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*Landing a Permanent Contract: Do Job
Interruptions and Employer Diversification
Matter?*

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Landing a Permanent Contract: Do Job Interruptions and Employer Diversification Matter?

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Abstract

A discrete-time multivariate hazard model is applied to investigate whether an individual's employment history conditions her chances of eventually obtaining a permanent contract in the Spanish labour market. This study differentiates the incidence of lagged duration dependence from occurrence dependence and individual employment history conditions are not exclusively defined in terms of the number of temporary contracts and job interruptions experienced by the worker, but also by the diversity of her past employers. My analysis focuses on Spanish labour market entrants aged between 18 and 29 for the 1995-2006 period, and performs the estimation by three age cohort groups separately to control for heterogeneity in initial conditions. The results suggest that some workers may become "trapped" in the temporary employment bracket, since their chances of obtaining a permanent contract seem to drop after some months of accumulating several temporary contracts under the same employer between bouts of unemployment. By contrast, moving from one firm to another as a temporary worker might have a positive influence on exit rates to permanent employment. Hence, this paper highlights that it is important to take into account whether or not the worker remains in the same firm when accumulating temporary contracts to test for the stepping stone effect of temporary contracts.

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I Introduction

Recently, several European countries have implemented policies that aim to reduce temporary employment, while successive EU employment directives have urged social advocates to negotiate agreements that will guarantee increases in productivity and competitiveness without compromising "the necessary balance between flexibility and stability". Both trends indicate a concern that temporary work may not ultimately enhance the performance of the labour market or increase workers' prospects of obtaining permanent employment. Temporary employment may serve as a springboard towards stable employment (Booth, Francesconi and Frank, 2002; Varejao and Portugal, 2002), or, on the contrary, it may represent an ongoing condition not necessarily leading to a permanent job. Clearly, this second case does not represent a undesirable alternative for the worker when a higher wage compensates for the intrinsic uncertainty of the temporary contract (Zijl, 2005) or the worker is unwilling to commit on a permanent basis with the first job offer they receive. Nevertheless, the available data indicates that temporary contracts, generally associated with labour precariousness and low-qualified paid labour (Farber, 1999; Araulampalan and Booth, 1998), might place workers at a disadvantage. For instance, Petrongolo and Guell (2007), show than during the period 1987-2002, only 1% of workers hired on a temporary basis indicated that they did not desire a permanent contract and Booth, Francesconi and Frank (2002) show that, in Great Britain, temporary contracts are also associated with low levels of job satisfaction. De la Rica (2004) and García Pérez and Rebollo (2005), for example, also sustain that temporary employment in Spain may lead to wage penalties among certain worker groups. This second line of research suggests that temporary contracts may foster the segmentation of the labour market and create a dual labour market characterized by a primary sector, comprised of workers with high social protection and good labour expectations, and a secondary one, comprised of workers whose social protections and employment prospects are precarious at best.

The aim of this research is to assess whether this second hypothesis describes the Spanish case to the extent that specific aspects of a worker's employment history can be said to negatively affect her probability of moving into a permanent position. To pursue this aim, I apply a time-event analysis to a sample of Spanish workers who entered the labour market after 1994 under a temporary contract, following them until the moment of their first permanent contract. I estimate the extent of several types of state dependence in transitions across three labour force states, (namely, temporary contract, unemployment and permanent contract), considering the last one as an absorption state. The parameterisation used in this paper is partially, inspired by

Heckman and Borjas's (1980) distinction between duration dependence, occurrence dependence and lagged duration dependence¹. Specifically, I include variables representing both the number of transitions and the time spent in each state prior to the start of the current spell, in addition to the time spent in the current spell. The resulting model is more general with regard to the type of state dependence allowed, and with regard to the measurement of the timing and duration of the non-permanent state. The presence of causal relationships between past labour market experiences and future outcomes has serious policy implications for economies (such as the Spanish one) beset by a high incidence of temporary employment. A clear understanding of these relationships can guide policymakers' efforts to foster permanent employment, for example by helping determine whether reducing the accumulation of temporary contracts is an efficient means of lessening a worker's chances of ending up in an unstable labour position.

One novelty of this paper is that it considers employer diversification as an integral part of the individual's employment trajectory. Previous studies (Petrongolo and Guell, 2007; Gagliarducci, 2005; García-Pérez and Muñoz-Bullón, 2007) fail to account for the differing degrees of employer diversity among different workers, who may either move from firm to firm or hold successive contracts with the same firm between bouts of unemployment. This is an important issue, since one could argue that both the external and internal labour markets contribute to the individual's employment trajectory (see Lazear and Oyer, 2004 and Green and Leeves, 2004). Thus, while job interruptions seem to correlate more strongly to poor individual employment prospects than does temporary employment, it may be that workers who experience job interruptions also remain at the same firm more frequently than do those who move successively from one temporary contract to another. In other words, lower employer diversity—and not job interruptions— may account for the worsened prospects of these workers.

The database used in this study comes from a sample taken from the Social Security information files (samples 2005-2007), whose main attraction is their richness with respect to longitudinal information. Spain offers a particularly interesting context for this analysis, given its singularity within the European labour market as far as temporary employment is concerned. Although within Spain there have been several attempts to lift employment protection restrictions, and national and regional governments have implemented a number of active labour market policies designed to foster the demand for permanent contracts², temporary work continues to be far

¹ A more recent paper that also follows this approach in a multivariate duration model is that of Doiron and Goergens (2008)

² In Jimeno, Kugler and Hernanz (2005), Arellano (2005), Mendez (2008) and García-Pérez and Rebollo (2009) one can find interesting evaluation studies of these active labour market policies.

more prevalent here than it is elsewhere in the EU. This might mean that temporary contracts do not ultimately help workers to obtain stable employment, or it might mean that workers must hold several temporary contracts before they can hope to obtain a permanent one. The international literature on this subject supports both views. Hence, how the worker's job trajectory affects her chances of reaching a permanent contract is an open empirical question.

My study obtains the following main results. First, it suggests that some workers may become "*trapped*" in the temporary employment bracket, since their chances of obtaining a permanent contract seem to drop after some months of accumulating several temporary contracts under the same employer between bouts of unemployment. In particular, this study shows that a worker who wishes to maximize her probability of obtaining a permanent position would be better off obtaining a few long-term temporary contracts with different firms than several short-term ones at the same firm. Finally, it also shows that in order to test for the stepping stone effect of temporary workers, one must take into account whether or not the workers changes firms between two different temporary contracts. I would argue that these results point to an important nuance in Spanish hiring practice: namely, that a high percentage of temporary contracts in Spain are used to fill "permanent" positions.

The rest of this paper is organized as follows. Section 2 surveys the relevant empirical literature on the problem of temporary employment, Section 3 describes my methodology, Section 4 draws some basic statistics from the data used, and Section 5 presents the principal results of my estimations. Finally, Section 6 summarizes the main results and offers some conclusions. In the Appendix A I offer a general overview of the institutional background.

II Previous Empirical Studies

The effect of temporary employment on one's chances of obtaining a permanent position has been the focus of several studies of the Spanish economy (Toharia, 1996; Alba-Ramírez 1998; Amuedo-Dorantes, 2000; García-Serrano 2004; Casquel and Cunyat, 2005; Güell and Petrongolo, 2007; García-Pérez and Muñoz-Bullón, 2007). Typically, these studies analyse the transition rate from a single temporary contract to a permanent one without taking into account the characteristics of the worker's previous employment history. Broadly speaking, they point out that temporary contracts might represent more of a "*trap*" than a step towards labour stability, particularly for certain worker groups, and that Spanish employers tend use temporary contracts to cover permanent work needs in order to reduce their overall labour costs. Only the study by García-Pérez and Muñoz-Bullón (2007) considers the effect of the individual worker's

prior employment history when analyzing the transition into permanent employment among members of the temporary labour force, and conclude that temporary contracts do not constitute stepping stones towards permanent employment for the Spanish labour market.

Using data from the European Community Household Panel, D'Addio and Rosholm (2005) find that the duration dependence of the exit rate from a temporary to a permanent contract is positive for the average European woman, but decreases after two years for men. However, they stress that Spain is an exception in this regard and obtain that the worker's probability of falling into the temporality trap increases with the length of the temporary contract. Booth, Francesconi and Frank (2001, 2002), Zijl, Van Den Berg and Heyma (2004) and Gagliarducci (2005) examine this same issue for Great Britain, Holland and Italy, respectively. The first group finds that temporary contracts lasting between 18 and 40 months tend to favour worker access to permanent positions. This strong variability, they suggest, depends on the type of temporary contract and increases among workers holding seasonal positions. Interestingly, Zijl, Van Den Berg and Heyma (2004) obtain that temporary contracts tend to help previously unemployed individuals transition into permanent work. However, since such transitions from unemployment to permanent work are more common than those from temporary to permanent work, they conclude that temporary contracts do not significantly improve worker access to stable employment among Dutch unemployed workers.

Gagliarducci (2005) measures the impact of prior unemployment and/or temporary employment on the current worker's probability of transitioning into a permanent contract and finds that, among temporary workers, the duration dependence of the exit rate to a permanent contract is not linear. This result is in line with that found by Petrongolo and Guell (2007) and García-Pérez and Muñoz-Bullón in Spain (2007). In terms of matching models, this implies that good matches quickly become permanent positions, normally after the first contract has expired, whereas for longer contracts the worker's probability of obtaining a permanent position initially increases but then rapidly decreases. He also concludes that job interruptions, rather than temporary contracts, are to blame for the deterioration in the employment trajectory of temporary workers and sustains that labour reforms must seek to guarantee the continuity of employment after the worker's temporary contract has ended, rather than to diminish the number of temporary contracts *per se*. However, these analyses fail to consider whether the worker under study had moved from firm to firm or had held various contracts with same firm between episodes of unemployment. This is an important issue, since one could argue that both the external and internal labour markets contribute to the individual's employment trajectory (see Lazear and Oyer, 2004 and Green and Leeves, 2004). Hence, the apparently negative effect of job interruptions on the worker's career prospects may point to (and be explained by) a

deeper underlying trend: that workers who experience job interruptions also change firms more frequently than do those who move successively from one temporary contract to another. Alternatively, it could be that job interruptions are associated to job movements at the same firm.

III The Econometric Approach

I investigate multiple discrete duration times³ (see Lancaster, 1990 or Jenkins, 1995, for the basic features of discrete-time duration models) of the form (t_{ij}, c_{ij}, x_{ij}) , for individual $i=1 \dots n$ where x_{ij} is a set of covariates that can be time-varying; t_{ij} is the duration of each spell $j=1 \dots, J$ and $c_{ij}=(c_{ij1} \dots c_{ijL})$ is an indicator vector describing whether or not the individual spell j ends and if so, in which type of alternative, $l=1 \dots L$. If the $c_{ijl}=0$ for all $l=1 \dots L$, the observation in state “ j ” is treated as censored. For each state, this censored situation means either that the individual terminates the spell for any reason other than those described by the potential outcomes, or that the spell remained in effect at the time of the sampling.

The movements between states in a work history database can be represented by a binary event history vector $\{y_{jkt}\}$ that takes value 1 if and individual makes a “ j ” to “ k ” transition in period t and zero otherwise. The origin-destination specific transition rate is specified as follows:

$$\text{Pr ob}(y_{jkt} = 1) = \lambda(z_{jkt}) \quad (1)$$

and where $\lambda(\cdot)$ is the logistic cumulative distribution function as in Bover and Gómez (2004), Bover, Arellano and Bentolila, (2002), Ham and LaLonde (1996) and where z_{jk} is expressed as follows

$$z_{jkt} = \gamma^{jk}(t_{jk}) + x_{jk}(t_{jk})\beta^{jk} + h_{jk}(t_{sj})\rho^{jk} + v_{jk} \quad (2)$$

where $x_{jk}(t_{jk})$ is a vector of explanatory variables that may be time-invariant and time-variant controlling for observed heterogeneity, $h_{jk}(t_{sj})$ captures the lagged duration dependence and the occurrence dependence terms; the term $\gamma(t_{jk})$ stands for the so-called baseline hazard which represents the pattern of duration dependence and v_{jk} is the individual –unobserved– heterogeneity term specific to the origin and destination state. As has been extensively shown in

³ Discrete rather than continuous time is a natural choice since the duration variables are measured to the nearest quarter.

the literature⁴, the existence of unobserved heterogeneity in duration models may lead to inconsistent estimates of the parameters of interest, in particular of the baseline hazard and lagged duration and occurrence dependence. Here, I follow the approach proposed by Heckman and Singer (1984) and I assume that the unobserved heterogeneity term v may be divided into a limited number of mass points with a given probability. I impose in (2) that $\lambda(t_{jk})$ and β^k are fixed across spells. This is not required for identification, but it reduces the computational burden, increases the precision of the parameters estimates and, by imposing more structure, means that identification will probably depend less on the parametric assumption.

I have three basic labour states: temporary contract, unemployment and permanent contract. The first state presents three competing risks upon exit (another temporary contract, unemployment, or a permanent contract) while the second presents two such risks (temporary or permanent contract). Given the aim of this paper, I limit the type of transitions and consider the permanent contract to be an absorption state, removing each observation that ends in a permanent contract from the sample analysed. Dependence between both states, employment and unemployment, is assumed to be captured by observed and unobserved characteristics. The general form of the likelihood function is:

$$L(y^T) = \prod_{j=1}^J \left[\prod_{m=1}^M \pi_{jm} \left[\prod_{k=1}^K \left(\lambda_{jkt}(\cdot)^{y_{jkt}} \left[1 - \lambda_{jkt}(\cdot) \right]^{(1 - \sum_{l=1}^K y_{jlt})} \right) \right]^{\varphi_{jt}} \right] \quad (3)$$

where $\varphi_{jt}=1$ if a spell starts in state j and equals zero otherwise, v_m represents the unobserved heterogeneity term, m the number of points of support and π_{jm} their corresponding probabilities. The idea is that if the number of points of support increases, then any true underlying distribution for the unobserved heterogeneity can be approximated well. Nonetheless, in practice it is often difficult to find more than a few different mass points and usually, if more than two or three points of support are taken, then the estimates of them coincide (Van den Berg, 2001)⁵. In particular, I consider the case of two mass points distribution function and assume that the unobserved heterogeneity term is common in all spells of the same type. I also assume that the unobserved heterogeneity term is the same for all the competing alternatives in each type of spell and only differs in the case of the entrance probability to a permanent contract

⁴ See Lancaster, 1979, 1990, as well as the discussion of the identification of time varying regressors in Van den Berg, 2001

⁵ The fact that it is often difficult to find more than a few mass points may reflect the lack of information of v from the data. It is important to stress that the data do not provide observations on drawings from v . The information on v comes from the observed interaction between the duration dependence and the regressors of the hazard function, and it may be that a mixing distribution with a few mass points is often able to capture most of this (Van den Berg, 2001; Heckman and Singer, 1994).

by a constant⁶, (χ^u , and χ^e for the spells of unemployment and employment, respectively).

One point of concern is the initial conditions problem, i.e., the fact that the individual's probability of being observed in the employment state occupied by her on the date of sampling is determined by previous unobserved factors associated with her. I try to alleviate this problem by using sample selection criteria designed to minimize its incidence in the econometric analysis. First, I make my analysis conditional upon the sample of workers who first enter the job market under a temporary contract. Second, I restrict the analysis to younger workers aged between 18 and 29 at the time of that entry. Third, since I do not properly observe the worker's educational attainment level, I estimate the model separately for each of three groups, corresponding to those who entered the workforce between the ages of 18-21, 22-25 and 26-29. This information allows me to roughly control for the educational attainment level of each group.

IV The Data: Social Security Registers (MCVL 2005-2007)

The sample data for my analysis was drawn from a register in the Social Security System called the Longitudinal Working Lives Sample (for a detailed description of this sample, see Duran, 2007 and García-Perez, 2008). Currently, the social security system offers four samples corresponding to the years between 2004 and 2007. For this paper, I merged the three most recent databases (MCVL 2005-2007) and omitted the MCVL-2004, since the information it offered differs slightly from that available for subsequent years. In effect, therefore, my initial sample includes all individuals who came into contact with the Social Security system at least once between 2005 and 2007. This initial dataset contains information for more than one million workers and covers the entire career trajectory of each. Consequently, it provides me with a sample in which the individual labour market history is not left-censored.

Some restrictions are imposed on the initial database. First, I disregard simultaneous employment spells and use instead the information corresponding to the longest of these spells. Second, I unify any two registers that present overlapping contracts, i.e., in which one of the contracts begins before the previous one has ended. Third, I eliminate any register that is incomplete or inaccurate, such as those in which key information is missing or is clearly

⁶ That is, $(v_m(e)^j = \chi^e v_m(e)^{pc})$, where $v_m(e)^j$ is the unobserved heterogeneity term for the employed with a temporary contract that exit either to unemployment or to a temporary contract and $v_m(e)^{pc}$ is the unobserved heterogeneity term for the employed with a temporary contract that exit to a permanent contract. Equivalently for the unemployed, $(v_m(u)^j = \chi^u v_m(u)^{pc})$.

incorrect (incompatible starting and ending dates, etc.). Fourth, I merge two consecutive employment spells when the unemployment period between them is shorter than fifteen days, when the worker remains at the same firm and when there is no contract modification.

This database gives data relating to the worker's age, gender, occupation and unemployment/employment spells and the exact duration of each. Specifically, I use the hiring and end-of-contract dates to determine the duration of each employment and unemployment spell. This information allows me to transform the exact duration of each employment or unemployment spell into monthly or quarterly units. The latter is especially relevant here. Since the information gathered in other databases is either annual or quarterly, it excludes any data relating to individual labour market transitions taking place over the course of an entire year or quarter, respectively. As a result, it tends to under-represent the real number of labour market transitions involving temporary contracts for any given period. Another outstanding characteristic of the Longitudinal Working Lives Sample is that it enables me to observe contract modifications occurring within a single employment spell⁷. Without this information, I would have risked biasing my results by excluding those workers who had worked for the same employer first as a temporary and then as a permanent worker, with no unemployment gap between the two contracts. As in the previous case, this kind of information cannot be found in other labour market databases.

Another interesting characteristic of this database is that it assigns an authentication code to each firm. This allows me to identify situations in which the worker remains with the same firm after her contract has changed, or after an unemployment spell has ended. Therefore, I can guess whether the incidence of job interruptions into the entrance probability to a permanent contract is due to the existence of unemployment periods or to the movement to a different firm. It can be interesting to disentangle these two effects in order to gain a better understanding of the determinants of worker success at obtaining a permanent contract. More specifically, the negative incidence of unemployment periods and/or the accumulation of temporary contracts can be attributed to human capital depreciation –including general and specific skills- while for the case of changing firms it is more related to the depreciation of specific skills and the relevance of external versus internal labour markets. However, it is important to point out that the information for workers who are hired by a temporary help agency presents a special problem. In this case, the firm's code corresponds to the agency instead of to the firm where the individual finally works. This shortcoming is overcome in the empirical analysis by controlling

⁷ That is, I use two variables from the database (MCVL) called the “first contract modification” and “second contract modification”.

for whether or not the worker is hired by a temporary help agency⁸.

I use the term “unemployment” to denote all periods of non-employment. Since this definition could hide a situation of inactivity, I also take into account the reasons for ending the contract and omit those related to situations of inactivity such as those caused by health problems, maternity leave or retirement. Temporary employment can be defined in a number of different ways. Following the lead of previous studies (Guell and Petrongolo, 2007 or Booth, Francesconi and Frank 2001, 2002), this study uses a broad definition and considers a contract to be temporary if it falls into at least one of the following categories: fixed-term, task-specific, driven by a specific production need, or designed to facilitate employee training, internship or replacement.

IV.a Some Characteristics of the Data Set

From my initial data pool, I construct one sample comprised of workers (herewith referred to as *labour market entrants*), for whom the first observation coincides with the worker’s entrance into the labour market, which took place before the age of 30 and after 1994⁹. These criteria yielded a sample of 226,196 labour market entrants. From this sample, I select those workers who entered the labour market under a temporary contract and follow them until they obtained their first indefinite contract, at which point I removed them from the sample. Once I apply this selection criteria (about 10% of the initial sample), the sample drops to 205,633 workers¹⁰.

Finally, it should be noted that the econometric exercise is an estimation of a multiple spell and multiple events models. In order to handle my large sample database, I finally express the data in quarters instead of in months.

IV.a.1 Worker Sample

Table 1 and Figure 1 describe the employment trajectories of those entering the workforce under a temporary contract. Table 1 shows that between 44% to 48% of the workers analyzed obtained an indefinite contract during the sample period. For these younger labour market entrants, temporary employment might indeed have served as a springboard to stable work; however, for the remaining workers (over 50% of those sampled), temporary work proved to be a dead end.

⁸ This issue is not very important in this analysis, since about 85% of workers in the sample who remain at the same employer had had no previous contact with a temporary help agency. This percentage only drops to 80% when I look at workers who had changed firm once.

⁹ The empirical analysis begins after 1994 because the information relative to the type of contract is only reliable after that year.

¹⁰ Without taking into account contract modifications taking place within the same employment spell, I would have had to eliminate about 16% of my initial sample.

The data in Table 1 points to two different worker groups with two contrasting employment trajectories. On average, workers who eventually obtained permanent jobs had lengthier temporary contracts, held fewer temporary contracts, had less firm contacts and experienced less and shorter job interruptions than the other workers in the sample. By contrast, those who failed to transition into permanent jobs appear to have suffered from poorer overall working conditions: on average, they spent more time unemployed and signed more temporary contracts, especially short-term ones¹¹, changing firms more frequently than did other workers in the sample.

Figure 1 shows the proportion of workers signing permanent contracts at the start of each quarter whose employment record had been irregular from the time of their entrance into the labour market. Again, this figure calls into evidence the dual nature of temporary contracts. On the one hand, spending more time in a non-permanent position appears to have increased some workers' chances of obtaining a permanent contract. On the other hand, the strikingly long duration of the temporary phase alerts us to the presence of a "trap" for the remaining workers, for whom the empirical probability of accessing a permanent contract evolves to a point where it tends to decrease as the amount of time spent by the worker in the temporary state increases. While the weight of the drop depends on the age-cohort group, it is clearly present for all groups after four years of temporary contracts. This is an important issue, since about 40% of workers in our sample remained in the non-permanent position for more than four years. Also interesting is the fact that the exit rate reached local maximums at certain duration intervals -such as the second, fourth and eighth quarters—which might indicate that institutional factors are partly responsible for the average amount of time spent by different workers in the temporary employment state.

Figure 1 also brings to light the fact that the influence of temporary contract on the worker's career prospects differs slightly by age cohort, which I use to proxy the educational level of the workers. In particular, this figure shows that the entrance probability to a permanent contract is greater for higher/educated workers only during the first two or three years of non-permanent employment. After that period, this probability would seem to be greater for other worker groups. Moreover, the higher the worker's starting educational level, the sooner she seems fall into the temporality trap. That is, there appears to be a negative relationship between labour market experience and formal education, since workers with low levels of formal education must spend more time in temporary employment in order to maximize their probability of

¹¹ About 25% of these individuals accumulated nine temporary contracts, changed firms once and experienced five spells of unemployment; that is, they appear to have fallen into the temporary contract "trap".

obtaining a permanent contract.

IV.a.2 Temporary Contracts and Unemployment: Sample Spells

Before describing my data of spells of temporary contracts and unemployment experiences, I should clarify what I mean by a labour market transition. The workers in my data pool, all of whom hold temporary contracts, inevitably do one of three things after their contract ends: they find a permanent position, find another temporary job, or lapse into unemployment. Transitions among the unemployed workers in my sample always lead either to a temporary or a permanent position. I define any period of unemployment of less than one month between two consecutive jobs as a job-to-job transition; in all other cases, I consider the worker to be unemployed. Hence, all of the unemployment spells sampled for this study lasted longer than one month. Finally, when a worker enters into inactivity from a temporary contract or from unemployment, this spell is treated as censored¹².

The information shown in Tables 2 and 3 illustrates sample transition probabilities to a permanent contract for workers exiting from a single temporary contract (Table 2) or a state of unemployment (Table 3). Table 2 shows a low transition probability to a permanent contract, ranging from 9% for those aged 18 to 21 to 11% for those in other age cohorts. The most probable course of action for workers exiting from a temporary contract is unemployment (the likelihood of such an outcome increases by age cohort from a minimum of 39% to a maximum of 43%), followed by the signing of a new temporary contract (in this case, the likelihood increases by age group from a minimum of 36% to a maximum of 40%). An additional characteristic of these transitions surfaces when we focus on the shifts taking place within the same firm. Such transitions are more common when the transition is from one temporary contract to another (between 38% and 59% of the cases) rather than from a temporary to a permanent one (between 11% and 16% of cases). Similarly, more temporary workers hired through a temporary help agency exit into unemployment or temporary work (between 15%-19% and 23%-25% of the workers in this category, respectively) than into a permanent contract (between 5% and 6% of the workers).

The most interesting aspect of the data in Table 3 is the much lower probability of transitioning into a permanent contract shown for unemployed workers, a probability that varies between

¹²I have checked whether this is an important issue in my dataset. I have found that it is not especially relevant since the transition to self-employment after a temporary contract represents around 0.86% and 0.49% of the cases for male and female workers respectively. For the case of unemployed, the entrance into self-employment represents 1.43% and 0.97% of the cases for male and female workers respectively. Although this state is not considered explicitly in the analysis, these observations are not eliminated of the database and they are included in the censored spells

2.5% and 3.5% in accordance with the worker's age cohort. In light of this trend, I will henceforth focus only on workers holding temporary contracts.

The following Tables 4 and 5 show the proportion of temporary employment spells that lead to a permanent one relative to different prior labour paths. Tables 4 give this proportion relative to the number of temporary contracts held and periods of unemployment and Table 5 gives it relative to the number of employers and temporary contracts held. The first striking pattern to be observed here is the significant drop in the worker's entrance probability to a permanent contract as her number of temporary contracts increases. Thus, for a worker with no unemployment experiences –column one of Table 4- this transition probability after the signing of a second temporary contract drops from 8.6% to 2.7%, from 13.5% to 5.9% and from 17.8% to 7.1% for those in the younger to older age cohorts, respectively. The entrance probability to a permanent contract also tends to decrease with the number of job interruptions; nevertheless, this seems to be a less important variable, since such drop is smaller than the one caused by repeated temporary contracts.

Interestingly, the opposite effect can be observed in Table 5, where the entrance probability to a permanent contract begins to rise as worker mobility between firms increases, reaching a maximum after an individual has worked for two different firms. Thus, while the chance of obtaining a permanent contract after having held two temporary ones is relatively low among those who stay with the same employer (averaging 1.8%, 2.4% and 2.9% for younger, middle-aged and older workers, respectively), these probabilities rise to 10.3%, 14% and 14.9% when more than one firm is involved. However, since we have no way of determining whether workers hired through a temporary help agency are effectively holding two contracts with the same firm it would be premature to derive any clear conclusions from this result.

The statistics presented in this section show that for certain workers, the greater the number of temporary contracts and job interruptions, the higher the worker's likelihood of becoming "*trapped*" in an unstable situation with little hope of landing a permanent job. Summing up, for some workers, and depending on the previous labour market career, the transition probability to a permanent contract, in quarterly terms, states above 8.6% while for others is not higher than 2.9%.

Two approaches may be advanced to explain this trend. On the one hand, it may be that state dependence and past labour experiences condition the worker's chances of finding permanent employment in the future. For example, repeated temporary contracts with different employers combined with spells of unemployment may lead to a loss of specific and general human capital that alters the future employability of workers who fall into this pattern. On the other hand, it

may be that individual workers present certain unique and unobserved skills which firms seek to discover by evaluating the candidate's employment history. In both cases, the specific characteristics of the worker's past labour experiences directly affect her career prospects. Alternatively, the individual worker's probability of finding permanent work may be compromised by certain observed or unobserved variables that have little or nothing to do with the person's prior job experiences. In this case, public policy should target these characteristics, and the timing of the intervention may not matter very much. If state dependence is significant, however, the policy should ideally intervene early in a person's career in order to prevent unfavourable outcomes.

Hence, whether or not temporary employment represents a stepping stone or a dead end for the worker might depend, among other things, on the unobserved and observed worker's characteristics or on her previous labour market experiences. However, because this statistical analysis is unconditional and therefore possibly biased by the selection effects associated with observed and unobserved characteristics, it offers no definitive conclusions.

V Determinants of the Exit Rate to a Permanent Contract

I investigate the determinants of the transition behaviour of young workers who start their labour market career with temporary a contract in a multi-state, multi-spell framework. I distinguish between two initial labour market states: temporary contract and unemployment. In this framework, workers who exit from a temporary position face unemployment, another temporary job or a permanent contract as competing outcomes. For workers who start from a situation of unemployment, only the latter two courses of action are possible. The aim is to assess whether the relatively long period spent by the average worker in the non-permanent position corresponds to her need to accumulate human capital skills in order find the proper match for her skills, or whether, on the contrary, it indicates that she has fallen into an unstable path of recurrent temporary contracts and unemployment episodes.

For both of these starting states, the duration dependence $\chi(t)$ is specified as a quadratic function in order to capture non-linearities. However, several dummy variables describing specific points in time (the second, fourth and eighth quarters for the pool of temporary workers and the second and fourth quarters for the sample of unemployed workers) have been included to add flexibility and to control for the role of institutional factors. The first spikes are meant to capture short-term effects on the pool of temporary worker, while the longer ones capture the longer-term renewal dynamic among these same workers in relation to other factors, such as institutional

ones (Guell and Petrongolo, 2007).

A main aim of this paper is to disentangle the effect of previous labour market outcomes from that of other factors on the exit rate of workers moving from a temporary to a permanent contract. In principle, every aspect of a worker's employment history can affect her transition intensities; however, since it is impossible to analyze this point comprehensively, I focus here on three sets of variables: i) occurrence dependence defined by the accumulated number of multi-contract experiences and job interruptions per individual; ii) accumulated multi-firm experiences and iii) lagged duration dependence defined in terms of the cumulative duration of each state prior to that occupied at the time of sampling. The first two set of covariates are modelled as a group of dummy variables, comprised of seven dummy variables chosen to measure the effect of the worker's first ten temporary contracts, spells of unemployment, and employers on the exit rate from the current labour state. For instance, these seven dummy variables describe the accumulation of temporary contracts, previous to the current state, as follows: 1, 2, 3, 4, 5-6, 7-10 and >10. Thus I isolate the marginal effects of the first fourth temporary contracts. This approach is also applied for the case of job interruptions and multi-firm experiences. By contrast, the third set of covariates is specified as a quadratic function for each state. This specification is flexible, since it captures any non-linearities in the relationship between the exit rate from each initial state and the individual's employment history, thus enabling me to measure the marginal effect of each new labour experience on this exit rate.

The empirical model also evaluates those variables in my database –some of which are time-varying over the course of the spell and or from spell to spell- that control for worker and job heterogeneity. These variables include mainly age, age of entrance into the labour market, gender, nationality, wage category, the presence or absence of a temporary help agency as an intermediary in the contract-signing process, hours of work, firm ownership, firm size, and firm activity sector. I also include some aggregate variables, such as national output and the regional unemployment rate, in order to control for regional and cyclical variability. To control for aggregate effects, dummy variables for the worker's year of entrance into the Social Security records are also used. Table 6 provides summary statistics for main covariates considered in the duration analysis.

In the Appendix B, I display -Tables B.1, through B.4 display- the results of the joint estimation of the quarterly exit rate from the temporary contract and from unemployment, following the econometric approach described in previous section. Since the transition rate from a temporary contract to a permanent one is empirically far more relevant than the rate from unemployment, and for the sake of concreteness, I will focus on the case of temporary contracts. In addition, I

will focus the analysis of the results to the model with unobserved heterogeneity, since, in all cases, this component is relevant in the estimation and its omission lead to misleading conclusions.

In all cases, I observe that: i) the duration dependence of the exit rate from a temporary to a permanent contract is non-linear and only begins to decrease after the fifth or sixth quarter of temporary employment; ii) this exit rate reaches its maximum levels at specific duration intervals and mainly at the fourth and eighth quarters, which suggest that firms may choose to wait until the contract has ended and exhaust all legal limits before converting a temporary contract into a permanent one; iii) this exit rate strongly depends on the characteristics of the worker's employment history in that job interruptions decrease the worker's probability of transitioning into a permanent contract while employer diversification increases it; iv) though certain observed individual qualities and job characteristics strongly influence the exit rate to a permanent contract the unobserved heterogeneity term is also a relevant explanatory factor in the observed dispersion of the exit rate. In particular, it shows that, for certain groups, the probability of becoming trapped in an unstable labour path is high regardless of her observed characteristics and the time spent as a temporary worker.

I begin by highlighting the results for the unobserved heterogeneity component which suggests that the chances of finding stable employment vary within each of the groups studied. Detailed results of the unobserved heterogeneity terms are in Table B.1 of the Appendix B. The main idea to highlight is that all the terms relative to the unobserved heterogeneity component are statistically significant. Given the definition of the unobserved heterogeneity component, the estimation shows there are two types of workers who face different probabilities to exit from the temporary contract and from unemployment. In Tables 7 and 8 I display the estimated average exit rate from a temporary contract and from unemployment, respectively, by type of worker considering the unobserved heterogeneity component. First column of Table 7 displays the share of workers that belong to worker Type II. By age cohorts, workers Type II represent between 63%-66% of the sample pool. As can be seen from this Table, these workers Type II are those with better employment prospect since they have lengthier temporary contracts, lower transitions rates to temporary contracts and unemployment and larger entrance probability to permanent contracts, than workers Type I. Thus, the average exit rate to a permanent contract from a temporary one, among Type II workers, varies between 6.2%-7.4% whereas it drops to vary between 4.1-5.0% for the workers in the Type I group. These differences indicate that a Type II worker is more likely than a Type I one to move into permanent work, regardless of her specific job history and other individual and job observed characteristics. In Table 8, I display the estimated transition probability from unemployment. In this case, the differences between

workers Type I and II are also large, but the transition rate to a permanent contract is, in any case, close to zero. From now on, all of the results presented here will be averaged over the distribution of unobserved heterogeneity.

The parameters that measure the duration dependence of the exit rate from the temporary contract to each of the competing alternatives are all statistically significant and their signs are in keeping with the standard results in the literature. Briefly, they indicate negative duration dependence when the exit is to unemployment or another temporary work, and a non-linear relationship when the exit is to a permanent contract. In particular, Figure 2 represents the duration dependence of the average worker's estimated exit rate from a temporary to a permanent contract. In this case, excepting a brief peak at the end of the second year of employment, the temporary worker's chances of moving into a permanent position rise during the first year of the contract but decline thereafter, dropping dramatically after the second year of employment to less than 3%. These results strongly suggest that staying with the same job for relatively long periods of time might favour the accumulation of general and specific human capital, thereby increasing the worker's probability of transitioning into a permanent contract. This result is also in line with that found by Petrongolo and Guell (2007). In terms of matching models, the implication here is that good matches quickly become permanent positions, normally after the first short-term contract has expired, whereas for longer contracts the worker's probability of obtaining a permanent position initially increases but then rapidly decreases (although in some cases firms will exhaust the maximum legal duration of a temporary contract before converting it to a permanent one).

With regard to demographic variables and job characteristics, the above results show that immigrants, women, part-time workers, low-qualified workers, those hired through a temporary help agency, and those employed in the service sector face lower transition probabilities into a permanent contract. Interestingly, when the observed job transition occurs at the same firm, the most probable option is to have a temporary contract instead of a permanent one. Nevertheless, this variable is not always statistically significant.

Henceforth, my discussion of the estimation results will focus on those factors that influenced the impact of the worker's employment history on her chances of obtaining a permanent job at the time of sampling. In the Appendix B, Tables B.2 to B.4 show the results of estimating the multivariate hazard model for each age-cohort group, except those relative to the unobserved heterogeneity component. From these tables one can observe that the parameters of the covariates that control for lagged duration dependence and occurrence dependence as well as the parameters related to multi-firm experiences tend to be statistically significant for all age-

cohort groups and for any labour market outcome.

V.a Lagged Duration Dependence of Entrance Probability to a Permanent Contract

My model views as covariates the cumulative time spent by each worker in temporary work and –independently- unemployed, prior to accepting the contract held when the sample was drawn. When the number of temporary work spells, job interruptions and employers per individual are assumed to be constant, the estimates obtained for these variables can pinpoint the effect of an additional quarter spent in a particular job state at some point in the worker’s past on her career prospects.

Tables B.2 through B.4 show that these parameters -both variables are specified as a quadratic function- on the cumulative duration of previous job experiences are statistically significant. In general one can observe that the incidence of lagged duration dependence on the exit rate from the temporary contract to each competing alternative is non-linear. To aid the understanding of the results, these variables are used to estimate the quarterly exit rate from temporary work to each of the specified outcomes, in relation to the cumulative amount of time spent in the non-permanent position either as a temporary worker or in unemployment. The corresponding estimated rates are shown in Figures 3 through 5. Here, the results indicate that the probability of obtaining a permanent position (Figure 3) only increases during the person’s first three or four quarters as a temporary employee, after which it begins to decrease monotonically to levels lower than the ones observed at the beginning of the temporary employment path. By contrast, once the worker has entered the temporary job market her chance of getting trapped in a cycle of recurrent unemployment episodes and temporary employment raises dramatically. For all age cohorts, the worker’s probability of exiting into another temporary contract (Figure 4) only decreases during the first year at the temporary position while the exit to unemployment (Figure 5) monotonically grows since the first quarter. Thus, the longer the worker stays in a non-permanent position, the greater the “trapped” effect of temporary employment.

Nevertheless, when one considers the entire span of time spent in non-permanent situations, we do not find large variations in this exit rate to permanent employment. For instance, for those workers aged between 18 and 21 this rate rises from approximately 4 percent to 5 percent during the first year, dropping back down to 4 percent five years later. For workers aged between 22 and 25 the incidence seem to be slightly larger whereas for workers aged between 26-29 this incidence is clearly lower, than the one obtain for workers aged between 18 and 21. This trend seems to suggest that the amount of time spent in non-permanent position only marginally influences workers’ chances of obtaining a permanent contract. This result is reinforced when I

isolate the cumulative amount of time spent in the temporary state from that lost to unemployment; in this case, the incidence of lagged duration dependence concerned to a temporary contract is similar to the one discussed previously. In fact, Figure 6 shows that the exit rate from a temporary to a permanent contract relative to the accumulation of time with temporary contracts behaves similarly to the one shown in Figure 3. Hence, it seems that the chances of getting trapped into unstable labour path are not so strongly related to the time spent in the non-permanent position, particularly when accumulated unemployment duration is close to zero.

V.b Worker Employment History and the Exit Rate to a Permanent Contract: Occurrence Dependence and multi-firm experiences

I now explore whether the specific characteristics of a worker's employment history, including the number of different employers, temporary contracts and job interruptions experienced, influence her exit rate from a temporary position to a permanent contract. Generally, occurrence dependence may arise if employers use employment and unemployment records in their hiring and firing decisions. If this type of occurrence dependence exists, then, the probability of exiting into a permanent contract will decrease, particularly with the number of accumulated temporary contracts and job interruptions.

As it was already explained above, the number of temporary contracts, unemployment spells and multi-firm experiences are modelled as a group of dummy variables, comprised of seven dummy variables chosen to measure the effect of the worker's first ten temporary contracts, spells of unemployment, and employers on the exit rate from the current labour state. In general, the results described in these tables suggest the existence of occurrence dependence. More specifically, the parameters on the cumulative number of previous temporary job spells and periods of unemployment tend to be statistically significant and suggest that workers with prior temporary job spells are more likely than other workers to transition into new temporary jobs and unemployment. When we consider these temporary spells together with job interruptions, the worker's likelihood of transitioning into a new temporary contract or lapsing into unemployment tend to be the same or larger. Conversely, working for a number of different employers appears to reduce the worker's chances of becoming unemployed.

The estimates for the cumulative number of temporary contracts, unemployment episodes and firm experiences per state, can be used to analyze the effect on workers of having acquired an extra spell at some point in the past, assuming that the total amount of time spent in each state is constant. Thus, the set of dummies that describes the number of temporary contracts can capture

the difference between having had various short temporary versus a few long ones. Equivalently, the set of dummies that control for the number of multi-firm experiences can capture the difference between having different temporary contracts at the same firm or in different firms. Tables 9-12 show these estimated exit rates for the average worker except for the case of the employer trajectory. Basically, the estimated exit rates shown in these tables differ in terms of the type of employer trajectory analysed. In Table 9, I compute the exit rate from a temporary contract to each of the competing alternatives while holding as constant all the parameters of the model except the dummy variables, relative to the number of temporary contracts. In this context, the exit rate varies only when the worker accumulates temporary contracts. Whereas in table 10, I compute this rate while holding as constant all parameters except those that refer to the number of temporary contracts and job interruptions. In both cases, however, I assume that she always returns to the same employer. Thus, for example, the exit rate for a worker who has remained with a single temporary contract appears in the first row of Table 9, the exit rate for the worker holding two temporary contracts over the same period appears in the second row, and so on. This format allows me to discern that, for the group in question, the exit rate varies with the number of temporary contracts accumulated when the total time spent in the temporary work sector remains the same. In Table 10 I offer a similar analysis but the rate is computed holding as constant all parameters except those that refer to the number of temporary contracts as well as those that refer to the number of unemployment episodes.

A number of interesting conclusions can be derived from the evolution of the estimated exit rate shown in Tables 9-10. First, it indicates that the exit rate to a permanent contract is greatest when the worker holds only one temporary contract over the course of a two years period – which is the reference time used in this exercise-, and that it decreases if she cycles through several temporary contracts during this same period (Table 9). Second, it shows that the exit rate to a temporary contract experiences a large increase as the worker accumulates temporary contracts in all age groups. For all but the youngest workers in this group, the exit rate from the temporary to a permanent contract drops most drastically when the workers move from their first to their second temporary contract. For these younger workers, the largest drop takes place in the transition from the second to the third temporary contract. This decline in the exit rate to a permanent contract is more pronounced among workers aged between 22 and 25 and 26 and 29, for whom the estimated exit rate drops from 8.11% to 5.37% among the former and 7.02% to 5.04% among the latter. After ten temporary contracts, the exit rate drops to 4.02% and 3.65%, respectively. For workers age between 18 and 21 this decline is less pronounced and the estimated exit rate drops from 4.70% to 4.37% from the second to the third temporary contract and after ten temporary contracts states around 4.29%. Clearly, therefore, from the worker's

perspective it is better to accept a single long-term temporary contract than several shorter ones over the same period of time. Once the worker starts accumulating temporary contracts, even short ones, the probability of rotating between temporary contracts strongly increases. Thus, this probability rises after the first temporary contract from 11.92% to 15.97%, from 8.16% to 10.59% and from 7.37% to 9.79%, by age cohort groups from the youngest to the oldest. After more than ten temporary contracts this exit probability grows to 33.35%, 22.95% and 28.92%, respectively.

When the worker experiences a job interruption when changing the temporary contract (Table 10), the exit rate to a permanent contract is always lower than the one obtained when the worker only accumulates temporary contracts (just shown above in Table 9). As before, the drop is most pronounced after the first job interruption, following which the worker's exit rate decreases at a lower rate as the period of unemployment persists. Moving from the youngest to the oldest age cohorts, the rate thus drops from 4.77% to 4.39%, from 8.11% to 5.32% and from 7.02% to 5.01% after just one temporary contract followed by one unemployment spell. For instance, the exit rate from a temporary to a permanent contract after two temporary contracts is 4.37%, 5.12% and 4.50%, respectively, whereas when having also job interruptions drops to 4.04%, 4.80% and 3.94%. The exit rate to another temporary contract notably increases as the worker experiences new job interruptions and in this case, also it sharply increases the exit rate to unemployment. Hence, the existence of job interruptions clearly worsens the employment perspectives of temporary workers.

My data also allows me to analyse how the exit rate from the temporary employment responds to the diversification of the worker's employer portfolio as she accumulates new temporary contracts (Tables 11 and 12). In Table 11, I compute the exit rate to a permanent contract while assuming that the worker experiences only job-to-job transitions; in Table 12, I assume that she also experiences job interruptions when changing firms. It is interesting to note that workers who accumulate temporary contracts at the same firm will have a lower exit rate to a permanent contract than those who accumulate such contracts at more than one firm. For instance, the exit rate to a permanent contract of a younger worker who has already held two temporary contracts at the same firm is between 4.37% and 5.12%, while this rate rises to between 6.39% and 7.62% when the temporary contracts are held with different firms. By contrast, this positive effect of changing firms drops when the worker also experiences job interruptions (Table 12). Thus, the exit rate to a permanent contract of a younger worker who has accumulated two temporary contracts with a different firm and has experience unemployment episodes in each case states around 5.58% and 7.28%. I thus conclude that multi-firm experiences may have a positive impact on the exit rate to a permanent contract, and that the behaviour of the firm is also

relevant the worker's probability of getting *trap* in a situation characterised by short-term temporary contracts and job interruptions. Moreover, these results also show that to value the incidence of the accumulation of temporary contracts over the transition probability to a permanent contract is important to take into account whether or not the worker remains in the same firm.

Summing up, the above results suggest that while a single temporary experience can be helpful, repeated temporary contracts may ultimately hinder the worker's chances of obtaining stable employment. The situation appears to worsen when repeated temporary contracts are followed by job interruptions. This result may indicate the existence of a negative signalling effect among certain temporary worker groups, i.e., those who accumulate temporary contracts followed by job interruptions, who may be viewed by employers as low-productivity workers or as workers specializing in short-term jobs. On the basis of this evidence, I conclude that the optimal strategy for workers wishing to obtain a permanent contract would be to accept a very limited number of long-term temporary contracts and to avoid job interruptions. From an economic policy point of view, a labour policy that aims to reduce the segmentation of the labour market should strive to discourage workers from accumulating short-term temporary contracts.

Nevertheless, the data also indicates that repeated temporary contracts may favour the worker's entrance into permanent work when more than one employer is involved. The overall suggestion is that if a worker must accumulate temporary contracts, it would be better for her to change firms than to stay with the same one. From an economic policy point of view, a labour policy that aims to reduce the segmentation of the labour market should strive to discourage firms to use temporary contracts to fill permanent positions.

VI Summary and Conclusions

After two decades of strong labour market segmentation in Spain, it is now generally accepted that temporary contracts must be limited. This consensus was a driving force behind the labour market reforms of the 1990s, which continue to figure prominently in Spain's economic agenda. Yet large numbers of temporary contracts continue to be signed year after year, with no clear sign of abatement; on the contrary, the percentage of new contracts occupied by temporary hires is still quite high in Spain (about 80%). A serious consequence of this trend is that workers tend to rotate constantly between temporary work to unemployment, with little hope of finding a stable position. The phenomenon has a severe negative impact on the workers' projected rents, since job instability goes hand in hand with low-paid work, which affects both unemployment

compensation and retirement funds.

In this study, I applied an event history approach and estimated a multivariate hazard model to investigate the extent and type of state dependence in labour market outcomes for a sample of young Spanish temporary workers, using data from the Spanish Social Security records, (MCLV, 2005-2007) and considering distinct employment states corresponding to unemployed, temporary and permanent workers. My empirical model incorporated observed and unobserved heterogeneity along with a flexible specification for state dependence, and included parameters for current duration dependence (that shown at the time of sampling), previous duration dependence (the cumulative number of spells over time) and cumulative lagged duration dependence. One interesting novelty of the paper is that it also included parameters for multi-firm experiences. To reduce the impact of the initial conditions problem, I studied only those workers entering into a permanent contract via a temporary contract and who could be classified in as younger entrant workers. In addition, I divided my pool of labour market entrants into three age cohorts (of workers aged 18-21, 22-25 and 26-29), performing separate estimations for each.

In my statistical analysis, I noted that the transition rate to a permanent contract in Spain was fairly low for the workers in my sample, although this result may reflect the worker's need to acquire the general human capital in the temporary sphere needed to acquire a permanent position. In other words, it may be that cycling through several temporary contracts allows the worker to sharpen her general and specific skills (given that she remains in the same firm or job type), thereby making it viable for firms to convert the temporary contract into a permanent one once her productivity rate is seen to offset the high cost of permanence.

The results presented in the paper confirm that high job turnover rates might reduce an employee's chances of obtaining permanent employment. In particular, it drops significantly among workers who have moved through several temporary contracts and periods of unemployment. On the contrary, changing employers as a temporary employee might increase the employer chances of finding a stable job. This last result points out that to test for the stepping stone effect of temporary contracts, one must take into account whether or not the worker changes firm between these contracts.

These results underscore certain aspects of current Spanish hiring practice and raise the question as to whether many of so-called "temporary" jobs truly are temporary in nature. On the one hand, some firms do use temporary contracts as screening devices (in which case a six-to-twelve-month contract gives employers the time they need to confirm the validity of a match), though, they might routinely exhaust their legal limits before converting temporary contracts

into permanent ones. But, on the other hand, some Spanish firms seem to be almost exclusively reliant on temporary contracts as a means of maintaining external and internal flexibility, despite the productivity costs that excessive labour rotation implies. Workers who establish labour relationships with such firms can get trapped in a permanent state of temporary employment that stunts their ability to accumulate specific human capital, for analysts agree that motivation among businesses and workers to invest in training and experience depends positively on the expected duration of the labour relationship. Hence, institutional hiring practices, in other words, also influence the duration of temporary employment.

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Tables

Table 1: Main Characteristics of the Labour Path (Sample of Workers, 1995-2006)

	<u>Workers with no PC</u>			<u>Workers who eventually get a PC</u>		
	18-21	22-25	26-29	18-21	22-25	26-29
				44.63%	48.67%	44.43%
Time spent in the <i>Non-Permanent</i> position	14.83	12.81	11.22	15.72	12.03	10.40
Time with TCs (multiple-spells of TC)	10.31	10.25	9.80	10.52	9.76	9.28
Time with Unemp. Periods (multiple-spells of Unemp.)	7.42	5.48	4.69	5.61	3.65	2.74
TC Duration (one spell)	3.65	4.95	4.21	8.87	10.23	11.33
Unemp. Duration (one spell)	3.70	3.56	3.65	1.51	1.57	1.61
N° of TC	7.75	6.29	5.54	4.62	3.90	2.47
N° of Unemp.	4.98	3.79	3.04	3.64	2.30	1.56
N° of Firms	3.32	2.41	2.15	3.01	2.17	1.71
N (Workers)	54,644	31,485	17,934	50,805	66,611	17,154

Note: TC=Temporary Contract; PC=Permanent Contract; Unemp.=Unemployment; *Non-Permanent position*=multiple spells of TC and Unemp. Experiences.

Figure 1: Entrance Probability to a Permanent Contract relative to the Duration of the “Non-Permanent” State by age cohorts (Sample of Workers 1995-2006)

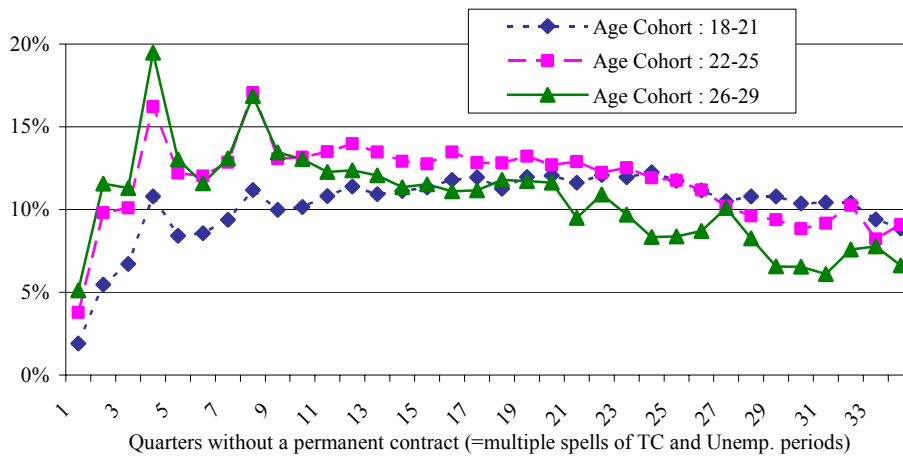


Table 2: Main sample transitions after the holding of a temporary contract by age-cohorts (Sample of Spells, 1995-2006)

	<u>18-21</u>		<u>22-25</u>		<u>26-29</u>	
	N	%	N	%	N	%
<u>Censored</u>	35,815	6.36%	23,518	8.88%	13,374	10.25%
<u>Unemp.</u>	243,083	43.16%	106,701	40.30%	51,909	39.69%
- Temporary Help Agency		15%		19%		18%
<u>TC</u>	229,207	40.70%	99,523	37.59%	49,638	36.98%
- Same firm		59%		39%		36%
- Temporary Help Agency		23%		26%		25%
<u>PC</u>	55,095	9.78%	33,041	11.23%	15,184	11.68%
- Same firm		16%		13%		11%
- Temporary Help Agency		5%		6%		6%
N° of Spells	563,200		262,783		130,105	

Note: TC=Temporary Contract; PC=Permanent Contract; Unemp.=Unemployment. Age Cohorts are defined by the age of entrance in the labour market

Table 3: Main Sample transitions following unemployment by age-cohorts (Sample of Spells 1995-2006)

	<u>18-21</u>		<u>22-25</u>		<u>26-29</u>	
	N	%	N	%	N	%
<u>Censored</u>	38,320	16.13%	23,135	18.42%	15,409	21.76%
<u>Temporary Contract</u>	193,398	81.38%	98,509	78.42%	52,905	74.70%
- Same firm		26%		29%		29%
- Temporary Help Agency		15%		19%		21%
<u>Permanent Contract</u>	5,917	2.49%	3,970	3.16%	2,513	3.55%
- Same firm		21%		21%		19%
- Temporary Help Agency		9%		11%		13%
N° of Spells	237,635		125,614		70,827	

Note: TC=Temporary Contract; PC=Permanent Contract; Unemp.=Unemployment. Age Cohorts are defined by the age of entrance in the labour market

Table 4: Entrance Probability to Permanent Contract from a temporary one relative to the number of TC and Unemp. experiences (Sample of Spells, 1995-2006)

Age-Cohort 18-21							
N° TC	N° of Unemp. Experiences						
	0	1	2	3	4	5	>=6
1	8.60%	9.41%	-	-	-	-	-
2	2.77%	4.32%	6.05%	-	-	-	-
3	1.06%	1.78%	3.54%	4.09%	-	-	-
4	0.40%	0.82%	1.75%	2.96%	2.85%	-	-
5	0.15%	0.39%	0.89%	1.67%	2.29%	1.95%	-
>=6	0.18%	0.79%	1.90%	3.76%	5.84%	6.99%	29.99%

Age-Cohort 22-25							
N° TC	N° of Unemp. Experiences						
	0	1	2	3	4	5	>=6
1	13.51%	10.67%	-	-	-	-	-
2	5.97%	5.48%	5.52%	-	-	-	-
3	1.97%	2.49%	3.91%	3.39%	-	-	-
4	0.79%	1.09%	2.02%	2.76%	2.18%	-	-
5	0.29%	0.47%	0.98%	1.61%	1.96%	1.39%	-
>=6	0.12%	0.47%	1.11%	2.06%	3.15%	4.19%	20.37%

Age-Cohort 26-29							
N° TC	N° of Unemp. Experiences						
	0	1	2	3	4	5	>=6
1	17.83%	10.82%	-	-	-	-	-
2	7.14%	5.52%	5.66%	-	-	-	-
3	2.63%	2.54%	3.64%	3.29%	-	-	-
4	0.83%	1.11%	2.00%	2.46%	2.08%	-	-
5	0.26%	0.47%	0.91%	1.57%	1.72%	1.27%	-
>=6	0.14%	0.48%	1.03%	1.82%	2.83%	3.61%	16.19%

Note: TC=Temporary Contract; Unemp.=Unemployment. Age Cohorts are defined by the age of entrance in the labour market

Table 5: Entrance Probability to Permanent Contract from a temporary one relative to the number of TC and Firm experiences (Sample of Spells, 1995-2006)

<u>Age-Cohort 18-21</u>						
N° TC	N° of Firms					
	1	2	3	4	5	>=6
1	8.60%	-	-	-	-	-
2	1.87%	10.32%	-	-	-	-
3	0.74%	3.79%	6.90%	-	-	-
4	0.44%	1.57%	3.62%	4.18%	-	-
5	0.39%	0.81%	1.88%	2.88%	2.57%	-
>=6	4.26%	1.87%	3.64%	5.76%	7.22%	26.65%

<u>Age-Cohort 22-25</u>						
N° TC	N° of Firms					
	1	2	3	4	5	>=6
1	13.50%	-	-	-	-	-
2	2.46%	14.15%	-	-	-	-
3	0.87%	4.07%	8.05%	-	-	-
4	0.54%	1.75%	3.87%	4.42%	-	-
5	0.46%	1.00%	1.86%	2.65%	2.35%	-
>=6	4.39%	2.25%	3.47%	5.00%	5.84%	17.10%

<u>Age-Cohort 26-29</u>						
N° TC	N° of Firms					
	1	2	3	4	5	>=6
1	17.83%	-	-	-	-	-
2	2.96%	14.99%	-	-	-	-
3	1.17%	4.32%	8.33%	-	-	-
4	0.74%	1.76%	3.53%	4.26%	-	-
5	0.56%	0.92%	1.65%	2.53%	2.26%	-
>=6	4.03%	2.22%	2.91%	3.75%	4.60%	14.68%

Note: TC=Temporary Contract; Age Cohorts are defined by the age of entrance in the labour market

Table 6: Main sample Characteristics by age -cohort groups (Sample of Spells, 1995-2006)

		<u>18-21</u>	<u>22-25</u>	<u>26-29</u>
<u>Initial State: Temporary Contract</u>				
<u>Personal</u>				
<u>Characteristics</u>	Age	21.8	23.5	27.2
	Immigrant	3.13%	10.94%	18.05%
	Gender	54.90%	45.78%	47.15%
<u>Job</u>				
<u>Characteristics</u>	Contract Duration (Quarters)	2.8	3.7	3.2
<u>(current Job)</u>	Temporary Help Agency	13.09%	11.97%	10.40%
	Part-time job	24.12%	22.21%	20.36%
Wage Category	Medium-High and High	12.96%	44.73%	13.75%
	Medium-Low	31.10%	31.75%	31.99%
	Low	52.40%	25.53%	35.90%
Sector of Activity	Industry	13.77%	10.46%	8.97%
	Construction	14.49%	11.76%	13.59%
	Services	72.73%	78.78%	78.33%
Firm's Size	>50 Employees	39.1%	39.9%	39.3%
	20-50 Employees	14.2%	13.4%	14.3%
	< 20 Employees	53.3%	52.7%	53.6%
	Private Firm	94%	95%	94%
	Same Firm (next spell)	16.11%	18.36%	18.37%
<u>Previous Labour</u>				
<u>Path</u>	N° of Unemp. Spells	3.1	2.9	2.9
	N° of firms	2.3	2.0	2.0
	N° of TC	5.5	4.4	5.4
	Accum. duration in Unemp. (quarters)	5.0	4.2	4.0
	Accum. duration with TC (quarters)	5.6	5.3	5.1
<u>Initial State: Unemployment</u>				
<u>Personal</u>				
<u>Characteristics</u>	Age	21.7	23.2	27.1
	Immigrant	5.43%	12.40%	21.18%
	Gender	50.79%	42.37%	47.15%
	Unemployment Duration (Quarters)	5.8	5.3	5.1
	Received Unemp. Benefits	8.75%	9.02%	11.52%
<u>Job</u>				
<u>Characteristics</u>	Temporary Help Agency	19.19%	17.78%	12.42%
<u>(previous Job)</u>	Part-time job	28.92%	32.21%	25.63%
Wage Category	Medium-High and High	12.96%	29.40%	13.75%
	Medium-Low	31.10%	34.57%	31.99%
	Low	52.40%	36.13%	35.90%
Sector of Activity	Industry	12.26%	9.26%	7.79%
	Construction	14.99%	10.02%	13.01%
	Services	73.75%	81.72%	79.20%
Firm's Size	>50 Employees	32.33%	33.81%	34.31%
	20-50 Employees	11.00%	11.25%	10.56%
	< 20 Employees	56.27%	55.04%	55.13%
	Private Firm	94%	96%	94%
	Same Firm (next spell)	14.91%	14.03%	14.07%
<u>Previous Labour</u>				
<u>Path</u>	N° of Unemp. Spells	4.3	4.1	3.9
	N° of firms	2.8	1.7	1.9
	N° of TC	5.1	3.6	5.1
	Accum. duration in Unemp. (quarters)	5.1	4.4	3.8
	Accum. duration with TC (quarters)	4.3	4.0	3.9

Note: TC=Temporary Contract; Age Cohorts are defined by the age of entrance in the labour market

Table 7: Estimated exit rate from a temporary contract to each competing alternative by type of worker defined in terms of the unobserved heterogeneity component

Age Cohort	Probability of being worker Type II	Unemp.		TC		PC	
		Type I	Type II	Type I	Type II	Type I	Type II
18-21	63.67%	23.52%	12.51%	22.31%	11.86%	4.79%	7.01%
22-25	64.54%	21.19%	10.50%	19.84%	9.83%	5.09%	7.48%
26-29	66.11%	23.62%	11.68%	18.40%	9.09%	4.13%	6.22%

Note: The unobserved heterogeneity term has two mass points so I estimate the exit rate for two types of individuals. These exit rates are estimated for the average worker. T.C.=Temporary Contract; Unemp.=Unemployment; exit rate measured at the second quarter of the TC.

Table 8: : Estimated exit rate from a unemployment to each competing alternative by type of worker defined in terms of the unobserved heterogeneity component

Age Cohort	TC		PC	
	Type I	Type II	Type I	Type II
18-21	40.39%	29.79%	0.02%	0.22%
22-25	20.96%	14.83%	0.06%	1.37%
26-29	32.81%	23.41%	0.12%	1.89%

Note: The unobserved heterogeneity term has two mass points so I estimate the exit rate for two types of individuals. These exit rates are estimated for the average worker. T.C.=Temporary Contract;

Figure 2 : Estimated duration dependence of the exit rate from a temporary to a permanent contract

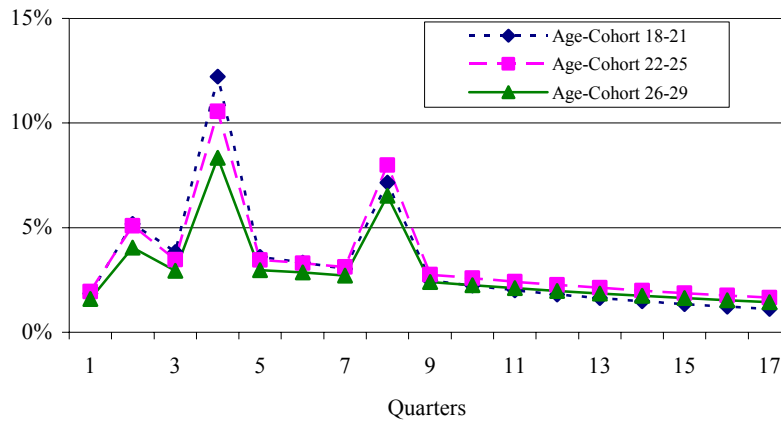


Figure 3: Estimated Transition probability to a permanent contract relative to the duration of the *non-permanent position* by age-cohorts (lagged duration dependence)

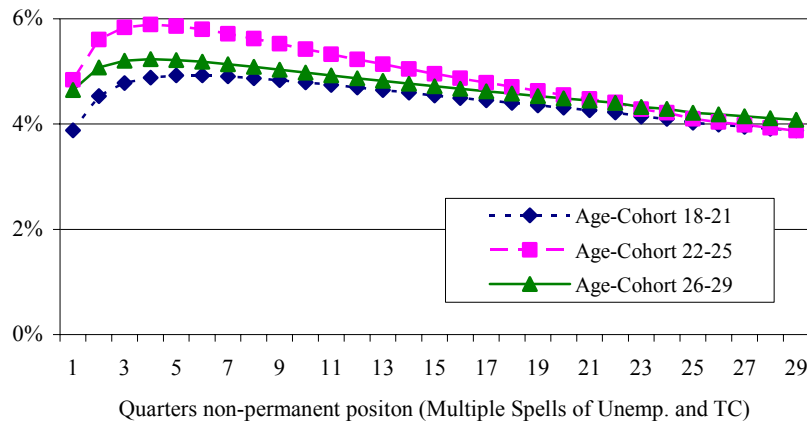


Figure 4: Entrance probability to a temporary contract relative to the duration of the *non-permanent position* by age-cohorts

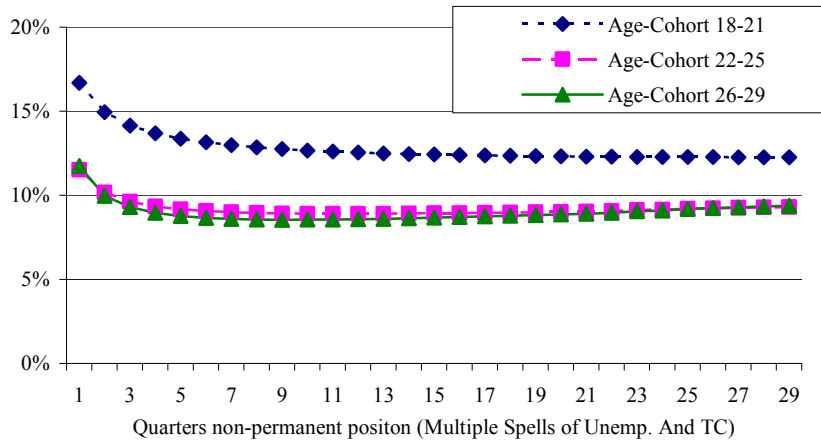


Figure 5: Entrance probability to unemployment relative to the duration of the *non-permanent position* by age-cohorts (lagged duration dependence)

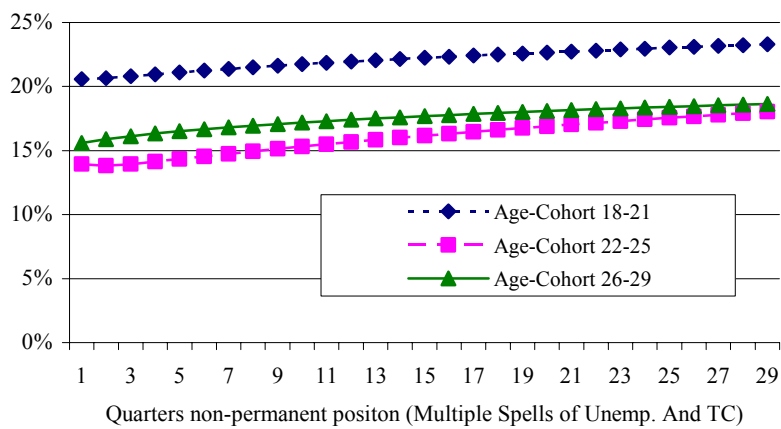


Figure 6: Entrance probability to permanent relative to the accumulated time with temporary contracts

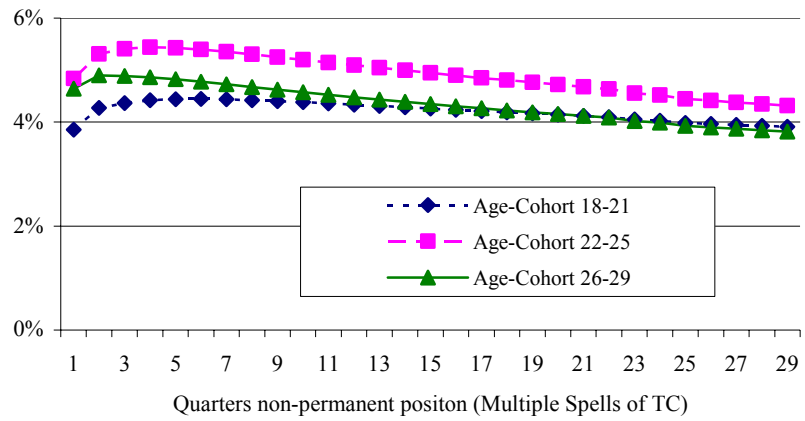


Table 9: Estimated exit rate from a temporary contract by the number of accumulated temporary contracts

N° of TC	<u>Age Cohort 18-21</u>			<u>Age Cohort 22-25</u>			<u>Age Cohort 26-29</u>		
	<u>U</u>	<u>TC</u>	<u>PC</u>	<u>U</u>	<u>TC</u>	<u>PC</u>	<u>U</u>	<u>TC</u>	<u>PC</u>
0	25.57%	11.92%	4.77%	14.76%	8.16%	8.11%	14.06%	7.37%	7.02%
1	18.18%	15.97%	4.70%	10.54%	10.59%	5.37%	10.82%	9.79%	5.04%
2	16.52%	19.24%	4.37%	9.37%	12.77%	5.12%	10.63%	11.80%	4.50%
3	14.82%	21.79%	4.27%	8.43%	14.36%	4.52%	9.39%	14.30%	4.14%
4	13.20%	23.78%	4.29%	7.52%	16.32%	4.22%	8.58%	16.24%	4.23%
5-6	10.84%	26.95%	4.36%	6.46%	17.36%	4.24%	6.94%	18.32%	4.15%
7-10	8.74%	29.77%	4.43%	5.11%	18.87%	3.91%	5.68%	21.55%	3.76%
>10	6.59%	33.35%	4.29%	3.60%	22.95%	4.02%	4.40%	28.92%	3.65%

Note: 0=Measure the transition probability for a worker currently employed with a temporary contract –at the second quarter of such contract-, who has had no temporary contracts previously; 2=Measures the transition probability when the worker has accumulated one temporary contract before de current temporary contract, and so on.

Table 10: Estimated exit rate from a temporary contract by the number of accumulated temporary contracts and job interruptions

N° of TC+Unemp	<u>Age Cohort 18-21</u>			<u>Age Cohort 22-25</u>			<u>Age Cohort 26-29</u>		
	<u>U</u>	<u>TC</u>	<u>PC</u>	<u>U</u>	<u>TC</u>	<u>PC</u>	<u>U</u>	<u>TC</u>	<u>PC</u>
0	25.57%	11.92%	4.77%	14.76%	8.16%	8.11%	14.06%	7.37%	7.02%
1	30.64%	12.43%	4.39%	14.24%	11.05%	5.32%	20.69%	7.45%	5.01%
2	28.95%	16.10%	4.04%	17.42%	13.48%	4.80%	20.12%	10.15%	3.94%
3	29.90%	18.33%	3.73%	18.69%	15.08%	4.30%	23.21%	11.35%	4.12%
4	31.16%	20.41%	3.14%	19.35%	16.44%	3.45%	23.14%	13.52%	3.66%
5-6	31.86%	21.46%	3.09%	18.99%	17.54%	3.82%	24.77%	14.20%	3.39%
7-10	30.47%	24.33%	2.85%	18.82%	18.89%	3.32%	24.60%	14.93%	3.42%
>10	25.76%	30.60%	2.50%	18.96%	27.56%	3.12%	21.64%	19.82%	3.34%

Note: 0= Measures the same transition probability as in Table 9; 1=Measure the transition probability for a worker currently employed with a temporary contract –at the second quarter of such contract-, who has had one temporary contract and one unemployment experience; 2=Measures the transition probability when the worker has accumulated two temporary contracts and two unemployment experiences before de current temporary contract, and so on.

Table 11: Estimated exit rate from a temporary contract by the number of multi-firm experiences and multi-temporary contracts

N° of TC and employer	<u>Age Cohort 18-21</u>			<u>Age Cohort 22-25</u>			<u>Age Cohort 26-29</u>		
	<u>U</u>	<u>TC</u>	<u>PC</u>	<u>U</u>	<u>TC</u>	<u>PC</u>	<u>U</u>	<u>TC</u>	<u>PC</u>
0	25.57%	11.92%	4.77%	14.76%	8.16%	8.11%	14.06%	7.37%	7.02%
1	15.28%	15.74%	5.79%	8.95%	9.80%	6.65%	8.71%	9.38%	5.79%
2	12.38%	18.98%	6.39%	7.33%	11.59%	7.62%	7.92%	11.16%	6.80%
3	10.43%	21.04%	6.77%	6.13%	12.72%	7.97%	7.10%	13.32%	6.51%
4	9.45%	22.90%	7.02%	5.41%	14.37%	7.57%	5.93%	14.91%	7.43%
5-6	7.98%	25.06%	7.72%	4.56%	15.14%	8.35%	5.16%	16.81%	7.92%
7-10	7.00%	28.16%	7.60%	3.90%	15.93%	7.87%	4.77%	20.68%	7.06%
>10	6.22%	36.31%	6.55%	3.53%	23.84%	7.62%	4.15%	31.86%	4.26%

Note: 0= Measures the same transition probability as in Table 9; 1=Measure the transition probability for a worker currently employed with a temporary contract –at the second quarter of such contract-, who has had one temporary contract and has changed firm once; 2=Measures the transition probability when the worker has accumulated two temporary contracts and two firm firms before de current temporary contract, and so on.

Table 12: Estimated exit rate from a temporary contract by the number of multi-firm experiences, multi-temporary contracts and job interruptions

N° of TC and employer experiences and unemp. spells	<u>Age Cohort 18-21</u>			<u>Age Cohort 22-25</u>			<u>Age Cohort 26-29</u>		
	<u>U</u>	<u>TC</u>	<u>PC</u>	<u>U</u>	<u>TC</u>	<u>PC</u>	<u>U</u>	<u>TC</u>	<u>PC</u>
0	25.57%	11.92%	4.77%	14.76%	8.16%	8.11%	20.69%	7.45%	7.02%
1	27.19%	15.73%	5.43%	16.67%	10.41%	6.59%	16.55%	9.93%	5.83%
2	25.64%	16.94%	5.58%	16.40%	12.36%	7.28%	17.93%	11.13%	6.12%
3	23.81%	19.36%	6.00%	16.06%	13.11%	7.86%	18.22%	13.11%	6.37%
4	24.91%	20.42%	5.55%	16.22%	14.87%	6.45%	18.15%	13.80%	6.44%
5-6	24.57%	22.41%	6.08%	17.07%	15.46%	7.84%	19.24%	14.40%	6.90%
7-10	22.33%	28.34%	5.40%	15.16%	19.07%	6.96%	18.69%	19.57%	6.13%
>10	20.64%	34.03%	3.86%	13.53%	28.84%	6.28%	16.69%	30.45%	3.62%

Note: 0= Measures the same transition probability as in Table 9; 1=Measure the transition probability for a worker currently employed with a temporary contract –at the second quarter of such contract-, who has had one temporary contract, one unemployment episode and has changed firm once; 2=Measures the transition probability when the worker has accumulated two temporary contracts, two unemployment experiences and two firm firms before de current temporary contract, and so on.

Appendix A: Institutional Background

Employment regulation in Spain is rooted in the 1980 Workers' Statute and its 1984 reformed version, which recognized the need for more flexible, modern labour institutions and employment contracts in order to reduce the high rate of unemployment. This law considered permanent contracts to be the general contracting framework, whereas temporary contracts were assumed to be used only for jobs whose nature was temporary (seasonal jobs, the temporary substitution of permanent workers, a temporary increase in production activity, etc.). However, the reformed Worker's Statute established that temporary contracts could be used to promote employment, and need not be associated with temporary labour activities. Under the new rules, a firm could fill a permanent need by hiring successive temporary workers for the same job. The core reform—which also described other fixed-term contracts such as those related to youth training, internships, and new project development, —was the non-renewable “employment promotion fixed-term contract” which allowed for an employment period ranging from six months to three years. Once the contract had expired, the firm either had to lay off the worker in question or re-hire her under permanent contract. Firms that chose the former option were prohibited from employing another worker for the same job for at least one year. Needless to say, supervising employers' compliance with these requirements, which could easily be satisfied merely by redefining the worker's job description, was extremely difficult. The indemnities for laid-off workers holding this type of contract were almost negligible, whereas indemnities for those holding permanent contracts remained essentially unaffected by the reform. It is well-documented (see, Guell and Petrongolo, 2007, Dolado et. al 2002) that this reduction of firing costs led firms to hire almost exclusively fixed-term workers from 1984 onwards.

By 1994, as much as one-third of the employed Spanish workforce held temporary contracts, yet the levels of unemployment in Spain remained as high as they had been in 1984. In this situation, some concern arose as to whether deregulation through temporary employment had failed to achieve its goal of reducing the unemployment rate over the long term, since it had failed to generate stable employment but had, instead, given rise to important inequalities among equivalent-productivity workers. In order to change this trend, in 1994 and 1997 the Spanish government introduced two labour market reforms that sought to undo the liberalisation of 1984 and reduce the proportion of temporary employment. In 1994, the conditions under which a temporary contract could be issued were restricted. In particular, employment promotion contracts were virtually eliminated, persisting only as a remnant to be used for workers aged over 45 or the long-term unemployed. This reform also restricted the use of all other types of temporary contracts to three specific cases: when the work concerned was of an intrinsically temporary nature, casual labour, temporarily services performed for those who were entitled to return to their jobs after an absence, and work associated with the launching of new activities); when it responded to specific employment policies (temporary job-creation contracts and relief contracts); and when it promoted entry into the labour force (work-experience contracts and new apprenticeship contracts¹³). Since these measures did not bring about the desired reduction of the temporary rate, and the contracts that were abolished were simply replaced by equally precarious contracts, such as the apprenticeship contract, they had marked effect on the temporary rate.

Given the persistent polarity between temporary and permanent workers despite the 1994 reform, in 1997 the Spanish government designed a new agreement between social partners addressed to increase job flexibility among permanent workers while reducing it among temporary ones. This reform led to stricter conditions governing the issuing of temporary

¹³ Training contracts were substituted by apprenticeship contracts

contracts, together with the elimination of the employment promotion fixed-term contracts. Since dismissal costs were regarded as one of the major reasons why Spanish firms had persistently refused to raise employment levels in response to economic prosperity, the 1997 reform also created a new type of indefinite contract for specific worker groups, which included lower severance payment in case of unfair dismissal (33 days of wage per year worked under a given employer, instead of 45 days) and offered fiscal incentives (a 40 percent reduction of the employer's Social Security contribution, which rose to 60 percent if the worker was over the age of 45 or was disabled) during the first two years of the contract to firms choosing to offer such contracts to either unemployed or temporary workers. Under certain conditions, this contract could also be used to turn a temporary contract into a permanent one. The contract was introduced during a four-year trial period, after which it was subjected to an evaluation process designed to determine whether it should be adopted, abolished or reformed.

On 2 March 2001 the government introduced a decree to reform the labour market. The most important aspect of this decree was that it extended the prevailing programme of employment promotion, which offered special permanent employment contracts that reduced employers' social security contributions on several fronts, to many new cases¹⁴. The decree also introduced limited compensation for the dismissal of temporary workers, amounting to eight days' pay per year worked.

¹⁴ These include: unemployed women aged 16 to 45 or in sectors where they are poorly represented; people who have been unemployed for at least six months or are over the age of 45; and unemployed women who have had children, if they are hired in the 24 months following childbirth; people earning integration incomes and young people from institutions for the protection of minors. The reduction in employers' contributions ranges from 20% to 100% (the highest rate being applied to women recruited after childbirth)

VIII Appendix B: Estimation Results of the Multivariate Hazard Model

Table B.1: Results Relative to the Unobserved Heterogeneity Component of the Multivariate Hazard Models for each age cohort

	<u>18-21</u>		<u>22-25</u>		<u>26-29</u>	
Prob. Type II (Unob. Heterogeneity)	0.560	16.80	0.585	38.42	0.583	22.56
Log (Likelihood Function)	-996361.58		-809720.1		-396252.97	
<u>Unobserved Heterogeneity Constant Terms</u>						
<u>Initial State: Temporary Contract</u>						
v_e (cte worker Type II, Alt 1 and Alt 2)	-0.961	-82.1	-0.994	-66.5	-1.028	-14.3
χ_e (Shifter worker Type II, Alt. 3)	-0.055	-3.5	-0.093	-2.9	-0.099	-2.0
$v_e * \chi_e$ (cte worker Type II, Alt 3)	0.054		0.092	-	0.102	-
<u>Initial State: Unemployment</u>						
v_u (cte worker Type II, Alt 1 and Alt 2)	-0.464	-32.2	-0.405	-16.5	-0.419	-4.3
χ_u (Shifter worker Type II Alt. 3)	-4.976	-21.3	-7.475	-10.1	-7.710	-8.7
$v_u * \chi_u$ (cte worker Type II, Alt 3)	2.311	-	3.058	-	3.232	-

* I consider the case of two mass points distribution function and assume that the unobserved heterogeneity term is common in all spells of the same type. I also assume that the unobserved heterogeneity term is the same for all the competing alternatives in each type of spell and only differs in the case of the entrance probability to a permanent contract by a constant. That is, $(v_m(e)^j = \chi^e v_m(e)^{pc})$, where $v_m(e)^j$ is the unobserved heterogeneity term for the employed with a temporary contract that exit either to unemployment or to a temporary contract and $v_m(e)^{pc}$ is the unobserved heterogeneity term for the employed with a temporary contract that exit to a permanent contract. Equivalently for the unemployed, $(v_m(u)^j = \chi^u v_m(u)^{pc})$.

Alt 1=Exit to Unemp.; Alt 2=Exit to Temporary Contract C; Alt 3=Exit to Permanent Contract

Table B.2: Results Relative to Multivariate Hazard Model (Age-Cohort 18-21)

	<u>to Unemp.</u>		<u>to TC</u>		<u>to PC</u>	
	Coef.	t-S	Coef.	t-S	Coef.	t-S
Initial State: Temporary Contract State						
Constant	0.769	2.2	-1.579	-6.3	-3.959	-10.1
Elapsed Duration						
Ln (t)	-0.725	-12.6	-0.542	-18.9	1.013	19.5
Ln (t)^2	-0.041	-9.9	-0.048	-4.6	-0.465	-19.0
Quarter=2	0.366	27.8	0.329	19.1	0.556	21.9
Quarter=4	0.835	35.1	0.693	29.6	1.438	46.1
Quarter=8	0.555	6.6	0.557	10.4	1.087	26.6
Personal Characteristics						
Age	-1.188	-24.8	-1.462	-30.1	-0.707	-13.8
Age of Entrance	0.634	10.3	1.088	15.8	0.480	7.0
Gender (Men)	-0.055	-12.2	0.079	4.9	0.005	2.8
Immigrant	0.130	19.9	0.147	9.4	0.107	-0.7
Current Job Characteristics						
Part-Time	0.389	32.4	0.291	19.3	-0.117	-6.4
Temporary Help Agency	0.532	52.8	0.880	43.1	-0.821	-23.1
Wage Category						
Medium Skill	0.417	34.3	0.432	34.3	0.174	8.3
Low Skill	0.713	48.3	0.647	42.9	-0.007	-0.8
Sector of Activity						
Industry	-0.272	-23.2	-0.366	-15.7	-0.159	-2.4
Construction	-0.055	-12.0	0.094	3.8	-0.760	-15.3
Same Firm	0.169	21.9	1.064	77.3	-0.004	-0.9
Firm's size						
>50 employees	-0.142	-22.2	-0.144	-23.2	-0.191	-9.9
20-50 employees	-0.172	-21.9	-0.191	-22.7	-0.102	-3.2
Public firm	0.024	26.5	0.043	34.7	-0.032	-3.4
Previous Spell						
Cum. Previous Duration ln(TC)						
(TC)	-0.285	-7.8	-0.189	-7.2	0.073	1.6
ln(TC)^2	0.026	4.1	0.016	2.8	-0.037	-1.7
Cum. Previous Duration ln(Unemp.)						
(Unemp.)	0.248	9.5	-0.025	-0.5	0.173	3.6
ln(Unemp.)^2	-0.008	-1.7	0.017	2.2	-0.038	-1.8
- Cumulative TCs						
1	-0.398	-15.2	0.235	5.3	-0.067	-8.7
2	-0.473	-10.1	0.442	9.4	-0.124	-8.1
3	-0.569	-17.1	0.579	11.2	-0.134	-9.2
4	-0.678	-14.2	0.673	13.4	-0.122	-9.4
5-6	-0.860	-14.9	0.814	14.8	-0.091	-9.4
7-10	-1.062	-17.2	0.927	15.6	-0.061	-9.8
>10	-1.321	-17.7	1.064	18.1	-0.071	-8.6
- Cumulative Unemp. Spells						
1	0.285	12.2	0.136	3.5	0.012	1.3
2	0.748	18.3	0.191	4.8	0.028	1.8
3	0.913	20.0	0.171	4.6	0.060	2.9
4	1.009	20.9	0.201	3.2	-0.042	-1.6
5-6	1.179	22.4	0.195	3.3	-0.030	-2.0
7-10	1.346	23.8	0.210	3.1	-0.113	-1.2
>10	1.408	21.8	0.355	5.3	-0.244	-2.5
- Multi-firm experiences						
1	-0.207	-6.6	-0.047	-3.5	0.171	4.8
2	-0.330	-7.5	-0.055	-2.2	0.322	8.1
3	-0.398	-7.8	-0.081	-1.2	0.394	10.7
4	-0.369	-6.7	-0.072	-0.6	0.435	10.0
5-6	-0.333	-5.6	-0.100	0.9	0.520	11.1
7-10	-0.228	-2.2	-0.062	0.3	0.506	8.9
>10	0.029	3.2	0.171	4.5	0.474	4.9
T.c GDP /10	-0.188	-3.2	1.040	7.4	1.759	8.9
Unemployment Rate /10	-0.111	8.1	0.203	1.9	-3.350	-10.1

Continued from Table B.2

Initial State: Unemployment State				
	Constant	-2.417	-10.0	-7.221 -1.4
Elapsed Duration				
	Ln (t)	-0.437	-7.2	-0.778 -1.0
	Ln (t)^2	0.008	-6.2	0.161 1.9
	Quarter=2	0.175	11.8	0.273 1.1
	Quarter=4	0.436	-1.6	0.134 1.8
Personal Characteristics				
	Age	-1.701	-24.4	-0.221 -3.3
	Age of Entrance	1.565	15.5	0.649 1.2
	Gender (Men)	0.011	7.6	-0.180 -4.7
	Immigrant	0.086	10.1	-0.027 -1.9
	Receive Unemp. Benefits	0.401	23.2	0.481 3.1
Current Job				
	Part-Time	0.004	-0.6	-0.080 -1.7
	Temporary Help Agency	0.035	-0.8	-0.767 -7.1
Wage Category				
	Medium Skill	0.026	2.7	-0.228 -3.7
	Low Skill	0.023	3.3	-0.449 -6.0
Sector of Activity				
	Industry	-0.017	-2.2	-0.041 -0.1
	Construction	0.105	4.3	-0.425 -5.1
	Same Firm	1.049	57.3	0.909 17.5
Firm's size				
	>50 employees	-0.055	-7.7	-0.010 -2.1
	20-50 employees	-0.076	-10.8	-0.098 -5.9
	Public Firm	0.024	4.5	-0.015 -5.4
Previous Spell				
Cumulative lagged Duration (TC)				
	ln(TC)	-0.098	-0.6	-0.067 -2.8
	ln(TC)^2	-0.005	-1.6	-0.068 -3.9
Cumulative lagged Duration (Unemp)				
	ln(Unemp.)	-0.032	-5.3	-0.035 -2.6
	ln(Unemp.)^2	0.375	4.0	-0.588 -1.0
- Cumulative TC				
	1	0.424	5.5	-0.843 -3.3
	2	0.446	5.4	-0.721 -3.8
	3	0.444	5.5	-0.807 -3.9
	4	0.491	5.5	-0.544 -3.6
	5-6	0.526	6.2	-0.605 -3.4
	> 7	0.523	6.8	-0.605 -3.2
- Cumulative Unemp. Spells				
	1	0.119	3.6	0.174 1.6
	2	0.234	3.8	0.300 1.9
	3	0.256	4.0	0.150 1.2
	4	0.322	3.3	0.348 1.8
	5-6	0.328	4.2	0.271 1.9
	> 7	0.425	4.7	0.344 0.8
- Multi-firm experiences				
	1	0.168	5.9	0.291 2.9
	2	0.231	6.7	0.312 3.9
	3	0.230	6.0	0.172 3.6
	4	0.228	5.2	0.363 1.8
	5-6	0.210	4.5	0.134 1.2
	> 7	0.245	2.0	0.386 0.6
	T.c GDP /10	2.655	25.8	2.314 5.0
	Unemployment Rate /10	-0.961	-6.4	-3.251 -6.1

*Constant term sample of temporary contracts: Men, full time worker, first temporary contract, no unemployment experience, no firm mobility, no temporary help agency, job in the service sector, high skill, small firm and private firm. Constant term sample of unemp. spells: The same as above and without unemp. benefits (time varying).

Control variables also include a set of dummy variables that describe the year of entrance at the labour market during the period 1995-2006.

Table B.3: Results Relative to Multivariate Hazard Model (Age-Cohort 22-25)

	<u>to Unemp.</u>		<u>to TC</u>		<u>to PC</u>		
	Coef.	t-S	Coef.	t-S	Coef.	t-S	
Initial state: Temporary Contract							
Elapsed Duration	Constant	0.023	2.7	-1.190	-7.0	-3.329	-13.9
	Ln (t)	-0.465	-14.4	-0.574	-18.3	0.778	16.6
	Ln (t) ²	-0.126	-7.8	-0.027	-1.8	-0.327	-16.8
	Quarter=2	0.307	16.6	0.348	18.9	0.595	21.8
	Quarter=4	0.795	31.8	0.754	29.6	1.309	45.5
	Quarter=8	0.608	5.4	0.604	10.1	1.096	26.3
Personal Characteristics							
	Age	-1.012	-18.9	-1.566	-29.0	-0.882	-12.5
	Age of Entrance	0.642	7.8	1.188	14.3	0.727	6.5
	Gender (Men)	-0.109	-7.4	0.056	3.8	0.056	2.9
	Immigrant	0.386	12.1	0.267	8.3	-0.066	-1.3
Current Job Spell							
	Part-Time	0.388	26.4	0.287	18.7	-0.177	-6.7
	Temporary Help Agency	0.447	26.1	0.702	42.5	-0.955	-24.0
Wage Category							
	Medium Skill	0.493	31.5	0.558	35.6	0.154	7.2
	Low Skill	0.821	47.9	0.768	43.9	-0.060	-2.1
Sector of Activity							
	Industry	-0.308	-14.0	-0.366	-16.3	-0.049	-1.8
	Construction	-0.064	-2.6	0.080	3.4	-0.641	-15.4
Firm's size							
	>50 employees	-0.164	-18.4	-0.163	-16.2	-0.201	-6.8
	20-50 employees	-0.191	-15.9	-0.221	-16.7	-0.112	-2.7
	Public Firm	0.068	56.7	0.054	45.7	-0.031	5.6
	Same Firm	0.323	19.9	1.071	76.8	0.037	1.3
Employment History							
Cumulative lagged Durations in TC							
	ln(TC)	-0.229	-8.6	-0.186	-7.1	0.120	1.9
	ln(TC) ²	0.022	2.3	0.018	1.9	-0.054	-2.2
Cumulative lagged Durations in Unemp.							
	ln(Unemp.)	0.170	6.4	-0.049	-1.9	0.142	3.6
	ln(Unemp.) ²	0.022	2.2	0.035	3.7	-0.040	-2.0
- Cumulative TCs							
	1	-0.400	-10.3	0.197	5.3	-0.476	-8.5
	2	-0.508	-10.7	0.395	8.9	-0.511	-7.5
	3	-0.612	-11.5	0.512	10.4	-0.636	-8.3
	4	-0.716	-12.5	0.651	12.3	-0.794	-8.4
	5-6	-0.869	-14.4	0.713	12.9	-0.690	-8.1
	7-10	-1.106	-16.8	0.793	13.3	-0.774	-8.3
	>10	-1.416	-19.4	1.028	15.6	-0.700	-6.6
-Cumulative Multi-firm experiences							
	1	-0.179	-7.2	-0.093	-3.9	0.200	4.5
	2	-0.255	-9.3	-0.107	-4.1	0.383	7.8
	3	-0.326	-10.9	-0.129	-4.5	0.556	10.5
	4	-0.339	-10.3	-0.137	-4.4	0.574	10.0
	5-6	-0.347	-10.6	-0.137	-4.5	0.678	11.6
	7-10	-0.272	-7.1	-0.171	-4.8	0.698	10.0
	>10	0.044	0.9	0.104	2.3	0.704	7.2
- Cumulative Unemp. Spells							
	1	0.350	10.7	0.097	3.3	0.057	2.3
	2	0.736	17.7	0.175	4.7	0.066	2.2
	3	0.948	19.6	0.207	4.8	0.135	2.3
	4	1.106	20.5	0.174	3.6	0.074	1.9
	5-6	1.258	22.0	0.195	3.8	0.089	1.2
	7-10	1.498	23.4	0.200	3.5	0.044	0.4
	>10	1.559	22.1	0.380	6.2	0.037	1.2
	T.c GDP /10	-0.266	-3.2	0.638	7.3	1.202	9.0
	Unemployment Rate /10	1.145	7.6	0.286	1.9	-2.331	-9.8

Continued from Table

Initial state: Unemployment State

	Constant	-2.136	-16.4	-7.346	-13.2
Elapsed Duration					
	Ln (t)	-0.406	-12.7	-0.569	-4.5
	Ln (t)^2	-0.089	-4.9	0.010	0.2
	Quarter=2	0.243	14.9	0.180	2.7
	Quarter=4	0.122	6.0	0.089	1.1
Personal Characteristics					
	Age	-1.803	-33.4	-0.755	-3.4
	Age of Entrance	1.618	22.6	1.439	5.0
	Gender (Men)	0.003	0.3	-0.013	-0.3
	Immigrant	0.210	12.3	-0.124	-1.6
	Receive Unemp. Benefits	0.523	27.5	0.421	5.5
Previous Job Spell					
	Part-Time	0.039	3.4	-0.260	-5.7
	Temporary Help Agency	0.058	4.1	-0.683	-10.5
Wage Category	Medium Skill	0.042	3.2	-0.141	-2.9
	Low Skill	0.014	1.0	-0.630	-11.2
Sector of Activity	Industry	-0.027	-1.4	-0.035	-0.5
	Construction	0.100	5.4	-0.733	-7.4
Firm's size	>50 employees	-0.045	-5.3	-0.007	-0.9
	20-50 employees	-0.069	-8.5	-0.090	-4.5
	Public Firm	0.032	1.9	-0.045	-1.2
	Same Firm	1.255	87.3	0.959	17.7
Employment History					
Cumulative lagged duration (TC)	ln(TC)	0.072	3.1	0.237	2.4
	ln(TC)^2	-0.056	-6.2	-0.011	-0.3
Cum. lagged duration (Unemp.)	ln(Unemp.)	-0.024	-1.0	-0.186	-1.9
	ln(Unemp.)^2	-0.017	-1.9	-0.011	-0.3
- Cumulative TCs	1	0.400	12.7	-0.178	-1.5
	2	0.445	11.4	-0.403	-2.6
	3	0.505	11.5	-0.495	-2.8
	4	0.540	11.3	-0.633	-3.2
	5-6	0.571	11.5	-0.817	-3.8
	> 7	0.620	11.4	-0.783	-3.2
- Cumulative Unemp. Spells	1	0.096	4.7	-0.026	-0.3
	2	0.169	7.3	0.165	1.7
	3	0.168	6.5	0.259	2.3
	4	0.192	6.5	0.255	1.9
	5-6	0.184	6.2	0.325	2.4
	> 7	0.145	4.4	0.022	0.1
- Cumulative Multi-firm experiences	1	0.107	3.0	0.096	0.9
	2	0.141	3.5	0.077	0.6
	3	0.226	5.0	0.125	0.8
	4	0.234	4.8	0.395	2.1
	5-6	0.353	6.7	0.368	1.8
	> 7	0.353	4.7	0.548	2.3
	T.c GDP /10	2.592	32.6	1.813	5.9
	Unemployment Rate /10	-1.095	-8.7	-5.270	-10.1

*Constant term sample of temporary contracts: Men, full time worker, first temporary contract, no unemployment experience, no firm mobility, no temporary help agency, job in the service sector, high skill, small firm and private firm. Constant term sample of unemp. spells: The same as above and without unemp. benefits (time varying).

Control variables also include a set of dummy variables that describe the year of entrance at the labour market during the period 1995-2006.

Table B.4: Results Relative to Multivariate Hazard Model (Age Cohort 26-29)

		<u>to Unemp.</u>		<u>to TC</u>		<u>to PC</u>	
		Coef.	t-S	Coef.	t-S	Coef.	t-S
	Constant	-1.629	-3.70	-1.578	-4.47	-3.934	-6.29
<u>Elapsed Duration</u>							
	Ln (t)	-0.225	-5.1	-0.496	9.49	0.529	11.55
	Ln (t)^2	-0.191	-8.9	-0.073	20.20	1.212	25.32
	Quarter=2	0.303	11.0	0.286	3.70	0.994	14.36
	Quarter=4	0.761	19.2	0.834	29.6	1.309	46.1
	Quarter=8	0.532	2.4	0.514	10.4	1.096	26.6
<u>Personal Characteristics</u>							
	Age	-0.957	-	-1.715	-	-0.810	-7.40
	Age of Entrance	1.150	8.6	1.658	12.09	0.740	4.04
	Gender (Men)	-0.135	-5.8	0.148	5.95	0.084	2.32
	Immigrant	0.301	7.9	0.129	2.72	-0.035	0.02
<u>Current Job Spell</u>							
	Part-Time	0.326	12.9	0.212	7.59	-0.232	-5.00
	Temporary Help Agency	0.290	9.6	0.596	21.34	-1.150	-16.98
<u>Wage Category</u>							
	Medium Skill	0.510	18.2	0.540	19.07	0.122	4.38
	Low Skill	0.805	26.8	0.710	23.06	-0.074	-0.15
<u>Sector of Activity</u>							
	Industry	-0.307	-7.7	-0.365	-9.24	-0.038	-1.40
	Construction	-0.043	-0.2	0.089	3.71	-0.689	-10.80
<u>Firm's size</u>							
	>50 employees	0.345	3.3	0.451	5.6	0.198	2.5
	20-50 employees						
	Public Firm	0.189	3.1	0.012	5.2	-0.210	2.0
	Same Firm	0.341	12.6	0.976	41.1	-0.010	0.3
<u>Labor History</u>							
	Cumulative lagged ln(TC)	-0.174	-4.0	-0.201	-4.6	0.049	2.4
	Duration in TC ln(TC)^2	-0.008	-1.0	0.018	2.8	-0.042	-1.5
	Cumulative lagged ln(Unemp.)	0.160	4.6	-0.114	-2.0	0.096	2.3
	Duration in Unemp. ln(Unemp.)^2	0.024	1.7	0.049	2.5	-0.012	-1.2
- Cumulative TCs	1	-0.302	-5.4	0.247	4.1	-0.370	-5.1
	2	-0.302	-4.3	0.448	6.3	-0.469	-4.5
	3	-0.408	-4.8	0.656	8.6	-0.495	-4.4
	4	-0.482	-5.1	0.797	9.7	-0.433	-4.0
	5-6	-0.681	-6.8	0.923	11.1	-0.428	-4.2
	7-10	-0.863	-7.7	1.107	12.5	-0.487	-4.5
	>10	-1.027	-8.4	1.497	15.1	-0.417	-3.9
-Cumulative Unemp.	1	0.473	9.9	0.103	2.7	0.069	1.2
	2	0.753	12.0	0.166	3.2	-0.006	-1.2
	3	0.950	12.7	0.136	2.0	0.106	1.5
	4	1.086	12.9	0.127	1.7	-0.030	-1.2
	5-6	1.268	14.0	0.068	1.6	-0.027	-0.9
	7-10	1.464	14.6	-0.007	-0.9	-0.019	-0.6
	>10	1.548	13.6	0.120	1.9	-0.005	-1.3
- Cumulative Multi-firm experiences	1	-0.247	-5.8	-0.068	-1.4	0.117	1.6
	2	-0.313	-5.5	-0.072	-0.0	0.403	4.8
	3	-0.294	-3.8	-0.096	0.3	0.400	4.2
	4	-0.380	-4.5	-0.116	0.5	0.529	4.9
	5-6	-0.297	-1.8	-0.097	1.6	0.643	5.3
	7-10	-0.165	0.6	-0.035	2.5	0.653	4.0
	>10	-0.008	1.7	0.142	3.6	0.238	-0.3
	T.c GDP /10	-0.162	-1.3	0.487	3.3	1.483	6.7
	Unemployment Rate /10	0.918	3.2	0.595	1.8	-2.337	-5.7

Continued from Table

Unemployment State					
Elapsed Duration	Constant	-2.054	-10.0	-2.404	-1.4
	Ln (t)	-0.384	-7.2	-0.303	-1.0
	Ln (t) ²	-0.178	-6.2	-0.256	-1.9
	Quarter=2	0.291	11.8	0.061	1.1
	Quarter=4	-0.048	-1.6	-0.264	-1.8
Personal Characteristics	Age	-2.145	-24.4	-0.906	-3.3
	Age of Entrance	1.829	15.5	-0.283	-0.2
	Gender (Men)	0.128	7.6	0.040	1.7
	Immigrant	0.210	10.1	-0.056	0.9
	Receive Unemp. Benefits	0.650	23.2	0.320	3.1
Previous Job Spell	Part-Time	0.003	-0.6	-0.260	-1.7
	Temporary Help Agency	-0.004	-0.8	-0.807	-7.1
Wage Category	Medium Skill	0.073	2.7	-0.376	-3.7
	Low Skill	0.088	3.3	-0.597	-6.0
Sector of Activity	Industry	-0.071	-2.2	-0.007	0.1
	Construction	0.113	4.3	-0.626	-5.1
Firm's size	>50 employees	-0.062	-15.6	-0.016	-1.7
	20-50 employees	-0.075	-15.4	0.065	4.5
	Public Firm	0.008	-3.9	-0.045	-1.6
	Same Firm	1.353	57.3	1.253	17.5
Labor History					
Cumulative lagged duration in TC	ln(TC)	-0.033	-0.6	0.120	0.8
	ln(TC) ²	-0.010	-1.6	0.042	0.9
Cumulative lagged duration in Unemp.	ln(Unemp.)	-0.158	-5.3	-0.337	-2.6
	ln(Unemp.) ²	0.037	4.0	0.024	1.0
- Cumulative TCs	1	0.247	5.5	-0.697	-3.3
	2	0.296	5.4	-0.998	-3.8
	3	0.325	5.5	-1.150	-3.9
	4	0.341	5.5	-1.168	-3.6
	5-6	0.404	6.2	-1.143	-3.4
	> 7	0.468	6.8	-1.133	-3.2
- Cumulative Unemp. Spells	1	0.142	3.6	0.271	1.6
	2	0.202	3.8	0.246	0.9
	3	0.268	4.0	0.389	1.2
	4	0.263	3.3	0.604	1.8
	5-6	0.360	4.2	0.388	0.9
	> 7	0.444	4.7	0.595	0.8
- Cumulative Multi-firm experiences	1	0.188	5.9	0.357	2.9
	2	0.237	6.7	0.620	3.9
	3	0.240	6.0	0.702	3.6
	4	0.243	5.2	0.311	0.8
	5-6	0.197	4.5	0.280	0.2
	> 7	0.090	2.0	0.208	-0.6
	T.c GDP /10	3.258	25.8	1.813	5.0
	Unemployment Rate /10	-1.101	-6.4	-5.270	-6.1

*Constant term sample of temporary contracts: Men, full time worker, first temporary contract, no unemployment experience, no firm mobility, no temporary help agency, job in the service sector, high skill, small firm and private firm. Constant term sample of unemp. spells: The same as above and without unemp. benefits (time varying).

Control variables also include a set of dummy variables that describe the year of entrance at the labour market during the period 1995-2006.