

# Transitions into Permanent Employment in Spain: An Empirical Analysis for Young Workers

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## Abstract

*This article analyses the transitions into permanent employment of a sample of young temporary employees in Spain for the period 1996–2003. For this purpose, we apply multiple-spell duration techniques to a longitudinal dataset of temporary workers obtained from Social Security registers. Our main findings are as follows. First, the transitions from a temporary contract into unemployment and into another temporary contract are very high when compared with transitions into permanent employment. Second, the entry into permanent employment — although slightly increasing with tenure at the temporary contract — is very low; the only exception is that of semi-skilled and unskilled individuals, who are particularly likely to enter into permanent employment at the 24th and the 36th month of tenure (respectively). Third, we find that there exists a substantial proportion of workers with unobservable characteristics that make them show high exit rates from temporary employment and, at the same time, a rapid exit from unemployment — while the remaining individuals exit from unemployment more slowly, particularly those who are receiving unemployment benefits.*

## 1. Introduction

In the mid-1980s, in order to fight against the high and persistent levels of unemployment, employers were allowed in Spain to hire workers on a fixed-term basis. The main purpose of this legislation was to lower layoff and discharge costs and thereby address the high unemployment rate by promoting hiring. This deregulation of temporary employment was undertaken

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without modifying the regulation of permanent employment (Bentolila and Dolado 1994). As a result, the consequences of the enhanced job flexibility were particularly acute in this country. Lower dismissals costs, and sometimes wages, under temporary contracts favoured employers' hiring of workers under fixed-term contracts — see for example, Bover *et al.* (2000). Temporary employment increased from around 10 per cent in the mid-1980s to more than 30 per cent in the early 1990s. Nowadays almost 91 per cent of all new registered contracts are temporary in Spain (García-Pérez and Muñoz-Bullón 2005a).

In this article, we examine the dynamics of temporary workers' transitions into other labour force states. In particular, we analyse the extent to which temporary work facilitates the movement into regular (or permanent) work for young workers. This issue is particularly important in Spain, where there is a general consensus that reduced wages, job stability and advancement opportunities for temporary employees has promoted a class of secondary workers who can be best characterized as involuntary and permanently employed on a temporary basis (Alba-Ramírez 1998; Amuedo-Dorantes 2000; Bentolila and Dolado 1994). In particular, the growth of temporary employment has raised many concerns regarding its capacity to act as a springboard towards permanent employment (Booth *et al.* 2002a). Thus, an important aspect of the use of temporary contracts is their pattern of promotion into regular contracts of indefinite duration. If at least some individuals holding temporary contracts are able to shorten their duration until regular work, then it may be sensible to stimulate the use of temporary work among such a group. On the contrary, if temporary employment offers few opportunities for advancement, a different targeted policy action is called for. The relevance of this issue from a policy point of view lies not only in the fact that policy makers and labour market analysts have become increasingly concerned about the growth of temporary employment in Europe — several studies have indicated the existence of a gap between the working conditions of permanent and temporary employees, particularly in terms of wages and working rights (OECD 2002) — but also in the fact that Spain constitutes an extreme experience in several labour market dimensions, such as its rate of unemployment, its employment protection legislation and its rate of temporary workers (see, in this respect, Güell and Petrongolo 2007).

It should be noted at the outset that the analysis carried out here will be basically descriptive. We will not estimate the effect of having a temporary job relative to some counterfactual situation, as the counterfactual situation — i.e. the absence of fixed-term contracts — is not specified. On the contrary, our aim is to describe temporary employees' subsequent labour market outcomes and to investigate factors associated with 'good' and 'bad' outcomes. Accordingly, therefore, we make no claims of causality. For this purpose, we use a longitudinal administrative dataset that tracks the work trajectory of workers whose initial contract was temporary in 1996 and follow them up to the year 2003. The analysis is carried out separately for workers in three

different occupational levels (skilled, semi-skilled and unskilled positions). We estimate a multiple-spell hazard model with competing risks, which jointly specifies the transition rates from temporary employment into unemployment, temporary or permanent employment, and also from unemployment into temporary versus permanent employment.<sup>1</sup>

Apart from all the observed heterogeneity among the individuals included in the estimation process, it is well known that in the presence of unobserved heterogeneity, the estimated hazard rates become biased towards negative duration dependence (Heckman and Singer 1984). If such unobserved covariates raise the hazard rate for some persons, they will leave the risk set earlier, on average, than others will, controlling for the covariates included in the model. This leads either to an overestimation of a negative duration effect or an underestimation of a positive duration effect. The bias in the duration effect may also lead to bias in the estimates of the effects of some covariates (Trussell and Richards 1985). This is the reason why we will do our best to control for the presence of unobserved heterogeneity in both the exit from temporary employment and from unemployment.

The analysis of the effect of repeated temporary contracts on the probability of finding a permanent job has been the subject of several studies. For instance, Van Ours (2004) investigates locking-in effects of temporary subsidized jobs through a natural experiment in the Slovak labour market in the 1990s. Booth *et al.* (2002b) study the labour market prospects of temporary workers in the UK. Their results show that temporary employment is associated with lower wages, less specific training and lower job satisfaction with respect to permanent employment, though it is not associated with negative trajectories. Zijl *et al.* (2004), using a multi-state model and applying the 'time of events' approach, find that temporary jobs serve as stepping stones towards regular employment. Finally, Gagliarducci (2005) presents evidence for the Italian labour market, indicating that the probability of moving into regular employment decreases with job interruptions.

Previous evidence for Spain has highlighted the difficulties of temporary workers in transiting into permanent employment. For instance, Amuedo-Dorantes (2000) examines the determinants of Spanish conversions of temporary contracts into permanent ones using information on the composition of employment at the firm level. She finds that dismissal costs hardly affect contract conversions, which mostly respond to employment expectations and union pressure for increased employment stability. Most existing studies on the determinants of individual conversion rates use *logit* specifications (Alba-Ramírez 1998; Toharia 1996), which may not be very flexible when applied to the analysis of the dynamic path of transition rates. In contrast, the only duration studies on Spanish conversion rates are those of Amuedo-Dorantes (2000), Güell and Petrongolo (2007) and Casquel and Cunyat (2004).<sup>2</sup> Amuedo-Dorantes (2000) estimates transitions out of temporary employment using the Labour Force Survey and finds that conversion rates are very low, regardless of job tenure. Güell and Petrongolo (2007) find estimates to deliver clear spikes at the legal limit, that higher conversion rates occur when

workers supposedly have higher outside options, and that conversion rates of temporary into permanent contracts increase with tenure. Finally, Casquel and Cunyat (2004) analyse whether the existence of observable and unobservable characteristics influences the transition rate into permanent employment and conclude that in Spain, temporary contracts do not play this role.

Our article is the first to consider the complete labour market career of a sample of young workers. This is important given the clear influence that past experience may have in future outcomes. The main findings are as follows. First, among the individuals in our sample, the transitions from a temporary contract into unemployment and another temporary contract substantially decline for short enough tenure at the temporary contract, but are very high when compared with transitions into a permanent contract (particularly at 6, 12, 24 and 36 months of tenure). Second, the individuals' entry into permanent employment — although slightly increasing with tenure at the temporary contract — is very low (this confirms previous results obtained, for instance, by Amuedo-Dorantes (2000) or Güell and Petrongolo (2007)). The only exception is that of semi-skilled and unskilled individuals, who are particularly likely to enter into permanent employment at the 24th and the 36th month of tenure (respectively). Third, as regards our control for unobserved heterogeneity, we find that the exit from unemployment into a temporary contract is very high for 39 per cent of skilled individuals, 58 per cent of semi-skilled individuals and 12 per cent of unskilled individuals — the remaining individuals exit from unemployment more slowly, particularly those who are unemployment benefit recipients. Complementary to this finding, we obtain also that 58.3 per cent of skilled individuals are very likely to exit from temporary employment into unemployment and into another temporary job. The same is obtained for 49.9 per cent of semi-skilled workers and 48 per cent of unskilled ones. Thus we find a clear pattern of high rotation for a substantial group of workers. Fourth, the entry into permanent employment is rather complicated for temporary help agency (THA) workers and more intense in regions where the employment growth rate is larger.

The article is organized as follows. Section 2 describes the Spanish institutional framework. Section 3 briefly presents the hypotheses under examination. Section 4 describes the data used. Section 5 presents the empirical model and Section 6 its main results. We conclude in Section 7.

## **2. The institutional framework**

Before 1984, Spanish legislation (contained in the Workers' Statute of 1980) assumed every contract to be an open-ended contract as a general case, whereas temporary contracts were intended to be used only for jobs whose nature were temporary (seasonal jobs, temporary substitution of permanent workers, etc.). In 1984, however, the Spanish government introduced the first

reform designed to reduce dismissal costs — since then, they require lower severance payments than permanent contracts when the contract terminates (in particular, temporary workers are entitled to eight days per year of seniority based on the salary whereas permanent workers may obtain up to 45 days if the dismissal is found to be unfair). This reform also liberalized the use of temporary contracts: it eliminated the requirement that the activity associated with the job was to be of a temporary nature. As a result, the proportion of employees under temporary contracts increased from 10 per cent during the 1980s to over 30 per cent in the early 1990s. These contracts can be signed for a period between a minimum of six months and a maximum of three years. After three years, the contract cannot be renewed, and the worker must be either fired or offered a permanent contract by his/her current employer (in the former case, the employer cannot hire any other worker for that job).

Between 1985 and 1994, over 95 per cent of all new hires were employed through temporary contracts and the conversion rate from temporary into permanent contracts was only around 10 per cent (Güell and Petrongolo 2007). Thus, the main concern with the liberalization of temporary contracts after 1984 was that it generated a huge segmentation between unstable low-paying jobs and stable high-paying jobs without helping to reduce unemployment.

Shifting direction in light of these concerns, in 1994, new regulations limited the use of temporary employment contracts to seasonal jobs. In addition, the 1994 reform slightly relaxed dismissal conditions for permanent contracts. In particular, the definition of fair dismissals was widened by including additional ‘economic reasons’ for them. In practice, however, approval for dismissals under ‘economic reasons’ was only granted when there was an agreement between employers and workers and labour courts continued to rule most dismissals as unfair, so that dismissal costs on permanent contracts did not change much.

In practice, however, employers continued to hire workers under temporary contracts for all types of jobs and not just for seasonal jobs. This perceived ineffectiveness of the 1994 reform led to a new reform in 1997, which was eventually extended in 2001. As with the 1994 reform, the goal of the 1997 and 2001 reforms was to reduce the use of temporary contracts. The 1997 reform created a new type of permanent contract, with lower severance costs in case of unfair dismissal (33 days per year of seniority) and with fiscal incentives in the first two years of the contract (i.e. reductions of employers’ payroll taxes). However, rather than trying to limit the use of temporary contracts by further possibly ineffective regulation, these new reforms widened the employers’ incentives to hire workers from certain population groups under permanent contracts.<sup>3</sup> As a result, this reform led to a sharp and sustained increase in the number of permanent contracts for workers in some of these affected groups. The 2001 reform essentially extended the 1997 reform by applying lower subsidies to more groups than the previous reform.

### 3. Hypotheses: the transitions under examination

One of the main issues addressed in this article is the following. To what extent and how does accumulating temporary jobs affect the probability of finding a permanent job? Existing theory fails to provide an unequivocal answer, given the number of alternative scenarios.

On the one side, the concern with temporary employment is based on the evidence that temporary contracts may help promote a segmented labour market: 'firms may prefer to have a cushion of workers without employment rights who can be freely discharged in the event of adverse market conditions' (Booth *et al.* 2000). That is, the employment stability of regular workers is raised by firms' using temporary workers as a buffer against transitory changes in the business environment (Saint-Paul 1996). Thus, some temporary workers may be trapped in a cycle of recurrent periods of unemployment and temporary work (Taubman and Wachter 1986). As a result, temporary employment may be a 'trap' of endless precariousness, especially as duration in the temporary contract increases. Temporary workers are relatively easy to replace and take few firm-specific skills with them when they leave — given that the majority of temporary contracts are typically characterized by short lasting work arrangements. In addition, as explained in the literature on career interruptions starting with Mincer and Offek (1982), subsequent temporary contracts might imply human capital depreciation due to the loss of work-specific productivity and to short spells of unemployment that usually follow the expiration of a temporary contract. This phenomenon may be fostered by inferior access to training and lower promotion prospects in temporary jobs (Booth *et al.* 2002b). This association of temporary employment with a secondary labour market occupation may be an adverse signal for future employers, at least if these jobs are associated with unfavourable attributes (McDonald and Solow, 1985: 1124). In addition, being employed under temporary contracts may serve as a signal that the person has not received any offers for permanent contract jobs, so these jobs may be stigmatized (Ma and Weiss 1993). Therefore, one may expect that the less similar two contracts are in terms of skill requirements, as well as the longer the interruption in between, the lower the probability of finding a stable job.

On the other side, the flexibility inherent in many types of temporary employment might benefit not only employers, but also workers, since temporary work may constitute a stepping-stone into permanent positions. First, being employed under a temporary contract allows the worker the acquisition of social contacts and information on permanent vacancies, which may allow him/her to deepen his/her attachment to the labour market and to search more effectively for more desirable jobs.<sup>4</sup> Moreover, a roughly continuous sequence of jobs increases the worker's human capital through the accumulation of work non-specific productivity (Gagliarducci 2005). Thus, workers interested in advancing their career goals might accept temporary work as a way to learn a variety of skills. Second, temporary employment

identifies those individuals most able to work, and signals to potential employers the individual's ability to work. Third, when individuals' abilities are only incompletely observable for potential employers, temporary contracts may be a kind of probationary period that allows employers to obtain information that is unavailable before hiring and that serves as a check on the quality of the match between the worker and the job. This is even more important in countries such as Spain, where the firing costs for permanent workers are quite relevant. Therefore, temporary job experience may be informative about the ability and motivation of the individual — indeed, some studies have shown that employers use atypical contracts as a way of screening for permanent jobs (Houseman *et al.* 2003; Storrie 2002). Thus, we would then expect that the rate of transition from a temporary contract into an open-ended contract would decrease as time goes by, since employers will use an individual's labour market history to sort good workers from bad workers and they might perceive (rightly or wrongly) that a previous history of multiple temporary contracts is likely to result in some loss of skills. Fourth, compared with unemployment, accepting a temporary job may not only reduce the cost of search for permanent employment (as unemployment depletes financial resources), but also may avoid any possible negative stigma associated with unemployment. Finally, if temporary employment is associated with reduced employment stability, rational workers will anticipate the higher risk of job losses and will, therefore, start searching for a (permanent) job earlier. That is, temporary employment may promote on-the-job-search (see Boeri 1999).

To conclude, the effect of multiple temporary employment experiences on the labour market career of a given worker is, *a priori*, not clear enough. Thus, we need to address this issue by analysing the dataset at hand and by looking into the effect of previous labour market experience on the future prospects of both temporary and unemployed workers. The next section addresses this issue.

#### **4. Data and descriptive statistics**

The dataset we use is drawn from the Spanish Social Security records. Our sample of workers is selected with two sampling criteria: those either employed or unemployed on 1 January 1990 (77,398 individuals), and those either employed or unemployed on 31 December 2003 (116,990 individuals). The objective was to cover in the sample both entrants and mature workers. The data provided includes information about the complete labour market history of these two samples of workers. Moreover, it offers information on their age and gender, the qualifications required for the job, the dates when each employment spell starts and ends, the reason for the termination of each spell (voluntary quit, dismissal or retirement), the Spanish province where employment spells took place, an identifier of whether or not each employment spell is accomplished through a THA, the type of contracts held by the

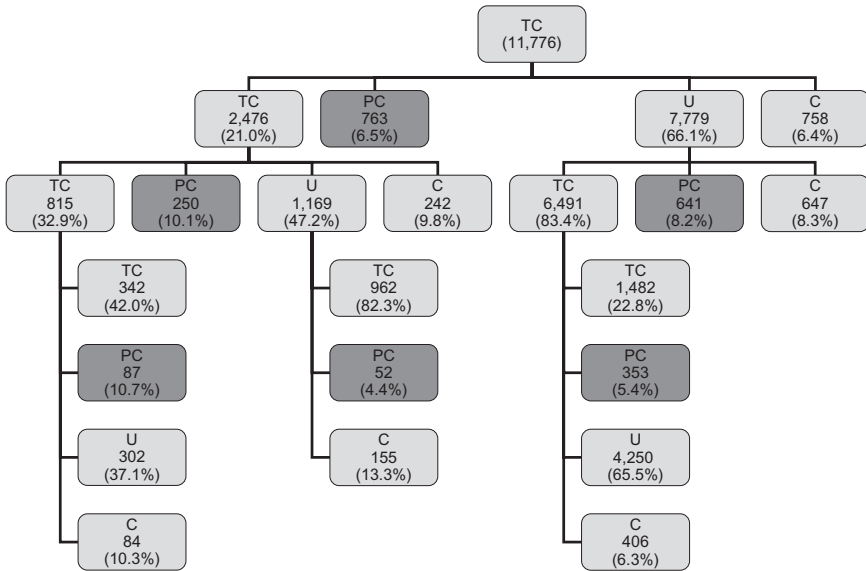
worker, and, finally, whether or not the individual is receiving unemployment benefits. Worker's qualification is not available in our dataset. Instead, the dataset collects the qualifications required for each job. This variable indicates a level in a ranking determined by the worker's contribution to the Social Security system. It is related to the individual's qualification level, since it comprises the required qualification level for the job. However, it does not comprise the workers' current qualification level. For instance, an individual working in the lowest occupation may well be in possession of a high academic degree (see, in this respect, García-Pérez and Muñoz-Bullón 2005a,b).

From this initial dataset, given that our interest is in labour careers starting out of temporary contracts and that the variable collecting the type of contract is only reliable from the second half of the 1990s, we select individuals whose initial contract in 1996 is temporary. In order to minimize the initial sample heterogeneity, we make another restriction: we select workers who, at the time of the initial temporary contract, were aged between 16 and 25 years old. This allows us to keep a final sample of individuals who can be considered very similar *a priori* and whose achievements in the labour market can then be attributed, after controlling for observable and unobservable heterogeneity, only to their career. We have also eliminated observations with missing information on any variable used. Moreover, we have removed workers in specific Social Security regimes such as agriculture or self-employed workers. This leaves us with a sample of 20,598 individuals.

There are two main advantages of using Social Security records for the analysis of labour careers. On the one hand, information is available on all jobs held by the individual; in particular, the longitudinal character of the database makes it possible to follow the same individuals from 1996 up to the end of 2003. We keep every temporary contract in the dataset separately, allowing workers to move from one job to the following one. On the other hand, we can accurately measure the duration between the start of a temporary job until when the individual moves either into a permanent contract, a new temporary job or becomes unemployed. And, subsequently, we can also accurately measure the duration between the start of unemployment and the moment when the individual moves into temporary or permanent employment. Given the scarcity of observations beyond 42 (30) months for employment (unemployment) spells, we have, respectively, treated observations beyond these durations as artificially right-censored.

Thus, there is only one initial state (a temporary contract, TC), and then the entry into subsequent spells is completely internalized. The initial spell includes individuals with the main types of temporary contracts: casual, work-experience (practice), per task, training or interim contracts — see Table A2 in the Appendix for definitions of each type of contract. Our analysis is done separately for three sub-samples of individuals, defined according to the qualification required for the first job held by the worker: skilled, semi-skilled and unskilled. Figure 1 shows the labour market states

FIGURE 1  
Transitions from the First Temporary Contract (TC): Unskilled.



PC, permanent contract; U, unemployment; C, censored.

for the unskilled group (up to their third transition).<sup>5</sup> As can be observed, there are three possible destination states out of the initial temporary contract: unemployment (U), TC and permanent contract (PC) — in the transitions TC–TC and TC–PC, the unemployment period in between the two contracts has to be no longer than 15 days. The transition TC–U implies that the initial temporary contract finishes and the subsequent unemployment spell lasts for more than 15 days. With respect to the exit from unemployment, there are two possible transitions: TC or PC. Thus, Figure 1 shows five possible transitions: TC–U, TC–TC, TC–PC, U–TC and U–PC. We consider the PC state to be an absorbing state, meaning that every spell after the transition to PC is removed from the sample.

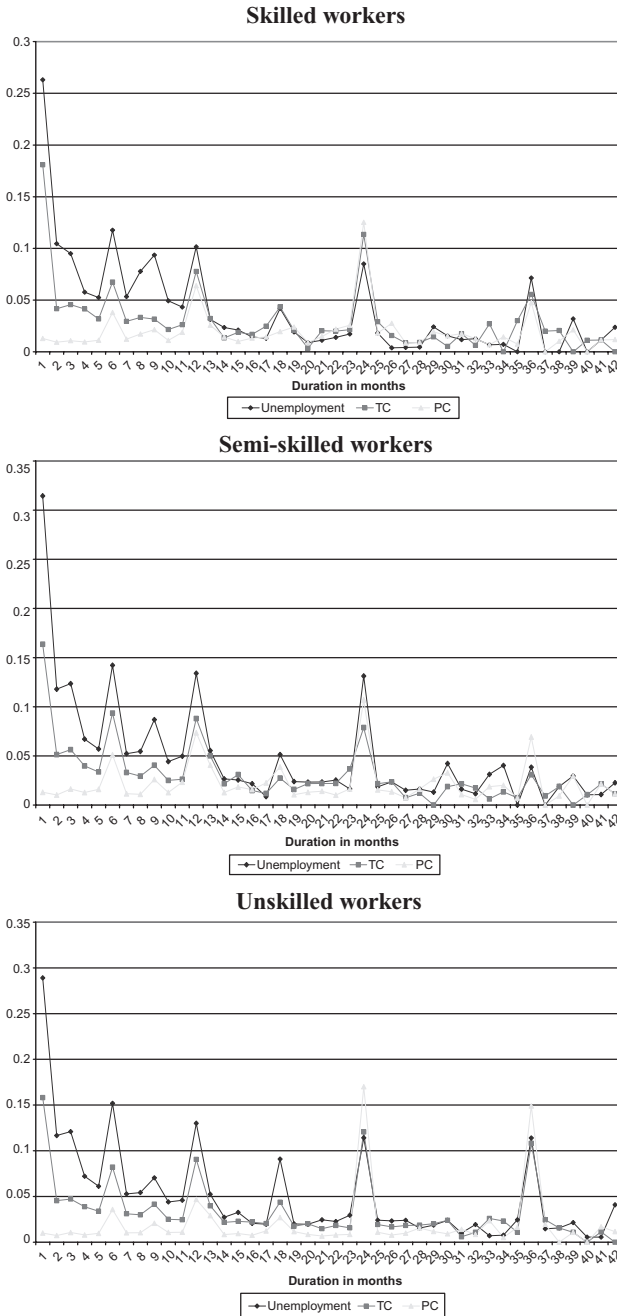
The most frequent transition out of the initial temporary contract is into unemployment, especially for the unskilled and semi-skilled groups. The second most empirically observed transition is into another temporary contract. The transition into a PC state positively depends on the qualification level (9.7 per cent for skilled workers, 7.8 per cent for semi-skilled, and 6.5 per cent for unskilled). Finally, transitions from temporary jobs into permanent jobs are not frequent, even less than transitions from unemployment into permanent employment. These numbers are roughly consistent with earlier findings in Spain (see Kugler *et al.* 2005, and Güell and Petrongolo 2007). As a first impression, therefore, temporary employment is unlikely to lead individuals into regular work.

We are also interested in the effect of duration in a determined state (either TC or U) on the likelihood of attaining regular employment. For this purpose, Figure 2 presents monthly Kaplan–Meier estimates of such transitions for each qualification group. These empirical hazard functions collect the proportion of individuals leaving the TC state at each moment in time, given that they have been temporarily employed until that moment (Lancaster 1990). For any qualification group considered, the probability of exiting from temporary employment into any destination state declines with tenure, and (as expected from the transitions described above) the most likely aftermath of a temporary job is a period of unemployment, followed by a new temporary contract. Moreover, exit rates into unemployment and into another temporary contract are very high early in the temporary job; the former reaches the maximum in the semi-skilled group (31.45 per cent), while the latter has its maximum in the skilled group (18.09 per cent). The exit rate into a permanent job is, however, minuscule, independently of the group considered. It is noteworthy that the hazard rates from TC rise to peaks in months 6, 12, 24 and 36. These peaks show that temporary contracts are very likely to finish at each of these particular months. Given that no special reason can be adduced to explain why individuals should be dismissed at those months, these duration effects are likely due to temporary contract terminations, since they are usually signed for these specific durations. Similar results are obtained in previous studies (see, in particular, García-Pérez and Muñoz-Bullón 2005a, and Güell and Petrongolo 2007).

Empirical hazard rates from unemployment are shown in Figure 3. As can be observed, exiting into a temporary contract is much more likely when compared with the alternative (permanent employment). The hazard rate into a TC is substantially high at the beginning of the unemployment experience, reaching levels above 10 per cent during the first 11 months (for any qualification group). It shows a peak around the 10th month, and falls very quickly from then on, remaining at levels slightly above 5 per cent. However, the likelihood of entering into a regular job remains basically flat and shows almost no duration dependence.

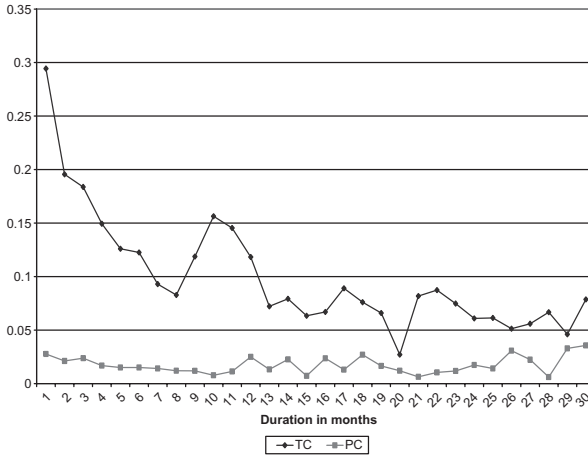
Descriptive statistics for the three sub-samples are provided in Tables 1–4. Table 1 shows the types of temporary contracts for each qualification group considered (skilled, semi-skilled and unskilled). As can be observed, most TC spells are based on per task and casual contracts, while work experience, training and interim contracts only account for approximately 11 per cent of TC spells. Work experience and training contracts are those having longer tenure, while interim, casual and per task are the shortest ones. The proportion of TC spells where dedication is part time is the highest in the semi-skilled group (37.31 per cent). Finally, by looking at the first spell, for the skilled group, the most remarkable finding is that the weight of work experience contracts substantially increases and that of interim contracts reduces, while the weight of the training contracts increases in the unskilled group.

FIGURE 2  
Empirical Hazard Rates from Temporary Contract, by Type of Worker (Kaplan–Meier Estimates).

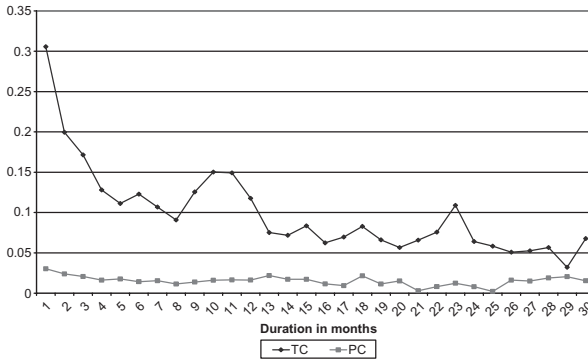


TC, temporary contract; PC, permanent contract.

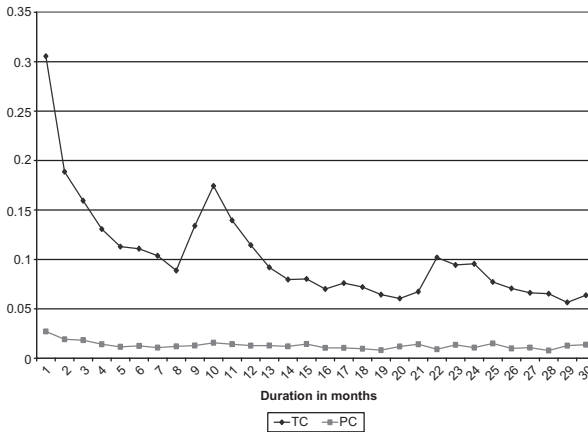
FIGURE 3  
Empirical Hazard Rates from Unemployment, by Type of Individual (Kaplan–Meier Estimates).



**Semi-skilled workers**



**Unskilled workers**



TC, temporary contract; PC, permanent contract.

TABLE 1  
TC Spells Composition

	<i>No. of spells</i>	<i>%</i>	<i>Mean length</i>	<i>% in first spell</i>
<b>Skilled</b>				
Type of contract				
Work experience	1,042	7.72	12.241 (11.103)	17.05
Training	83	0.61	10.072 (8.531)	0.06
Interim	2,125	15.74	3.395 (2.544)	9.74
Per task	3,513	26.02	6.083 (4.279)	21.00
Casual	4,038	29.91	3.637 (3.359)	24.96
Other	2,698	19.99	11.709 (6.119)	27.18
Dedication				
Part time	4,485	33.22	4.252 (3.684)	35.89
Full time	9,014	66.78	5.541 (4.329)	64.11
<b>Semi-skilled</b>				
Type of contract				
Work experience	905	3.62	10.940 (10.021)	4.87
Training	289	1.16	10.806 (9.987)	0.02
Interim	2,006	8.03	3.152 (2.382)	4.37
Per task	6,744	26.99	5.068 (2.931)	21.22
Casual	9,931	39.74	3.576 (3.583)	39.19
Other	5,112	20.46	11.152 (5.649)	30.35
Dedication				
Part time	9,322	37.31	3.827 (3.259)	44.86
Full time	15,665	62.69	4.617 (3.829)	55.14
<b>Unskilled</b>				
Type of contract				
Work experience	980	1.81	10.947 (9.959)	1.63
Training	3,849	7.12	11.436 (10.781)	20.62
Interim	2,579	4.77	2.981 (2.255)	1.88
Per task	17,186	31.81	5.098 (3.700)	22.48
Casual	21,133	39.11	3.677 (3.394)	31.29
Other	8,302	15.37	11.004 (5.727)	22.10
Dedication				
Part time	14,151	26.19	3.770 (3.271)	29.02
Full time	39,878	73.81	5.131 (4.294)	70.98

*Note:* Sample size is 3,366 individuals for skilled workers, 5,816 for semi-skilled workers and 11,776 for unskilled workers. All individuals are between 16 and 25 years old in 1996, and their first spell is temporary. ‘Median length’ measured in months, in parentheses for complete spells only.

TC, temporary contract.

As Table 2 shows, most skilled workers experience less than two spells of unemployment (50.6 per cent) and three or less TC spells (61.5 per cent). For the remainder groups, individuals usually have a larger number of both unemployment and TC spells. In the semi-skilled (unskilled) group, only 43.8 per cent (38.8 per cent) of workers suffer less than two unemployment spells, and 56.3 per cent (52.1 per cent) experience three or fewer TC spells. Moreover, as the number of TC spells rises, the incidence of unemployment spells is larger. Given the short duration of the majority of temporary contracts analysed, the group of workers who experience several temporary contracts will be over-represented in our sample. This fact cannot be dealt with in the descriptive analysis, but in the econometric one.

TABLE 2  
Number of Individuals by TC and Non-Employment Experiences (%)

Number of TC spells	Number of unemployment spells											
	Skilled (n = 3,366)											
	0 (%)	1 (%)	2 (%)	3 (%)	4 (%)	5 (%)	6 (%)	7 (%)	8 (%)	9 (%)	>9 (%)	Total (%)
1	17.3	7.6	1.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	26.6
2	6.8	8.9	4.8	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0%	21.2
3	2.1	3.8	5.3	2.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0%	13.7
4	0.7	1.5	3.2	3.4	1.5	0.3	0.0	0.0	0.0	0.0	0.0%	10.6
5	0.3	0.7	1.5	1.8	1.4	0.6	0.0	0.0	0.0	0.0	0.0%	6.4
6	0.1	0.4	0.8	0.8	1.1	1.1	0.5	0.1	0.0	0.0	0.0%	4.9
7	0.1	0.1	0.3	0.5	0.7	0.9	0.9	0.2	0.0	0.0	0.0%	3.7
8	0.0	0.0	0.1	0.4	0.6	0.7	0.9	0.4	0.1	0.0	0.0%	3.2
9	0.0	0.1	0.1	0.1	0.4	0.5	0.3	0.4	0.1	0.1	0.0%	1.9
>9	0.1	0.1	0.4	0.4	0.9	0.7	0.9	0.9	0.8	0.7	2.1	7.8
Total	27.4	23.2	18.2	10.5	6.7	4.9	3.4	1.9	1.0	0.8	2.1	100

Semi-skilled (n = 5,816)												
	0 (%)	1 (%)	2 (%)	3 (%)	4 (%)	5 (%)	6 (%)	7 (%)	8 (%)	9 (%)	>9 (%)	Total (%)
1	12.0	8.3	1.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	22.1
2	4.1	9.0	5.8	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	19.9
3	1.7	3.9	5.4	2.8	0.4	0.0	0.0	0.0	0.0	0.0	0.0	14.3
4	0.7	1.9	3.0	3.4	1.6	0.2	0.0	0.0	0.0	0.0	0.0	10.8
5	0.3	0.8	1.5	2.3	2.1	1.1	0.2	0.0	0.0	0.0	0.0	8.3
6	0.1	0.4	0.9	1.7	1.4	1.3	0.7	0.1	0.0	0.0	0.0	6.4
7	0.0	0.1	0.4	0.8	0.7	1.2	0.8	0.3	0.0	0.0	0.0	4.4
8	0.0	0.1	0.2	0.4	0.6	0.7	0.6	0.5	0.1	0.0	0.0	3.0
9	0.0	0.0	0.1	0.3	0.4	0.4	0.6	0.3	0.1	0.0	0.0	2.4
>9	0.0	0.1	0.1	0.3	0.5	0.7	0.9	1.0	1.0	0.9	2.7	8.4
Total	19.1	24.7	19.3	12.9	7.6	5.5	3.7	2.2	1.3	1.0	2.7	100

*Unskilled (n = 11,776)*

	0 (%)	1 (%)	2 (%)	3 (%)	4 (%)	5 (%)	6 (%)	7 (%)	8 (%)	9 (%)	>9 (%)	Total (%)
1	11.8	6.0	1.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	19.6
2	3.6	8.3	5.3	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	18.0
3	1.3	3.7	6.0	3.2	0.5	0.0	0.0	0.0	0.0	0.0	0.0	14.6
4	0.5	1.8	3.2	3.7	1.9	0.3	0.0	0.0	0.0	0.0	0.0	11.3
5	0.2	0.8	1.6	2.4	2.3	1.1	0.1	0.0	0.0	0.0	0.0	8.5
6	0.1	0.5	0.7	1.5	1.8	1.5	0.6	0.1	0.0	0.0	0.0	6.6
7	0.1	0.2	0.5	0.7	1.0	1.1	0.9	0.4	0.0	0.0	0.0	4.9
8	0.0	0.1	0.2	0.5	0.5	0.8	0.7	0.5	0.2	0.0	0.0	3.5
9	0.0	0.0	0.1	0.2	0.4	0.6	0.5	0.4	0.3	0.1	0.0	2.6
>9	0.1	0.1	0.1	0.6	0.8	0.9	1.1	1.4	1.5	1.1	2.8	10.4
Total	17.5	21.3	19.6	13.5	9.2	6.3	3.9	2.6	2.0	1.2	2.8	100

Source: Social Security records and authors' own calculations.  
 TC, temporary contract.

TABLE 3  
Length of Spell by Type of Transition

<i>Skilled</i>										
<i>Months</i>	<i>TC-TC</i>		<i>TC-PC</i>		<i>TC-U</i>		<i>U-TC</i>		<i>U-PC</i>	
	<i>n</i>	<i>%</i>	<i>n</i>	<i>%</i>	<i>n</i>	<i>%</i>	<i>n</i>	<i>%</i>	<i>n</i>	<i>%</i>
0-6	543	69.35	122	37.54	1,589	84.07	967	63.37	122	59.22
7-12	131	16.73	81	24.92	227	12.01	335	21.95	36	17.48
13-18	47	6.00	37	11.38	36	1.90	123	8.06	25	12.14
19-24	42	5.36	62	19.08	30	1.59	64	4.19	10	4.85
25-30	11	1.40	9	3.69	4	0.21	37	2.42	13	6.31
31-36	6	0.77	2	2.77	2	0.11	—	—	—	—
>36	3	0.38	—	0.62	2	0.11	—	—	—	—
Total	783		325		1890		1526		206	
Censored	368						158			
<i>Semi-skilled</i>										
<i>Months</i>	<i>TC-TC</i>		<i>TC-PC</i>		<i>TC-U</i>		<i>U-TC</i>		<i>U-PC</i>	
	<i>n</i>	<i>%</i>	<i>n</i>	<i>%</i>	<i>n</i>	<i>%</i>	<i>n</i>	<i>%</i>	<i>n</i>	<i>%</i>
0-6	964	79.74	234	51.54	3,386	88.62	1886	61.29	251	61.37
7-12	154	12.74	115	25.33	292	7.64	746	24.24	69	16.87
13-18	42	3.47	49	10.79	71	1.86	220	7.15	54	13.20
19-24	35	2.89	32	7.05	47	1.23	155	5.04	18	4.40
25-30	5	0.41	11	2.42	11	0.29	70	2.27	17	4.16
31-36	6	0.50	11	2.42	8	0.21	—	—	—	—
>36	3	0.25	2	0.44	6	0.16	—	—	—	—
Total	1209		454		3821		3077		409	
Censored	332						335			
<i>Unskilled</i>										
<i>Months</i>	<i>TC-TC</i>		<i>TC-PC</i>		<i>TC-U</i>		<i>U-TC</i>		<i>U-PC</i>	
	<i>n</i>	<i>%</i>	<i>n</i>	<i>%</i>	<i>n</i>	<i>%</i>	<i>n</i>	<i>%</i>	<i>n</i>	<i>%</i>
0-6	1,766	71.32	289	37.88	6,635	85.29	3,737	57.57	371	57.88
7-12	336	13.57	159	20.84	642	8.25	1,646	25.36	125	19.50
13-18	141	5.69	69	9.04	294	3.78	541	8.33	61	9.52
19-24	159	6.42	180	23.59	147	1.89	373	5.75	54	8.42
25-30	30	1.21	12	1.57	25	0.32	194	2.99	30	4.68
31-36	38	1.53	51	6.68	33	0.42	—	—	—	—
>36	6	0.24	3	0.39	3	0.04	—	—	—	—
Total	2,476		763		7,779		6,491		641	
Censored	758						647			

*Source:* Social Security records and authors' own calculations.  
TC, temporary contract; PC, permanent contract; U, unemployment.

TABLE 4  
Main Descriptive Statistics

<i>Variable</i>	<i>Skilled</i>		<i>Semi-skilled</i>		<i>Unskilled</i>	
	<i>Mean</i>	<i>(s.d.)</i>	<i>Mean</i>	<i>(s.d.)</i>	<i>Mean</i>	<i>(s.d.)</i>
In the first TC spell						
Age	21.978	(2.406)	20.975	(2.427)	19.466	(2.315)
Gender (= 1 if male)	0.399		0.330		0.603	
Temporary help agency	0.235		0.174		0.209	
Type of contract						
Work experience contract	0.171		0.049		0.016	
Training contract	0.001		0.000		0.206	
Interim contract	0.097		0.044		0.019	
Per task contract	0.210		0.212		0.225	
Casual contract	0.250		0.392		0.313	
Other contract	0.272		0.303		0.221	
Part time	0.359		0.449		0.290	
Across the work history						
Equal Employer in the following spell	0.342		0.334		0.247	
Qualification in the following spells:						
Skilled	68.66		13.23		7.62	
Semi-skilled	17.98		68.30		17.93	
Unskilled	13.36		18.47		74.45	
Number of observations	3,366		5,816		11,766	

TC, temporary contract.

Table 3 shows that at relatively short durations, TCs are more likely to end up in unemployment. The likelihood of another TC, though not as large as that of ending up in unemployment, is rather large for short tenure in TC as well. As duration proceeds, the probability of unemployment and that of another TC substantially reduces, while the chances of permanent employment rise. In addition, the length of transitions from TC into PC is longer than from TC into TC, and especially from TC into Unemployment. This may imply that employers generally use temporary contracts as a probation period and that ‘good’ matches (in terms of renewal into PC or TC) last longer.

Finally, Table 4 shows descriptive statistics at the time of the first TC considered. In the skilled and semi-skilled groups, workers are predominantly females (60.1 and 67.0 per cent, respectively), while unskilled individuals are essentially men (60.3 per cent). The higher the qualifications, the older the worker is, although differences as regards age are not substantial on average. In addition, only around one fifth of workers are initially hired through a THA.

Finally, we have in Table 4 the transition of each worker across occupation groups along his/her career. Almost 70 per cent of those initially classified as skilled or semi-skilled continue in these categories throughout the remainder of their job history. On the contrary, the mobility of unskilled workers is slightly larger: 25.5 per cent of them are able to achieve skilled positions

along their career — this is consistent with previous evidence on occupational mobility (García-Pérez and Muñoz-Bullón 2005b).<sup>6</sup>

## 5. Econometric specification

Our main objective is to study the hazard rate out of both employment and unemployment. We will use a discrete-time duration model (see Lancaster 1990 or Jenkins 1995 for the basic features of such models) where the hazard rate is given by the following conditional probability:

$$\phi(t) = \Pr(T = t | T \geq t) \quad (1)$$

where  $T$  is a discrete random variable denoting either employment or unemployment duration. Following Bover *et al.* (2002) and García-Pérez (1997), we use a logistic distribution to model the hazard rates, so that the two conditional exit rates can be written as follows:

$$\phi_U^j = F(\theta_0^j(t) + \theta_1^j(t)x(t)) \quad (2)$$

$$\phi_E^k = F(\gamma_0^k(t) + \gamma_1^k(t)x(t)) \quad (3)$$

where  $x(t)$  denotes the vector of explanatory variables, some of them varying with spell's duration ( $t$ ),  $j$  is a counter for the two possible exits from U, TC and PC, and  $k$  is a counter for the exits from a TC (U, TC and PC).  $\theta_0^j(t)$  and  $\gamma_0^k(t)$  represent the additive terms of the duration dependence in the hazard rates that will be estimated in the most general way possible. Finally,  $\theta_1^j(t)$  and  $\gamma_1^k(t)$  are the coefficients for the explanatory factors which in general depend on duration. As we are considering a competing risk framework, the exit from a given state (either unemployment or temporary employment), is specified as:

$$\phi_U(t) = \sum_{j=1}^{J_U} \phi_U^j(t) \quad (4)$$

$$\phi_E(t) = \sum_{j=1}^{J_E} \phi_E^j(t) \quad (5)$$

So far, in this model, we have assumed that all relevant covariates for explaining variation in the hazard rates have been observed and measured, that is, that there are no omitted variables in the model, and consequently no unobserved heterogeneity in the data on transitions. However, if unobserved heterogeneity exists, this can lead to problematic inferences in so far as parameter estimates can be inconsistent (Flinn and Heckman 1982). For instance, as commented in Section 4 above, the employment empirical

hazard functions decline steadily over time (Figure 2). This implies that individuals with only a few months of experience are at greatest risk of leaving their TC, and that once they gain experience, the risk of leaving employment declines. Because of the possible existence of unobserved heterogeneity, this simple conclusion may be wrong. Consider the case where there are three types of individuals: (a) 'high-risk' individuals who have a high hazard rate out of TC; these individuals may not have wanted to enter into a temporary contract in the first place, but did so because they have high skills and the temporary contract serves as a screening device for them (they are, hence, more likely to enter sooner into a permanent contract); (b) 'medium-risk' individuals, whose commitment to staying with a temporary contract is larger, but are susceptible to exploring other options (e.g. finding a PC or taking another TC); (c) 'low-risk' individuals, who have a low (but constant) hazard rate out of a TC. Further suppose that for each group, the risk of leaving the TC state is constant over time (so that the only difference between individuals is the level of their hazard function: high, medium or low). If we ignore the fact that these individuals come from three distinct groups (this is what we do if we omit the — admittedly unobserved — predictor that distinguishes the three groups), immediately after their initial TC, the hazards would fall given the existence of such three levels of risk. Over time, individuals in the high-risk group would be most likely to leave the TC, those in the medium-risk group would be moderately likely to leave, and those in the low-risk group would be likely to stay. The net result is that the overall hazards — evaluated over the entire set of individuals — will decline over time, owing to nothing more than the changing composition of the risk set. Thus, unobserved heterogeneity raises a serious interpretive problem. This same problem may exist when analysing exits from unemployment as long as there are several groups of individuals who exit from unemployment at different rates (according to some unobserved characteristics). Moreover, such unobserved heterogeneity may be correlated across unemployment and employment spells. Thus, in order to avoid this spurious duration dependence in the hazard rate (generated by the presence of unobserved factors), we will estimate both the unemployment and employment hazard rates simultaneously and assuming that unobserved heterogeneity is present in both hazard rates. We will assume that it follows a discrete distribution function with different mass points (as in Heckman and Singer 1984). In particular, the distribution of unmeasured heterogeneity is best described as a three-point distribution.<sup>7</sup>

The estimation of this model is based on maximum likelihood where the three mass point distribution function for unobserved heterogeneity in each of the two hazard rates is specified. Moreover, the likelihood function considers the three possibilities of censoring present in our data. First, unemployment duration may be censored, in which case employment duration is not observed. Second, we may have a completed unemployment spell and a censored employment one. And finally, both unemployment and employment spells may be completed ones, that is, not censored. The individual

likelihood function with unobserved heterogeneity can easily be constructed as follows:

$$L_i(\eta_u, \eta_e) = \left[ \prod_{s=1}^{t_u} (1 - \phi_{ui}(s, \eta_u)) \right]^{d_{ui}} \left[ \phi_{ui}(t_u, \eta_u) \prod_{s=1}^{t_u-1} (1 - \phi_{ui}(s, \eta_u)) \prod_{s=1}^{t_e} (1 - \phi_{ei}(s, \eta_e)) \right]^{(1-d_{ui})d_{ei}} \left[ \phi_{ui}(t_u, \eta_u) \prod_{s=1}^{t_u-1} (1 - \phi_{ui}(s, \eta_u)) \phi_{ei}(t_e, \eta_e) \prod_{s=1}^{t_e-1} (1 - \phi_{ei}(s, \eta_e)) \right]^{(1-d_{ui})(1-d_{ei})} \tag{6}$$

where  $t_u$  and  $t_e$  represent unemployment and employment durations, and  $d_{ui}$  and  $d_{ei}$  are two indicators that allow us to distinguish between censored and completed unemployment and employment spells respectively (for ease of exposition, this expression does not include the alternative exits from each state). The log-likelihood function with unobserved heterogeneity then takes the form:

$$\ln L = \sum_{i=1}^N \ln \int \int L_i(\eta_u, \eta_e) dF(\eta_u) dF(\eta_e) \tag{7}$$

where  $F(\eta_l)$  takes the following specification that allows unobserved heterogeneity to be correlated across unemployment and employment spells for the same individual in a very general way that allows to exits differential effects over each hazard rates:

$$\eta_l = \begin{cases} \eta_l^1 & \text{with prob. } p_l^1 \\ \eta_l^2 & \text{with prob. } p_l^2 \\ \eta_l^3 & \text{with prob. } 1 - p_l^1 - p_l^2 \end{cases} \quad \text{with } l = u, e \tag{8}$$

## 6. Results

The competing risks hazard model specified in the previous section is used to examine the likelihood that workers exit temporary employment and (a) enter unemployment; (b) enter a new temporary job; or (c) enter permanent employment versus the alternative of continuing in the current temporary job. Simultaneously, we estimate the likelihood that temporary workers who enter unemployment exit into (a) a new temporary job; or (b) a permanent job versus continuing unemployment. Given that qualifications are likely to imply different employment and unemployment prospects for individuals — particularly as regards their outside options and their bargaining power on temporary jobs (in particular, skilled workers have lower unemployment rates than the less-skilled; see Dolado *et al.* 2002) — we will carry out separate estimations for three sub-samples of individuals, defined according to the

qualifications required for the first job held: skilled, semi-skilled and non-skilled (the specific categories within each qualification group are detailed in the Appendix, Table A1).

Tables 5–7 report the results obtained from the simultaneous estimation of employment and unemployment hazard rates controlling for unobserved heterogeneity. The specification for unobserved heterogeneity is additive in the hazard rate and similar for all possible exits, except for the exit into a permanent contract. In this exit, we allow for a shifter parameter ( $\theta_2$  in  $\phi_U(t)$  and  $\gamma_2$  in  $\phi_E(t)$ ) in order to test whether hidden heterogeneity is making such an exit systematically different from the remaining ones. Figure 4 plots predicted employment hazard rates for entries into a temporary contract or unemployment, and Figure 5 shows predicted employment hazard rates for entries into a permanent contract. Similarly, Figure 6 shows predicted unemployment hazard rates into unemployment, and Figure 7 plots predicted unemployment hazard rates into a permanent contract. These figures have been calculated at the mean of covariates of the individuals in each group, and take into account the existence of unobserved heterogeneity.

Apart from the explanatory variables described above, we control for the economic cycle through the employment growth rate in the region where the employment/unemployment takes place, and the regional unemployment rate in order to account for geographical differences. Moreover, duration-dependence has been taken into account through the inclusion of a polynomial in  $\log(t)$  in the specification of each hazard rate. Finally, since Kaplan–Meier estimates for the employment hazard indicate that the likelihood of exiting from employment is significantly higher at the 6th, 12th, 24th and 36th month (see Section 4); other studies (see, e.g. García-Pérez and Muñoz-Bullón 2005a) also show evidence in this respect — the specification of the employment hazard rate includes dummy variables indicating whether or not the individual is on-the-job at such months.

### *Results on Duration Dependence*

As can be observed in Tables 5–7, the duration dependence of the hazards is always significant independently of which hazard is considered, and even when unobserved heterogeneity has been taken into account. In particular, tenure in the TC has a clear negative effect on the hazard into both unemployment and another temporary contract: for any of the skill groups considered, the hazard out of a TC decreases for the initial months in the TC. However, one might expect that workers who accept a temporary job are initially strongly attached to that job, for instance, for contractual reasons. This expectation is confirmed in the results, since the decreasing trend in these hazards reverses once some months in the TC have passed. That is, the negative estimated effect for duration dependence is reversed as tenure in the temporary job increases (the estimated coefficient on  $\log(t)$  is negative but the coefficient on  $\log(t)^2$  is positive). This effect can easily be observed in Figure 4, which plots the predicted hazard from a TC into U or another TC

TABLE 5  
Regression Estimates: Skilled Individuals

	TC-U		TC-TC		TC-PC		U-TC		U-PC	
	Coef.	t-stat.	Coef.	t-stat.	Coef.	t-stat.	Coef.	t-stat.	Coef.	t-stat.
Log( <i>t</i> )	-1.218	-25.8	-1.569	-27.25	-0.670	-6.04	-0.466	-8.59	-0.701	-5.07
Log( <i>t</i> ) <sup>2</sup>	0.225	12.31	0.371	17.49	0.236	6.94	0.063	3.21	0.173	3.83
No. of previous contracts	-0.031	-7.14	0.034	10.43	0.003	0.26	0.074	7.84	-0.095	-3.4
Previous unemployment duration	0.019	5.87	-0.017	-3.52	-0.009	-1.13	-0.014	-3.28	-0.023	-2.22
Previous employment duration	-0.032	-7.63	-0.014	-3.06	0.015	2.57	0.024	4.3	0.048	4.66
Unemployment benefits	—	—	—	—	—	—	-1.248	-12.83	-1.198	-5.02
Unemployment benefits × Log( <i>t</i> )	—	—	—	—	—	—	0.406	4.58	0.573	2.93
Age	-0.273	-3.46	0.059	0.62	0.601	3.16	0.115	1.33	0.551	2.38
Age <sup>2</sup>	0.003	1.79	-0.004	-1.72	-0.012	-3.04	-0.002	-0.89	-0.010	-1.91
Unemployment rate	0.003	0.8	-0.001	-0.26	-0.057	-7.82	-0.024	-5.8	-0.057	-5.72
Δ Employment rate	-0.892	-1.09	-0.519	-0.53	2.083	1.25	-0.287	-0.32	4.356	1.95
Equal employer	-0.059	-1.78	0.281	7.34	0.995	14.91	0.957	23.7	0.248	2.2
Sex	-0.187	-4.54	-0.187	-3.96	0.089	1.34	-0.080	-1.85	0.058	0.65
THA	0.450	11.08	0.569	12.35	-0.454	-4.5	0.093	2.19	-0.391	-3.42
High quality	—	—	—	—	—	—	—	—	—	—
Med-High quality	0.462	10.15	0.168	3.12	0.270	3.19	-0.079	-1.5	-0.098	-0.84
Med-Low quality	0.359	6.46	0.395	6.33	0.660	6.48	0.168	2.58	0.296	1.98
Low quality	0.461	7.38	0.535	7.58	0.442	3.41	0.254	3.59	0.266	1.56
Period 6	0.994	16.82	1.092	14.5	1.268	12.4	—	—	—	—



TABLE 6  
Regression Estimates: Semi-Skilled Individuals

	TC-U		TC-TC		TC-PC		U-TC		U-PC	
	Coef.	t-stat.	Coef.	t-stat.	Coef.	t-stat.	Coef.	t-stat.	Coef.	t-stat.
Log( <i>t</i> )	-1.392	-40.01	-1.448	-32.82	-0.420	-4.97	-0.621	-16.91	-0.716	-7.81
Log( <i>t</i> ) <sup>2</sup>	0.250	18.17	0.318	18.99	0.175	6.65	0.105	7.99	0.123	3.94
No. of previous contracts	-0.033	-10.1	0.012	3.99	-0.008	-0.87	0.062	9.75	-0.016	-1.09
Previous unemployment duration	0.023	10.65	-0.009	-2.61	-0.009	-1.53	-0.008	-2.91	-0.017	-2.69
Previous employment duration	-0.040	-11.82	-0.009	-2.36	0.006	1.12	0.024	5.65	0.056	8.01
Unemployment benefits	—	—	—	—	—	—	-1.401	-19.21	-0.927	-5.97
Unemployment benefits × Log( <i>t</i> )	—	—	—	—	—	—	0.415	6.44	0.153	1.08
Age	-0.033	-0.57	0.381	5.26	0.659	4.82	-0.037	-0.57	0.483	3.1
Age <sup>2</sup>	-0.002	-1.29	-0.010	-6.09	-0.014	-4.63	0.002	1.28	-0.009	-2.5
Unemployment rate	-0.007	-2.88	-0.011	-3.6	-0.044	-8.46	-0.011	-3.99	-0.051	-7.69
Δ Employment rate	0.777	1.33	0.204	0.28	6.134	4.87	0.065	0.1	4.277	2.89
Equal employer	-0.099	-4.17	0.243	8.47	0.924	18.55	0.998	34.68	0.217	2.84
Sex	-0.069	-2.37	-0.131	-3.75	-0.132	-2.52	-0.094	-2.99	0.097	1.57
THA	0.624	20.5	0.812	22.83	0.150	2	0.143	4.5	-0.360	-4.28
High quality	-0.677	-9.76	-0.467	-6.19	-0.263	-2.22	0.192	2.26	-0.133	-0.67
Med-High quality	-0.206	-4.83	-0.030	-0.62	-0.061	-0.78	0.157	3.15	0.127	1.17
Med-Low quality	—	—	—	—	—	—	—	—	—	—
Low quality	0.057	1.74	0.203	5.15	-0.040	-0.53	0.202	5.56	0.066	0.78
Period 6	1.194	27.38	1.389	26.18	1.428	19.75	—	—	—	—

Period 12	1.631	22.82	1.650	19.42	1.703	18.05	—	—	—	—	—	—
Period 24	1.825	12.32	1.552	8.56	1.972	11.83	—	—	—	—	—	—
Period 36	0.069	0.15	0.037	0.07	1.165	3.18	—	—	—	—	—	—
Years 1997–2000	-0.129	-1.97	0.449	4.13	0.845	2.61	0.591	6.07	1.679	2.200	1.679	2.88
Years 2001–2003	-0.221	-3.06	0.277	2.42	0.633	1.93	0.749	7.29	2.200	2.200	2.200	3.75
Work experience contract	-1.436	-18.38	-0.886	-10.48	-0.136	-1.09	0.301	3.03	0.883	0.883	0.883	5.13
Training contract	-1.549	-13.89	-1.502	-10.06	0.101	0.5	0.317	2.39	0.365	0.365	0.365	1.19
Casual contract	0.094	2.2	-0.021	-0.39	0.479	4.81	0.095	1.99	0.187	0.187	0.187	1.68
Per task contract	-0.086	-1.94	-0.309	-5.55	-0.416	-3.86	0.118	2.38	-0.063	-0.063	-0.063	-0.53
Interim contract	0.157	2.62	0.202	2.88	0.380	2.85	0.330	4.88	0.159	0.159	0.159	0.95
Other	—	—	—	—	—	—	—	—	—	—	—	—
Part time	0.086	2.61	-0.026	-0.62	-0.123	-1.57	0.014	0.38	-0.133	-0.133	-0.133	-1.59
Constant	2.805	4.43	-3.779	-4.61	-11.834	-7.45	-1.818	-2.52	-10.868	-10.868	-10.868	-5.96
Prob. type I	49.90%	—	—	—	—	—	58.23%	18.26	—	—	—	—
Cons. type I (high exit)	0.211	—	—	—	—	—	1.267	0.90	—	—	—	—
Prob. type II	44.85%	—	—	—	—	—	37.32%	12.23	—	—	—	—
Cons. type II (medium exit)	-1.159	-22.11	—	—	—	—	0.078	0.81	—	—	—	—
Prob. type III	5.25%	2.53	—	—	—	—	4.16%	—	—	—	—	—
Cons. type III (low exit)	-2.189	-35.94	—	—	—	—	-0.016	—	—	—	—	—
$\theta_2/2$	—	—	—	—	0.304	1.64	—	—	0.306	0.306	0.306	3.13
No. of observations	—	170,276	—	—	—	—	—	—	—	—	—	—
Log likelihood	—	-97,336.93	—	—	—	—	—	—	—	—	—	—

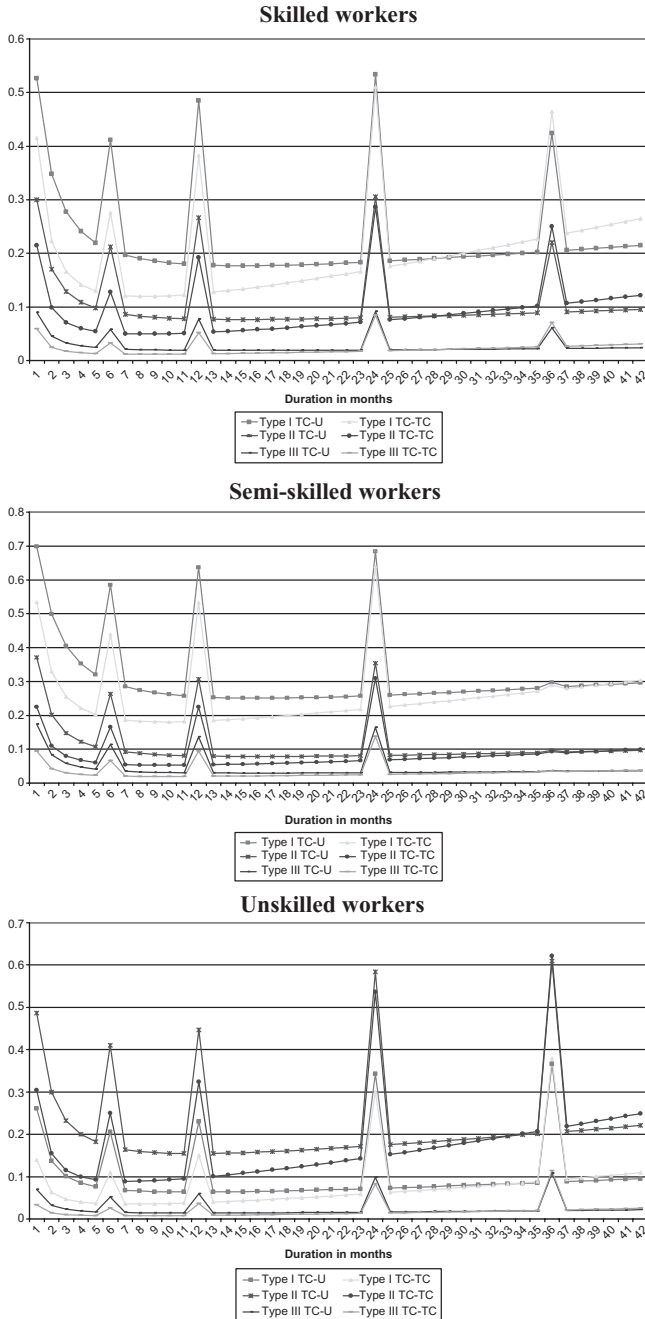
TC, temporary contract; PC, permanent contract; U, unemployment.

TABLE 7  
Regression Estimates: Unskilled Individuals

	TC-U		TC-TC		TC-PC		U-TC		U-PC	
	Coef.	t-stat.	Coef.	t-stat.	Coef.	t-stat.	Coef.	t-stat.	Coef.	t-stat.
Log( <i>t</i> )	-1.337	-57.73	-1.527	-51.25	-0.504	-7.85	-0.744	-30.22	-0.811	-12.37
Log( <i>t</i> ) <sup>2</sup>	0.271	29.70	0.389	34.81	0.245	11.71	0.165	18.57	0.175	7.79
No. of previous contracts	-0.012	-4.44	0.036	13.31	0.004	0.77	0.058	11.39	-0.013	-1.12
Previous unemployment duration	0.017	12.33	-0.018	-8.52	-0.007	-1.87	-0.004	-2.57	-0.008	-2.04
Previous employment duration	-0.045	-22.99	-0.017	-7.72	0.009	2.62	0.025	10.53	0.049	11.57
Unemployment benefits	—	—	—	—	—	—	-1.410	-30.69	-1.440	-11.54
Unemployment benefits × Log( <i>t</i> )	—	—	—	—	—	—	0.352	8.47	0.570	5.64
Age	0.013	0.34	0.265	5.72	0.272	3.11	0.141	3.18	0.357	3.39
Age <sup>2</sup>	-0.002	-2.30	-0.007	-6.81	-0.006	-3.12	-0.002	-2.15	-0.006	-2.42
Unemployment rate	-0.003	-1.76	-0.009	-4.61	-0.063	-15.40	-0.018	-9.39	-0.071	-14.32
Δ Employment rate	-0.069	-0.18	2.035	4.12	1.693	1.73	0.597	1.41	1.475	1.37
Equal employer	-0.161	-9.82	0.122	6.07	0.976	24.58	0.951	46.47	0.404	7.32
Sex	-0.174	-9.55	0.027	1.20	-0.087	-2.25	0.122	5.64	0.051	1.16
THA	0.932	46.16	1.315	56.50	0.279	4.36	0.145	7.03	-0.414	-7.09
High quality	-0.617	-8.78	-0.380	-4.83	-0.085	-0.63	0.144	1.77	0.060	0.32
Med-High quality	-0.258	-7.61	-0.324	-7.65	0.204	2.83	0.112	2.79	-0.007	-0.07
Med-Low quality	-0.170	-8.04	-0.032	-1.24	0.271	5.63	0.111	4.33	0.174	3.00
Low quality	—	—	—	—	—	—	—	—	—	—
Period 6	1.216	44.40	1.309	36.41	1.421	25.68	—	—	—	—

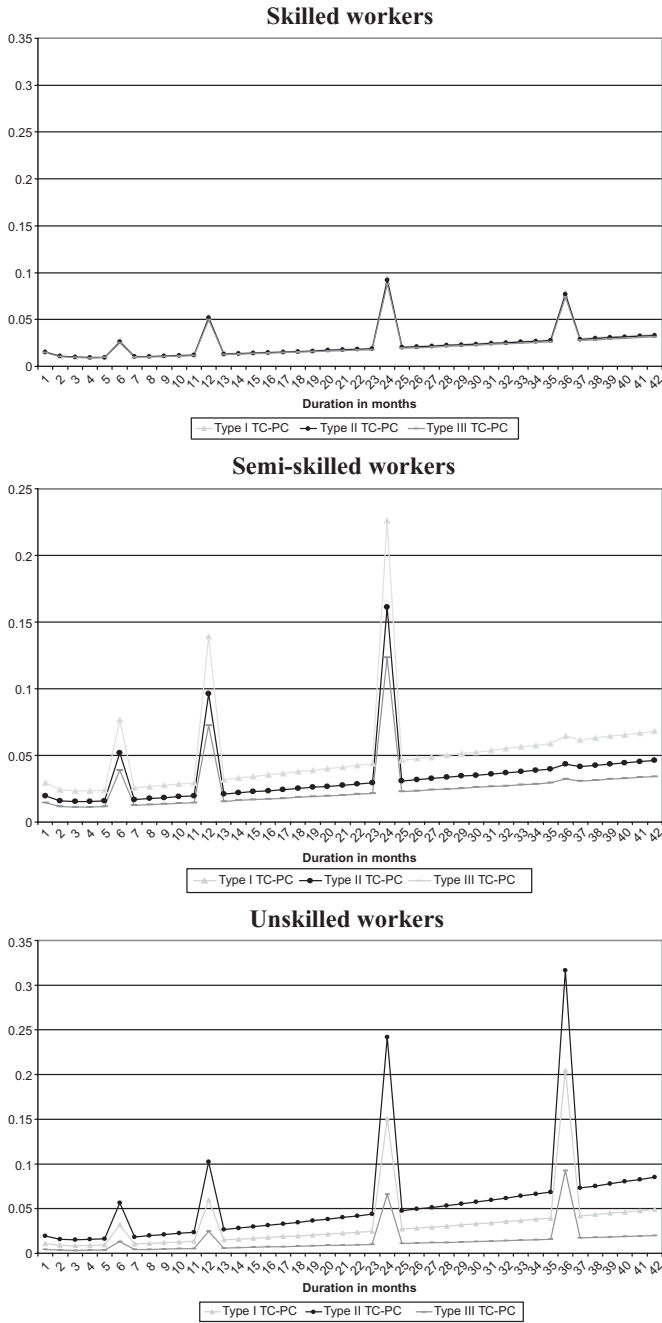


FIGURE 4  
 Predicted Hazard from a Temporary Contract into Unemployment or a Temporary Contract, by Type of Worker.



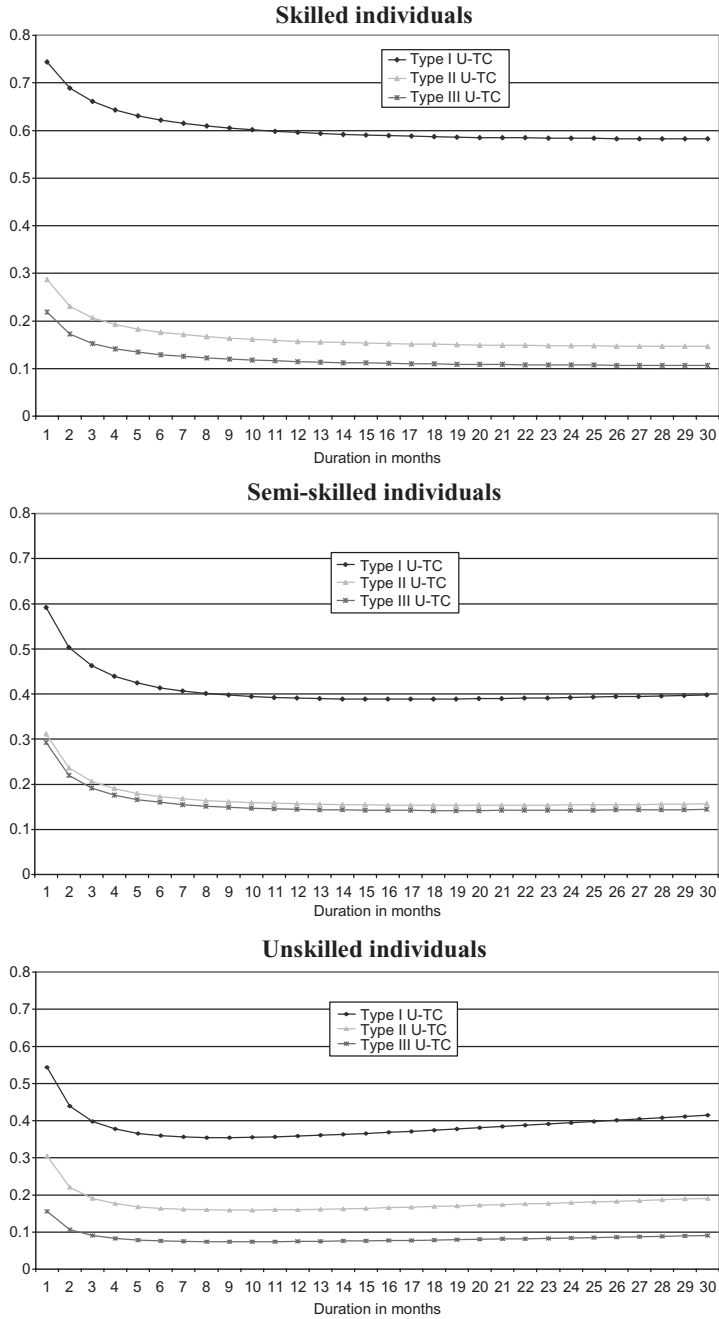
TC, temporary contract; PC, permanent contract; U, unemployment.

FIGURE 5  
 Predicted Hazard from a Temporary Contract into a Permanent Contract, by Type of Individual.



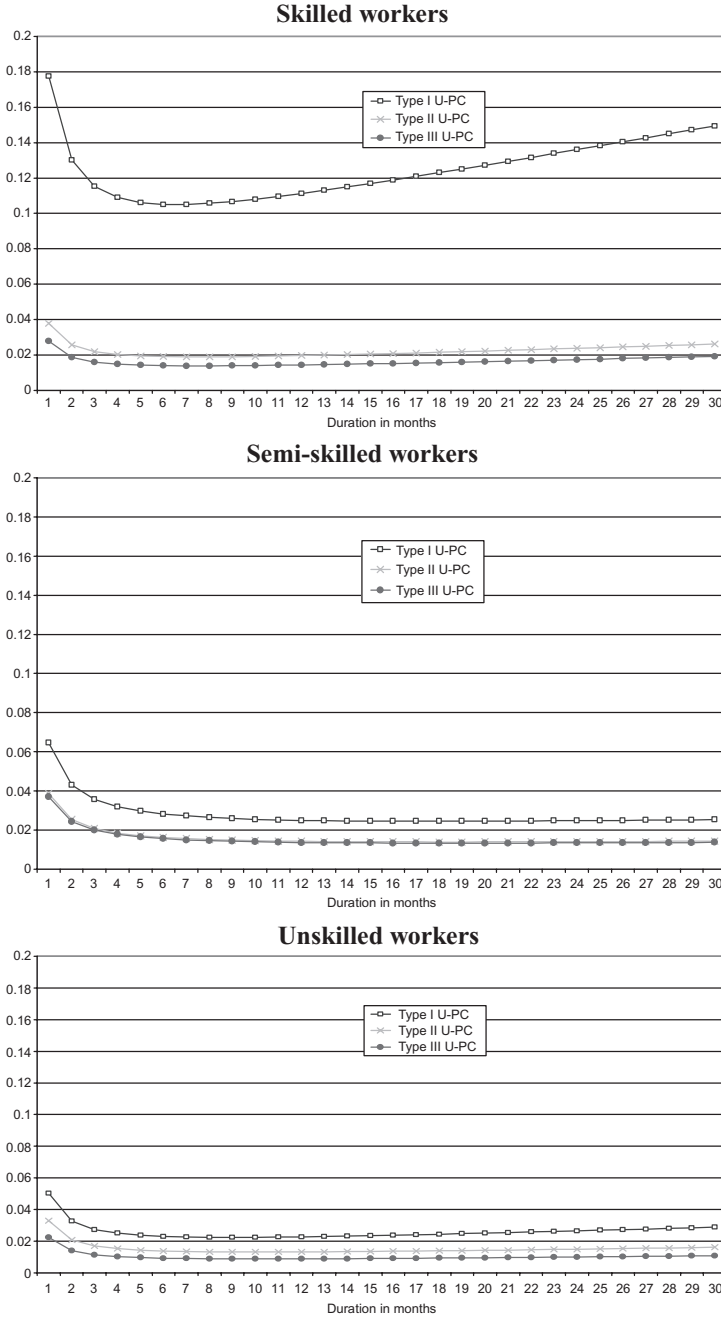
TC, temporary contract; PC, permanent contract.

FIGURE 6  
 Predicted Hazard from Unemployment into a Temporary Contract, by Type of Individual.



U; unemployment; TC, temporary contract.

FIGURE 7  
 Predicted Hazard from Unemployment into a Permanent Contract by Type of Individual.



U; unemployment; PC, permanent contract.

for each skill group considered. This implies that the probability of ending up as unemployed or of receiving another temporary contract decreases during the initial months of temporary employment, but increases slightly thereafter. We also obtain a very significant positive effect on these two hazards from the dummies describing employment durations of 6, 12, 24 and 36 months. As expected, therefore, temporary contracts end more likely at such durations than otherwise.

As regards the transition into permanent employment, on the other hand, the effect of duration dependence on the hazard out of a TC is significant but weaker than for the previous commented hazards. Figure 5 shows that it is slightly positive. In this case, the dummies collecting durations of 6, 12, 24 and 36 months also exert a very significant positive effect on this hazard. That is, the transition into a PC mainly occurs at peak months (when the employer has no other way to retain these workers). Thus, firms are predominantly converting temporary contracts into permanent ones once the legal limit for the temporary contract has been reached. Note also that the spike in the 36th month is relatively more pronounced for skilled workers when compared with semi-skilled ones. This may be explained by the fact that the former occupy more productive job matches, which are thus more likely to be converted into permanent ones before the legal limit. Moreover, one can also think that semi-skilled workers are in a weaker bargaining position than skilled ones, as they may be more easily replaced.

As regards the transitions out of unemployment (last four columns in Tables 5–7), the probability of finding a temporary contract declines with unemployment duration. Indeed, Figure 6 shows that the likelihood of exiting from unemployment through a temporary contract is very high at the beginning of the unemployment spell, but it substantially reduces during the first months in unemployment (these results are consistent with Kaplan–Meier estimates commented on above). However, contrary to duration dependence for employment transitions, this negative effect of duration dependence is not reversed (the only exception is that of unskilled type-I individuals). Thus, the more time goes by, the higher the locking-in effect of unemployment, since the latter causes the transition rate into temporary work to be lower as time passes. We interpret this result in light of human capital theory: an unemployment spell not only precludes the accumulation of work experience, but may also bring about the deterioration of general skills (Gregory and Jukes 2001) and an individual's psychological well-being (Goldsmith *et al.* 1996).

Duration dependence from unemployment into a PC is negative as well (see Figure 7). However, as this figure shows, there are differences among the three groups of unemployed individuals when unobserved heterogeneity is considered (see the next sub-section for an explanation on these three types of individuals): high-skilled type-I individuals are more likely to exit from unemployment via a PC from the sixth month in unemployment onwards. In contrast, this does not occur for any particular type of individuals among the semi-skilled and unskilled groups.

Finally, note also that out of unemployment, the rate into temporary work (Figure 6) is much larger than the rate into permanent work (Figure 7). This fact, together with the fact that the rate of flowing from temporary into permanent employment is quite low (Figure 5), provides rather dull employment prospects for young temporary workers in Spain.

### *Results on Unobserved Heterogeneity*

As explained in Section 5 above, we have estimated a three mass point distribution function in each of the two hazard rates analysed. This allows us to consider the influence of unobserved heterogeneity by separating individuals into three groups: those with a high risk of exit, those with a medium risk, and, finally, those with a very low risk of exiting. As a result, by combining the two distributions, one in the employment hazard rate and the other in the unemployment hazard rate, we are able to identify nine different categories of workers by means of our specification.

The last panel of Tables 5–7 shows the results for the estimated distribution functions in each of the three groups analysed. We identify a wide group of workers with a large intensity of exiting out of temporary employment — 58.3 per cent of skilled workers belong to this group versus 48 per cent among unskilled workers — another large group with intermediate intensity of exiting, and, finally, a quite small group — 3.3 per cent in the skilled group versus 8.7 per cent in the unskilled group — with a very low probability of exiting out of temporary employment. Compared with the situation with only two mass points in the distribution for unobserved heterogeneity (see the results for the same model in García-Pérez and Muñoz-Bullón 2007), we are basically identifying a new intermediate group in the middle of the two extremes identified in the version with two mass points. This group in the middle is quite important for semi-skilled workers, but less so for the other two groups of individuals.

Complementary to this, in the case of exiting from unemployment, we find quite different results depending on the qualification group we consider. First, in the case of skilled individuals, the majority of them (52.9 per cent) have low intensities of exiting from unemployment, although an important fraction (39.8 per cent) also has a high intensive exit rate. The proportion of workers with low exit rates out of unemployment is small in the semi-skilled group, whereas most unskilled individuals have low intensities of exiting out of unemployment.

The main advantage of our approach to unobserved heterogeneity is that for a given individual, the effect of such heterogeneity may differ for the unemployment hazard when compared with the employment hazard. Hence, taken jointly, we find that, for example, in the most numerous group of workers analysed (the unskilled ones), the most usual worker (with respect to unobserved factors) is the one with a very high risk of exiting from temporary employment, and, at the same time, a very low exit rate from unemployment (the joint probability of observing these two situations is  $37.85\% = 48.05\% \times$

78.78%). This same group is the most important for the case of skilled individuals, whereas in the case of semi-skilled individuals the most likely situation is that of a worker with a high risk of exiting from both temporary employment and from unemployment ( $29.06\% = 49.9\% \times 58.23\%$ ).

The joint effect of unobserved heterogeneity and duration on temporary employment over the exit rate from such a contract is plotted in Figures 4 (for entries into unemployment or a TC) and 5 (for entries into a PC). Similar plots for the exit from unemployment are given in Figures 6 (for entries into a TC) and 7 (for entries into a PC). Apart from the duration pattern of each hazard rate, a clear impact of unobserved heterogeneity is apparent. Type I individuals exit out of temporary employment at a very high rate, and, at the same time, exit out of unemployment very quickly. The effect of unobserved heterogeneity on the exit into a permanent contract (Figures 5 and 7) is different from the rest of destination states, since, as discussed in the previous section, we have allowed our model to estimate a differential effect for the destination into a PC (the coefficients  $\theta_2$  and  $\gamma_2$  are always estimated to both be lower than 1). In this case, we find smaller differences among the different types of workers, and, more importantly, a different duration dependence of the exit rates, both out of temporary employment and out of unemployment.

#### *Results on Previous Employment and Unemployment History*

Although not as important in magnitude as the impact that arises from unobserved heterogeneity and from the duration of the ongoing spell, the individuals' background prior to the current TC is also relevant in order to explain both employment and unemployment duration. In particular, a larger number of previous temporary contracts increases the likelihood of transiting into a new temporary employment but has a non-significant impact on the transition from temporary employment into permanent employment. This is the case for whatever skill group is considered (see Tables 5–7). At the same time, for those individuals who are currently unemployed, the number of previous temporary contracts held increases the exit from unemployment into a new temporary contract but shows a non-significant effect for explaining the transition into permanent employment, with the only exception of skilled workers — the latter move from unemployment into permanent employment at a lower rate as the number of prior temporary contracts rises (see Table 5). Therefore, a previous history of temporary contracts has a non-significant effect for entering into permanent employment out of the current temporary contract, and has a detrimental effect for skilled unemployed (in the sense that their movement into permanent employment is achieved later the larger the number of previous temporary contracts).

The duration of the previous spell of unemployment lowers the current temporary workers' transitions into another temporary contract and, in contrast, promotes their entry into unemployment (as was expected). However, it has a non-significant effect on the movement into a permanent contract,

with the only exception being unskilled workers (see Table 7). As regards the exit from unemployment, prior unemployment duration is negatively associated with either the finding of a TC or a PC. This finding is reasonable to the extent that — since productivity is imperfectly observable — the likelihood of exiting from unemployment will be lower if the employer takes a past history of unemployment as signalling low productivity.

In contrast, the larger the tenure in the previous job, the larger is the likelihood of exiting out of a TC into a PC, and the lower is the likelihood of moving into a TC or into unemployment. Thus, previous employment experience helps workers attain regular employment. This finding is consistent with dual labour market theory, since experience (captured by tenure at the job) has a negative association with the propensity of being employed in the secondary market (temporary jobs) relative to the primary market (permanent jobs).

Moreover, during an unemployment spell, the longer previous tenure is, the higher is the likelihood of re-entering into employment (either a TC or a PC). Our interpretation for this finding is that employers are likely to regard prior long contracts as positive signals in order to screen individuals for permanent positions or to hire unemployed individuals under a temporary contract.

The type of temporary contract held is another relevant determinant of the transitions. For any sub-sample, having a *casual* contract increases the probability of achieving a permanent contract (the *interim* contract also has a positive effect on the transition into a permanent contract for semi-skilled and unskilled groups). In contrast, *per-task* contracts have a detrimental effect on the movement into regular employment. As regards individuals who are currently unemployed, a previous job under a *work experience* contract helps them enter into a permanent job (independently of the qualification group considered). For these individuals, *casual* contracts also present a positive impact in the transition into regular employment (although only among the highest and the lowest qualified). Finally, individuals on part-time work have non-significantly different transition rates into regular work than workers on full-time work.<sup>8</sup> At the same time, semi-skilled and unskilled workers in temporary help jobs are appreciably more likely to enter sooner into regular employment out of their temporary position at a THA than those who are not holding these jobs (a similar finding is reported by Heinrich *et al.* 2005, for the USA). On the contrary, however, previous agency workers currently unemployed are substantially less likely than other temporary workers to enter soon into regular employment, although their exit to another temporary job is much more likely (see, in this respect, Autor and Houseman 2005, who find that THA employment does not improve the transition into stable employment out of poverty in the long run).

### *Results on Socio-Demographic Variables and Other Variables*

Finally, we have also obtained other results regarding the rest of the controls in our estimations, which are generally in line with the findings in previous

literature. The probability of achieving a permanent contract among skilled male temporary workers does not significantly differ from skilled female workers, while men are at a disadvantage (relative to women) in the two remaining groups. Age has a positive effect on the likelihood of transiting from TC to another job (either under a TC or a PC) and a significant negative effect on the likelihood of entering into unemployment in the highest skilled group. As regards transitions out of unemployment, age also exerts a positive impact (when significant) into another employment (either a TC or a PC). These results for age are most probably related to the fact that age is positively correlated with firm-specific human capital, which is highly valued by employers. In addition, it is a fact that younger workers are more willing to move from jobs (and employers) for improving their job match, even though this may imply an experience of unemployment, and eventually settling in a more stable career path (Jensen and Svarer 2003).

We also find that, out of a TC spell, the unemployment rate has a negative impact on the transitions into a PC. This may be attributed to the fact that when the unemployment rate is high, firms might keep on searching for better employees, and so the probabilities that a worker is renewed or converted into a permanent job are lower. A lower unemployment rate implies better outside opportunities for temporary workers in search of better jobs. It enables them to more credibly threaten their employer in case of low conversion rates. The unemployment rate also inflicts a negative impact as regards the exit from unemployment into a new temporary contract. In contrast, the growth employment rate exhibits a positive impact on these transitions (as expected).

Finally, the worker's unemployment benefits status is included in the estimation of the unemployment hazard rate as a dummy, which takes on the value 1 when the individual receives contributory benefits (and 0 otherwise). This variable exerts the expected negative sign for any group considered. In addition, results show a large and statistically significant increase in transitions into permanent employment after 1997. These findings are consistent with the evidence provided on permanent conversion rates in previous studies in Spain (see the 'Introduction' section and Section 2 above).

## **7. Summary and conclusions**

In this article, we have investigated the transitions from unemployment and temporary work into more stable positions for a sample of young Spanish workers. For this purpose, we have applied multiple-spell duration techniques to a longitudinal dataset of young temporary workers obtained from Social Security records for the period 1996–2003. The dataset contains multiple spells in labour market states for three groups of individuals with different skills. Our results show, first of all, that both becoming unemployed and finding a new temporary contract is less likely as tenure at the current temporary contract increases — although as tenure becomes long enough,

both chances slightly rise. In this respect, our analysis has also underlined the relevance of 'peak' months: these two transitions are very high at the 6, 12, 24 and 36 months of tenure in the temporary job.

In contrast to these movements out of the temporary status, the conversion rate from temporary into permanent employment is very low in Spain among young workers, in spite of being slightly increasing with tenure at the temporary contract. One exception is that of semi-skilled and unskilled individuals, who are particularly likely to enter into permanent employment at the 24th and the 36th month of tenure (respectively). Moreover, the entry into permanent employment is rather complicated for unemployed individuals who had previously been employed by temporary help agencies. Finally, the transition out of temporary employment and into permanent employment is more intense in regions where the growth in the employment rate is larger.

As regards our control for unobserved heterogeneity, the evidence provided shows that there exists a group of 23.2 per cent of skilled individuals, 29 per cent of semi-skilled ones and 4.3 per cent of unskilled workers who show very high exit rates from both temporary employment and also from unemployment. Hence, they are rotating from one temporary job into a new one, with very few opportunities of entering into permanent employment. Complementary to this, we have also found that 30.8 per cent of skilled workers, 2.1 per cent of semi-skilled and 37.8 per cent of unskilled ones exit very quickly from temporary employment but exhibit, at the same time, a very low exit rate from unemployment. The identification of these two groups of workers seems very important from a policy perspective in order to solve the problem of young temporary workers being trapped in such dead-end situations.

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### **Notes**

1. Among the advantages of jointly analysing the dynamics of temporary and unemployment spells is that multi-spell data greatly facilitates the identification and estimation of the joint distribution of the unobserved heterogeneity variables (see Honoré 1993; Van den Berg 2001).
2. García-Serrano (2004) also analyses whether temporary workers have a high employment exit rate. Using the living and working conditions database (*Encuesta de Calidad de Vida en el Trabajo*) for the year 2001, he concludes that individuals under temporary contracts suffer worse labour conditions and face a larger employment exit rate, especially those with tenure below 18 months.

3. In particular, the 1997 reform reduced dismissal costs for unfair dismissals by about 25 per cent and payroll taxes between 40 per cent and 90 per cent for newly signed permanent contracts and for conversions of temporary into permanent contracts after the second quarter of 1997 for workers under 30 years old, over 45 years old, the long-term unemployed, women under-represented in their occupations, and disabled workers (see, in this respect, Kugler *et al.* 2005).
4. Although it is also true that temporary employment does not usually provide the same amount of on-the-job training as permanent employment does due to the worker's expected shorter job tenure.
5. The figures for the other two occupational groups are qualitatively the same, although the transitions to a permanent contract is a bit larger in the high occupational group. These figures are available in García-Pérez and Muñoz-Bullón (2007).
6. Because workers in each skill group can move along their work trajectory to different skilled positions, our model will control for the qualification required by the succession of temporary contracts held: high (categories 1, 2 and 3 in Table A1), medium-high (categories 4, 5 and 6), medium-low (categories 7 and 8) and low (categories 9 and 10).
7. Estimations with two mass points are also available in García-Pérez and Muñoz-Bullón (2007).
8. Other studies have found that full-time employment has a positive effect on the likelihood that temporary workers become employed on a permanent basis. See, for instance, Amuedo-Dorantes (2000: 323).

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## Appendix

TABLE A1  
Aggregation of Social Security Contribution Groups into Skills Levels

<i>Skills level</i>	<i>Description of corresponding social security contribution groups</i>
Skilled	1 — Engineers and graduates — <i>ingenieros y licenciados</i>
	2 — Technical engineers and other skilled workers — <i>ingenieros técnicos, peritos y ayudantes titulados</i>
Semi-skilled	3 — Chief and departmental heads — <i>jefes administrativos y de taller</i>
	4 — Other semi-skilled workers — <i>ayudantes no titulados</i>
	5 — Skilled clerks — <i>oficiales administrativos</i>
	6 — Auxiliary workers — <i>subalternos</i>
Unskilled	7 — Semi-skilled clerks — <i>auxiliares administrativos</i>
	8 — Skilled labourers — <i>oficiales de primera y segunda</i>
	9 — Semi-skilled labourers — <i>oficiales de tercera y especialistas</i>
	10 — Unskilled labourers — <i>peones</i>

*Note:* These groups are proxies for workers' skills level, because these categories are a mix of occupation and educational level required for jobs.

TABLE A2  
Description of Work Contract Denominations Used in the Analysis

<i>Work contract name</i>	<i>Description</i>
Work experience (practice) contract ( <i>Contrato de prácticas</i> )	The purpose of this contract is to enable persons who have completed secondary, vocational training or university education to gain work experience according to their educational level.
Training contract ( <i>Contrato de formación</i> )	This contract is related to the provision of theoretical and practical knowledge required to perform a skilled job. This contract replaced the old apprenticeship contract in 1997.
Interim contract ( <i>Contrato de interinidad</i> )	This temporary contract is related to interim situations in the firm.
Per task contract ( <i>Contrato de obra o servicio</i> )	This contract was introduced for temporary needs of firms related to specific works or services of unknown duration (but presumably not permanent).
Casual contract ( <i>Contrato eventual por circunstancias de la producción</i> )	This contract is related to unusual or seasonal circumstances of the goods markets and excess of work in the firm.