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Emanuela Ghignoni

Human capital, unemployment, and probability of transition to permanent employment in the Italian regional labour markets

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1. Introduction

In the last decade Italian and European labour markets have been characterized by a strong increase of temporary employment and the recent approval of the "Biagi Law"[1] is often assumed to be a factor to boost temporary work in Italy. Referring to some theoretical frameworks, we could look at this situation in terms of a "contractual exchange"[2]. In this manner workers (or trade unions) could accept more precariousness in exchange for higher employment rates[3]. Nevertheless a number of empirical researches show that, since allowing for more temporary jobs to be created entails an increase in both job creation and job destruction, the effects on total employment are uncertain[4]. In any case, even if we believed that more precariousness involves higher employment rates, another very important question would emerge, that is: how long are people going to spend in precarious jobs?In effect the recent evolution of labour markets induced many economists to investigate the nature of temporary work, and one of the most

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[1] . Legislative Decree n. 276/2003.

[2] . See, for example, Tarantelli, 1986.

[3] . Saint Paul, 2004.

[4] . Blanchard, Landier, 2001.

important question to answer has been: can temporary jobs serve as "*stepping stones*" to enter stable employment or do they represent "*dead-end jobs*"?[5] On the one hand, temporary contracts should help the unemployed to get (back) into employment and to find a stable job, by reducing unemployment spells, the risks of long-run unemployment, and by preserving/improving their human capital through *on the job* experience. In this case temporary contracts would be a way to select the future permanent employees[6]. On the other hand, it has been argued that, if temporary work is characterized by worse monetary and non-monetary conditions than stable jobs, and if flexible firms adopt a segmentation of the workforce into a "core" of stable jobs and a "periphery" of temporary workers, then *dual labour markets* may arise and precariousness may become a "trap"[7]. In any case, the variables involved in this phenomenon seem to be very complex and, as far as other theoretical contributions[8] are concerned, in this paper I intend to focus upon the influence of learning processes, human capital accumulation[9] and unemployment rates at local level. In particular, to highlight the influence of these variables on the probability of escaping from the temporary work "trap" and on the intensity of transition to permanent employment, after developing a simple theoretical model, a discrete time duration model with gamma-distributed unobserved heterogeneity, based on ECHP data for Italian regions (1995-2001), will be estimated. The paper is organized as follows. Section 2 presents a simple theoretical model in which the intensity of transition between precarious and stable jobs depends on individual human capital and unemployment rates at regional

[5] . Booth et al., 2002.
[6] . Storrie, 2002; Erickcek, Houseman, Kalleberg, 2003.
[7] . Lindbeck, Snower, 1988, 1990; Saint Paul, 1996.
[8] . Snower, 1996; Pappadà, 2003.
[9] . The role of heterogeneous human capital (education, training, and work experience) in a flexible labour market has even brought out by Biagi (2001), when he wrote "working time is signed by cycles of dependent and independent jobs...and within them, some training periods should be".

level; section 3 illustrates the steps of my empirical analysis; section 4 presents the econometric model I used; section 5 is devoted to the empirical estimates and the discussion of the main results. Some concluding remarks and policy implications follow.

2. Training and the probability of transition to permanent employment: the influence of educational levels and unemployment rates

I consider an economy with heterogeneous labour force and a given number of firms, which are assumed to be identical. Firms always hire workers on short-term contracts, thereby incurring into hiring costs. If workers have a suitable level of education, the firm offers them training and confirms them on the expiry of the contract. Otherwise the firm dismisses the workers at the end of their fixed-term contract, without incurring into firing costs, and replaces them with new entrants. All the new entrants in the first period, *t=0*, are employed on fixed term contracts and their wage is a negative function of unemployment:

$w_0 = w(u)$ with: $w'(u) < 0$ and $w''(u) > 0$

In *t=0* workers' productivity, η_i, depends on their educational level, E_i:

$\eta_i(E_i)$ with $\eta'(E) > 0$ and $\eta''(E) < 0$

I assume $\eta_i \in \left[\eta^+ ; \eta^-\right]$; where η^+ and η^- are, respectively, the maximum and minimum value of η. η has a distribution function $F(\eta)$, where $F(h) = prob(\eta < h)$. As η_i depends directly on the educational level, it is perfectly observed by the firms. If the educational level of a worker is high enough, that is, if: $\eta_i(E_i) \geq \eta^*(E^*)$, the firm will offer him/her training and, then, will confirm this worker with a permanent contract in the second

period (*t=1*). Trained workers' productivity in the second period is[10] $\alpha\eta_i > \eta_i$, and their wage, $w_i(1)$, is the outcome of a Nash bargain between the firm and each of its trained-permanent employees. In this case the firm has to take into account the presence of firing costs, which are assumed to be a proportion ϕ of the permanent workers' wage[11] $w_i(1)$: $F = \phi \cdot w_i(1)$. On the contrary, if the worker's level of education is not high enough, the firm will not offer training and will not confirm him/her at the end of the first period. Not confirmed workers can find another precarious job with wage $v(1)\eta_i$, which take into account their experience on the job. I assume $w(u) < v(1)\eta_i < w_i(1)$.

The wages bargaining

The Nash bargaining problem[12], between the firm and its trained-permanent workers, to solve at the beginning of the second period is:

$$[\alpha\eta_i - w_i(1)\cdot(1+\phi)]^{1-\beta} \cdot [w_i(1) - v(1)\eta_i]^{\beta}$$

where β is the worker's bargaining power, with $0 \le \beta \le 1$. From the first order conditions of the previous maximization problem I obtain the negotiated wage[13]:

$$w_i(1) = \frac{\eta_i[\alpha\beta + (1-\beta)(1+\phi)\cdot v(1)]}{1+\phi} \qquad [1]$$

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[10] . Obviously, $\alpha > 1$. α could also be considered individual-variant. In this case: $\alpha_i > 1$.

[11]. See Nunziata, Staffolani, 2001.

[12] . See Muthoo A., 1999.

[13] . Note that:

$\frac{\partial w_i(1)}{\partial \beta} = \frac{\eta_i[\alpha - (1+\phi)\cdot v(1)]}{1+\phi} > 0$ if $\alpha > (1+\phi)\cdot v(1)$ and:

$\frac{\partial w_i(1)}{\partial \phi} = -\frac{\alpha\eta_i\beta}{(1+\phi)^2} < 0$

The firm

The firm has to decide whether or not to offer training and confirm a worker, by comparing his expected gain in case of training with the expected gain without training. In case of training the workers' productivity raises, but wages and firing costs raise as well. Without training, the firm dismisses the workers and replaces them with new entrants, characterised by the same productivity, η_i, and the same wage, $w(u)$. In this case the firm holds some hiring costs, *H*. I assume $w(u)+H=\omega \cdot w(u)$. For the sake of simplicity the trained workers, with a permanent contract, do not quit the firm until retirement. The following condition must be satisfied:

$$2[\eta_i-\omega \cdot w(u)] \leq [(\eta_i-\bar{c}-\omega \cdot w(u))+(\alpha\eta_i-w_i(1)\cdot(1+\phi))] \qquad [2]$$

where $\eta_i-\bar{c}$ is the productivity of a worker in training in the first period.

By substituting [1] in [2] I obtain:

$$\eta_i \geq \frac{\bar{c}-\omega \cdot w(u)}{\alpha(1-\beta)-(1-\beta)(1+\phi)v(1)-1} \equiv R \qquad [3]$$

where *R* is the minimum level of education for investment in training to be profitable for the firm. It is easy to see that the higher is the unemployment rate, the higher will be the threshold *R*.

The workers

The worker accepts to be trained and confirmed by the firm if:

$$w(u)+v(1)\eta_i \leq w(u)+w_i(1) \quad \text{that is if:} \quad v(1)\eta_i \leq w_i(1) \qquad [4]$$

which is always satisfied, since I assumed[14]: $w(u)<v(1)\eta_i<w_i(1)$.

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[14] . In any case, by substituting [1] in [4] I obtain: $v(1) \leq \frac{\alpha\beta+(1-\beta)(1+\phi)v(1)}{1+\phi}$ which is always satisfied.

From [1] – [4] I can infer that the proportion of workers in training in the first period, and confirmed on the basis of a permanent contract in the second period, is: $1 - F(R) = prob(\eta_i \geq R)$. This proportion is an increasing function of the average human capital and of the unemployment rates at local level. Thus, the firms prefer to offer training and confirm with a permanent contract those workers that have a high level of education. Nevertheless the threshold, *R*, in not a constant, but a positive function of the unemployment rate. In this case the probability of transition from a precarious/temporary job to a stable one does not solely depend on the workers' individual human capital. The conditions of labour markets at local level also matter. This result is consistent with the following empirical analysis.

3. The steps of the empirical analysis

In the economic literature there is no conclusive evidence about the effects of the incidence of temporary contracts on the occupational performances of the labour markets. In this case it becomes more and more important to try to understand if temporary employment can be useful to enter stable occupation or if it could generate a vicious circle of precarious contracts. In this context the importance of individual human capital is widely recognized by the literature[15]. In particular, people who are in a temporary/precarious status of employment risk will not obtain a permanent job if they do not have a satisfactory level of education and/or if during the precarious period they do not acquire the stock of knowledge/competencies

[15] . See E.C., 2004; Gagliarducci S., 2004; Origo F., Samek M., Zanzottera C., 2004.

necessary to escape from it. Consequently, if precarious jobs are associated with low wages *and*[16] little opportunity to accumulate human capital[17], they may cause an erosion of workers' competencies and generate a "precarious job - low human capital" vicious circle. On the contrary, if the workers involved with precarious employment have a high level of education, and if temporary jobs offer them an opportunity to improve their competencies through training activities and experience, we can expect a faster transition to permanent employment. In actual fact, the theoretical model presented in section 2 shows that individual human capital is not the only (the main?) variable affecting this kind of labour market transitions. In this theoretical framework, this paper attempts to analyse the individual speed of transition to permanent employment in the Italian regional labour markets, focusing on the role of human capital accumulation and labour markets conditions at local level. To this aim I analysed the data of the European Community Household Panel, which allows following a sample of individuals for 8 years (1994-2001) and estimating a variety of duration models. In this survey the main question on "precariousness" is PE0024: "What type of employment contract do you have in your main job[18]?" Respondents are asked to select the type of contract among the following categories: (1) Permanent employment; (2) Fixed-term or short term contract; (3) Casual work with no contract; (4) Some other working arrangement. In this case I

[16] . Sometimes low wages are associated with on-the-job training. This occurs when workers pay for their training, in order to obtain higher human capital, higher productivity and so higher wages in the future.

[17] . Thus if precarious jobs have the same characteristics of the Snower's "bad jobs" (Snower, 1996).

[18] . Obviously, this question is applicable only for dependent employment.

could consider category 2 and category 3 "temporary/precarious jobs", (category 4 includes only few observations and I dropped them from the analysis). Moreover, due to the absence of the PE0024 question in the first wave (1994), I had to exclude this wave from the sample. In the *first step* of the analysis I studied the transition processes between three alternatives employment statuses (precarious employment, unemployment, non-participating labour forces (16-65 years old) towards permanent employment. In the *second step* I concentrated my attention on the precarious employees and I analysed the intensity of transition from temporary employment to permanent employment.

4. The econometric model

The most common specifications[19] of the *hazard rate* are adequate when the spell length is measured in *continuous time*, e.g. when duration is measured in days or in weeks. On the contrary, my analysis is based on a "year to year" transition and the unit of measurement of time (1 wave = 1 year) is, without doubt, *discrete*. Then, in this paper, two different *discrete-time* formulations of the proportional hazard rate model are estimated:
Model 1: Prentice and Gloeckler (1978) model (see equation [1] below); and
Model 2: Prentice and Gloeckler (1978) model incorporating a Gamma distribution to summarize unobserved individual heterogeneity (see equation [2] below), as proposed by Meyer[20].

Notice that unobserved heterogeneity among individuals is a crucial issue for most economic and econometric analysis. In general, when we have a

[19] . See, for example, Cox, 1972.
[20] . Meyer, 1990.

population of individuals and we observe a correlation between a "treatment" (temporary contract or not) and an "outcome" (permanent contract or not) we cannot conclude that this *correlation* implies *causation* if we do not take into account individual heterogeneity. In effect, people who get/accept a temporary contract might be heterogeneous from both permanent employees and unemployed individuals. They could be younger, more or less capable, characterized by a different risk aversion, by a different preference for leisure, etc. In short, they could have some (unobservable) individual characteristics that make them more/less likely to get a permanent job, apart from the influence of their experience as temporary workers. In other words, due to the presence of unobservable characteristics at the same time affecting both the probability of being a temporary worker and the subsequent employment chances, we cannot infer the effect of the "treatment" on the outcome because we do not observe the *counterfactual* evidence, i.e. what would have happened to the "outcome" in the absence of the "treatment". Suitable methods to handle this problem are illustrated by a wide literature[21]. In this paper, following Meyer, unobserved heterogeneity, v, is assumed to be multiplicative in specification [2] (see below) and to be Gamma distributed[22] with expectation $E(v)=1$, and a constant variance, $V(v)=\sigma^2$. The hazard rates for both models, θ_{kj}, are the discrete time counterpart of the hazard rates for the underlying continuous time proportional hazard models. Specifically, the discrete time hazard rates measure the (conditional) probability for individual i that the transition to

[21] . For a review of the literature, see Ichino, 2002.

[22] . This method is widely utilized in survival analysis empirical models (see Pozzoli D., 2005). It gets consistent estimates of parameters if the underlined hypotheses are respected.

state *j* (permanent employment) occurs during period (wave) t_i, provided that the same individual was in state *k* (out of labour forces, unemployment or temporary employment) until the start of that period (wave), and are defined by:

Model 1: $$\theta_{kj}\left(t_i \mid X_{ikj}(t_i);\beta\right)=1-exp\left[-exp\left(\gamma_{kj}(t_i)+X_{ikj}(t_i)'\beta_{kj}\right]\right. \quad [1]$$

Model 2: $$\theta_{kj}\left(t_i \mid X_{ikj}(t_i);\beta;v\right)=1-exp\left[-exp\left(\gamma_{kj}(t_i)+X_{ikj}(t_i)'\beta_{kj}+log(v)\right)\right] \quad [2]$$

where X_{ikj} is a vector of covariates summarizing observed differences between individuals (either fixed or time-varying), β is a vector of parameters to be estimated, and $\gamma_{kj}(t_i)$ is a function describing duration dependence in the hazard rate. In effect, the resulting parameters of the baseline hazard $\gamma_{kj}(t_i)$ may be specified by a parametric function of duration, however, with a suitable definition of the covariates, models with a fully non-parametric specification for duration dependence can be estimated[23].

5. Model estimation

In the first step of this analysis I considered a sample of people who entered the panel as precarious employees, unemployed, non-participating labour forces, aged 16-65, and I studied their transition processes to permanent employment. At this stage of the analysis I had to limit the covariates[24] to those applicable to all the individuals in this sample[25]: (1)

[23] . The Prentice and Gloeckler approach is similar to Cox's partial likelihood technique (Cox, 1972, 1975). Both estimators make no assumption about the baseline hazard. The log-likelihood function of model 2 is reported in Meyer, 1990.

[24] . For a more detailed description of the variables, see Appendix B.

starting condition in the labour market, (2) human capital characteristics, such as educational level and health status[26], (3) individual characteristics, such as gender, age, marital status, "migration trajectory"[27], (4) local labour market characteristics, such as a territorial dummy and the employment rate at regional level. In the second step of the analysis, confining the estimates to temporary employees, I could utilize some job related covariates. In particular I could: (1) integrate the definition of individual human capital by considering training activities and experience acquired on the job, (2) include in the estimates some information about the type of job, such as full time/part time contract, total length of the temporary contract, public/private sector of activity, size of the firm, type of occupation, main activity of the firm, etc. Before proceeding to more complicated models, I estimated the Kaplan-Meier curves for the *categorical* predictors. This will provide insight into the shape of the survival function for each group and, as far as the log-rank test of equality across strata are concerned, it allows deciding whether or not to include the predictor in the final model. Besides the Kaplan-Meier survival estimates can be considered as a "spurious" measure of the effect of time on the probability of exit towards permanent

[25] . At this stage of the analysis, for most individuals in the sample, I have no information about the demand-side of the labour market. In this case, following some other empirical contributions on labour markets transition processes (see, e.g., Hernanz, Origo, Samek, Toharia, 2004, Barbieri, Sestito, 2004) I preferred to concentrate my attention on the supply-side characteristics.

[26] . As we can state that firms prefer to invest in more "reliable" workers, with less probability of absenteeism, "health" could be included within a wide definition of individual "human capital" (Croce, Ghignoni 2004).

[27] . For details see Appendix B.

employment[28]. As usual[29] I included a predictor in the final model if its log-rank test has a p-value of 0.2 or less[30].

6.1. The intensity of transition towards permanent employment: temporary employees, unemployed and non-participating labour forces

In this section, in order to have a better understanding of the transition processes to stable employment in the Italian regional labour markets, I estimated equation [1] (exogeneity of initial status) and equation [2] (endogeneity of initial status) on a sample of people who entered the panel as temporary workers, unemployed or non-participating labour forces (aged 16-65), by disaggregating the analysis across geographical areas (Centre-North and "Mezzogiorno"). The main results are reported in tab. 1 (without unobservable heterogeneity) and in tab. 2 (with unobservable heterogeneity).

Overall[31] the estimates indicate that temporary workers enter permanent employment faster than unemployed and inactive people in both geographical areas (tab. 1), even after controlling for unobservable heterogeneity (tab. 2). Nevertheless, it is worth highlighting that the estimated coefficients for the "starting conditions" dummies are statistically lower in tab. 2 than in tab. 1 (at least for central and northern regions). This

[28] . The graphics of the estimated KM survival function can be requested to the author.
[29] . See Cleves, Gould, Gutierrez, 2004.
[30] . I used this elimination scheme because all the predictors in the selected dataset are variables that could be relevant to the model, but if the predictor has a p-value greater than 0.2 in a univariate analysis it is highly unlikely that it will contribute at all in a model that includes other predictors. The results of this kind of analysis may be requested to the author.
[31] . Note that some estimated coefficients for Italy as a whole are biased because of area-variability.

could mean that some unobservable individual characteristics influencing the probability of being a temporary worker (instead of being unemployed or inactive) are also likely to increase the probability of getting a stable job. A very low educational level (compulsory education or lower, with respect to tertiary education) has a significantly negative effect on the intensity of transition to permanent employment in Italy as a whole (tab. 1) or at least in the southern regions (tab. 2). On the other hand, good health conditions seem to improve the chances of employment only in the *Mezzogiorno*.

Tab. 1 –Transition rates to permanent employment (precarious employees, unemployed, non-participating labour forces, 16-65) (1) PGM hazard model *without* unobserved heterogeneity by geographical areas, (Bernoulli distribution, cloglog link)

	Italy*			**Centre-North****			**South-Islands*****		
Covariates	Coef.	t	P>|t|	Coef.	t	P>|t|	Coef.	t	P>|t|
Constant	-2.0359	-19.10	0.000	-2.0093	-15.29	0.000	-3.0357	-15.13	0.000
Starting condition (P*recarious employees*)									
Unemployed	-3.2928	-42.86	0.000	-3.5398	-24.90	0.000	-2.9826	-32.41	0.000
Non-participating L.F. (aged 16-65)	-4.1800	-69.89	0.000	-4.3708	-50.21	0.000	-3.8406	-46.38	0.000
Human capital									
Educational level (*Tertiary education*)									
Upper Secondary Education	0.0221	0.88	0.379	0.0537	1.61	0.107	0.0251	0.65	0.517
Compulsory education or lower	-0.3447	-14.53	0.000	-0.1327	-4.26	0.000	-0.6596	-17.82	0.000
Good health conditions (*Bad*)	0.2534	0.62	0.533	-0.1014	-1.56	0.119	0.1022	1.95	0.051
Individual characteristics									
Male (*Female*)	0.0642	4.33	0.000	-0.4362	-1.70	0.089	0.1022	5.60	0.000
Married (*Other*)	0.0867	4.71	0.000	0.0186	0.84	0.402	0.2141	6.40	0.000
Age	0.1081	20.26	0.000	0.1104	16.60	0.000	0.1359	14.42	0.000
Age^2	-0.0013	-20.62	0.000	-0.0015	-18.13	0.000	-0.0014	-15.13	0.000
"Mobility" ("*Immobility*")	0.1115	5.66	0.000	0.1675	7.33	0.000	-0.0007	-0.02	0.985
Labour markets conditions									
South/Islands (*Centre-North*)	-0.3480	-10.44	0.000	-			-		
Regional employment rate	0.0064	3.62	0.000	0.0116	4.56	0.000	0.0001	0.02	0.981

*Log likelihood (-0.5*Deviance) = -24831.773; Cf. log likelihood for intercept-only model (Model 0) = -42108.474; Chi-squared statistic for Model (1) vs. Model (0) = 34553.402; Prob. > chi2(12) = 0
**Log likelihood (-0.5*Deviance) = -14309.562; Cf. log likelihood for intercept-only model (Model 0) = -23981.495; Chi-squared statistic for Model (1) vs. Model (0) = 19343.867; Prob. > chi2(11) = 0
***Log likelihood (-0.5*Deviance) = -10183.597; Cf. log likelihood for intercept-only model (Model 0) = -17402.889; Chi-squared statistic for Model (1) vs. Model (0) = 14438.584; Prob. > chi2(11) = 0

Tab. 2 – Transition rates to permanent employment (precarious employees, unemployed, non-participating labour forces, 16-65); (2) PGM hazard model with Gamma distributed unobserved heterogeneity by geographical areas

Covariates	Italy*				Centre-North**				South-Islands***			
	Coef.	H. ratio	t	P>|t|	Coef.	H. ratio	t	P>|t|	Coef.	H. ratio	t	P>|t|
Constant	-2.5893	-	-46.86	0.000	-2.5571	-	-18.58	0.000	-3.5606	-	-9.71	0.000
Starting condition (*Precarious employees*)												
Unemployed	-2.9527	0.0522	-19.59	0.000	-2.6895	0.0679	-12.95	0.000	-2.6136	0.0732	-14.60	0.000
Non-participating L.F. (16-65)	-3.9305	0.0196	-31.65	0.000	-4.1396	0.0159	-22.83	0.000	-3.5846	0.0277	-20.52	0.000
Human capital												
Educational level (*Tertiary education*)												
Upper Secondary Education	0.0129	1.0129	0.31	0.758	0.0297	1.0302	0.52	0.605	-0.0048	0.9952	-0.07	0.947
Compulsory education or lower	-0.2141	0.8072	-5.18	0.000	-0.0513	0.9499	-0.89	0.371	-0.4521	0.6363	-6.05	0.000
Good health conditions (B*ad*)	0.1387	1.1488	1.82	0.068	-0.0556	0.9459	-0.53	0.597	0.2238	1.2508	2.32	0.020
Individual characteristics												
Male (*Female*)	0.0177	1.0179	0.60	0.547	-0.0742	0.9285	-1.42	0.157	0.0621	1.0641	1.81	0.071
Married (*Other*)	0.0631	1.0651	2.03	0.042	0.0313	1.0318	0.76	0.446	0.2237	1.2508	3.34	0.001
Age	0.0483	1.0495	32.40	0.000	0.0485	1.0497	6.15	0.000	0.0764	1.0794	4.56	0.000
Age^2	-0.0006	0.9993	-29.07	0.000	-0.0007	0.9992	-7.37	0.000	-0.0008	0.9991	-4.20	0.000
"Mobility" ("*Immobility*")	0.1278	1.1363	3.42	0.000	0.1357	1.1453	3.18	0.001	0.0425	1.0435	0.53	0.595
Labour markets conditions												
South/Islands (*Centre-North*)	-0.3369	0.7140	-14.97	0.000	-	-	-	-	-	-	-	-
Regional employment rate	0.0076	1.0076	2.14	0.032	0.0140	1.0141	2.78	0.005	0.0010	1.0010	0.21	0.834

*Likelihood ratio statistic for testing models (1) vs (2) = 19295.199; Prob. test statistic > chi2(1) = 0

**Likelihood ratio statistic for testing models (1) vs (2) = 9219.6407; Prob. test statistic > chi2(1) = 0

***Likelihood ratio statistic for testing models (1) vs (2) = 9359.1496; Prob. test statistic > chi2(1) = 0

Being a male and being married has a sizable positive impact upon the transition process to stable employment, especially in southern regions (tab. 1 and tab. 2). Age has a significantly positive, albeit non linear (as shown by the age^2 variable), impact on the transition process in both geographical areas. The individuals *who have been living in the same region since birth*, generally have a significantly lower probability of entering permanent employment rather than "mobile" people[32]. Anyway this is not true for people who lived in the southern regions at the time of the interview. This could mean that a certain degree of territorial mobility, allowing people to make a lot of different experiences, might improve the intensity of transition toward a stable job, *but not if the living region is a southern one*. The territorial dummy shows a clearly lower probability of getting a stable job for southern workers. Nevertheless, regional employment rates have a significantly positive effect on the transition processes towards permanent employment only in the central and northern regions (tab. 1 and tab. 2) and not in the southern ones. Overall, the transition probability in the southern regions appears to be more responsive to the personal characteristics (such as human capital) and to the role of the individual within the family (such as gender and marital status) rather than in the Centre-North, whereas local labour market conditions appear not to be very important. On the contrary, in the central and northern regions local employment rates have a substantial effect on the employment opportunities of the individuals. These results are consistent with the theoretical model presented in section 2 and they are

[32] . That is, people with some experiences of territorial mobility before the interview; see Appendix B for details.

substantially confirmed by the results of the analysis carried out in the next section.

6.2. The intensity of transition of temporary employees towards permanent employment

In this section I analyse the temporary workers' transition towards permanent employment. As mentioned above to restrict the sample to temporary employees allows utilizing some job related covariates. In particular I could introduce in the model training activities, experience *on the job* and some information about the type of temporary job. Moreover, if all individuals in the sample are temporary workers there should no longer be any problems of "unobservables" and I could estimate a model without unobserved heterogeneity. However individual heterogeneity could also depend on individual characteristics not correlated to the employment status. For this reason I estimated two different models (with and without unobserved heterogeneity) in this section as well.

The definition of "training" used in the estimated model deserves some explanations. The main question on "training participation" in the ECHP is as follows: "Have you been in education or training since January last year?" (PT001). On the basis of a positive answer the individual is asked to report additional information ("Which kind of course(s) was it?", PT002) that allows to distinguish between "general education" and "vocational training". Starting from 1995, respondents who have been in vocational education or training are asked to select the type of training received (PT012) among the following categories: (a) Third level qualification, such

as technical college; (b) Specific vocational training at a vocational school or college; (c) Specific vocational training within a system providing both work experience and a complementary instruction elsewhere; (d) Specific vocational training in a working environment; (e) Other. Following Bassanini, Brunello (2003); Lowenstein, Spletzer (1998,1998) and OECD (2003), I used the distinction between *off-site* and *workplace* training to *proxy* the distinction between *general* and *firm-specific* training. Assuming that all *off-site* training[33] is at least partly *general*, I treated category *a*, *b* and *c* as "general training" and category *d* as "firm-specific training"[34].

ECHP survey also provides complete information on (general and specific) work experience, working conditions in the actual job, working conditions in the previous job and on the eventual unemployment experiences prior to the current job, for each individual. Among these variables I included in the model only the variables statistically significant from the point of view of the previous univariate analysis.

It is worth to notice that the empirical literature on High Performance Work Organisations (HPWOs, Osterman, 2000) shows that the adoption of HPWO practices[35] is associated with a lower rate of precariousness and, *coeteris paribus*, with a higher probability of transition toward stable employment. Unluckily the ECHP does not provide information about work organization in the firms. However, it has been argued that the adoption of

[33] . Actually, while categories *a* and *b* refer unambiguously to *off-site* training course, category *c* refers to courses partly taken *off-site* and partly received in the workplace. Nevertheless it is usual in literature to consider category c as *general training* (see Bassanini, Brunello, 2003). On the other hand category *d* refers to workplace training only.
[34] . In the category "other" there are very few observations and I neglected them.
[35] . i.e. self-managed teams, Total Quality Management, Quality Circles, and Job Rotation.

HPWOs appears to be most prevalent in large establishments, in the manufacturing sector and in the public sector[36]. In this case, to control the estimates for the size of the firms and the sector of activity could be a suitable method to handle this problem.

The results have been disaggregated by geographical area and are summarized in tab. 3 (without unobserved heterogeneity) and in tab. 4 (with unobserved heterogeneity). Regarding the educational level, I can state that temporary workers with a compulsory educational level (or lower) have a significantly lower probability of transition towards permanent employment, rather than graduates in both regions. *Furthermore, in the southern regions a tertiary education degree seems to provide better chances to succeed than an upper secondary level of education* (tables 3 and 4). On the other hand, temporary workers who have been in *general* training appear to have, *coeteris paribus*, worse chances of entering into stable employment than people who did *specific* training and people who have not been in training at all. Possibly this is because since the very beginning those who did *general* training were more interested to improve their own human capital rather than working for a long period for the same employer. Alternatively, we could state that people choice to dedicate more time to general training activities when they expect their temporary contracts not to be confirmed. Moreover, firms should offer firm-specific training mainly to workers they want to retain. In any case, *specific* training appears to be a key variable in determining a faster transition from a temporary job to a stable job in both

[36] . See Bauer, 2004 and Kalleberg, 2003.

geographical areas[37]. The intensity of transition to stable jobs, in both regions, is positively correlated with specific *on the job* experience, whereas good health conditions seem to positively influence the occupational chances of temporary workers only in the southern regions. Turning to individual characteristics, the temporary workers' age has a positive (albeit decreasing) effect on the probability of getting a stable job both in the Centre-North and in the *Mezzogiorno*. Being a male and being married in the South clearly increases the probability to get a permanent job, while neither gender nor marital status seems to be so relevant in the northern and central regions. As a final note, I would like to mention the influence on the transition process towards permanent employment of job characteristics and labour markets conditions. In this context the economic sector, the firm's size and the kind of occupation would play a crucial role. In actual fact the estimated probability of transition to a stable job is highest for temporary workers in public sector, in manufacturing industries and in big/medium firms, in both regions. Furthermore, temporary workers in elementary occupation are less likely to enter into stable employment than other workers, in both northern and southern regions. On the contrary regional employment rates would have a substantial positive effect on transition probability *only* in the northern regions. Overall, even if the sample is restricted to temporary employees, the estimates would nonetheless confirm the main result of previous analysis.

[37] . Notwithstanding the positive effects of human capital accumulation on the southern workers' occupational chances, Italian labour markets are characterised by the presence of territorial differentials in the educational levels, which strongly penalize the southern regions (Frey, Ghignoni, 2002). Furthermore, southern firms would offer less training than northern ones; see Croce, Ghignoni, 2004.

Tab. 3 –Transition rates to permanent employment (precarious employees only)
(1) PGM hazard model *without* unobserved heterogeneity by geographical areas, (Bernoulli distribution, cloglog link)

Covariates	Italy*			Centre-North**			South-Islands***		
	Coef.	t	P>|t|	Coef.	t	P>|t|	Coef.	t	P>|t|
Constant	-1.5625	-7.53	0.000	-1.9984	-7.80	0.000	-1.5705	-3.97	0.000
Human capital									
Educational level (*Tertiary education*)									
Upper Secondary Education	0.0495	1.03	0.305	0.1051	1.44	0.151	-0.1211	-1.92	0.055
Compulsory education or lower	-0.1992	-4.35	0.000	-0.3173	-4.14	0.000	-0.2680	-4.50	0.000
Training on the job (*no training*)									
General training	-0.1334	-3.75	0.000	-0.091	-3.29	0.001	-0.2604	-3.49	0.000
Specific training	0.3374	5.05	0.000	0.3610	4.82	0.000	0.3725	2.58	0.010
Specific *on the job* experience	0.0418	15.77	0.000	0.0411	12.40	0.000	0.0427	9.45	0.000
Good health conditions (*Bad*)	0.0194	0.92	0.359	0.1005	0.23	0.820	0.0750	2.46	0.014
Individual characteristics									
Male (*Female*)	0.1722	5.85	0.000	0.0686	1.31	0.190	0.0686	6.31	0.000
Married (*Other*)	0.0912	2.60	0.009	0.0475	1.12	0.262	0.1699	2.69	0.007
Age	0.0415	3.96	0.000	0.0708	5.38	0.000	0.0264	5.40	0.000
Age^2	-0.0007	-5.86	0.000	-0.0012	-7.45	0.000	-0.0004	-1.94	0.052
"Mobility" ("*Immobility*")	0.1292	3.28	0.001	0.2334	5.08	0.000	0.1062	1.36	0.175
Job characteristics									
Elementary occupations (*other*)	-0.0716	-11.41	0.000	-0.0699	-11.00	0.000	-0.1187	-5.57	0.000
Public sector (*Private sector)*	0.8590	24.45	0.000	0.6682	14.47	0.000	1.0760	19.69	0.000
Big and medium firms (*Small firms*)	0.7570	24.11	0.000	0.7564	19.23	0.000	0.7662	14.26	0.000
Manufacturing industries (*other*)	0.5821	17.03	0.000	0.5209	12.88	0.000	0.6731	10.38	0.000
Labour markets conditions									
South/Islands (*Centre-North*)	-0.2466	-3.82	0.000	-	-	-	-	-	-
Regional employment rate	0.4305	11.24	0.000	0.0579	11.11	0.000	0.0004	0.08	0.939

* Log likelihood (-0.5*Deviance) = -5987.1834; Cf. log likelihood for intercept-only model (Model 0) = -7407.7531; Chi-squared statistic for Model (1) vs. Model (0) = 2841.1395; Prob. > chi2(17) = 0
** Log likelihood (-0.5*Deviance) = -3597.7857; Cf. log likelihood for intercept-only model (Model 0) = -4304.9396; Chi-squared statistic for Model (1) vs. Model (0) = 1414.3078; Prob.> chi2(16) = 0
*** Log likelihood (-0.5*Deviance) = -2311.979; Cf. log likelihood for intercept-only model (Model 0) = -3065.1216; Chi-squared statistic for Model (1) vs. Model (0) = 1506.2852; Prob. > chi2(16) = 0

The intensity of transition towards permanent employment would be more influenced by the workers' individual characteristics (such as human capital and individual position within the family) in the southern regions rather than in the Centre-North, while local labour market conditions would not be significant in the *Mezzogiorno*.

Tab. 4 – Transition rates to permanent employment (precarious employees only); (2) PGM hazard model with Gamma distributed unobserved heterogeneity by geographical areas

Covariates	Italy*				Centre-North**				South-Islands***			
	Coef.	Hazard ratio	t	P>|t|	Coef.	Hazard ratio	t	P>|t|	Coef.	Hazard ratio	t	P>|t|
Constant	-2.1512	0.1163	-6.99	0.000	-1.934	0.1446	-5.34	0.000	-2.1303	0.1188	-9.75	0.000
Educational level (*Tertiary education*)												
Upper Secondary Education	0.0780	1.0811	0.93	0.350	0.0101	1.0101	0.12	0.901	-0.0585	0.9432	-2.42	0.016
Compulsory education or lower	-0.1114	0.8946	-7.26	0.000	-0.1286	0.8793	-3.69	0.000	-0.2181	0.8040	-10.01	0.000
Training on the job (*no training*)												
General training	-0.1747	0.8397	-3.59	0.000	-0.0929	0.9113	-5.80	0.000	-0.1295	0.8785	-3.58	0.000
Specific training	0.0883	1.0923	3.12	0.000	0.0947	1.0993	4.09	0.000	0.1015	1.1068	4.65	0.000
Specific *on the job* experience	0.0228	1.0231	6.40	0.000	0.0229	1.0232	5.32	0.000	0.0248	1.0251	4.62	0.000
Good health conditions (B*ad*)	0.0316	1.0321	0.28	0.777	0.0389	1.0397	0.27	0.786	0.1794	1.1965	2.03	0.042
Male (*Female*)	0.0850	1.0887	1.93	0.054	0.0839	1.0875	1.69	0.091	0.0113	1.0114	4.17	0.000
Married (*Other*)	0.0817	1.0851	3.46	0.000	0.0721	1.0748	1.29	0.196	0.0764	1.0794	4.01	0.000
Age	0.0281	1.0285	3.69	0.000	0.0452	1.0462	2.82	0.005	0.0229	1.0232	7.44	0.000
Age^2	-0.0005	0.9995	-2.23	0.026	-0.0008	0.9992	-4.07	0.000	-0.0003	0.9997	-7.92	0.000
"Mobility" ("*Immobility*")	0.0654	1.0676	3.28	0.000	0.1351	1.1446	2.29	0.022	0.0352	1.0358	0.35	0.727
Elementary occupations (*other*)	-0.0675	0.9347	-7.93	0.000	-0.1207	0.8863	-6.29	0.000	-0.0304	0.9700	-6.30	0.000
Public sector (*Private sector)*	0.5699	1.7681	12.17	0.000	0.4168	1.5198	7.09	0.000	0.7355	2.0865	10.01	0.000
Big and medium firms (*Small firms*)	0.4152	1.5147	10.52	0.000	0.4233	1.5270	8.60	0.000	0.4128	1.5110	6.32	0.000
Manufacturing industries (*other*)	0.4396	1.5521	7.96	0.000	0.3606	1.4342	6.68	0.000	0.5604	1.7514	6.68	0.000
South/Islands (*Centre-North*)	-0.1232	0.8841	-5.44	0.000	-	-	-	-	-	-	-	-
Regional employment rate	0.1239	1.1319	10.07	0.000	0.1908	1.2102	11.01	0.000	0.0009	1.0009	0.13	0.898

* Likelihood ratio statistic for testing models (1) vs (2) = -408.297; Prob. test statistic > chi2(1) = 0; ** Likelihood ratio statistic for testing models (1) vs (2) = -374.89995; Prob. test statistic > chi2(1) = 0; *** Likelihood ratio statistic for testing models (1) vs (2) = -128.79413; Prob. test statistic > chi2(1) = 0

On the contrary, in the central and northern regions local employment rates would have a strong and significantly positive effect on the intensity of transition, while individual characteristics seems not to be very important.

These empirical results seem to confirm the implications of the theoretical model presented in section 2 and they could also be interpreted in the theoretical framework of Thurow's queues theory, revised by Tarantelli. In effect, as Tarantelli[38] said, we observe a significantly increasing proportion of young workers, aged 20-30, "in transit" in the "lower external labour market" (characterised by high turnover rates and low qualification levels). If these workers do not reach the qualification level necessary to enter at least the "lower internal labour market" (characterised by low turnover rates and high qualification levels) they could be "trapped" in the lower external labour market. In this context human capital accumulation would have a strong influence on the probability of transition towards stable employment[39]. However we have to take into account the role of labour demand as well. With this purpose in mind, following Tarantelli and Thurow, we could imagine a "queue" of workers who apply for a (permanent) job subdivided according to increasing training costs[40] (see graph. 1). In both situations depicted in graphic 1: (a) the first worker has the lowest training cost, that is the highest educational level; and (b) the last worker has the highest training cost, that is the lowest educational level. Obviously, $m>n$, because in southern region the labour demand is lower and the "queue" is longer. We could also suppose that

[38] . Tarantelli, 1986.
[39] . And we saw from the previous empirical analysis that it is true, under certain conditions.
[40] . Note that training costs are generally lower for better educated individuals.

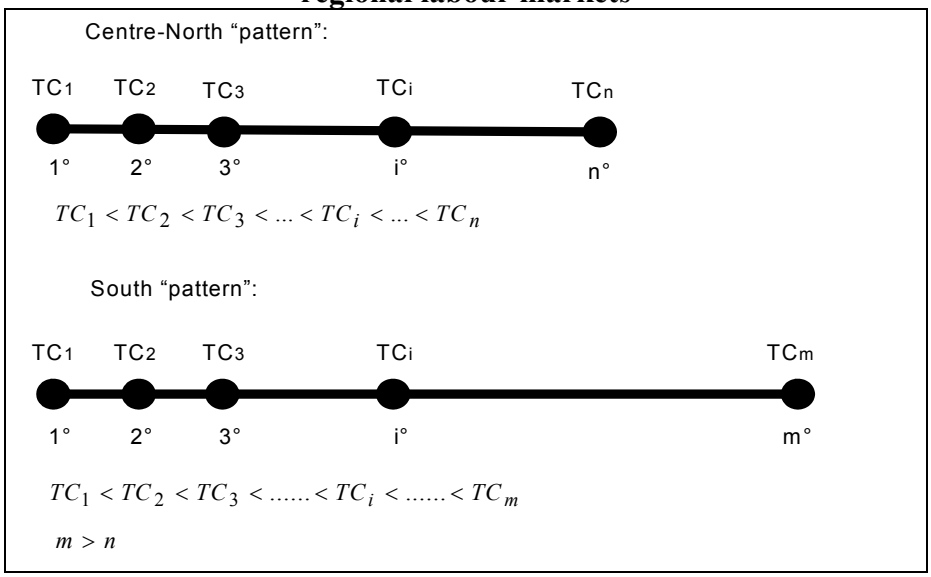
firms choose the worker to hire (with a permanent contract) on the basis of these training costs[41]: "Basically, employers use background characteristics[42] to indicate expected training costs and then attempt to rank and hire their potential labour force from those with the lowest training costs to those with the highest training costs" (Thurow, 1975). In this theoretical framework, the higher the labour demand, the smaller would be the influence of individual human capital on the speed of transition towards permanent employment, and *vice versa*. This means that: (a) in the regional labour markets in which the "queue" is longer (South), the worst - highest cost - workers could hardly get a stable job and, in this case, education matters; (b) in the regional labour markets in which the "queue" is shorter (Centre-North), most of workers have a high probability of entering into permanent employment, almost irrespectively of their position in the queue, which is based on their individual level of education.

The results of my empirical analysis are consistent with this kind of assertion. In actual fact, in the labour markets of the southern regions education seems to have a great influence on the transition probability between a precarious job toward a stable one. On the other hand, in the central and northern regions, in which the labour demand is higher, education has not a decisive role on the transition processes toward permanent employment. These results are also consistent with the implications of the theoretical model presented in section 2. The main innovation of this model, with respect to the interpretation of Tarantelli and Thurow, is the explicit consideration of the effect of unemployment on new

[41] . Thurow, 1975, 1982; Lindbeck, Snower, 1988; Weiss, 1990.
[42] . Such as education, innate abilities, age, sex, personal habits, etc.

entrants' wages. In this case, a high level of unemployment at local level, by exerting a pressure on the wages of the new entrants, would contribute to increase the threshold *R*, that is the minimum level of education for investment in training to be profitable for the firm. Then, the importance of a high level of education in determining the transition process toward a stable job increases.

Graph. 1 – Training costs and "queues" for a stable job in the Italian regional labour markets



6. Concluding remarks and policy implications

This paper deals with the terms of the "contractual exchange" between more employment and more precariousness in the Italian regional labour markets, and tries to answer the question: how long does it take to get a stable job in different Italian regions? To this end, I developed a theoretical model in which the "speed" of transition between a precarious job towards a

stable one depend on individual human capital and unemployment rate at local level. Afterward I applied a discrete time proportional hazard model with Gamma distributed unobserved heterogeneity to the data of the European Community Household Panel, for the period 1995-2001, focusing on the important role of individual human capital and local conditions of the labour markets.

The results show that, even after controlling for unobservable individual characteristics which possibly affect both the initial condition and the subsequent transition probabilities, temporary workers are characterized by higher intensity of transition towards permanent employment compared with both unemployed and inactive people. Anyway, by disaggregating the analysis across "macro-regions" and even by including in the sample only the precarious workers, some important regional differences emerged. In effect, as expected, the probability of getting a stable job is generally lower for southern workers, for female workers and for individuals who do not attain a high level of human capital, both at school and *on the job*. At the same time I generally found a positive relationship between the local employment rate and the probability of entering into permanent employment. Nevertheless, in different regions the variables involved in the estimated models would influence labour market transitions in a very different way. In particular, the local employment rate seems to be a key variable in determining the transition from a temporary job to a stable job in the *central and northern regions*, whereas the individual characteristics of temporary workers (such as human capital and the individual position within the family) have a stronger influence on transition processes in the

southern regions. These empirical results, which could also be interpreted in the light of Tarantelli/Thurow's queues theory, are consistent with my theoretical model, in which I explicitly take into account the negative influence of a high level of local unemployment on the wages of the new entrants. In any case it seems possible to state that the influence of education on the intensity of transition towards a stable job is significant if labour demand is low. On the contrary, if labour demand is high, most of workers, more or less educated, have a high probability of getting a stable job. In this context temporary jobs would serve as "*stepping stones*" to enter stable employment in case of high labour demand, whereas they risk to be "*dead-end jobs*" in case of low labour demand, aside from the potential positive effect of individual human capital accumulation.

It is possible to deduce from these results some policy indications. To begin with, if we want the temporary contracts not to be the first step of a vicious circle of precarious contracts, some development and jobs creation's policies at local level are necessary. Secondly, heterogeneous human capital (and in particular, firm-specific training) is relevant to improve the intensity of transition toward stable employment. Then, should we invest in firm-specific training? Probably we should. Anyway, it is well known that firms offer (general and specific) training to workers with a high level of education[43]. In this case labour market policies based on lifelong learning for all, for always, should be preferred.

[43] . See Croce, Ghignoni, 2004.

Appendix - Data and variables description

The data used for the estimations are obtained from the European Community Household Panel of Eurostat in relation to the years 1995-2001 (7 waves). For the purpose of this analysis the individuals included in the sample have been selected so as to include only "precarious employed", unemployed and inactive people, aged 16-65 (63,693 individuals).

The goal of the analysis is to model time until attainment of a permanent employment contract for each individual in the sample. The variable **time** contains the number of waves (years) until getting a stable job and the variable **censor** indicates whether or not the individual get a permanent contract. This variable is built on the basis of PE024 question (*What type of employment contract do you have in your main job*) and takes value 1 for permanent employment and value 0 otherwise (fixed term or short term contract, casual work with no contract). People with "some other working arrangement" have been dropped from the analysis.

Precarious employees, unemployed and people **non-participating** in labour forces (aged 16-65) have been classified on the basis of PE002A question (*Main activity status – self-defined*) which include the following categories: normally working, unemployed, inactive. "Normally working" people have been considered "precarious/temporary employed" if their answer to question PE024 is either fixed term/short term contract or casual work with no contract.

Educational level: dummies variables built on the basis of question PT022 (*Highest level of general or higher education completed*) as follows (ref. category: Tertiary education):

Upper secondary degree $\begin{cases} 1 & Second\ stage\ of\ secondary\ level\ education\ (ISCED\ 3) \\ 0 & otherwise \end{cases}$

Compulsory educ. or lower $\begin{cases} 1 & Less\ than\ second\ stage\ of\ secondary\ educ.\ (ISCED\ 0-2) \\ 0 & otherwise \end{cases}$

Training: dummies variables built on the basis of questions PT001 (*Have you been in education or training since January last year?*), PT002 (*Which kind of course(s) was it?*) that allows to distinguish between "general education" and "vocational training" and PT012 (*Type of the vocational education course*). Following the most recent literature I considered: (1) "general training" or (partly) *off-site* training: third level qualification courses (such as technical college); specific vocational training courses at a vocational school or college; specific vocational training courses within a system providing both work experience and a complementary instruction elsewhere; (2) "specific training" or *workplace* training: the specific vocational training courses in a working environment. Ref. category: no training at all.

Specific Experience: variable built on the basis of the question PE011 as follows:

$$Specific\ experience = year\ of\ the\ survey - starting\ year\ of\ current\ job$$

Good health conditions: *dummy variable* built on the basis of the question PH001 (*How is your health in general?*). The variable has value 1 for: *very good*, *good*, *fair* and value 0 for *bad*, *very bad*.

Male: dummy variable built on the basis of the question PD004 (Male=1; female=0).

Married: dummy variable built on the basis of the question PD005 (Married=1; otherwise=0).
Age: age of the individual at the time of the survey, question PD003.
Mobility: dummy variable built on the basis of the question PM001 about individual's "migration trajectory". "Immobile" people are "born in the country of present residence, lived in the same region since birth", whereas "mobile" people are all the other ones: "people born in the country of present residence, lived in a different region within the country before coming to this region; people born in the country of present residence, lived abroad before coming to this region; people born abroad, still lived in the same foreign country before coming to the country of present residence; people born abroad, lived in another foreign country before coming to the country of present residence".
Elementary occupation: question PE006c (*Occupation in current job, i.e. principal activity performed*), Elementary occupations = 1; other = 0 (Legislators, senior officials and managers, Professionals, Technicians and associate professionals, Clerks, Service workers and shop and market sales workers, Skilled agricultural and fishery workers, Craft and related trades workers, Plant and machine operators and assemblers, Armed forces).
Public sector: question PE009 (*Current job in private or public sector*), public sector, including para-statal=1, private sector, including non-profit private organisations=0.
Big and medium firms: question PE008 (*Number of regular paid employees in the local unit in current job*). I considered: (1) small firms, from 0 to 49 employees; (2) medium firms, from 50 to 499 employees; (3) big firms, 500 or more employees. The dummy variable is medium/big=1, small=0.
Manufacturing industries: question PE007b (*Main activity of the local unit of the business or organisation in current job*), Manufacture = 1; other = 0.
Fulltime/part time (temporary) contract: question PE005C (full time =1; part time=0).
Total length of temporary contract: question PE0025 recoded as following: 1= less than a year; 0 = 1 year or more.
Existence of an unemployment period of time before the current (temporary) job: question PE014, yes=1; no=0.
These last three variables have been dropped from the final model because they did not appear to be significant in the univariate analysis.
South/Islands: dummy variable built on the basis of the question HG015; South and Islands = 1; Centre-North = 0.
Regional employment rate: variable calculated on ISTAT data (1995-2001) by each EUROSTAT regions.

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