

THE CAUSES AND CONSEQUENCES OF TEMPORARY JOBS IN SPAIN: A THEORETICAL-EMPIRICAL APPROACH*

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ABSTRACT

This paper analyzes the dynamics of temporary jobs in a labor market characterized by worker heterogeneity and employment protection. We argue that segmentation in the labor market arises endogenously from the heterogeneity of workers. In this sense, we show the existence of two opposite dynamics of temporary contracts: for some type of workers temporary jobs act as stepping stones to permanent jobs, whereas other type of workers get stuck in temporary jobs. Using microdata on labor market transitions for Spain, we test and confirm the model's prediction obtaining that for more educated workers temporary contracts serve as stepping stone. By contrast, young workers, women, less educated workers and "bad history" workers seem to experiment a penalty and temporary contracts seem to be dead-end jobs. Moreover, we test the "screening device hypothesis" by introducing unobserved heterogeneity. We obtain that the transition into permanency depends exclusively on the observed characteristics of workers (education, past labor history, etc).

Keywords: temporary contracts, permanent contracts, unemployment, transitions.

JEL classification: J63, J64

RESUMEN

En el presente trabajo se analiza el papel jugado por los contratos temporales como puerta de entrada a contratos permanentes y otros estados utilizando una muestra extraída de las cinco primeras olas del Panel Europeo de Hogares. Nuestro principal resultado consiste en que hay determinados colectivos de trabajadores que permanecen "atrapados" en contratos temporales. Concretamente, trabajadores con menores niveles educativos no sólo tienen menos probabilidades de conseguir un contrato permanente sino que además es más probable que acaben desempleados o en otro contrato temporal. Mujeres y trabajadores jóvenes tienen una alta probabilidad de acabar desempleados. El pasado laboral de los empleados también juega un papel importante en todas las transiciones. En este sentido, aquellos trabajadores que hayan experimentado desempleo de larga duración es muy probable que acaben otra vez desempleados.

Palabras clave: contratos temporales, contratos permanentes, desempleo, transición.

Clasificación JEL: J63, J64

1 Introduction.

This paper analyzes the dynamics of temporary jobs in a labor market characterized by worker heterogeneity and employment protection.

The motivation for this work is the following. A better understanding of where temporary contracts led when they expire can shed some light on the actual benefits and costs of labor market flexibility. In this sense, there are two contradictory hypotheses. One view considers the bridging function of temporary contracts, suggesting that they can serve as an entry route to permanency. The second one suggests that temporary contracts can become dead-end jobs without any good prospect.

In this paper, we show the existence of two opposite dynamics of temporary contracts. We argue that there is no need to discriminate between these two alternatives, since both coexist in the labor market, that is, it is possible a different use of temporary contracts for different types of workers.

In the theoretical section of the paper we develop a matching model built on Blanchard and Landier (2002) and Wasmer (1999) in a labor market with heterogeneous workers and symmetric information, which suggests the existence of two opposite dynamics of temporary contracts: for some type of workers ("high-productivity workers") temporary jobs act as stepping stones to permanent jobs, whereas other type of workers ("low-productivity workers") get stuck in temporary jobs. We characterize a labor market in which firms, knowing workers' type when matching, hire workers in temporary contracts and, then, if the match turns out to be good (which is an exogenous event), they have to decide whether they keep them in a permanent job or they fire them. Therefore, two conditions are required for the conversion of a temporary contract into permanent. First, firms are matched with some specific type of worker. Second, the match turns out to be of good quality.

It is important to note that firms know the type of the worker they are matched to before hiring. Hence, they are not using the temporary contract as a screening device to obtain information about worker's type. On the other hand, workers of different types enter the labor market in the same conditions, with a temporary contract. Therefore, we are not assuming an exogenous dual labor market, where some workers are in the core segments of the labor market and other in the peripheral segments. Segmentation in our framework arises endogenously from the heterogeneity of workers. Other novel argument is in place here. Firms use temporary jobs with some type of workers as a waiting device until they are matched with some specific type of worker.

The empirical analysis of the paper tests the prediction of two opposite

dynamics for different type of workers, focusing on Spain. A study of Spain is especially compelling. First, as in the theoretical model, the Spanish labor market is a "two-tier system", in which firing costs only apply to the termination of permanent contracts. Secondly, Spain provides a fascinating case of study since the share of temporary contracts not only is the highest in the OECD but also remains highly persistent above 30 per cent since the last decade. We test the theoretical model analyzing the transition from temporary to permanency, to unemployment and to temporary to other firm by means of a "competing-risks model". We expect that "high-productive workers" make integrate¹ transitions and have less probability to go to unemployment or temporary contracts. By contrast, "low-productivity workers" make transitions to unemployment or to other firms under a temporary contract. We adress these issues using a sample of temporary contracts drawn for the first five waves of the European Panel Household Survey (EPHS) for Spain.

Our results confirm that two opposite dynamics of temporary contracts seem to emerge. We obtain that for more educated workers temporary contracts serve as stepping stone. By contrast, workers who have a "bad history" seem to get stuck in temporary contracts. Moreover, the results suggest that workers' characteristics play a key role in the transition to unemployment. In this sense, youngsters, women, less educated workers and "bad history" workers seem to experiment a penalty. Therefore, for these groups of workers temporary contracts seem to be dead-end jobs. These results reinforce the existence of a "precariousness" trap for some kind of workers.

Finally, we test the "screening device hypothesis" by introducing unobserved heterogeneity. Our results indicate that the transition into permanency depends exclusively on the observed characteristics of workers (education, past labor history, etc.), which suggests that temporary contracts are not used as a "screening device", that is, conversion into permanency does not depend on unobservable characteristics of individuals (ability, preferences, etc.).

Our empirical work is closely related to Gath (2003), in the sense that she tries to integrate both hypothesis. Booth et al (2002) also pay attention to the fact that the use of contracts depends on workers characteristics.

The paper is organized as follows. In Section 2 we survey the related literature. In Section 3 we introduce the theoretical model and their re-

¹We consider integrate transitions as transitions from a temporary contract to a permanent one.

sults. Section 4 empirically tests the existence of two opposite dynamics of temporary contracts. Finally, Section 5 concludes and summarizes.

2 Literature review

There is a growing literature on temporary contracts and many theoretical approaches to analyze the effects of temporary contracts on the labor market². The appropriate framework to analyse the dynamics of temporary contracts is a search and matching model a la' Pissarides extended to the case in which permanent and temporary contracts coexist. To the best of our knowledge there is no work available analysing this issue in a matching framework. In Blanchard and Landier (2002), Cahuc and Postel-Vinay (2002) and Dolado et al (2004) temporary contracts have been accounted for in a matching model a la' Pissarides focusing on the effects of partial reforms on the conversion of temporary contracts on permanent ones. On the other hand, Wasmer (1999), in the same framework focuses on the effects of exogenous productivity growth on the tightness of labor market.

With respect to the empirical literature, there are some new works that analyze these dynamics. They mainly try to test the stepping stone hypothesis. Toharia (1996), using the Labor Force Survey (LFS) observes that transition probabilities from temporary to permanent depend on workers and vacancy characteristics. Alba-Ramirez (1998) also uses the LFS for Spain and finds evidence of a segmented labour market where the weaker workers are more prone to persist in short-term employment relationships. Finally, Guell and Petrongolo (2003), using microdata obtained from the LFS, try to test if temporary contracts are used as a screening device or, by contrast, as a cheaper option.

Zijl et al (2004), using a multi-spell model also test the "stepping stone" hypothesis obtaining evidence that temporary jobs serve as stepping stones for unemployed workers. Moreover, Gagliarducci (2003) shows that in Italy, temporary contracts are used as a "cheaper option".

Our work is closely related to Gath (2003). She argued that firms' use of temporary contracts depends on the type of worker, because probatory contracts are too expensive for "less-skilled workers". Moreover, Booth et al (2002) also pay attention to the fact that the use of temporary contracts depends on workers characteristics and some ethnic minorities and women are especially affected.

²See Dolado et al (2002) for a brief survey.

3 The Theoretical model

The purpose of the model is to formalize in the most simple way the following idea: the segmentation in the labor market arises endogenously from the heterogeneity of workers. In this sense, two opposite dynamics emerge: temporary contracts are for some types of workers stepping-stone jobs, whereas for others, they are dead-end jobs.

In characterizing the labor market, we think of it as one in which firms hire workers in temporary jobs and, then, they have to decide whether they keep them in a permanent job or they fire them. In this sense, our setup shares some similarities with, on the one hand, Blanchard and Landier (2002) and, on the other hand, Wasmer (1999).

Contrary to these authors, a key point for our analysis is to allow for worker heterogeneity. In this framework, firms's decision is simple, they can:

- (i) Never convert temporary jobs into permanent no matter the type of worker the firm is matched to.
- (ii) Always convert temporary jobs into permanent no matter the type of worker the firm is matched to.
- (iii) Convert temporary jobs into permanent only for some type of workers.

The first one implies that a firm always fills a vacant with a temporary job regardless of the worker the firm is matched to. The last one implies that temporary jobs are used as a waiting device until the firm is matched with some specific type of worker.

We construct this model and consider its implications for some types of workers in a world characterized by a heterogenous workforce. Assume a continuous-time model in which workers live forever and are risk neutral. To simplify, we suppose that there are two types of workers (*A*-type and *B*-type workers), which differ in their productivity only if the match turns out to be good and firms know the workers's type³ before hiring. Specifically, the mass of *A*-type workers is μ , and the mass of *B*-type workers is $1 - \mu$.

The number of firms is endogenously determined. Each firm offers one job, which costs c to set up and it is either vacant or filled. In the former case, the firm is actively engaged in hiring at a cost k . We assume that when a new

³In this sense, we are ruling out the existence of private information about the worker's productivity. Hence, worker's types are not defined as usual in models with private information. Here, the type of a worker is simply a class of worker.

firm is created, a temporary job⁴ is offered which starts with productivity y , regardless of the type of worker the firm is matched⁵. Productivity then changes with instantaneous probability λ . The new level of productivity can take two values. With probability p , it changes to a low productivity level such that the match is destroyed and the position is vacant again. With probability $1 - p$, it changes to a new value y_i , $i \in \{A, B\}$, which depends on the type of worker the firm is matched to. When productivity changes from y to y_i , the firm can decide either to lay off the worker (and, hence, hire a new worker in a temporary job), or keep him in a permanent job. In the latter case, the permanent job can be destroyed with instantaneous probability⁶ $\phi < \lambda$, in which case there exist firing costs, f , which are pure waste.

Unemployed workers and vacancies are assumed to meet each other randomly according to a conventional function $m(v, u)$ with constant returns to scale, where v and u denote, respectively, the masses of job vacancies and of unemployed workers. We denote the arrival rate for workers as $h(\theta)$, where $\theta = \frac{v}{u}$ is the labor market tightness. We assume that $h'(\theta) > 0$ and that $\lim_{\theta \rightarrow 0} h(\theta) = 0$. We suppose that A and B-type workers meet vacancies at the same rate. Similarly, vacancies meet unemployed workers at the rate $l(\theta)$. We assume that $l'(\theta) < 0$ and that $\lim_{\theta \rightarrow 0} l(\theta) = \infty$. Let η denote the fraction of the unemployed workers who are A-type, then the arrival rate for vacancies of A-type workers is $\eta l(\theta)$.

When a match is formed, the firm and worker divide the surplus of the match according to the asymmetric Nash bargaining solution. The worker's share of the surplus is exogenous and denoted by $\beta \in (0, 1)$.

In deriving the asset value equations we use the following notation. Let U_i be the value of an unemployed worker of type $i \in \{A, B\}$, and V the value of a vacancy. J_{ij} the value of a type of contract $j \in \{T, P\}$ filled with a worker of type i . Similarly, let W_{ij} denote the value of employment for a worker of type i in a contract of type j . The surplus of a match between

⁴Blanchard and Landier (2002) refer to them as entry-level jobs.

⁵The idea is that at the beginning of any employer-employee relationship all workers start in the same conditions. Only if the match turns out to be good, A-type workers will perform better for the firm. This is a simplifying assumption which can be easily relaxed without affecting substantially the results.

⁶This assumption was introduced by Wasmer (1999). The interpretation is that temporary contracts are terminated either by destruction or due to reaching the maximum duration, which is proxied as another Poisson process, that is, $\lambda = \phi + s_{\text{maximum duration}}$.

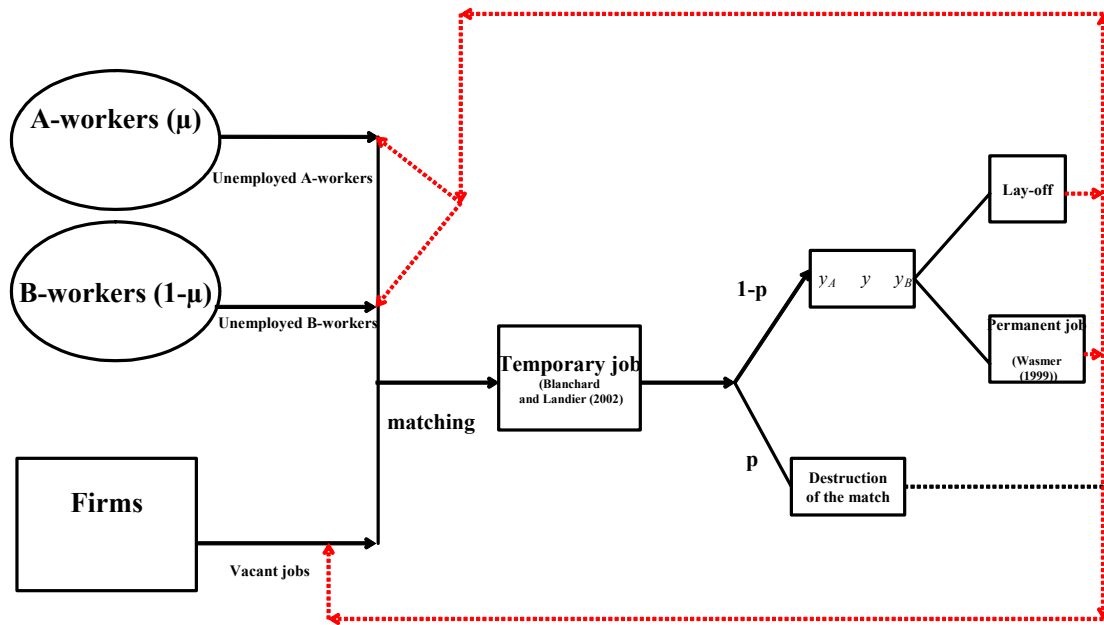


Figure 1: The model

worker of type i and a job with contract of type j , will then be given by

$$S_{iT} = W_{iT} + J_{iT} - U_i - V \quad (1)$$

$$S_{iP} = W_{iP} + J_{iP} - U_i - V + f \quad (2)$$

Hence, the wage w_{ij} is given by the Nash Bargaining solution of

$$\beta (J_{iT} - V) = (1 - \beta) (W_{iT} - U_i) \quad (3)$$

$$\beta (J_{iP} - V + f) = (1 - \beta) (W_{iP} - U_i) \quad (4)$$

Finally, we assume that the common discount rate of workers and firms is r . Moreover, the unemployed workers earn a flow income $z < y$. We now develop expressions for the asset value equations.

First, the value to a firm of employment of a worker of type i on a job with temporary contract is given by:

$$rJ_{iT} = y - w_{iT} + \lambda [p(V - J_{iT}) + (1 - p)(\max(V, J_{iP}) - J_{iT})] \quad (5)$$

and for a permanent contract:

$$rJ_{iP} = y_i - w_{iP} + \phi(V - J_{iP} - f) \quad (6)$$

Next, the value to a worker of type i of employment on a job with temporary contract is:

$$rW_{iT} = w_{iT} + \lambda [p(U_i - W_{iT}) + (1 - p)\{\max(U_i, W_{iP}) - W_{iT}\}] \quad (7)$$

and for a permanent contract:

$$rW_{iP} = w_{iP} + \phi(U_i - W_{iP}) \quad (8)$$

The value of unemployment for a worker of type i is:

$$rU_i = z + h(\theta)(W_{iT} - U_i) \quad (9)$$

Finally, the value of a vacancy is given by:

$$rV = -k + \eta l(\theta)(J_{AT} - V) + (1 - \eta) l(\theta)(J_{BT} - V) \quad (10)$$

3.1 Equilibrium

A steady-state equilibrium in this model is a collection of three variables $\{\theta, u, \eta\}$ that satisfy the following conditions:

- (i) firm vacancy creation satisfies free entry condition
- (ii) the flow of A-type workers into and out of unemployment is equal, and the same for B-type workers.

As a previous step, to solve for equilibrium we obtain the surplus of the different job-worker matchings.

>From (1), (2), (6), (8), and (9), the surplus of a job in a permanent contract occupied by a worker of type $i \in \{A, B\}$, S_{iP} , is given by:

$$S_{iP} = \frac{y_i - z + r(f - c)}{r + \phi} - \frac{\beta h(\theta)}{r + \phi} S_{iT} \quad (11)$$

and the surplus of a job in a temporary contract occupied by a worker of type i , S_{iT} , is given by:

$$S_{iT} = \frac{y - z - rc - \lambda(1 - p)f}{r + \lambda + \beta h(\theta)} + \frac{\lambda(1 - p)}{r + \lambda + \beta h(\theta)} (\max\{f, S_{iP}\}) \quad (12)$$

Applying condition (i), free entry condition, to (10) we obtain:

$$k + (r + l(\theta))c = \eta l(\theta) J_{AT} + (1 - \eta) l(\theta) J_{BT} \quad (13)$$

Using (3), $J_{iT} = (1 - \beta) S_{iT}$. (13) can be rewritten as:

$$\frac{k + (r + l(\theta))c}{l(\theta)} = (1 - \beta) [\eta S_{AT} + (1 - \eta) S_{BT}] \quad (14)$$

3.2 Segmentation Equilibrium

We focus on the equilibrium in which firms convert temporary jobs into permanent only when matched with a A-type worker. We refer to this case as *equilibrium with segmentation*.

This equilibrium exists if match between a firm and a worker is only profitable under a permanent contract with a A-type worker, that is, $S_{BP} < f < S_{AP}$. In which case (12), can be rewritten as:

$$S_{BT} = \frac{y - z - rc}{r + \lambda + \beta h(\theta)} \quad (15)$$

$$S_{AT} = \frac{y - z - rc - \lambda(1-p)f}{r + \lambda + \beta h(\theta)} + \frac{\lambda(1-p)}{r + \lambda + \beta h(\theta)} S_{AP} \quad (16)$$

>From (11), (15) and (16), free entry condition, (14) in a segmentation equilibrium is given by:

$$\frac{k + (r + l(\theta))c}{l(\theta)} = (1 - \beta) \left[\eta \left(\frac{(y - z - rc - \lambda(1-p)f)(r + \phi) + (\lambda(1-p))(y_A - z + r(f - c))}{(r + \lambda + \beta h(\theta))(r + \phi + \beta h(\theta))} \right) + (1 - \eta) \left(\frac{y - z - rc}{r + \lambda + h(\theta)\beta} \right) \right] \quad (17)$$

Condition (ii) in a segmentation equilibrium implies that the flow of workers out of unemployment equals the flow into unemployment.

For A-type workers:

$$h(\theta)\eta u = \lambda(p + (1-p)\phi)(\mu - \eta u) \quad (18)$$

For B-type workers:

$$h(\theta)(1 - \eta)u = \lambda(1 - \mu - (1 - \eta)u) \quad (19)$$

The two steady-state conditions can be solved for η and u in terms of θ . This yields:

$$\eta = \frac{\frac{\lambda(p + (1-p)\phi)\mu}{\lambda(p + (1-p)\phi) + h(\theta)}}{\frac{\lambda(1-\mu)}{\lambda + h(\theta)} + \frac{\lambda(p + (1-p)\phi)\mu}{\lambda(p + (1-p)\phi) + h(\theta)}} \quad (20)$$

$$u = \frac{\lambda(1 - \mu)}{\lambda + h(\theta)} + \frac{\lambda(p + (1-p)\phi)\mu}{\lambda(p + (1-p)\phi) + h(\theta)} \quad (21)$$

Therefore, a segmentation equilibrium is a vector of endogenous variables $\{\theta^*, u^*, \eta^*\}$, satisfying conditions (17), (20) and (21), that is, the free entry condition and the two steady state conditions.

To solve for the equilibrium, given our assumptions on $m(v, u)$, (17) has a unique solution for θ . If we insert this solution on (20) and (21) we get

a unique solution for η and u . Therefore, when we have a segmentation equilibrium, it is unique.

For the existence of a segmentation equilibrium, as it was mentioned above, it is required that a permanent contract is only profitable with a A-type worker, that is,

$$S_{BP} < f < S_{AP} \quad (22)$$

>From (11) and (12), we obtain that (22) holds when:

$$y_A > \bar{y} > y_B \quad (23)$$

where

$$\bar{y} = \left(1 - \frac{\beta h(\theta)}{r + \lambda + \beta h(\theta)}\right) (z + rc) + \frac{\beta h(\theta)}{r + \lambda + \beta h(\theta)} y + \phi f \quad (24)$$

There exists a threshold productivity level, \bar{y} , such that a permanent contract is only profitable when the productivity of a worker exceeds this value. In a segmentation equilibrium this is the case only for a A-type worker. If we look at the components of the threshold productivity level, \bar{y} , the first two account for the outside option of the worker and the set up costs, and the third one for the firing costs.

Therefore, a worker gets permanency only if the productivity of the match exceeds the worker's outside option (the sum of the value of being unemployed and hired under a temporary job in another firm), the set up costs and the firing costs.

3.3 Comparative statics

The higher \bar{y} , the more difficult for B-type workers to get permanency. Hence, the next step is to look at all the factors that affect the threshold productivity level:

$$\begin{aligned}
\frac{d\bar{y}}{dz} &= 1 - \frac{\beta h(\theta)}{r + \lambda + \beta h(\theta)} > 0 \\
\frac{d\bar{y}}{dc} &= \left(1 - \frac{\beta h(\theta)}{r + \lambda + \beta h(\theta)}\right) r > 0 \\
\frac{d\bar{y}}{df} &= \phi > 0 \\
\frac{d\bar{y}}{d\phi} &= f > 0 \\
\frac{d\bar{y}}{d\beta} &= \frac{h(\theta)(r + \lambda)}{(r + \lambda + \beta h(\theta))^2} (y - z - rc) > 0 \text{ if } y > z + rc
\end{aligned}$$

An increase of the unemployment benefits (z), firing costs (f), destruction rate of permanent contracts (ϕ), the set up costs (c) and the workers' bargaining power (as long as $y > z + rc$) (β), raise the threshold productivity level, \bar{y} , and, therefore it makes more difficult for L-type workers to obtain a permanent job.

On the contrary, an increase of the interest rate (as long as $y > z + c \left(1 + r - \frac{\beta h(\theta)}{r + \lambda + \beta h(\theta)}\right)$) (r) and the destruction rate of temporary contracts (as long as $y > z + rc$) (λ), reduce the threshold productivity level:

$$\begin{aligned}
\frac{d\bar{y}}{dr} &= \frac{\beta h(\theta)(z + rc - y)}{(r + \lambda + \beta h(\theta))^2} + \left(1 - \frac{\beta h(\theta)}{r + \lambda + \beta h(\theta)}\right) c < 0 \\
&\quad \text{if } y > z + c \left(1 + r - \frac{\beta h(\theta)}{r + \lambda + \beta h(\theta)}\right) \\
\frac{d\bar{y}}{d\lambda} &= \frac{\beta h(\theta)(z + rc - y)}{(r + \lambda + \beta h(\theta))^2} < 0 \text{ if } y > z + rc
\end{aligned}$$

Summing up, in this section we conclude that getting a permanent contract depends basically on workers characteristics (A-type or B-type workers). Moreover, other factors such as institutional and economic factors (firing costs, unemployment benefits, destruction rate of permanent and temporary contracts, bargaining power of workers) and firms characteristics (set up costs) are also relevant.

4 The Empirical Results

Our model predicts the existence in this system of two opposite dynamics of workers. For some workers, temporary jobs act as a stepping stone to permanent jobs, whereas other type of workers get stuck in temporary jobs. In this section, we test this prediction by analyzing the transition of temporary workers to other states using duration models focusing on Spain. A study of Spain is especially compelling. First, as in the theoretical model, the Spanish labor market is a "two-tier system" (see next subsection), in which firing costs only apply to the termination of permanent contracts. Secondly, Spain provides a fascinating case of study since the share of temporary contracts not only is the highest in the OECD but also remains highly persistent above 30 per cent since the last decade. Finally, the dataset we use, the ECHP has a panel structure and contains abundant information on workers' transitions across labor market states and the type of contract held.

Our empirical strategy is to analyze the transitions from temporary to permanency, to unemployment and to temporary to other firm by means of a "competing-risks model". This allows not only to test the model but also to detect which workers are preferred by firms.

We move on to describe institutional background and the data and variables used in our analysis. Next, we present the econometric model that fits the structure of the data. Finally, we provide the estimation results.

4.1 The institutional background

Spanish legislation on labor contracts is contained in the Workers 'Statute of 1980 (Estatuto de los Trabajadores). This law when it was created considered indefinite contracts as the general case, whereas temporal contracts were intended to be used only for jobs whose nature was temporary (seasonal jobs, temporal substitution of permanent workers, etc).

Later on, it has been modified four times with the 1984, 1994, 1997 and 2001 reforms.

The reform of 1984 introduced flexibility⁷ establishing that it is no longer necessary that the activity associated to the job is of temporary nature. These contracts can be signed for a period between a minimum of six months and a maximum of three years. After three years, the contract cannot be renewed and the worker must be either fired. or offered a permanent contract. In the former case, the firm cannot employ another worker for this job. In the case the dismissal is considered "fair" by a judge, the worker

⁷For more details, see Toharia and Malo (1999).

receives the wage of 20 days per year of seniority. If considered "unfair" by the judge, the worker receives the wage of 45 days per year of seniority for at least one year.

The 1994 and 1997 reforms, promoted permanent contracts by reducing their firing costs. In the 1994 reform it was almost eliminated the general applicability of temporary contracts (only was maintained for workers older than 45, disabled and long-term unemployed). and, moreover, firing legislation was modified to reduce the firing costs. The 1997 reform created a new type of permanent contract, with lower severance costs in case of unfair dismissal (33 days wage per year) and with fiscal incentives in the first two years of the contract (reductions of employers' payroll taxes).

Finally, the 2001 reform extended the use of the new type of permanent contracts created in the 1997 reform and extended their use to other groups of workers. It was also introduced a severance payment of 8 days' wages per year of seniority in temporary contracts not renewed.

4.2 Data and variables.

The data used in our analysis is drawn from the five first waves of ECHP. Since 1994, the ECHP has been designed to compare different aspects of European countries and annually interviews a representative sample of 80.000 households, of which 8.000 are Spanish. The same individuals are reinterviewed each successive year, and if they leave their original households to form a new one, all adults' members of these new households are also interviewed. Similarly, children in original households are interviewed when they are sixteen. The sample remains broadly representative of the Spanish population.

At each date of interview, all respondents are asked detailed questions related to their current employment status (kind of contract occupation, size of firm) regarding household composition, individual demographics and income. Respondents are also asked about other labor experience and unemployment experience in the previous five years. Particularly, respondents are asked to recall start date of current job and finish date of last job, although no contract identifier is supplied. Various related characteristics are collected for each job spell experience, included type of employment (full-time, part-time), type of contract (permanent, fixed-term contract, casual work and other arrangement), occupation and industry.

The data allow us to distinguish three types of temporary contracts, but we have collapsed this information in a simple category since we are interested in the transitions and we have not enough observations to analyze

them in a more disaggregated manner.

In order to test the main prediction of the theoretical model, we are interested both in analyzing the determinants of transitions from temporary work to other states and how long do temporary contracts last. For these purposes, we select only those individuals who had a temporary contract at least once in the period analysed⁸.

The duration of each spell is constructed using information of the individual questionnaire from the successive waves. Spell duration is defined as months in the same job with the same employer and not involving a promotion in a permanent position. To each job spell we have attached a vector of demographic, household, job related and local labor market conditions, and the details of previous labor market status. Some problems arise since both the information is annual and no contract identifier is supplied. Therefore, in order to follow the temporary contract and to determine the spell duration we rely on the information concerning to the type of contract held and main activity. Moreover, we can determine the start (last) date of the spell using the variable, month starting the current job (month finishing the last job).

We are also interested in where workers go at the conclusion of a temporary job. The data allow us to distinguish among four states: a) having a permanent position (regardless of the firm)⁹ b) unemployment¹⁰ c) other states as inactivity or working with an employer in training d) temporary contract in other firm. As no direct information is provided, we follow the variable year starting the current job and year finishing last job during different waves in order to obtain if the individual switches the firm. Finally, if the worker is last observed holding the temporary contract in the last interview, we consider the spell right-censored¹¹.

The transition to permanency allows us to test the stepping-stone hypothesis. By contrast, other transitions will be useful to contrast whether some temporary contracts are dead-end jobs by themselves.

The final sample yields 4126 spells. Jobs that start prior to the wave one are discarded, since we have not information about start date and duration.

⁸Because of data constraints, we focus on people who are working with an employer in paid employment more than fifteen hours a week.

⁹When the individual obtains a permanent position in the same firm we have no information about the timing. We assume that in this case the spell finishes in December.

¹⁰In order to define this state we use LFS classification.

¹¹A lot of information gaps can be filled (individuals who appear and disappear in the sample following the variable year starting the current job is the same). In these case, we assume that the variable marital status, and educational level are invariant.

We also drop some spells because we have missing information about the elapsed duration. Finally, we have deleted 946 spells. Table 1 provides some descriptive statistics of the duration data for the four transitions. Transitions to other states are less relevant because we have a small number of spells (157). Moreover, it shows that for some individuals there are multiple observations. Since in the econometric model we assume independence between spells, we only use this information to estimate the standard errors. It is also interesting to note that only a 13,08 % of temporary contracts end in a permanent position. By contrast, a 18,73 % of the contracts go to unemployment.

Figure 1 depicts the estimated Kaplan-Meier survivor functions for the four transitions. The survivor function from temporary work to permanent contract (Figure 1a) strongly declines at 6-12 month. Moreover, there is another change at 24 months. By contrast, the survivor function from temporary work to unemployment (Figure 1b) declines strongly until 12 months and later declines at a constant rate. The performance of the survivor function from temporary to another firm (Figure 1d) is similar to the former transition, although the estimated survivor function experimented a stronger declining at 6-12 months.

The variables used are described here (Table 1A of the Appendix) reports a complete definition of all variables). Table 2 reports some descriptive statistics of our sample.

Individual controls

These variables are used in order to test the hypothesis of the theoretical model and, therefore, they will be used to identify which workers make integrate transitions.

Age, sex and marital status are used in order to establish if the transitions are function of demographic characteristics. We use a dummy for sex, three dummies for age and two dummies for marital status. Education levels were included as categorical variables. We use two dummies in order to measure the level of education. These variables allow us to establish whether more educated workers are more likely to make transitions to permanency and less likely to go to "negative states".

Occupational level is included to characterize variations in transitions among different grades of workers. For this reason, nine dummies for occupation are used. Some variables measuring previous labor market attachment are introduced to identify the impact of previous unemployment on future transitions. More specifically, we include a set of dummies reflecting whether the individual has been long term unemployed, whether the individual has worked before in a different firm and a continuous variable reflecting

the number of times the individual has been unemployed.

Demand-side variables

In order to control also the demand-side variables, we introduce some industrial controls. We use four dummies reflecting size of the firm, sector dummies (six), a dummy to indicate if the individual works in the public sector and if the individual is a part-time worker. Finally, we include dummies of industry (nine).

Long-term differences between regions are controlled using six regional dummies. Short-term macroeconomics variations were controlled for through the introduction of a variable measuring the time-varying unemployment rate disaggregated by sex and area (see Graph 1A in the Appendix).

4.3 The Econometric Model.

Denote t as duration of interest (say, the time a temporary worker remains in the same contract) by the continuous random variable t , let $\mathbf{x}(t)$ a column vector of time-invariant and time-variant regressors to which is associated a column vector of parameters $\boldsymbol{\beta}$. The time-variant regressors contained in $\mathbf{x}(t)$ are age, changes in marital status and current unemployment rate disaggregated by sex and the time-invariant regressors are sex, occupation, educational attainment and past labor market experiences. The (instantaneous) hazard function for each individual (spell) i is assumed to take the proportional hazard form:

$$\theta_i(t | \mathbf{x}) = \Psi(t) \exp(\boldsymbol{\beta}' \mathbf{x}_i(t)) \tag{25}$$

where $\Psi(t)$ is the unknown baseline hazard. The associated survivor function is given by the probability of survivor in a determinate state and can be expressed as:

$$S_i(t | \mathbf{x}) = \exp\left(-\int_0^t \theta_i(s) ds\right) \tag{26}$$

Consider we have n spells of longitude t_i and some of the observations are right-censored. In this case, the likelihood function is given by (see Lancaster (1990)):

$$LnL = \sum_{i=1}^n c_i \ln \theta_i(t_i) + \sum_{i=1}^n [\ln S(t_i)]$$

where c_i is a censored indicator that is 1 if the spell is completed and zero otherwise. In our approach, the baseline hazard is not restricted to any parametric specification in order to avoid the potential biases caused by mis-specification of parametric baseline (Meyer (1990)).

The model outlined specifies the determinants of a single risk: leaving a temporary job. But we consider that temporary work can terminate in alternative states. For this reason, we extend the former model into a competing risks model framework. Let the indices 1, 2, 3 and 4 denote the states of "permanent", "unemployment", "other states" and "other firms", the individual transition rate from temporary to state j is denoted by $\theta_{ij} = \Psi(t) \exp(\beta' \mathbf{x}_{ij}(t))$. The survivor function for survival in temporary work can be expressed as

$$S_i(t | \mathbf{x}) = \exp\left(-\sum_{j=1}^{j=4} \int_0^t \theta_{ij}(s) ds\right) \quad (27)$$

The likelihood contribution for the individual i in this case is as follows

$$LnL_i = \sum_{j=1}^{j=4} c_{ij} \ln \theta_{ij}(t_i) + [\ln S_i(t_i)] \quad (28)$$

The full log likelihood is given by $LnL = \sum_{i=1}^n LnL_i$. Note that the likelihood is separable in the hazard (see Lancaster (1990)).

The inclusion of unobserved heterogeneity allows for measurement errors in the dependent variable as well as omitted unobserved covariates. Let v be a random variable that has a gamma distribution with variance σ^2 , then the hazard rate can be reexpressed as:

$$\theta_{ij} = \Psi(t) \bullet \exp(\beta' \mathbf{x}_{ij}(t)) v_{ij}. \quad (29)$$

We assume that v is independent of t and $\mathbf{x}(t)$. However, in a competing risks framework, allowing for a random disturbance term in each of the cause-specific hazards requires an additional assumption that imposes the independence of these disturbance terms across the cause-specific hazards¹². Given this, it is easy to construct a log likelihood function as (28). For more details, see Han and Hausman (1990) or Lancaster (1990).

¹²This model can be extended allowing that disturbance among cause-specific hazard to be related for a given individual (see van den Berg et al (2002)).

The former model identifies three sources of variation among individuals hazard rates: the elapsed duration of the temporary contracts $\Psi(t)$, the observable differences between individuals $x(t)$ and the unobservable ones (v).

4.4 Results

In this section, we estimate the econometric model described in the former subsection for the three transitions. Tables 3, 4 and 5 report the estimated parameters of the covariates for each transition, respectively. In Graph 2, we show the estimates of the baseline hazard. Moreover, in Tables 6 and 7 we investigate the transitions for youngsters and women. Finally, in Table 8 we report the estimates of the parameters of the distribution of unobserved heterogeneity and in Table 9 the new estimates taking into account unobserved heterogeneity.

We specify four models in order to obtain a better understanding of the relationship between different controls and the outcome variable. In model I, we control for individual characteristics as sex, age, education and occupation. In model II, we include demand-side variables: dummies reflecting size of the firm, sector dummies, regional controls, a dummy to indicate if the individual works in the public sector, part-time and, also, local unemployment rates. In model III we drop sector dummies and include dummies of industry. Finally, in model IV, we drop industry dummies and include variables related to past labor market history. We fully exploit the time variation of job tenure by using a monthly measure. We allow the unemployment rate to vary quarterly, the highest frequency available although the other time-varying regressors take the same values for all months during each interview.

We first examine the transition rate from temporary to permanent. Our purpose is to investigate whether integrate transitions depend on workers characteristics. In model I, we observe that educational attainment (both secondary and tertiary education) is very significant and positive. Moreover, we find that this kind of transition is more likely to be made by associate professionals and clerks. By contrast, age and woman are irrelevant.

In model II we control for demand-side variables and we drop profession dummies in order to avoid correlations between professions and education. In this case, we find that living in regions with adverse labor market conditions (south, center or Canaries Island) reduces the chance of exiting temporary job into permanency. Firm size is also relevant. In this sense, working in a medium size firm (20-100) increases the probability of renewal

in permanent. It is important to note that when we drop controls for profession, the transition rate for workers with higher education increases more than for workers with secondary education. Finally, sector dummies show that renewal rates into permanency are higher in services.

In model III, we make a further step by using more disaggregated controls by sectors. We obtain that working in construction reduces the probability of a permanent renewal, as opposed to working in the retail or transport sector, where this renewal rate is higher and significant.

Finally, in model IV we find that workers that have experienced a long-term unemployment spell and workers who have a history of unemployment are significantly less likely to gain permanency.

Our results suggest that for more educated workers temporary contracts serve as stepping stone. By contrast, workers who have a "bad history" seem to get stuck in temporary contracts. Therefore, as it was predicted in the theoretical model, two opposite dynamics of temporary contracts seem to emerge.

This is consistent with previous results obtained for Spain. Guell and Petrongolo (2003), using a sample of temporary workers drawn from the LFS during the period 1987 to 1996, obtain that education is a strong predictor although they obtain that being a woman has a negative effect in a transition rate to permanency. This can be explained because we use a more disaggregated sample that allows us to use a wide set of controls.

Booth et al (2002), using data from the British Household Panel Survey, observe that the transition to a permanent position is determined by a temporal pattern, which has little to do with either observed personal characteristics and firm specific characteristics. Two reasons can explain these differences. They use different definitions of temporary work: causal, seasonal and fixed-term contracts. Moreover, it can be explained by the different role that temporary contracts have played in the UK labor market (they are only 10 per cent of the contracts and this rate keeps constant over time).

Next, we analyze the transition from temporary jobs to unemployment. This transition serves to test whether temporary contracts represent for some workers dead-end jobs.

In model I, we observe that either young people (between 16-25) and workers who are between 46-65 are more likely to exit into unemployment. These results remain for any controls we include. We also obtain that this probability is higher for females than males. As opposed to the former transition, both higher education and working in an associate profession affect negatively to this transition. These results reinforce the role played

by these variables in the transition into permanency. By contrast, secondary education is irrelevant.

In model II we introduce demand-side variables. We obtain that region of residence has a significant impact on the exit into unemployment. Sector effects also emerge in the data. Individuals employed in agriculture have the highest probability of ending in unemployment.

Public sector workers have higher rates of exit into unemployment than those in the private sector. This result is consistent with Dolado et al (2002). They find that the public sector has increased a lot the proportion of temporary hires for this period due to the fiscal consolidation pursued by the Spanish government after the Maastricht Treaty. This change in the hiring behavior of the public sector has also been reflected in a higher exit of public workers into unemployment.

Part-time workers have also higher transition rates into unemployment. Finally, local unemployment rate has a positive and significant effect on this transition as opposed to the transition into permanency where this variable is irrelevant.

In model III, we find that a number of industry effects emerge in the data. Individuals employed in agriculture, construction, health service, education and social work have the highest transition rates into unemployment. The number of times a worker has been unemployed has also a positive and significant effect. Therefore, there is some evidence of a causal relationship between past and present labor market experiences.

Finally, in model IV we observe that previous labor market experience increases the transition rate into unemployment. Workers who have experienced long-term unemployment spells have a higher probability of ending in unemployment.

These results suggest that workers' characteristics play a key role in the transition to unemployment. In this sense, young workers, women, less educated workers and "bad history" workers seem to experiment a penalty. Therefore, for these groups of workers temporary contracts seem to be dead-end jobs, which is consistent with the results obtained in the former transition, that is, there exist two opposite dynamics of temporary contracts.

Finally, we analyze the exit from temporary work to work in another firm. This transition closes the gap, allowing us to study in a complete manner the "dead-end" hypothesis. We observe that educational attainment plays an important role. In this sense, possessing a university degree affects negatively the probability of switching from one temporary job to another. Size firm and industry effects are relevant. More specifically, working in a medium size firm and in the agricultural sector increases the proba-

bility of this transition. By contrast, working in the service sector affects in the opposite way. The number of times a worker has been unemployed and experience in another firm have also a positive and significant effect. These results reinforce the existence of a "precariousness" trap, in the sense that those workers having a temporary contract in the past or experiencing unemployment spells, have a lower probability of finding a permanent job.

Tables 6 and 7 show the results from performing the model IV only for women and youngsters, respectively.

The results of Table 6 show that women have a strong probability to make integrate transitions to permanency if they work in small and medium size firm. Also, it is interesting to observe that the coefficient of part-time is quite larger for women in the transition to unemployment and to another firm than when we pool the sample. Finally, in Table 7, we observe that young educated people are more likely to obtain a permanent position than older ones.

In order to test "screening device hypothesis" we introduce unobserved heterogeneity. Table 8 shows the estimates for unobserved heterogeneity distribution for model IV of each transition. More specifically, it presents the estimates of $\ln(\sigma^2)$ and also the likelihood ratio test (LR) to test model with unobserved heterogeneity versus model without unobserved heterogeneity. For the transition into permanent, both LR and estimates of $\ln(\sigma^2)$ indicate that there is no evidence of individuals unobservables in this transition. By contrast, we observe the existence of unobserved heterogeneity in the transition into unemployment and in the transition to another firm.

Our results indicate that the transition into permanency depends exclusively on the observed characteristics of workers (education, past labor history, etc), which suggests that temporary contracts are not used as a "screening device", that is, conversion into permanency does not depend on unobservable characteristics of individuals (ability, preferences, etc).

Table 9 displays the estimates of these transitions taking into account unobserved heterogeneity for specification IV. For both transitions we obtain similar results that in the previous models without unobserved heterogeneity. However, for transition into unemployment we observe that with unobserved heterogeneity the estimates are quite larger indicating some biases in the estimates. In this sense, it is important to note that for the former transition both part-time and long term unemployment play a more important role.

Finally, we present additional results to understand in a complete manner the dynamics of the transitions presented above. Figure 2 displays the baseline hazard estimates of model IV for exits from temporary jobs to the four transitions. The figure shows a sharply different pattern between the

temporary to permanent baseline hazard estimates and the temporary to unemployment one. In the former, we observe sharp spikes at durations around one, two and three years. By contrast, in the latter we observe a rising baseline hazard with a small spike at around the first year, followed by a longer decrease with small spikes until the second year. Finally, in the third year the baseline hazard shortly increases.

This evidence on the baseline hazard may suggest that there exist strong cyclical patterns in exits from temporary work to unemployment and much weaker (or nonexistent) cyclically in exits to permanent. Secondly, the fact that exits to permanent concentrate at around the twelfth, twenty-fourth and thirty-sixth months indicate that employers wait until the expiration of the temporary contract to proceed to the permanent renewal. Besides, exits to permanency are virtually zero in the first months of a temporary contract.

5 Conclusions

In this paper we have developed a matching model in a labor market with heterogeneous workers and symmetric information in which segmentation arises endogenously from the heterogeneity of workers, that is, two opposite dynamics emerge: for some type of workers temporary jobs act as stepping stones to permanent jobs, whereas other type of workers get stuck in temporary jobs. Besides, the model suggests that temporary contracts can be used by firms as a waiting device until the firm is matched with some specific type of worker and the match turns out to be good. Notice that this is another alternative use of temporary contracts apart from the classical "screening device" or the "cheaper option".

The second part of the paper contains evidence of two opposite dynamics for different type of workers. The empirical analysis has focused on Spain, that provides an interesting case of study with a "two-tier" labor market and a share of temporary contracts, which not only is the highest but also remains highly persistent above 30 per cent since the last decade. Our results show that for more educated workers temporary contracts serve as stepping stone. By contrast, workers who have a "bad history" seem to get stuck in temporary contracts. Moreover, workers' characteristics play a key role in the transition to unemployment. In this sense, young workers, women, less educated workers and "bad history" workers seem to experiment a penalty. Therefore, for these groups of workers temporary contracts seem to be dead-end jobs.

Finally, we test the "screening device hypothesis" by introducing unobserved heterogeneity. Our results indicate that the transition into permanency depends exclusively on the observed characteristics of workers (education, past labor history, etc.), which suggests that temporary contracts are not used as a "screening device", that is, conversion into permanency does not depend on unobservable characteristics of individuals (ability, preferences, etc.).

The evidence presented in this paper has policy implications. The existence of two opposite dynamics for different type of workers implies a different use of temporary contracts. Therefore, in the design of any labor market policy, it should be taken into account that any general policy will have different (even opposed) effects for different type of workers. By contrast, policies targeted to specific group of workers should take into account the channels through which the "precariousness trap" emerge.

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TABLES AND FIGURES

Table 1.
Summary statistics of durations.

Number of individuals	3130
Number of spells	4126
Average duration of temporary to permanent transitions*.	17,04
Average duration of temporary to unemployment transitions*.	16,35
Average duration of temporary to other states transitions*.	15,61
Average duration of temporary to other temporary in other firm transitions.	16,39
Average duration of uncompleted spells.	11,10
Number of spells censored.	1998
Number of spells that end in a permanent job.	540
Number of spells that end in Unemployment.	773
Number of spells that end in other states.	157
Number of spells that end in a temporary contract in another firm.	658

Note: Duration of spells is measured in number of months.

Figure 1. Kaplan Meier Survival Estimates

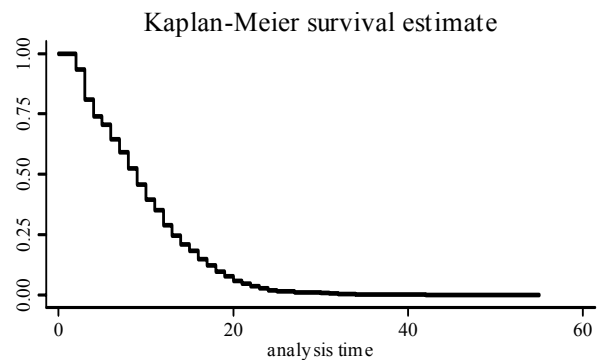
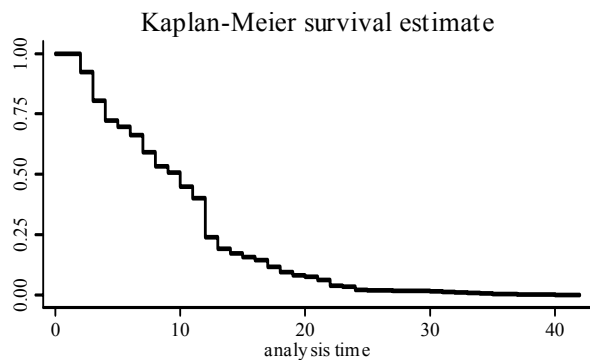
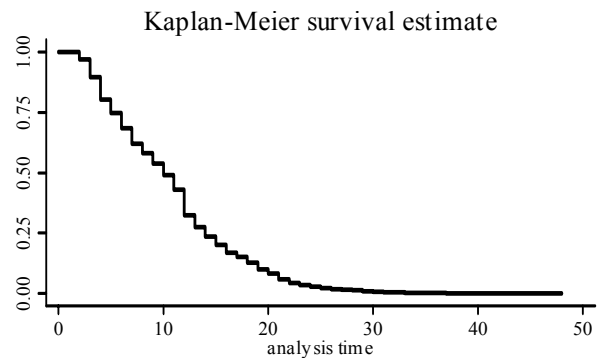
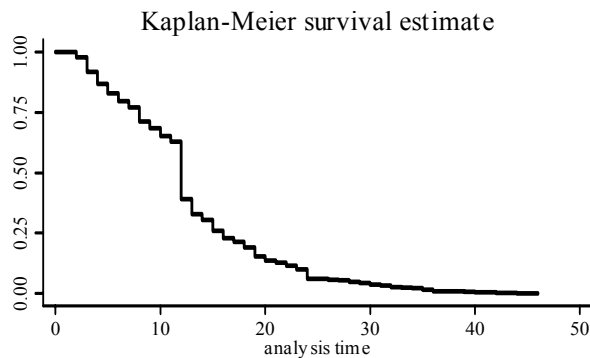


Table 2.
Sample characteristics of the temporary workers.

	Means
Aged between 16 and 25	0.314
Aged between 26 and 34	0.405
Aged between 35 and 46	0.200
Aged between 47 and 65	0.136
woman	0.387
Married or cohabiting	0.500
Other States	0.035
Single	0.463
Part-time	0.117
Public sector	0.122
Size1-5	0.243
Size 5-20	0.277
Size 20-50	0.161
Size 51-99	0.082
Size 100-500	0.089
Size 500+	0.059
Agricultural	0.066
Industry	0.378
Services	0.534
Primary	0.066
Energy	0.010
Manufacturing	0.163
Construction	0.182
Wholesale	0.132
Hotels and restaurants	0.072
Transport	0.066
Banking	0.066
Local Public sector	0.042
Education, health and social services.	0.066
Higher qualification	0.193
Secondary qualification	0.204
Some qualification	0.601
Unemployment spells longer than 1 year.	0.339
Number of times unemployed	0.793
Experience in another firm	0.780
Northeast	0.125
Northwest	0.142
Madrid	0.079
Center	0.145
East	0.224
South	0.197

Table 3.
Exits from temporary to permanency

	(1) Model I	(2) Model II	(3) Model III	(4) Model IV
Aged between 16 and 25	0.093 (0.77)	0.060 (0.48)	0.034 (0.27)	0.041 (0.33)
Aged between 26 and 35	0.053 (0.50)	0.049 (0.46)	0.017 (0.16)	0.070 (0.66)
Aged between 47 and 65	-0.155 (0.93)	-0.171 (1.02)	-0.177 (1.07)	-0.189 (1.14)
Other States	-0.407 (1.27)	-0.545+ (1.75)	-0.544+ (1.68)	-0.506 (1.56)
Single	-0.039 (0.38)	-0.068 (0.63)	-0.082 (0.78)	-0.036 (0.35)
woman	-0.041 (0.41)	-0.084 (0.85)	-0.121 (1.22)	-0.063 (0.62)
Higher qualification	0.282** (2.15)	0.360*** (3.05)	0.347*** (3.02)	0.345*** (2.94)
Secondary qualification	0.236** (2.16)	0.277** (2.51)	0.217** (2.03)	0.257** (2.42)
Managerial	0.471 (1.24)			
Professional	0.223 (0.89)			
Teachers and others	-0.014 (0.06)			
Associate Professional	0.296 (1.01)			
Associate Teachers	0.545*** (3.02)			
Clerks	0.306+ (1.93)			
Protection, personal services and sales.	0.145 (1.11)			
Semi-skilled workers	-0.274 (0.73)			
Miscellaneous	-0.372*** (2.83)			
Northeast		-0.246 (1.42)	-0.237 (1.32)	-0.214 (1.22)
Northwest		-0.172 (1.06)	-0.200 (1.22)	-0.166 (1.04)
Centre		-0.689*** (3.84)	-0.658*** (3.57)	-0.663*** (3.68)
East		-0.163 (1.09)	-0.184 (1.22)	-0.139 (0.95)
South		-0.790*** (4.53)	-0.761*** (4.21)	-0.728*** (4.07)
Canarias		-0.626*** (3.02)	-0.561** (2.55)	-0.593*** (2.75)
Size1-5		0.149 (0.91)	0.173 (1.08)	0.146 (0.88)
Size5-20		0.280+ (1.80)	0.316** (2.05)	0.284+ (1.82)
Size20-50		0.121 (0.71)	0.133 (0.80)	0.122 (0.72)
Size51-99		0.368+ (1.93)	0.392** (2.03)	0.385** (1.99)

Size100-500	0.126	0.105	0.118
	(0.67)	(0.56)	(0.63)
Agricultural	0.210		0.183
	(0.95)		(0.81)
Services	0.382***		0.381***
	(3.63)		(3.52)
Part-time	-0.178		-0.154
	(1.14)		(1.01)
Public sector	-0.228		-0.203
	(1.52)		(1.34)
Local unemployment rate	-0.004	0.001	-0.002
	(0.19)	(0.03)	(0.09)
Unemployment spells longer than 1 year.			-0.179+
Number of times unemployed			(1.80)
Experience in another firm			-0.141**
Primary		-0.114	(2.05)
		(0.49)	
Energy		-0.059	0.171
		(0.15)	(1.35)
Construction		-0.743***	
		(4.42)	
Wholesale		0.254+	
		(1.75)	
Hotels and restaurants		-0.122	
		(0.72)	
Transport		0.483***	
		(2.67)	
Banking		-0.013	
		(0.07)	
Local Public sector		-0.351	
		(1.28)	
Education, health and social services.		-0.084	
		(0.57)	
Person-month observations	58212	58212	58212

Note: Obtained using semi-parametric proportional hazard models. The sample used is sample 2. Robust z statistics in parentheses. The robust standard errors allow for clustering by individual. + Significant at 10%; ** significant at 5%; *** significant at 1%

Table 4.
Exit from temporary work to unemployment.

	(1)	(2)	(3)	(4)
	Model I	Model II	Model III	Model IV
Aged between 16 and 25	0.278*** (2.63)	0.293*** (7.46)	0.323*** (3.06)	0.310*** (2.89)
Aged between 26 and 35	-0.059 (0.65)	-0.047 (1.40)	-0.036 (0.40)	-0.071 (0.79)
Aged between 47 and 65	0.291** (2.46)	0.285*** (6.42)	0.285** (2.39)	0.306*** (2.63)
Other States	0.090 (0.55)	0.055 (0.82)	0.057 (0.34)	-0.017 (0.10)
Single	-0.093 (0.99)	-0.088** (2.50)	-0.090 (0.94)	-0.133 (1.38)
woman	0.332*** (3.98)	0.271*** (8.75)	0.332*** (3.83)	0.235*** (2.81)
Higher qualification	0.482*** (3.27)	-0.529*** (11.64)	-0.537*** (4.20)	-0.500*** (3.83)
Secondary qualification	-0.013 (0.14)	-0.024 (0.68)	-0.016 (0.17)	0.008 (0.08)
Managerial	-0.061 (0.12)			
Professional	0.107 (0.35)			
Teachers and others	0.033 (0.12)			
Associate Professional	-0.031 (0.09)			
Associate Teachers	-0.657** (2.20)			
Clerks	0.035 (0.22)			
Protection, personal services and sales.	0.059 (0.54)			
Semi-skilled workers	0.381+ (1.67)			
Miscellaneous	0.136 (1.43)			
Northeast		0.405*** (5.97)	0.381** (2.04)	0.375** (2.05)
Northwest		0.325*** (4.78)	0.333+ (1.73)	0.334+ (1.75)
Centre		0.374*** (5.72)	0.354+ (1.91)	0.363** (1.99)
East		0.305*** (4.84)	0.312+ (1.77)	0.282 (1.62)
South		0.507*** (8.12)	0.497*** (2.82)	0.431** (2.49)
Canarias		0.155** (2.07)	0.116 (0.55)	0.098 (0.48)
Size1-5		0.251*** (5.02)	0.252+ (1.94)	0.258+ (1.92)
Size5-20		0.217*** (4.47)	0.214+ (1.68)	0.224+ (1.74)
Size20-50		-0.009 (0.17)	-0.004 (0.03)	0.004 (0.02)
Size51-99		0.105 (1.62)	0.109 (0.64)	0.115 (0.66)

Size 100-500	0.223*** (3.81)	0.266+ (1.72)	0.248 (1.61)
Agricultural	0.165*** (3.03)		0.241 (1.64)
Services	0.006 (0.19)		-0.003 (0.03)
Part-time	0.368*** (9.55)		0.334*** (3.32)
Public sector	0.308*** (7.05)		0.271** (2.26)
Local unemployment rate	0.026*** (2.84)	0.024 (0.89)	0.031 (1.12)
Unemployment spells longer than 1 year.			0.394*** (5.10)
Number of times unemployed			0.101+ (1.87)
Experience in another firm			-0.177+ (1.65)
Primary		0.364** (2.21)	
Energy		0.120 (0.35)	
Construction		0.266** (2.02)	
Wholesale		-0.070 (0.47)	
Hotels and restaurants		0.228 (1.58)	
Transport		0.324 (1.64)	
Banking		0.090 (0.47)	
Local Public sector		0.600*** (3.39)	
Education, health and social services.		0.419*** (3.11)	
Person-month observations	58212	58212	58212

Note: Obtained using semi-parametric proportional hazard models. The sample used is sample 2. The robust standard errors allow for clustering by individual. Robust z statistics in parentheses. + Significant at 10%; ** significant at 5%; *** significant at 1%

Table 5.
Exit form from temporary work to work in other firm.

	(1) Model I	(2) Model II	(3) Model III	(4) Model IV
Aged between 16 and 2	0.101 (0.85)	0.090** (2.08)	0.079 (0.68)	0.183 (1.56)
Aged between 26 and 3	-0.172 (1.63)	-0.173*** (4.70)	-0.174+ (1.68)	-0.197+ (1.93)
Aged between 47 and 6	-0.156 (0.98)	-0.188*** (3.62)	-0.172 (1.10)	-0.171 (1.10)
Other States	-0.072 (0.30)	0.028 (0.32)	0.052 (0.22)	0.012 (0.05)
Single	0.028 (0.27)	0.093** (2.43)	0.112 (1.09)	0.131 (1.30)
woman	-0.058 (0.55)	-0.001 (0.04)	0.082 (0.79)	0.031 (0.30)
Higher qualification	-0.378*** (2.58)	-0.507*** (9.97)	-0.465*** (3.30)	-0.448*** (3.21)
Secondary qualification	-0.107 (0.93)	-0.127*** (3.20)	-0.112 (0.98)	-0.076 (0.66)
Managerial	-1.982+ (1.93)			
Professional	-0.011 (0.03)			
Teachers and others	-0.274 (0.96)			
Associate Professional	0.072 (0.23)			
Associate Teachers	-0.302 (1.14)			
Clerks	-0.209 (1.04)			
Protection, personal services and sales.	-0.098 (0.71)			
Semi-skilled workers	0.044 (0.17)			
Miscellaneous	0.268** (2.53)			
Northeast		-0.143** (2.07)	-0.084 (0.42)	-0.106 (0.54)
Northwest		-0.155** (2.31)	-0.118 (0.62)	-0.130 (0.69)
Centre		-0.232*** (3.57)	-0.193 (1.03)	-0.243 (1.30)
East		-0.241*** (3.90)	-0.214 (1.18)	-0.231 (1.28)
South		-0.081 (1.32)	-0.044 (0.25)	-0.097 (0.54)
Canarias		0.250*** (3.69)	0.231 (1.17)	0.272 (1.40)
Size1-5		-0.038 (0.66)	-0.039 (0.25)	-0.005 (0.03)
Size5-20		0.221*** (4.14)	0.178 (1.22)	0.220 (1.52)
Size20-50		0.303*** (5.36)	0.286+ (1.87)	0.307** (2.02)
Size51-99		0.094 (1.34)	0.074 (0.41)	0.077 (0.42)

Size100-500		0.014 (0.20)	-0.012 (0.07)	0.004 (0.02)
Agricultural		0.373*** (6.88)		0.337** (2.18)
Services		-0.203*** (5.58)		-0.183+ (1.82)
Part-time		0.163*** (3.25)		0.193 (1.47)
Public sector		0.031 (0.60)		0.032 (0.21)
Local unemployment rate		0.034*** (4.26)	0.033+ (1.65)	0.030 (1.48)
Unemployment spells longer than 1 year.				-0.086 (0.94)
Number of times unemployed				0.178*** (3.16)
Experience in another firm				0.302** (2.24)
Primary			0.449*** (2.68)	
Energy			-0.095 (0.24)	
Construction			0.140 (1.07)	
Wholesale			-0.223 (1.40)	
Hotels and restaurants			0.129 (0.84)	
Transport			-0.098 (0.43)	
Banking			0.089 (0.48)	
Local Public sector			-0.139 (0.55)	
Education, health and social services.			-0.425** (2.43)	
Person-month observations.	58212	58212	58212	58212

Note: Obtained using semi-parametric proportional hazard models. The sample used is sample 2. Robust z statistics in parentheses clustered by individuals. + Significant at 10%; ** significant at 5%; *** significant at 1%.

Table 6.
Transition from temporary job. Women

	Permanent	Unemployment	Other firms
Aged between 16 and 25	0.033 (0.17)	0.359** (2.24)	0.366+ (1.94)
Aged between 26 and 35	0.138 (0.80)	-0.003 (0.03)	-0.199 (1.11)
Aged between 47 and 65	0.046 (0.15)	0.318 (1.57)	-0.213 (0.62)
Other States	-0.895+ (1.88)	-0.022 (0.11)	-0.038 (0.11)
Single	0.106 (0.64)	-0.344** (2.39)	0.299+ (1.74)
Northeast	-0.569+ (1.92)	0.359 (1.42)	-0.383 (1.14)
Northwest	-0.187 (0.74)	0.287 (1.07)	-0.203 (0.67)
Centre	-0.741** (2.34)	0.448+ (1.68)	-0.251 (0.76)
East	-0.196 (0.87)	0.290 (1.21)	-0.221 (0.79)
South	-1.212*** (3.77)	0.383 (1.53)	-0.215 (0.69)
Canarian	-0.842** (2.33)	0.300 (1.08)	0.428 (1.38)
Size 1-5	0.360 (1.26)	0.248 (1.28)	-0.389 (1.38)
Size 5-20	0.731*** (2.66)	0.019 (0.09)	-0.056 (0.21)
Size 20-50	0.673** (2.48)	-0.385 (1.57)	0.342 (1.40)
Size 51-99	0.441 (1.25)	0.105 (0.41)	-0.145 (0.45)
Size 100-500	0.224 (0.70)	0.171 (0.74)	-0.050 (0.16)
Part-time	-0.016 (0.08)	0.329** (2.57)	0.526*** (3.08)
Public sector	-0.020 (0.09)	0.115 (0.66)	-0.092 (0.35)
Agricultural	0.627 (1.27)	-0.025 (0.07)	-0.251 (0.62)
Services	-0.053 (0.27)	0.023 (0.14)	-0.352+ (1.93)
Higher qualification	0.189 (1.04)	-0.520*** (3.11)	-0.416** (2.15)
Secondary qualification	0.208 (1.25)	0.084 (0.64)	-0.152 (0.76)
Unemployment spells longer than 1 year.	-0.009 (0.06)	0.341*** (2.92)	-0.108 (0.66)
Number of times unemployed	-0.054 (0.39)	0.103 (1.23)	0.134 (1.17)
Experience in another	0.047 (0.25)	-0.191 (1.26)	0.416** (2.10)
Local unemployment rate	0.019 (0.68)	0.058 (1.61)	-0.004 (0.11)
Observations	20795	20795	20795

Note: Obtained using semi-parametric proportional hazard models. The sample used is sample 2. Robust z statistics in parentheses clustered by individuals. + Significant at 10%; ** significant at 5%; *** significant at 1%.

Table 7.
Transition from temporary for youngsters.

	Permanent	Unemployment	Other firms
Northeast	-0.398 (1.34)	0.476+ (1.67)	-0.006 (0.02)
Northwest	-0.495+ (1.79)	0.451 (1.52)	0.300 (1.02)
Centre	-0.724** (2.40)	0.560** (2.00)	-0.105 (0.36)
East	-0.240 (1.01)	0.431 (1.62)	0.098 (0.36)
South	-1.242*** (3.73)	0.404 (1.50)	-0.112 (0.38)
Canarian	-0.853+ (1.96)	0.520+ (1.74)	0.337 (1.10)
Size 1-5	-0.169 (0.60)	0.275 (1.24)	0.036 (0.16)
Size 5-20	-0.028 (0.11)	0.106 (0.48)	0.003 (0.01)
Size 20-50	-0.038 (0.12)	0.071 (0.29)	0.133 (0.54)
Size 51-99	0.385 (1.32)	0.127 (0.47)	-0.296 (1.00)
Size 100-500	0.062 (0.19)	0.288 (1.13)	-0.052 (0.18)
Part-time	-0.339 (1.26)	0.390** (2.48)	0.337+ (1.79)
Public sector	-0.603 (1.64)	0.360** (1.99)	-0.077 (0.28)
Agricultural	0.094 (0.24)	0.075 (0.25)	0.596** (2.35)
Services	0.043 (0.25)	0.131 (0.95)	-0.016 (0.10)
Higher qualification	0.510** (2.55)	-0.370+ (1.85)	-0.310 (1.52)
Secondary qualification	0.209 (1.19)	0.329** (2.41)	0.018 (0.11)
Unemployment spells longer than 1 year.	-0.312 (1.60)	0.334** (2.50)	0.066 (0.42)
Number of times unemployed	-0.166 (1.13)	0.184+ (1.77)	0.118 (0.93)
Experience in another	0.167 (1.04)	-0.198 (1.59)	0.362** (2.30)
Local unemployment rate	-0.028 (0.58)	0.051 (1.49)	0.038 (1.49)

Note: Obtained using semi-parametric proportional hazard models. The sample used is sample 2. Robust z statistics in parentheses clustered by individuals. + Significant at 10%; ** significant at 5%; *** significant at 1%. Robust z statistics in parentheses

Table 8.
Results of estimated heterogeneity distribution

	Temporary to permanent	p-value
$\ln(\sigma^2)$	0,0002	0,8926
Likelihood ratio statistic*	0,0000	0,9950
Temporary to unemployment		
$\ln(\sigma^2)$	3,637	0,001
Likelihood ratio statistic *	19,623	0,000
Temporary to other transitions		
$\ln(\sigma^2)$	2,490	0,022
Likelihood ratio statistic *	10,594	0,001

*Note: The Likelihood ratio statistic for testing model without unobserved heterogeneity versus model with unobserved heterogeneity

Table 9.
Estimation results with unobserved heterogeneity.

	Transition into unemployment	Transition into other enterprises
Aged between 16 and 25	0,452** (2,560)	0,396** (2,410)
Aged between 26 and 35	-0,280 ⁺ (-1,870)	-0,095 (-0,710)
Aged between 47 and 65	-0,061 (-0,290)	-0,208 (-1,050)
Other States	0,080 (0,230)	0,296 (0,930)
Single	0,060 (0,360)	0,214 (1,480)
women	0,544*** (3,430)	0,005 (0,030)
Higher qualification	-0,988*** (-4,440)	-0,583*** (-3,080)
Secondary qualification	-0,173 (-1,080)	-0,242 (-1,580)
Size1-5	0,380 ⁺ (1,690)	-0,017 (-0,080)
Size5-20	0,346 ⁺ (1,650)	0,396** (2,410)
Size20-50	-0,066 (-0,290)	0,153 (0,610)
Size51-99	0,173 (0,620)	0,069 (0,290)
Size100-500	-0,067 (-0,260)	0,069 (0,290)
Agricultural	0,444 ⁺ (1,760)	0,431** (1,980)
Services	-0,107 (-0,710)	-0,306** (-2,23)
Part-time	0,742*** (3,750)	0,316 ⁺ (1,680)
Public sector	0,510** (2,390)	-0,159 (-0,790)
Local unemployment rate	0,085** (2,350)	0,046 (1,500)
Unemployment spells longer than 1 year.	0,776*** (5,110)	0,025 (0,200)
Number of times unemployed	-0,004 (-0,050)	0,142 ⁺ (1,810)
Experience in another firm	-0,127 (-0,700)	0,389** (2,170)

Note: Obtained using semi-parametric proportional hazard models. The sample used is sample 2. Robust z statistics in parentheses clustered by individuals. Include regional controls+ Significant at 10%; ** significant at 5%; *** significant at 1%. Robust z statistics in parentheses.

Figure 2. Baseline Hazard Estimates

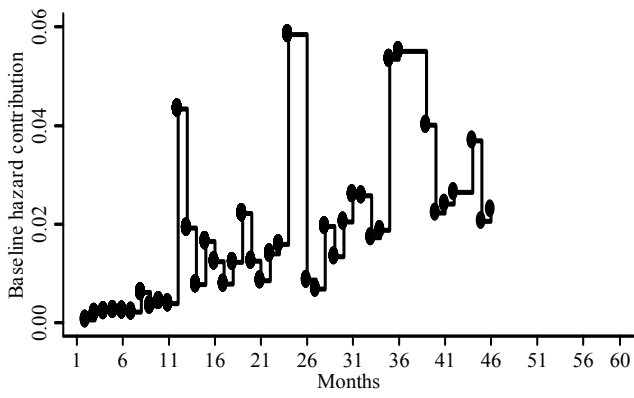


Figure 2a: Temporary into permanent

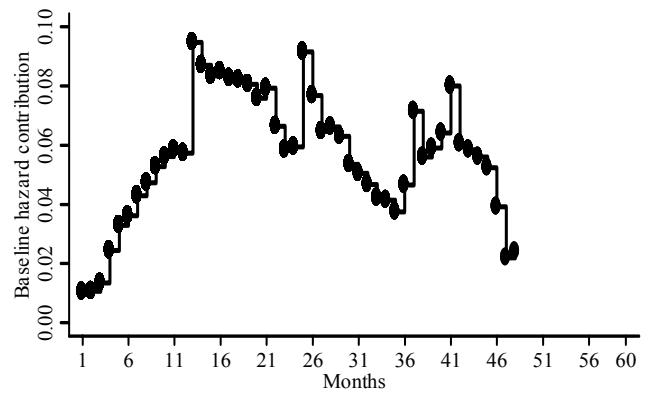


Figure 2b: Temporary into unemployment

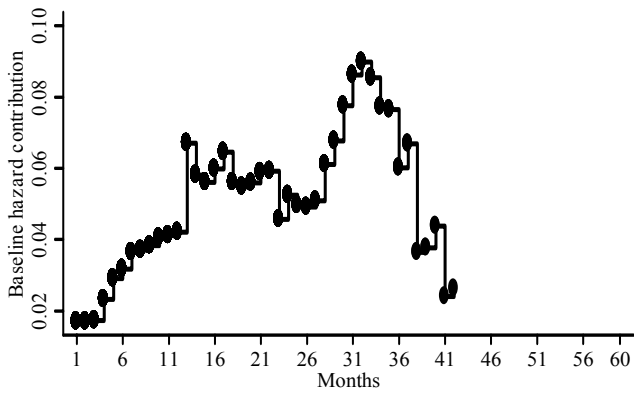


Figure 2c: Temporary into other states

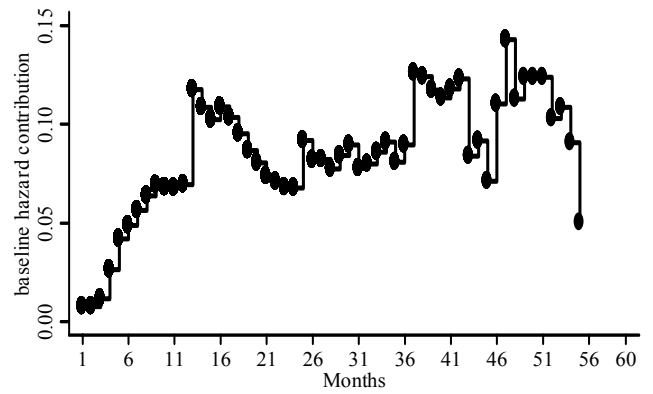


Figure 2d: Temporary into other firms

APPENDIX

**Table 1A.
Definition of Variables.**

Variable	Definition
Woman	Sex female
Age group	
Aged between 16 and 25	Aged between 16 and 25
Aged between 26 and 34	Aged between 26 and 34
Aged between 35 and 46 (Reference category)	Aged between 35 and 46
Aged between 47 and 65	Aged between 47 and 65
Marital status	
Married or cohabiting (Reference category)	Married or consensual union at interview date
Other States	Divorced, widowed or separated at interview date
Single	Single
Part-time	Part-time worker
Public sector	Work in the public sector
Current Profession (Grouped A)	
Managerial	Legislators, senior officials Corporate managers Managers of small enterprises.
Professional	Physical, mathematical and engineering science professionals Life science and health professionals
Teachers and others	Teaching professionals and others professionals
Associate Professional	Physical and engineering science associate professionals Life science and health associate professionals
Associate Teachers	Teaching associate professionals and other associate professionals
Clerks	Office clerks and customer services clerks
Protection, personal services and sales.	Personal, protective services workers, Models, salespersons, demonstrators
Semi-skilled workers	Services elementary occupations Skilled agricultural and fishery workers, Agricultural, fishery and related labourers
Unskilled workers (Reference category)	Metal, machinery and related trades workers Precision, handicraft, printing and related trades workers Stationary-plant and related operators Drivers and mobile-plan operators Machine operators and assemblers
Miscellaneous	Labourers in mining, construction, manufacturing and transport Miscellaneous
Industry (grouped B)	
Primary	Agriculture, hunting and forestry + Fishing
Energy	Mining and quarrying + Electricity, gas and water supply
Manufacturing (reference category)	Manufacture of metal products, machinery and equipments n.e.c. Manufacture of food products, beverages and tobacco Manufacture of textiles, clothing and leather products Manufacture off wood and paper products; publishing and printing Manufacture of coke, refined petroleum/chemicals/rubber & plastic/... Other manufacturing
Construction	Construction
Wholesale	Wholesale and retail trade; repair of motor vehicles, motorcycles and personal/household goods
Hotels and restaurants	Hotels and restaurants
Transport	Transport, storage and communication
Banking	Financial intermediation Real estate, renting and business activities

Local Public Sector	Public administration and defence; compulsory social security
Education, health and social services.	Education Health and social work Other community, social and personal service activities; private households with employed persons; extra-territorial organizations and bodies
Main activity in the current job (grouped c)	
Agricultural Industry (Reference category)	Agricultural Industries
Services	Services
Firm size	
Size1-5	Firm size: fewer than 5 employees at the establishment
Size5-20	Firm size: 5-20 employees at the establishment
Size20-50	Firm size: 20-49- employees at the establishment
Size51-99	Firm size: 50-99- employees at the establishment
Size100-500	Firm size: 100-499 employees at the establishment
Size500+(reference category)	Firm size: +500 employees at the establishment
Educational Attainment	
Higher qualification	Recognised third level education (ISCED 5-7)
Secondary qualification	Second stage of secondary level education (ISCED 3)
Some qualification (Reference category)	Less than second stage of secondary education (ISCED 0-2)
Past jobs	
Experience in another firm	Have work in another place before the current job
Number of times unemployed	Number of times individuals have been unemployed during the five years before joining the survey.
Unemployment spells longer than 1 year.	1 if individuals are unemployed for more than a year.
Region	
Northeast	Northeast
Northwest	Northwest
Madrid (Reference category)	Madrid
Centre	Centre
East	East
South	South
Canaries	Canaries
Local unemployment rate	Quarterly local unemployment rate disaggregated by sex.

