Temporary contracts' transitions: the role of training and institutions

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Abstract
Despite recent reforms, labour market segmentation is still a marked feature of several European countries. This work empirically analyses transitions out of temporary contracts, by means of a discrete duration model, with a particular focus on human capital features, labour market protection and their interaction. Transitions to open-ended contracts with the same or with a new employer are considered separately, as well as transitions to joblessness, based on data for ten European countries taken from the European Community Household Panel. Firm-training significantly increases the likelihood of transitioning to an open-ended contract with the same employer, but not in countries with more segmented labor markets. In these countries, instead, educational attainment and labour market flexibility are more important determinants of transitions to open-ended contracts. Interestingly, in these countries, firm training actually mitigates the positive (and significant) impact of labor market flexibility on the likelihood of transitioning to an open-ended contract with the same employer. (JEL: E24, J24, J41)

Introduction

Despite recent reforms, labour market segmentation, characterized by strong differences between temporary and open-ended contracts, namely as regards employment protection, is still a marked feature of several European countries.[1]

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1. According to the definition of the International Labour Organization, labour market segmentation consists in the division of the labour market into separate submarkets or segments, distinguished by different characteristics and behavioural rules. Segmentation may arise, *inter alia*, from particularities of labour market institutions, such as governing contractual arrangements.

A large part of the literature on this topic has focused on transitions from temporary to permanent jobs and on the ability of the former to serve as career stepping stones. In particular, a number of papers focus on firm and worker characteristics that favour the conversion of a temporary contract into an open-ended (permanent) one (Portugal and Varejão (2009), Amuedo-Dorantes (2000), D'Addio and Rosholm (2005), etc.). Other studies have focused instead on the impact of labour market institutions on transitions from temporary to permanent (Kahn (2010), Centeno and Novo (2012)) or job-to-job mobility among permanent workers (Gielen and Tatsiramos (2012) and Orsini and Vila Nuñez (2014) among others). Less explored in the literature is the connection between training decisions and transitions, even though labour market segmentation may imply that temporary workers receive less training, which can have a longer term impact on the skill level of the economy, given that these workers may become trapped in cycles of low productivity jobs, with a consequent effect on output. Even less explored in the literature is the interaction between labour market institutions, namely employment protection legislation (EPL), and training decisions (Bassanini *et al.* (2005) suggest that there is a negative impact of EPL on temporary contracts on training incidence). This work tries to analyse the impact of the interaction between labour market regulations and training decisions on labour market transitions for workers holding temporary contracts. This issue has relevant implications for the definition of both labour market and training policies.

The analysis in the current work is an empirical exercise, based on a panel of survey data for European countries, the European Community Household Panel (ECHP). The modelling approach is based on a semi-parametric discrete duration model with the aim of accessing how the probability of transition to other labour market states evolves over the duration of a temporary contract. This analysis is disaggregated into transitions within the same firm (intra-firm transitions) and to other firms (inter-firm transitions). This distinction of transitions according to employer type is motivated by the fact that training may play a role on the type of transition obtained. In addition, in the case of inter-firm transitions, reasons to quit a job may be substantially different for temporary and permanent workers. In the case of temporary workers this movement may result from the expectation of contract non-renewal or non-conversion. In fact, according to the data used in this study, the reasons that lead to the end of a temporary and a permanent job are somewhat different, given that for the former the legal limit of the contract assumes substantial relevance.

The results presented in this article show that interactions between training and labour market regulations influence transitions to permanent contracts. Moreover, the distinction between intra and inter-firm transitions matters as regards the relative importance of the determinants. For transitions to a permanent job with the same employer, the characteristics of the firm appear to be the most relevant feature, while for inter-firm transitions, the

characteristics of the worker seem to be more relevant. Moreover, being in a training firm insulates to some extent temporary workers from the impact of changes in labour market protection.[2] The breakdown of results across two country groups shows that this latter result stems from segmented labour markets. In these economies, higher labour regulation flexibility increases the probability of all types of transitions considered. However, the size of this response is mitigated in some cases for employees of training firms, which are therefore insulated to some extent from the effects of changes in labour market regulation. In countries with less segmented labour markets, aspects related to training appear to be more relevant than institutional ones, with firm training favouring transitions to an open-ended contract with the same employer, while reducing the probability of transitions to joblessness.

Data and descriptive analysis

Data

The European Community Household Survey is an harmonized longitudinal survey covering fifteen European Union member states (Belgium, Denmark, Germany, Greece, Spain, France, Italy, Ireland, Luxembourg, The Netherlands, Portugal, United Kingdom, Austria, Finland and Sweden) and comprising eight waves (from 1994 to 2001) for the majority of countries. The survey is carried out by national data collection units and coordinated by the Statistical Office of the European Union (Eurostat). The longitudinal nature and standardized methodology and questionnaire are advantages of this database, which allows for the analysis of individual transitions and cross-country comparisons. However, it has the disadvantage of being relatively outdated, and therefore not capturing the impact of policy changes that have taken place in recent years. Notwithstanding, as will be argued bellow, the broad situation as regards labour market segmentation has not changed dramatically since the period of the survey. The main reason for the choice of the database is the availability of questions regarding training incidence, duration, and nature, as well as firm training choices. However, for estimation only part of this information could be used due to sample size limitations.

Some countries were excluded from the database due to data coverage issues (Germany, Luxembourg, UK, France and Sweden). The sample was further restricted to dependent employees working more than 15 hours per week and included in the survey for at least two consecutive years.

2. The term "training firm" is used to define a firm that offers benefits related to training to its workers. The exact wording of this question in the ECHP is "Does your employer provide free or subsidised services or benefits to employees in any of the following areas?", with one of the options considered being education and training.

Employment status is consistent with the International Labour Organization standards. Data from the first wave of the survey could not be used, given that information on the type of contract held by the worker is only available from wave 2 onwards. Furthermore, only observations in which workers state being in a permanent contract or in a fixed or short-term contract are considered.[3] In addition, the treatment of duration prior to the beginning of the survey restricts the sample to those observations for which information on year and month of start of the current job is available. In the case of agents which recorded multiple transitions from a temporary contract to one of the risk states, only the first transition is considered. Individuals which have reported having permanent jobs prior to a temporary contract have also been excluded from estimation.

Finally, the sample is restricted by the availability of information on the regressors considered. These comprise firm characteristics, including sector of activity, provision of training to employees and number of employees in the production unit of the worker. Worker characteristics used as controls include gender, age, highest level of general or higher education completed (ISCED[4] level), job satisfaction[5] and attendance of education or training in the recent past. Job and career information like duration of current job and the number of temporary contracts held prior to the current one is also considered. The available sample comprises 8947 observations and 5910 individuals after these conditions are satisfied.

To control for the evolution of labour market protection over time at country level, the indicator related to labour legislation included in the International Institute for Management Development (IMD) World Competitiveness Yearbook is used. IMD is an yearly assessment of country competitiveness, which includes the results of an executive opinion survey on several issues, including whether labour regulations hinder business activities. An increase in the indicator implies an increase in flexibility of labour market regulation. This indicator has the advantage of having a time series interpretation (Antunes and Centeno (2007)) and more time variability than the commonly used OECD EPL indicator. It also has a scope which is

3. The exact wording of this question is “What type of employment contract do you have in your main job? Please indicate which of the following best describes your situation." The options available for answer are: permanent employment, fixed-term or short-term contract, casual work with no contract and some other working arrangement.

4. ISCED is the acronym for the International Standard Classification of Education, provided by the United Nations Educational, Scientific and Cultural Organization (UNESCO).

5. The indicator on job satisfaction consists of an average of the evaluation of workers regarding several aspects of their job. The exact wording of the question is “How satisfied are you with your present job or business in terms of earnings, hours of work, working conditions etc." and the topics considered are earnings, job security, type of work, number of working hours, working time, working conditions/environment and distance to job/commuting. A higher value implies higher satisfaction, from 1 (not satisfied) to 6 (fully satisfied).

broader than EPL, and relates to actual enforceability of regulations, instead of simply legislative changes like the OECD indicator. The main drawback of the IMD indicator is that it does not allow for a separate analysis of the impact of labour regulations affecting temporary and permanent contracts.

The analysis is developed for the overall sample and for two country subgroups, in order to control to what extent results are driven by more segmented labour markets, where temporary contracts share a relatively similar institutional framework. Group M (more segmented labour markets) is composed of Spain, Portugal and Italy, while group L (less segmented labour markets) contains the remaining countries. This partition was adopted because countries in group M are among those with highest share of temporary contracts in employment at the time of the ECHP survey, and have maintained that status in recent years (Table 1).[6] In addition, these countries implemented two-tier labour market reforms over the 80's and 90's (Boeri (2011)), maintaining however strict average levels of labour market protection (OECD (2013)). Table 2 shows that the relative ranking of the countries regarding labour market regulations strictness measured by the IMD indicator has not changed substantially since the ECHP survey period. In addition, group M countries are among those in the European Union with lowest training incidence (Bassanini *et al.* (2005)). This evidence, along with the one in Table 1, suggests that the fact that the ECHP data extends only to 2001 may not be critical for the analysis of this work, given that the main features under analysis have not changed fundamentally since then.

Descriptive analysis of the data

Table 3 shows how the employment structure described in Table 1 translates into temporary worker flows for the sample considered.[7] About half of the workers change state after one year, and a large share of workers obtain a permanent contract each period, the majority of which with the same employer. One distinctive feature is that while the share of temporary workers that is promoted to a permanent job with the same employer is relatively stable across countries (ranging from about 17% to 33%), the share of workers that transition to open-ended contracts with a new employer is more heterogenous. In fact, the share of inter-firm transitions is lower for countries with a higher share of temporary workers, which also show a higher

6. The temporary employment concept in the OECD data used to compute the composition of employment in recent years is more encompassing than the fixed-term aggregate in the ECHP. However, based on data from the two databases for 2000-2001, the employment share defined by fixed-term plus other temporary contracts in the ECHP is very comparable to the OECD aggregate, with differences of less than five percentage points.

7. Because these are annual flows, some intra-anual transitions (from temporary employment to joblessness and back to temporary employment, for example) are not accounted for.

Country	1995-2001				2008-2012
	permanent	fixed-term	none	other	temporary employment[a]
Spain	64.1	29.7	3.8	2.4	25.7
Finland	84.2	13.5	1.7	0.5	15.3
Portugal	80.0	10.6	3.3	6.1	22.1
Belgium	89.1	8.8	0.4	1.6	8.3
Greece	76.8	8.6	14.0	0.6	11.5
Italy	86.9	7.9	3.2	2.0	13.1
Ireland	82.1	6.1	8.7	3.1	9.4
Denmark	88.3	5.6	5.5	0.6	8.6
Austria	91.7	4.9	0.4	3.0	9.2
Netherlands	89.4	3.3	0.7	6.6	18.6

TABLE 1. Composition of employment by contract type

Notes:[a] Share in dependent employment, OECD data. Data sorted in descending order by share of fixed-term contracts in 1995-2001.
Sources: ECHP and OECD.

	1995-2001	2008-2012
Italy	2.4	3.7
Belgium	3.1	3.3
Spain	3.4	3.4
Portugal	3.9	3.9
Austria	4.1	5.4
Greece	4.2	3.6
Netherlands	4.5	4.4
Finland	4.6	5.0
Ireland	5.9	5.2
Denmark	7.6	8.1

TABLE 2. IMD- Labour regulations indicator

Notes: Data sorted in ascending order by 1995-2001 values. A higher value of the indicator implies higher perceived flexibility in the economy.
Source: IMD World Competitiveness Online.

percentage of transitions into joblessness (unemployment plus inactivity). This evidence suggests that there is a margin for use of temporary contracts that is similar across countries (possibly related to temporary labour needs from firms), but another one which is more variable. In addition, there is some overlapping of countries with a low share of inter-firm transitions and with strict labour regulations as measured by the IMD indicator.

Table 4 shows the descriptive statistics for the sample used, which illustrate the main differences between workers that experience intra and inter-firm transitions and also transitions into joblessness. These statistics correspond to the sample averages of all the individual level variables used in estimation. With the exception of age, for time-varying variables the lagged values were considered (see Section *Transitions out of temporary employment* for more details).

Country	Remain Temporary	Intra-firm transition	Inter-firm transition	Joblessness	Observations
Spain	56.2	17.5	4.3	22.1	3917
Portugal	54.2	24.8	6.6	14.5	1361
Finland	45.6	16.7	8.5	29.2	945
Greece	53.9	18.0	8.8	19.4	434
Italy	44.1	20.2	10.3	25.4	891
Belgium	51.0	26.8	12.1	10.1	298
Austria	36.7	33.3	14.4	15.5	264
Ireland	39.2	26.5	18.0	16.3	245
Denmark	34.8	23.3	21.5	20.4	270
Netherlands	39.8	17.7	25.8	16.8	322
Total	51.0	20.0	8.1	20.9	8947
Observations	4562	1791	726	1868	8947

TABLE 3. Transitions from temporary jobs

Note: Data sorted in ascending order by share of transitions to a job with a new employer.
Source: ECHP.

Table 4 shows that workers that undergo inter-firm transitions tend to be younger and have higher education levels. These workers also received training in the period prior to transition in higher proportion than those that experienced intra-firm transitions. These features suggest that a separate analysis of intra and inter firm transitions may be relevant. Other distinctive features are that workers experiencing the first temporary contract recorded in the survey are much more likely to make a transition than those which had at least one previous temporary contract, and this reflects in particular transitions to joblessness. Transitions to joblessness are made by workers with a higher average age and a lower education level than those going to other states. These workers are also mostly female and work in production units that are on average smaller and less likely to provide training. Regarding the comparison between country groups M and L (results available upon request), workers in the latter have on average a higher education level. The incidence of firm-provided training is also higher in this country group.

Modelling approach

The dependent variable considered in estimation is the time elapsed since the admission into a fixed-term contract with a given employer.[8] Given the annual frequency of the survey, a discrete duration model was adopted.

8. For estimation purposes no distinction is made between contract and job, *i.e.*, renewals or other contractual changes are not accounted for when they do not imply a change in the type of contract declared in the ECHP (permanent, fixed-term, no contract or other arrangement).

Variable	Overall	Remain temporary	Intra-firm transition	Inter-firm transition	Joblessness
Duration in months:					
$]0,3[$	0.20	0.18	0.13	0.25	0.28
$[3,6[$	0.15	0.14	0.10	0.15	0.20
$[6,9[$	0.10	0.10	0.09	0.12	0.11
$[9,12[$	0.08	0.07	0.08	0.09	0.08
$[12,15[$	0.11	0.11	0.13	0.11	0.10
$[15,18[$	0.08	0.08	0.09	0.06	0.06
$[18,21[$	0.05	0.05	0.06	0.04	0.04
$[21,24[$	0.04	0.04	0.05	0.03	0.02
$[24,30[$	0.08	0.09	0.10	0.06	0.05
≥ 30	0.12	0.14	0.17	0.08	0.05
First job	0.58	0.39	0.75	0.77	0.80
Not first job	0.42	0.61	0.25	0.23	0.20
Age [16,30[	0.54	0.53	0.54	0.60	0.53
Age [30,45[	0.33	0.35	0.35	0.32	0.29
Age [45,65]	0.13	0.13	0.12	0.08	0.18
Firm size <20 workers	0.48	0.46	0.48	0.44	0.54
Firm size 20-99 workers	0.28	0.30	0.27	0.26	0.27
Firm size >99 workers	0.24	0.24	0.25	0.29	0.19
Secondary education or more	0.53	0.52	0.58	0.64	0.47
Less than secondary education	0.47	0.48	0.42	0.36	0.53
Training worker	0.34	0.32	0.33	0.44	0.34
No training worker	0.66	0.68	0.67	0.56	0.66
Training firm	0.24	0.24	0.30	0.31	0.18
No training firm	0.76	0.76	0.70	0.69	0.82
Training worker+firm	0.15	0.14	0.18	0.21	0.11
Training worker+no training firm	0.18	0.17	0.15	0.22	0.24
No training worker+training firm	0.09	0.09	0.12	0.10	0.07
No training worker+no training firm	0.57	0.59	0.55	0.47	0.59
Men	0.52	0.54	0.52	0.54	0.47
Women	0.48	0.46	0.48	0.46	0.53
Agriculture	0.04	0.05	0.02	0.03	0.06
Industry	0.33	0.34	0.35	0.30	0.29
Services	0.63	0.62	0.63	0.67	0.65
Private sector	0.73	0.72	0.77	0.73	0.71
Public sector	0.27	0.28	0.23	0.27	0.29
Job satisfaction	3.88	3.85	4.00	4.01	3.77
Observations	8947	4562	1791	726	1868

TABLE 4. Descriptive statistics - Overall Sample

Note: the statistics presented are the average proportion of the sample corresponding to each category, with the exception of job satisfaction, for which the average sample value is reported. Source: ECHP.

Each period, the length of a spell, in this case of a temporary contract, is expressed as a random variable T, with an associated cumulative distribution function $F(t)$. The elapsed time since the beginning of the spell is given by the survivor function $S(t) = 1 - F(t)$.

In a discrete duration setup in which data is grouped, *i.e.*, in which the underlying process is inherently continuous but observed in at discrete frequency, time is aggregated into intervals of the type $]a_i, a_j]$ where $a_i \in \{0, 1, ...a_{j-1}\}$ and $a_j \in \{1, 2, ...\infty\}$. In that case, the hazard rate corresponds to the probability that a spell ends before a_j, given that it lasted up until a_{j-1}:

$$\begin{aligned} h(a_j) &= Pr(a_{j-1} < T \leq a_j | T > a_{j-1}) \Leftrightarrow \\ h(a_j) &= 1 - \frac{S(a_j)}{S(a_{j-1})}. \end{aligned} \tag{1}$$

The duration is modeled by assuming a proportional hazard model, where $h_0(t)$ represents the baseline hazard function, λ_t the proportional changes implied by different values of the covariates X_t and v is an unobservable individual effect, assumed to be a random variable with unit mean, finite variance and independently distributed from t and X, that only assumes positive values:

$$h(t, X_t | v) = h_0(t) \lambda_t v. \tag{2}$$

The modeling approach followed was a complementary log-log (cloglog) specification, which corresponds to the discrete time representation of a proportional hazard model with grouped data (see Jenkins (2005) for a proof). In that case, the hazard rate of the discrete process can be specified as:

$$h(a_j, X_t) = 1 - \exp[-\exp\left(\beta' X_t + \gamma_j + u\right)]. \tag{3}$$

where γ_j is the log of the difference between the integrated continuous time baseline hazard corresponding to the continuous process which is only observed at discrete intervals, evaluated at the extremes of the interval $]a_{j-1}, a_j]$, X is the vector of (possibly) time varying covariates and $u = \ln(v)$. The baseline hazard is assumed to be constant over a given interval.

A competing risk approach is adopted that takes into account three mutually exclusive possible modes of exit from temporary employment: being promoted to a permanent contract with the same employer, obtaining an open-ended contract with a new employer or joblessness (unemployment or inactivity). A latent duration variable is associated with each exit mode from a temporary job, and only the minimum of the latent failure times, if any, is observed. For simplicity, competing risks are assumed to be independent. Moreover, transitions are assumed to occur at the limits of intervals, *i.e.*, at the moments the survey takes place, which allows the model to simplify to three single cause hazard models (Portugal and Varejão (2009)).

Estimation Results

Transitions out of temporary employment

Overall Sample. Table 5 presents the results of the estimation of the competing risks duration model for transitions out of temporary employment. Robust standard errors (in order to correct for potential error heteroskedasticity) are presented in parenthesis.

One note on coefficient interpretation: in a continuous proportional hazard model, the exponential of the coefficients can be interpreted as hazard ratios, the relative change in the hazard rate when a covariate changes by one unit. Given that the cloglog model corresponds to the discrete version of a continuous proportional hazard model, the exponential of coefficients in Table 5 can be interpreted as the hazard ratio of the corresponding continuous model. Therefore, a positive (negative) coefficient associated with a given covariate will imply that an increase in that covariate corresponds to a higher (lower) hazard than for the reference (omitted) category.

For the estimated models presented in this article, a non-parametric approach was followed as regards the estimation of the baseline hazard rate, with dummies representing regular intervals of duration of the temporary job. These durations are measured at the beginning of intervals, therefore corresponding to the minimum duration of the temporary job. Therefore, the last dummy included covers minimum durations above 2.5 years. Due to legal limitations on the maximum duration of a temporary contract, closed intervals above that duration would lead to the exclusion of some countries from that parameter estimation sample.

For time-varying variables (except age), lagged values were considered, not only to reduce potential regressor endogeneity issues, but also because that would be the only way to make models comparable by considering the characteristics of the departure state for all competing risks. For example, the time frame of the question regarding training spans the whole year prior to the one of the survey, so a worker that has changed job in survey year t can report in that survey training received either with his previous or current employer.[9] In addition, the variable related to labour market flexibility (IMD indicator) is standardized across countries to facilitate the interpretation of interaction effects.

Duration is measured using a combination of stock sampling (individuals that are in a temporary contract when they started being observed in the survey) and flow sampling (individuals which enter the state of interest during the period of the survey), to account for the fact that a large part

9. The exact question on training for survey year t is: Have you at any time since January of *year t-1* been in vocational education or training, including any part-time or short courses?

VARIABLES	Same employer	Diferent employer	Joblessness
Duration in months:			
$[3,6[$	0.1166	-0.1494	-0.1259*
	(0.1003)	(0.136)	(0.0716)
$[6,9[$	0.3739***	0.0641	-0.4443***
	(0.1041)	(0.1485)	(0.0867)
$[9,12[$	0.4661***	-0.0594	-0.3885***
	(0.11)	(0.1682)	(0.0981)
$[12,15[$	0.8105***	0.023	-0.3803***
	(0.0972)	(0.1554)	(0.0934)
$[15,18[$	0.8245***	-0.1668	-0.5726***
	(0.1082)	(0.1953)	(0.1136)
$[18,21[$	0.8404***	-0.0802	-0.6988***
	(0.1207)	(0.2311)	(0.1352)
$[21,24[$	0.9814***	-0.0497	-0.8167***
	(0.1273)	(0.2557)	(0.1578)
$[24,30[$	0.9655***	-0.0187	-0.6619***
	(0.1135)	(0.2071)	(0.1214)
≥ 30	1.1303***	0.0702	-1.0957***
	(0.1188)	(0.1972)	(0.1262)
Not first job	-0.9981***	-0.8352***	-1.3165***
	(0.0623)	(0.1164)	(0.0726)
Age [30,45[	0.0744	-0.1477	-0.1858***
	(0.0565)	(0.1002)	(0.0599)
Age [45,65]	-0.0508	-0.7493***	0.1871**
	(0.0813)	(0.1716)	(0.0734)
Firm size 20-99 workers	-0.0684	-0.075	-0.1170*
	(0.0583)	(0.1057)	(0.0597)
Firm size >99 workers	-0.0506	-0.036	-0.2213***
	(0.0628)	(0.1135)	(0.0708)
Secondary education or more	0.2581***	0.2398**	-0.4864***
	(0.0579)	(0.1045)	(0.0611)
Training worker+firm	0.2361***	0.3316**	-0.5437***
	(0.0838)	(0.1457)	(0.1023)
Training worker+no training firm	-0.1559**	0.2314*	0.1420**
	(0.0775)	(0.1211)	(0.0695)
No training worker+training firm	0.2769***	-0.0995	-0.2906***
	(0.0829)	(0.1666)	(0.1046)
IMD Labour market Regulations	0.3716***	0.5968***	0.1056
	(0.0933)	(0.1542)	(0.1017)
IMD Training worker+firm	-0.3274***	-0.4309***	0.0804
	(0.0853)	(0.1326)	(0.1024)
IMD Training worker+no training firm	-0.157	-0.1361	0.0584
	(0.0999)	(0.1357)	(0.0925)
IMD No training worker+training firm	-0.2424**	-0.1548	-0.0877
	(0.0969)	(0.1488)	(0.122)
Men	0.0543	0.3433***	-0.2522***
	(0.052)	(0.0946)	(0.0561)
Industry	0.5451***	0.2778	-0.2379**
	(0.1588)	(0.2641)	(0.1163)
Services	0.4418***	0.3137	-0.1316
	(0.159)	(0.2577)	(0.1141)
Job satisfaction	0.1652***	-0.0132	-0.1845***
	(0.0301)	(0.0492)	(0.0297)
Private sector	0.5140***	0.3343***	-0.2627***
	(0.0704)	(0.1111)	(0.0659)
Constant	-3.6854***	-3.1474***	0.7546**
	(0.3635)	(0.6032)	(0.3581)
Observations	8,947	8,947	8,947
Country dummies	yes	yes	yes
Time dummies	yes	yes	yes
ρ	0.000145	0.433	0.127
Log-pseudolikelihood	-4078	-2277	-3972

TABLE 5. Transitions - Results for the overall sample

Notes:Robust standard errors in parentheses.
*** p<0.01, ** p<0.05, * p<0.1.

of spells is left-censored (the temporary job has already started when the individual enters the survey).

Results in Table 5, column 2, which refer to temporary workers who were promoted to permanent with the same employer, show that the probability of intra-firm transition increases with the duration of the job, a common result in the literature (Portugal and Varejão (2009), Alba-Ramirez (1998) and others), which supports the theory that a temporary job is an experience good (Jovanovic (1979)) with a screening objective. There is a peak of conversions for contracts that lasted more than two years and a half (this corresponds to the legal duration limit of temporary contracts for some countries at that time, including Belgium, Denmark and Portugal (OECD (2004))). A similar result is found for Spain by Guell and Petrongolo (2007). The fact that firms appear to explore to some extent the legal limits of the temporary contracts suggests that firms take advantage of the lower (actual and potential) firing costs associated with this type of contracts while it is possible to retain the option value of converting the worker to a permanent position.

Workers that have higher formal education show a higher hazard of promotion to a permanent contract than their lower educated counterparts. The same is true for workers with temporary jobs in training-providing firms, independently of whether the worker has actively taken advantage of that feature in the recent past, when compared to the reference category (employees which do not receive training and that work in firms that do not provide training to their workers). On the contrary, there is a significant negative impact on the hazard for those workers which received training prior to transition while employed in a non-training firm.

The estimated models include regressors that control for the interaction between IMD and the firm-worker pairs training status. The corresponding estimated coefficients show that the positive net impact of an increase in labour market flexibility measured by the IMD indicator is mainly relevant for workers of non-training firms. That is, workers in training firms are somewhat insulated from the negative impact that a strict labour market legislation will have on transitions to a permanent contract. This is possibly related to the nature of the production process of the firm, given that a training investment in a specific individual may imply expected productivity gains for that worker that are more relevant for the contract conversion decision than the changes in the expected value of the job brought about by legislation changes.

Other significant coefficients signal that agricultural workers have a lower hazard than their counterparts from other sectors of activity of being promoted to permanent with the same employer, which possibly reflects the seasonal nature of many of the jobs in agriculture. There is also a lower hazard of transitions for workers in the public sector when compared to those from the private sector. In addition, higher job satisfaction implies an increased hazard of transition.

For inter-firm transitions (Table 5, column 3), duration dependence is negative but not significant, and therefore there is no large difference in the probability of leaving to obtain an open-ended with a new firm after only a few months of tenure or after two years.

As concerns human capital effects, both formal education and training favour transitions to a permanent job with a new employer, independently of whether that training was obtained in a training firm (and thus has more likely a vocational nature) or not. However, the interaction coefficients between the IMD indicator and firm-worker training show that a change in labour market flexibility has a low net impact on the hazard of workers that received training and which worked in training firms, possibly because these type of transitions are more related to firm competition (another firm hiring a worker that had vocational training in another firm in the same sector of activity) than to the overall state of the labour market. Workers with all other training status types see the hazard associated to inter-firm transitions increase with less strict labour market regulation.

Additionally, men have a higher probability than women of experiencing inter-firm transitions, in line with the findings by Booth *et al.* (1997) that job quitting behaviour is more pronounced for this group. Older workers, on the other hand, have lower hazards than their younger counterparts, possibly because mobility costs increase with age (Winkelmann and Zimmermann (1998)), while benefits to hiring firms decrease, given that they have less time to benefit from the new worker skills. Similarly to what happens for intra-firm transitions, private sector employees are also favoured in transitions to a permanent contract with another employer vis-á-vis their public sector counterparts.

The view that a temporary job is an experience good is also supported by the negative duration dependence found for transitions to joblessness (Table 5, column 4), given that both the firm and the worker access the quality of the match, and as the job progresses the probability that the match is found to be poor decreases. Job duration and human capital determinants have an impact on transitions to joblessness that is to a large extent of symmetrical sign to those in the model for intra-firm transitions. Namely, the hazard of transition from a temporary job to joblessness declines with time, reaching the lowest point for durations longer than 30 months. As concerns the effects of human capital variables, education and presence in a training firm reduce the hazard to non-employment, while having received training while working in a non-training firm increases it. However, the degree of labour market regulation strictness does not have a significant effect on these transitions, independently of training status, which resonates with the unclear sign found in the literature for the impact of EPL on unemployment levels (see Boeri and van Ours (2013) and Blanchard and Portugal (2001), among others).

Smaller firms are more likely to originate transitions into joblessness, possibly because in these cases the end of the job is more directly connected

with the survival of the firm itself. The lower hazard of men into joblessness is possibly associated with higher incidence of transitions of women into inactivity due to family reasons. Being in the private sector implies a lower hazard of transition into joblessness, which in addition to the previous results regarding this regressor, indicates that private sector employees are more likely to transition to permanent employment than their public sector counterparts.

It is worth mentioning that a complementary analysis (available on request) focusing on the overall number of temporary contracts held by workers over the period of the sample by means of a count variable model was also performed. Given that some worker and firm characteristics favour transitions to permanent employment and/or longer durations of temporary contracts, these should consequently imply a lower count of temporary contracts. The results of this exercise confirm some of the results of this section, namely regarding the impact of firm (like sector of activity or size) or firm-related characteristics (like job satisfaction) on transitions.

A feature which is common to the three competing destinations is the strong and negative impact on the hazard of having had at least one previous temporary contract. This regressor tries to control for initial conditions, limiting the sample problem of unavailability of the whole career history of workers. Having at least one previous temporary contract has a large negative impact on the hazard of leaving temporary employment, particularly trough joblessness. This feature suggests that some workers may be trapped in a succession of temporary employment cycles.

Results by country group. Tables A.1 to A.3 in the appendix show the results of the estimation of the competing risk models for country groups M (more segmented) and L (less segmented). Although in many cases results are qualitatively similar for both groups, the significance or even the sign of some coefficients differs across them. This section focuses on the most relevant of these differences.

In the case of workers that obtain an open-ended contract with the same employer (Table A.1), higher formal education has a positive impact on transitions for both country groups, similarly to what was found for the overall sample, but this is only significant for group M countries. This result stems possibly from the fact that in some group M countries higher education levels are only attained by a relatively low share of the population. Training status appears to act trough different channels in groups M and L: being in a training firm directly favours transitions within than firm in group L, without a significant impact in group M, which can be related to the low incidence of vocational training in this latter group (CEDEFOP (2010)). However, training status appears to act on group M through the effect that the degree of labour market regulation strictness has on transitions. As was the case for the whole sample, the transitions of workers in country group M

that are enrolled in temporary contracts in training firms are not affected so much by changes in labour market flexility. This effect is absent from group L results, possibly because in these countries the strictness of labour market regulations is too low to play a relevant role in the contractual options of firms, with production process and consequently human resources policy assuming greater relevance.

The differences across country groups regarding the impact of human capital variables are similar for transitions to a permanent job with a new employer (Table A.2). Inter-firm transitions are favoured by higher formal education in group M countries only, possibly due to the the same reason pointed out above. In this case, however, training status has no significant impact for any of the country groups considered separately (contrarily to what was found for the overall sample). Institutional effects appear to play a larger role in explaining inter-firm transitions in segmented labour markets than individual effects. In particular, changes in the strictness of labour market regulation are only significant for country group M (mitigated for workers in training firms). In addition, job satisfaction does not have a significant effect on inter-firm transitions for this group of countries, while it has a negative significant impact for group L. This is in line with Gielen and Tatsiramos (2012) results for job quits, suggesting that an open-ended contract obtained with a new employer may ensue a voluntary quit for group L, being therefore the result of low satisfaction with the previous job, while for group M countries it may reflect the end of the temporary contract, having therefore an involuntary nature.

The higher relevance of institutional factors for group M is also present in the case of transitions to joblessness (Table A.3), where the impact of the labour market regulation indicator is positive and significant. Given the finding that labour reallocation is larger in countries (or labour market segments) with less strict regulation, job-to-job transitions will be more frequent in those countries, and the survey measurement is more likely to coincide with unemployment periods between jobs simply because flows into and out of unemployment will be higher. For this type of transitions, there do not appear to be other major differences between the two country groups.

As was the case with the overall sample, for all country groups and transition types there is a negative impact in the hazard associated with having at least one temporary job prior to the current one.

Conclusion

This work analysed transitions from temporary to permanent contracts in European countries, with a special focus on human capital aspects and their interaction with labour market institutions. This analysis was empirical, based on a longitudinal survey of European households (ECHP) and performed

trough a discrete duration model with competitive risks. A new perspective was adopted given that the possibility of obtaining an open-ended contract through a promotion with the current employer or having to change job to obtain it were analysed separately. Results support the view that these channels are similar in some aspects, namely that they both benefit from the education of workers and from increases in labour market flexibility, as measured by the IMD. However, they also present differences, namely regarding duration dependence, and interactions between labour market flexibility and different aspects of training. Intra-firm transitions from a temporary to an open-ended contract are facilitated for workers enrolled in training firms, and these transitions appear to be somewhat protected from the effects of changes in labour market protection. On the other hand, the training characteristics of the worker and not of the firm appear to be more relevant in the case of inter-firm transitions. The breakdown of results across country groups indicate that in segmented labour markets institutional aspects play a large role in transitions, rendering individual aspects in some cases a more secondary role. In fact, in more segmented labour markets, higher labour market flexibility favours transitions out of temporary employment, although this effect is mitigated in some cases for workers in training firms. On the other hand, in less segmented markets, aspects related to training appear to be more relevant than institutional ones (which are not found to be significant).

Further research would benefit from a disaggregated analysis of labour market regulations into those affecting temporary and permanent employment, which was not possible with the available data. This would allow to ascertain whether differences observed between country groups stem from overall higher levels of employment protection in southern European countries or from the differences in protection between the two segments, *i.e.*, what is the importance of absolute and relative strictness of labour market regulations, particularly EPL.

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Appendix: Results by country group

The following tables show the results of the competing risk models presented in Table 5, broken down across country groups M and L.

VARIABLES	Group M	Group L
Duration in months:		
$[3,6[$	-0.0249	0.3203**
	(0.1345)	(0.1592)
$[6,9[$	0.3264**	0.4397**
	(0.136)	(0.175)
$[9,12[$	0.5595***	0.3238
	(0.1359)	(0.2007)
$[12,15[$	0.8899***	0.6921***
	(0.1405)	(0.175)
$[15,18[$	0.8345***	0.8430***
	(0.151)	(0.2022)
$[18,21[$	0.8306***	1.0660***
	(0.1712)	(0.2351)
$[21,24[$	0.9767***	1.2425***
	(0.1734)	(0.2447)
$[24,30[$	1.1344***	0.6910***
	(0.1896)	(0.2254)
≥ 30	1.3625***	0.7686***
	(0.2624)	(0.2351)
Not first job	-1.1371***	-0.8137***
	(0.1231)	(0.1205)
Age [30,45[	0.0875	0.1215
	(0.0703)	(0.1077)
Age [45,65]	-0.0867	0.0906
	(0.1052)	(0.1396)
Firm size 20-99 workers	-0.0787	-0.0793
	(0.069)	(0.1171)
Firm size >99 workers	-0.1854**	0.1014
	(0.0816)	(0.1161)
Secondary education or more	0.2924***	0.1154
	(0.0745)	(0.1207)
Training worker+firm	0.0823	0.3545**
	(0.1512)	(0.149)
Training worker+no training firm	-0.0274	-0.5504***
	(0.1041)	(0.1877)
No training worker+training firm	0.1378	0.3105*
	(0.1463)	(0.1618)
IMD Labour market Regulations	0.8715***	-0.1196
	(0.1701)	(0.1557)
IMD Training worker+firm	-0.4753**	-0.1829
	(0.2328)	(0.1299)
IMD Training worker+no training firm	-0.0553	0.1506
	(0.1736)	(0.1776)
IMD No training worker+training firm	-0.5308**	-0.0534
	(0.2398)	(0.144)
Men	0.0725	-0.0251
	(0.0665)	(0.0956)
Industry	0.4722***	0.6873*
	(0.1832)	(0.3548)
Services	0.4103**	0.4982
	(0.1845)	(0.3476)
Job satisfaction	0.1837***	0.1429**
	(0.0371)	(0.061)
Private sector	0.4597***	0.5792***
	(0.0953)	(0.114)
Constant	-2.5364***	-2.6162***
	(0.3344)	(0.606)
Observations	6,169	2,778
Country dummies	yes	yes
Time dummies	yes	yes
ρ	0	0.156
Log-pseudolikelihood	-2704	-1309

TABLE A.1. Transitions to an open-ended contract with the same employer- Results by country group

Notes:Robust standard errors in parentheses.
*** p<0.01, ** p<0.05, * p<0.1.

VARIABLES	Group M	Group L
Duration in months:		
$[3,6[$	-0.1588	-0.1603
	(0.2045)	(0.18)
$[6,9[$	0.3078	-0.1513
	(0.2088)	(0.2049)
$[9,12[$	0.005	-0.1345
	(0.2351)	(0.2402)
$[12,15[$	0.3401*	-0.3048
	(0.2045)	(0.224)
$[15,18[$	-0.1482	-0.1867
	(0.27)	(0.2847)
$[18,21[$	-0.0188	-0.0375
	(0.3065)	(0.3448)
$[21,24[$	-0.0946	0.0601
	(0.3602)	(0.3771)
$[24,30[$	0.1165	-0.1775
	(0.2638)	(0.3035)
≥ 30	0.2033	-0.1167
	(0.2532)	(0.2959)
Not first job	-0.8723***	-0.7677***
	(0.1568)	(0.1681)
Age [30,45[	-0.0986	-0.172
	(0.143)	(0.1377)
Age [45,65]	-0.3211	-1.0154***
	(0.2371)	(0.2405)
Firm size 20-99 workers	-0.0788	-0.1173
	(0.1404)	(0.1565)
Firm size >99 workers	-0.0583	-0.0597
	(0.1635)	(0.1564)
Secondary education or more	0.4502***	-0.1151
	(0.1351)	(0.1502)
Training worker+firm	0.2955	0.2864
	(0.2656)	(0.2132)
Training worker+no training firm	0.1718	0.3009
	(0.1863)	(0.2083)
No training worker+training firm	-0.0709	0.0689
	(0.3172)	(0.2324)
IMD Labour market Regulations	0.9167***	0.3207
	(0.2551)	(0.204)
IMD Training worker+firm	-0.6117*	-0.2983*
	(0.371)	(0.1728)
IMD Training worker+no training firm	-0.1352	-0.1226
	(0.2819)	(0.1978)
IMD No training worker+training firm	0.3953	-0.1702
	(0.483)	(0.1971)
Men	0.2097	0.4527***
	(0.1287)	(0.1368)
Industry	0.2251	0.2347
	(0.33)	(0.4336)
Services	0.2849	0.23
	(0.3276)	(0.4099)
Job satisfaction	0.067	-0.1252*
	(0.0661)	(0.0734)
Private sector	0.3312**	0.2933**
	(0.1683)	(0.1462)
Constant	-2.6979***	-1.6212**
	(0.6101)	(0.7812)
Observations	6,169	2,778
Country dummies	yes	yes
Time dummies	yes	yes
ρ	0.406	0.381
Log-pseudolikelihood	-1254	-1003

TABLE A.2. Transitions to an open-ended contract with a new employer - Results by country group

Notes:Robust standard errors in parentheses.
*** p<0.01, ** p<0.05, * p<0.1.

VARIABLES	Group M	Group L
Duration in months:		
$[3,6[$	-0.088	-0.2153*
	(0.0898)	(0.122)
$[6,9[$	-0.4299***	-0.4913***
	(0.1096)	(0.1452)
$[9,12[$	-0.2395**	-0.7290***
	(0.1168)	(0.1872)
$[12,15[$	-0.2813**	-0.5330***
	(0.1148)	(0.1661)
$[15,18[$	-0.4786***	-0.7809***
	(0.1334)	(0.2304)
$[18,21[$	-0.6686***	-0.7090***
	(0.1609)	(0.2583)
$[21,24[$	-0.7528***	-0.8715***
	(0.1869)	(0.3045)
$[24,30[$	-0.4726***	-1.2146***
	(0.1417)	(0.263)
≥ 30	-0.9357***	-1.6515***
	(0.1437)	(0.2856)
Not first job	-1.3041***	-1.4091***
	(0.0868)	(0.14)
Age [30,45[	-0.0788	-0.3801***
	(0.0709)	(0.1121)
Age [45,65]	0.2007**	0.195
	(0.0924)	(0.1218)
Firm size 20-99 workers	-0.1404*	-0.1382
	(0.0722)	(0.1093)
Firm size >99 workers	-0.2795***	-0.2406**
	(0.0901)	(0.1222)
Secondary education or more	-0.4972***	-0.4314***
	(0.0749)	(0.1146)
Training worker+firm	-0.3783*	-0.8711***
	(0.195)	(0.1639)
Training worker+no training firm	-0.0153	0.1498
	(0.1065)	(0.1375)
No training worker+training firm	-0.1909	-0.6098***
	(0.2021)	(0.191)
IMD Labour market Regulations	0.3737**	-0.2114
	(0.151)	(0.1638)
IMD Training worker+firm	-0.1325	0.4092***
	(0.3107)	(0.1562)
IMD Training worker+no training firm	-0.2636	0.1938
	(0.161)	(0.1605)
IMD No training worker+training firm	-0.1497	0.2521
	(0.3066)	(0.1865)
Men	-0.2947***	-0.1914*
	(0.0683)	(0.0996)
Industry	-0.2862**	-0.1006
	(0.1281)	(0.2941)
Services	-0.1526	-0.0982
	(0.1273)	(0.2788)
Job satisfaction	-0.2258***	-0.0836
	(0.0352)	(0.0573)
Private sector	-0.2918***	-0.3131***
	(0.0869)	(0.1037)
Constant	1.4113***	0.8286
	(0.2591	-0.5309
Observations	6,169	2,778
Country dummies	yes	yes
Time dummies	yes	yes
ρ	0.146	0.0884
Log-pseudolikelihood	-2765	-1175

TABLE A.3. Transitions to joblessness - Results by country group

Notes: Robust standard errors in parentheses.
*** p<0.01, ** p<0.05, * p<0.1.