161	0.058
50–249 workers	0.088	0.053		0.288	0.045	***	0.197	0.052
250+ workers	0.146	0.056	***	0.467	0.047	***	0.301	0.056
							0.425	0.040

Table 6 (continued)

	Years 2005–2007				Years 2008–2010			
	Find a job and do not return to UCS				Find a job and do not return UCS			
	Coeff.	S.E.	Sig.		Coeff.	S.E.	Sig.	
Contract in previous job								
Open-ended	—	—	—	—	—	—	—	—
Temp. per task	0.406	0.050	***	0.314	0.043	0.054	0.237	0.040
Casual	0.307	0.050	***	0.097	0.043	0.052	0.052	0.039
Other fixed-term	0.698	0.068	***	0.500	0.057	0.075	0.594	0.054
Regions & unemployment rate								
Above average	—	—	—	—	—	—	—	—
Average	0.310	0.043	***	0.104	0.036	0.045	0.080	0.030
Below average	0.395	0.034	***	0.168	0.029	0.034	0.078	0.024
Prev. job duration (months)	−0.010	0.001	***	−0.020	0.001	0.001	−0.020	0.001
Lagged accum. UB duration (months)	−0.003	0.001	***	−0.003	0.001	0.001	−0.001	0.000
Mass points and probability:								
$\varepsilon_1$ (s.e.)	−2.326 (0.101)***				−4.552 (0.205)***			
$\varepsilon_2$ (s.e.)	−4.345 (0.176)***				−2.124 (0.089)***			
Pr ( $\varepsilon_1$ )	0.79				0.24			
Pr ( $\varepsilon_2$ )	0.21				0.76			
Observations (indiv.-month)	2,681,675				4,216,600			
Log-likelihood	−59,315.269				−79,829.019			

Notes see Table 4

unemployment experience as a signal of workers' low productivity, which reduces their future probability of obtaining a job (Lockwood, 1991).<sup>10</sup>

We interacted the regional unemployment rate and the lagged covered unemployment duration to investigate whether the unemployed who had covered unemployment experiences in regions with high unemployment rates were less stigmatized, as suggested by Omori (1997), or exhibit longer subsequent unemployment periods, as suggested by Pissarides (1992). Our findings (not shown) suggest that past unemployment benefit duration is longer in regions with higher unemployment rates. This result has also been detected for Spain during the 1990s (see Arranz and Muro, 2004).

The attributes of the immediately prior match also seem to influence the unemployment exit rates significantly. Examining the effect of previous job tenure, we find that the longer the previous job duration, the lower the probability that the worker would find a job and, therefore, the longer the expected duration of reciprocity. This result can be explained because the previous job tenure is a proxy variable for benefit entitlement duration. There is substantial empirical evidence showing that job losers with longer tenure in their previous firm are more heavily hit by covered unemployment through the depreciation of specific human capital (Kuhn, 2002) and that individuals who are unemployed with longer entitlement durations are those who exhibit lower hazard rates from unemployment in receipt of benefit (see Cebrián et al., 1996; Arranz and Muro, 2004).

With regard to the impact of the industry affiliation of the previous employer, the unemployed who worked in agriculture and public administration during the boom received unemployment benefits for longer; however, once the downswing began, workers in business activities, financial intermediation, real estate and renting made up the group that remained in receipt of benefits for longer. This latter result reflects the impact of the recession in Spain, which incorporated an idiosyncratic shock related to the end of a speculative bubble affecting household prices and, therefore, is associated with the construction sector and related activities. Therefore, the groups in which employment is more linked to these sectors have been the hardest hit in terms of covered unemployment increases. Since mainly males are employed in construction and its expansion has been associated with the large inflows of immigration starting in the mid-1990s, the result of the collapse of construction has been a sharp, strong worsening of labour market indicators for (young) men, foreign-born people and low- and medium-skilled workers (see García-Serrano and Malo, 2013).

This finding is in part reflected in the variable of the job category, which is related to the required level of qualification for the job, so it may be taken as a proxy for qualifications and educational levels. The estimate results point out that those workers previously employed in white-collar high-skilled (WCHS) jobs exhibit a higher probability of finding a job and not returning to the UCS in both periods. On the contrary, blue-collar low-skilled (BCLS) workers have a lower probability of finding a job. The financial crisis has brought about a dramatic drop in this probability. In particular, it has declined for BCLS workers from about 45 % in expansion years to 61 % in recession years, when compared with WCHS workers (the reference category). The drop has been substantial not only in manual occupations but also in non-manual low-skilled occupations.

<sup>10</sup> Some authors point out that this apparent negative relationship between unemployment duration and employment prospects can have a reverse causation: rather than having poor job prospects because individuals become long-term unemployed, individuals are long-term unemployed because they have poor job prospects (Roed et al., 1999).

The contractual arrangement the individual had in his or her last job also affects the probability of finding a job when unemployed. The potential relationship between seasonal/temporary work and outflow from unemployment is captured in our regressions through the variable “type of contract”. Workers with temporary contracts survive for a shorter time in covered unemployment than workers who held open-ended contracts, either in expansion or in recession. Nevertheless, we should be cautious about this result since open-ended contracts are associated with longer entitlement durations and, therefore, lower hazard rates from covered unemployment.

One of the key variables with different effects on the transition from covered unemployment to a job is the employer size. A positive relationship between the firm size and the hazard rate from unemployment benefit reciprocity is observed during the trough: the larger the employer, the sooner the individuals leave compensated unemployment. This finding is less clear-cut during boom years. It may indicate that workers in large firms possess certain unobserved characteristics that make them more prone to return to employment quickly. Another possibility is that large employers rely more heavily on rehiring, so unemployed workers separated temporarily from these firms exhibit greater chances of being recalled when compared with workers from small and medium-sized firms (see Alba-Ramírez et al. 2007; Arranz and García-Serrano, 2011), although this explanation probably applies more to the group of unemployed persons with multiple incidences than to this one.

Finally, personal variables, such as gender, citizenship and age, also play a role in shaping the transition from unemployment benefit to a job: men, non-Spanish and younger workers show a greater probability of finding a job than women, Spanish and older workers do in both periods.

Now we turn our attention to the estimate results concerning the unemployed who found a job and returned to the UCS during the observation period, experiencing multiple incidences of the receipt of benefits. First, we find (as previously) that the longer the lagged cumulative benefit experience, the lower the probability of finding a job. Nevertheless, this effect is smaller than in the case of the unemployed who found a job and did not come back to the UCS.

Second, the effects of some variables (gender, citizenship, age, regional conditions and firm size) are rather similar to those obtained previously. For instance, in the case of the impact of age, we find that younger workers are more likely to exit unemployment benefits sooner than older workers. It is a fact that they are more willing to change jobs to improve their job match and eventually settle in a more stable career path. Nevertheless, it is also true that temporary employment falls disproportionately on young workers, so they are more prone to enter unemployment involuntarily and move repeatedly between employment and unemployment. This finding, thus, might reflect either the “job shopping” of young workers (Topel and Ward, 1992) or the fact that individuals with a higher degree of mobility and multiple unemployment incidences may be offered less secure jobs because they lose valuable work experience while unemployed (Phelps, 1982). With regard to the impact of the regional economic conditions, the probability of finding a job in regions with unemployment rates under the average is significantly higher than in regions with unemployment rates over the average in all the estimations, although this effect is slightly smaller during the recession period.

Third, the impacts of job category and industry are considerably different. While WCHS workers who found a job and did not return to the UCS spent less time

receiving unemployment benefit than the rest of the category groups, workers in manual occupations (especially those in high-skilled occupations) are those who exhibit a greater probability of finding a job among the workers who experienced multiple incidences of unemployment benefits during the boom period (and only BCHS during the recession period). Moreover, when compared with individuals who worked in construction, workers from several sectors (agriculture; education; business activities, financial intermediation and renting; hotels and restaurants; manufacturing and energy; transport; and health) are more likely to move to employment. In particular, workers from the health sector show the highest probability of making the transition between unemployment benefit and unstable employment: they have about 76 % (50 %) higher probability of finding a job and coming back to the UCS than those from the reference group in the boom (recession) period. This finding agrees with the previous results concerning the extension of rehiring and the linking of successive short contracts with periods of unemployment benefit in that sector (Arranz and García-Serrano, 2011).<sup>11</sup>

## Conclusions

The objective of this paper was to investigate the duration and recurrence of the receipt of unemployment benefits in Spain across the period 2005–2010. We focused our attention on examining, on the one hand, the composition of the unemployed receiving benefits (i.e. whether unemployment benefit may be characterized by the existence of a large group of workers with long reciprocity durations—as the LFS data suggest—and another, smaller group showing more recurrences of compensated unemployment and shorter durations), and, on the other hand, the factors associated with the duration and recurrence of unemployment benefits. In order to carry out this analysis, we made use of administrative data defining observation windows of equal length for two periods, one of expansion years (2005–2007) and the other of recession years (2008–2010), which allowed us to analyse the impact of changing economic conditions on unemployment benefit duration and recurrence. This is the first paper to address the study of recurrence in UCS using these data and methodology for Spain.

Regarding the first issue, our findings suggest the existence of (at least) three groups of unemployed individuals:

The first one (56 % and 65 % of the individuals accessing the UCS in 2005 and in 2008, respectively, after the loss of a job) is comprised of workers who entered and exited the UCS with relatively short unemployment benefit durations (their durations were 109 days in 2005–2007 and 121 in 2008–2010).

The second one (38 % in 2005 and 24 % in 2008) is made up of individuals who exhibit only one but long experience in the UCS, taking a relatively longer time to return to employment (186 days in 2005–2007 and 216 days in 2008–2010).

<sup>11</sup> Our estimations also capture the estimated duration dependence distinguishing between the individuals who found a job and returned to the UCS and the ones who found a job and did not return (at first incidence). We obtain that the estimated hazard rates of recipients who found a job and returned to the UCS are higher than the ones corresponding to the unemployed who found a job and did not return to the UCS in both periods. Furthermore, this latter group clearly remained in receipt of unemployment benefit for a shorter time during the boom years than during the trough years.

Finally, the third one (5.8 % in 2005 and 11.4 % in 2008) consists of workers who spent a lot of time out of employment (475 days in 2005–2007 and 600 days in 2008–2010) and ended up either out of the labour force or still receiving benefits at the end of a period of 3 years.

These results show, therefore, that the recurrence of unemployment benefits is relatively high and increased during the recession period. At the same time, long-term unemployment (or joblessness) seemed to be of minor importance in the boom years, increasing substantially during the recession, although without reaching the dramatic figures put forward by the LFS.

As for the second question, the recurrence of unemployment benefits is not only potentially affected by seasonal effects or demand factors but also by personal or job characteristics and by the previous unemployment experience of receiving benefits. In particular, state dependence seems to be a powerful explanatory factor of recurrent unemployment since we find evidence that the duration of previous unemployment benefit increases the current unemployment benefit duration, this effect being stronger in the boom than in the recession and higher for the individuals with multiple incidences in the UCS than for those with only one incidence. This result is consistent with the scarring theory, whereby employers use previous unemployment experience as a signal of workers' low productivity or human capital decay.

Several personal, job and employer attributes are also relevant to duration. Within the group of unemployed individuals with multiple incidences of unemployment benefits, younger workers and blue-collar workers are the groups that receive unemployment benefits for a shorter time and exhibit a high probability of exiting from the UCS to unstable employment. Moreover, the larger the employer, the sooner the individuals leave compensated unemployment, reflecting that large employers rely more heavily on rehiring. All in all, these results seem to point to the importance of segmentation, whereby workers in the secondary labour market (in particular, young and less-skilled workers) move across jobs that do not define ascending chains.

In summary, our results should contribute to the understanding of the duration and recurrence of unemployment benefit and help to implement adequate policy measures. Our findings indicate that there seems to be a sort of segmentation in the Spanish labour market into individuals with longer unemployment benefit duration and longer jobs, on the one hand, and individuals with frequent transitions between unemployment benefits and unstable employment with multiples incidences in UCS, on the other hand. The Government could design policy measures to promote more stable labour relationships and to reduce recurrent unemployment, since frequent unemployment spells might reduce the ongoing accumulation of skills or the learning of new techniques, with a resulting impact on productivity and wages (García-Serrano and Malo, 2013). A reform of the UCS introducing an experience rating system would be a potential measure in order to limit the pervasive use of fixed-term contracts and the repeated use of unemployment benefits. This would avoid to some extent unemployment benefits artificially subsidizing the regular use of temporary jobs. One proposal would be to transform the uniform payroll taxes into a layoff (or separation) tax so that the firms that use the UCS more intensely pay higher contribution rates (Blanchard and Tirole, 2008). This would make employers internalize the social costs associated with layoffs, reduce excessive job separations and eliminate (or at least reduce) cross-subsidization across firms and industries.

## Appendix 1

Table A.1 Descriptive statistics (first incidence of unemployment benefits). Spain (MCVL, 2005–2010)

	Years 2005–2007						Years 2008–2010					
	Do not return to UCS (1st incidence)			Return to UCS (+1 incidence)			Do not return UCS (1st incidence)			Return to UCS (+1 incidence)		
	Find a job		Do not find a job		Find a job		Find a job		Do not find a job		Find a job	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
Gender (men)	0.554	0.497	0.351	0.478	0.520	0.500	0.539	0.498	0.509	0.500	0.578	0.494
Citizenship (Spanish)	0.928	0.258	0.908	0.289	0.929	0.256	0.843	0.364	0.814	0.389	0.846	0.361
Age groups												
19–25 years old	0.131	0.338	0.058	0.235	0.094	0.292	0.136	0.343	0.074	0.262	0.093	0.291
26–34 years old	0.444	0.497	0.346	0.476	0.385	0.487	0.420	0.494	0.299	0.458	0.368	0.482
35–45 years old	0.265	0.442	0.276	0.447	0.302	0.459	0.275	0.446	0.287	0.452	0.306	0.461
46–59 years old	0.160	0.366	0.320	0.467	0.219	0.413	0.169	0.374	0.341	0.474	0.233	0.423
Job category												
WCHS	0.069	0.253	0.058	0.235	0.048	0.213	0.072	0.259	0.031	0.173	0.041	0.198
WCMS	0.045	0.207	0.038	0.192	0.034	0.182	0.055	0.228	0.038	0.192	0.033	0.178
WCLS	0.277	0.447	0.282	0.450	0.209	0.407	0.281	0.449	0.254	0.435	0.197	0.398
BCHS	0.204	0.403	0.157	0.364	0.215	0.411	0.206	0.404	0.234	0.423	0.275	0.446
BCMS	0.157	0.364	0.164	0.370	0.159	0.365	0.140	0.347	0.154	0.361	0.146	0.353
BCLS	0.249	0.432	0.301	0.459	0.335	0.472	0.246	0.431	0.289	0.453	0.309	0.462
Industry												
Agriculture, fish.	0.017	0.128	0.021	0.143	0.030	0.171	0.024	0.153	0.014	0.117	0.033	0.179

Table A.1 (continued)

	Years 2005–2007						Years 2008–2010					
	Do not return to UCS (1st incidence)			Return to UCS (+1 incidence)			Do not return UCS (1st incidence)			Return to UCS (+1 incidence)		
	Do not find a job		Do not find a job		Find a job		Find a job		Do not find a job		Find a job	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
Manufact., energy	0.162	0.368	0.160	0.367	0.151	0.359	0.128	0.334	0.137	0.344	0.113	0.317
Construction	0.128	0.334	0.086	0.281	0.124	0.330	0.111	0.314	0.152	0.359	0.130	0.337
Trade	0.169	0.375	0.206	0.404	0.128	0.335	0.174	0.380	0.182	0.386	0.110	0.313
Hotels & restaur.	0.085	0.279	0.097	0.296	0.094	0.292	0.084	0.277	0.088	0.283	0.089	0.285
Transport	0.065	0.247	0.043	0.202	0.049	0.215	0.067	0.251	0.048	0.214	0.050	0.219
Business act., financial interm., real state, renting	0.212	0.409	0.186	0.389	0.216	0.411	0.247	0.431	0.254	0.435	0.305	0.460
Public admintr.	0.054	0.226	0.088	0.283	0.077	0.266	0.048	0.215	0.041	0.198	0.060	0.238
Education	0.017	0.130	0.018	0.134	0.016	0.126	0.020	0.142	0.013	0.112	0.017	0.128
Health	0.047	0.212	0.040	0.196	0.077	0.267	0.055	0.228	0.032	0.176	0.061	0.239
Other serv., personal serv. & housing	0.044	0.206	0.055	0.228	0.037	0.190	0.041	0.198	0.039	0.194	0.031	0.174
Firm size												
0	0.382	0.486	0.319	0.466	0.340	0.474	0.314	0.464	0.346	0.476	0.330	0.470
1–9 workers	0.184	0.388	0.220	0.414	0.156	0.362	0.207	0.406	0.242	0.429	0.190	0.392
10–19 workers	0.076	0.266	0.087	0.282	0.079	0.270	0.087	0.282	0.084	0.277	0.083	0.276
20–49 workers	0.089	0.284	0.113	0.317	0.106	0.308	0.104	0.305	0.098	0.297	0.102	0.302
50–249 workers	0.136	0.343	0.139	0.347	0.154	0.361	0.143	0.350	0.124	0.329	0.147	0.354



Table A.1 (continued)

	Years 2005–2007				Years 2008–2010			
	Do not return to UCS (1st incidence)		Return to UCS (+1 incidence)		Do not return UCS (1st incidence)		Return to UCS (+1 incidence)	
	Find a job		Do not find a job		Find a job		Do not find a job	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
250+ workers	0.132	0.338	0.121	0.326	0.166	0.372	0.144	0.351
Contract in previous job								
Open-ended	0.245	0.430	0.371	0.483	0.164	0.370	0.285	0.452
Temp. per task	0.326	0.469	0.248	0.432	0.369	0.483	0.295	0.456
Casual	0.317	0.465	0.287	0.452	0.314	0.464	0.308	0.462
Other fixed-term	0.113	0.316	0.094	0.292	0.154	0.361	0.112	0.315
Regions & unemployment rate								
Above average	0.347	0.476	0.397	0.489	0.421	0.494	0.339	0.473
Average	0.166	0.372	0.161	0.368	0.158	0.365	0.162	0.369
Below average	0.487	0.500	0.442	0.497	0.421	0.494	0.498	0.500
Prev. job duration (months)	13,923	26,016	23,786	41,799	7,967	18,728	14,460	26,804
Lagged accum.								
UB duration (months)	13,923	26,016	23,786	41,799	7,967	18,728	11,277	18,472
Current UB (months)	6,209	6,159	15,818	10,599	3,622	4,086	7,207	7,320
Individuals	187,825		28,675		280,575		163,900	
							163,900	
							11,807	
							4,047	
							447,475	

S.D. stands for standard deviation. See also Table 4

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