



Instituto Juan March

Centro de Estudios Avanzados en Ciencias Sociales (CEACS)

Juan March Institute

Center for Advanced Study in the Social Sciences (CEACS)

Not the right job, but a secure one: over-education and temporary employment in France, Italy and Spain

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Date 2008

Type Working Paper

Series Estudios = Working papers / Instituto Juan March de Estudios e Investigaciones, Centro de Estudios Avanzados en Ciencias Sociales 2008/235

City: Madrid

Publisher: Centro de Estudios Avanzados en Ciencias Sociales

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NOT THE RIGHT JOB, BUT A SECURE ONE:
OVER-EDUCATION AND TEMPORARY EMPLOYMENT
IN FRANCE, ITALY AND SPAIN

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Estudio/Working Paper 2008/235
June 2008

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This is the first in a series of papers from a collective research project of the Center for Advanced Study in the Social Sciences, Juan March Institute, on “Labour Markets, Inequality and Interest Representation”, coordinated by Andrew Richards.

Abstract

Recent educational expansion in many OECD countries has renewed interest in over-education. The educational system has often been highlighted as the main source of over-education, whereas the labour market has received less attention. Using European Community Household Panel data on three countries with similar educational systems but different levels of temporary employment, the association between temporary employment and over-education is explored. Temporary contracts may be stepping stones into more permanent, and adjusted, positions in the labour market; alternatively, in quite segmented labour markets, where a permanent contract is an especially valuable asset, human capital might be traded for job security. Preliminary evidence of this association between over-education and temporary employment is presented for Spain.

1. Introduction*

This research deals with over-education; that is, with the occupational mismatch that occurs when investment in human capital is generally agreed upon as being *excessive* for the job currently carried out by the individual.¹ At the individual level, over-education has been associated with low productivity and low job satisfaction (Tsang and Levin 1985). At the aggregate level, a substantial increase in human capital investment without a parallel increase of labour productivity may be also a matter of concern for the country, as in the case of Spain (Dolado 2002).

The current research gives *exploratory* explanations of over-education, resorting to individual-level variables often considered in the literature, but paying special attention to job security, which is often neglected by it. The research will show an inconsistent relationship between over-education and temporary employment. In labour markets where job security becomes an especially valuable asset, this relationship may turn out to be negative, revealing that permanent workers are *more likely* to be over-educated than temporary ones. Human capital, therefore, may be partly aimed at attaining secure jobs, rather than jobs suitable to the education received.

After reviewing the theories dealing with job mismatch and over-education, labour market regulation in the selected countries will be briefly described. Data and methods will be then presented, including a discussion of different possible indicators of over-education.

* I am grateful to members of the CEACS Research Project on “Labour Markets, Inequality, and Interest Representation” (of which this paper forms a part) for their comments, and to the CEACS itself for its financial and technical support. I also appreciate the advice and comments from Pau Baizan, Anna Cuxart, Matthew Ellman, Ignacio Lago, Clara Riba and Geraldine Riecau, as well as the comments received at the ‘Atypical Employment & Welfare Regimes Workshop’ (EQUALSOC Network of Excellence, Milan, 13-15 December 2006).

¹ The relationship between education and occupation is intrinsically problematic. It may vary considerably within every occupational group, so that it becomes difficult to establish which educational level is suitable to perform a job included in a given occupational group. Moreover, a given job, or occupation, may require different levels of education across countries. Intra-occupational and cross-country differences for a given occupation are just two of many possible difficulties in assessing the match between education and occupation. These and other issues will be considered when reflecting on the suitability of indicators of over-education (see below).

Next, the results of a multivariate analysis will be explained. Finally, the relevance of these results for the theories initially considered will be discussed.

2. Theoretical framework

Different economic theories have attached more or less importance to over-education, subsequently considering it a more or less stable phenomenon. They have implicitly paid more attention either to the supply or the demand side of the labour market. On the supply side, *human capital theory* regards job mismatch as a negligible phenomenon (Becker 1980; Becker and Tomes 1986), to be naturally corrected by the market. Human capital theory may even claim that over-education is actually a compensatory mechanism for the lack of skills of workers who actually lack the *right* abilities to perform their jobs optimally.

The *job competition theory* (JCT) attaches more importance to the demand side. This theory highlights the role of jobs, instead of workers, as the origin of over-education. Employers hire the candidate who implies the least additional training cost in order to perform the job optimally (Rosen 1972; Spence 1974; Sorensen 1977). Training should be here understood as an asset that locates individuals in a queue. Over-education could thus be advantageous for the individual, but it would not necessarily guarantee that the job matches qualifications. Job competition theory is said to work better where “the employer cannot easily adjust wages to individual’s productivity” and does not have full control over “terminating employment relationships”² (Rosenfeld 1992). In other words, this theory should have higher explanatory power in internal labour markets, where accepting a job below the individual’s educational requirement could be a way of getting access to an “entry port” in an organisation, from which promotion is possible and, eventually, an alignment with their educational background (Dekker *et al.* 2002; Malo and García 2002). Internal labour

² A similar argument was made by Eliason (1995) in an “extension” of Sorensen and Kalleberg’s theory of “labor market matching and attainment process”: “an employer will be unable to distribute rewards in direct response to worker productivity and/or market fluctuations”; to compensate for this, “those factors often influencing rewards (e.g., schooling and market experience) will be used by employers in closed systems to screen potential employees” (Eliason 1995, 250).

markets are known to be more present in large firms, since “a firm must have a certain minimum workforce to offer internal job openings and develop rules and procedures for the allocation and pricing of jobs” (Althauser 1989; Dekker *et al.* 2002, 109). Internal mobility (promotion) should work here as a mechanism of adjustment.³

Other demand-side factors, like the sector, may be also important for explaining over-education. New technologies foster a demand for increasing skills (Acemoglu 1998), but they are not equally distributed across sectors. Through cluster analysis of UK and US labour force surveys, Peneder (2003) has demonstrated the heterogeneity among industries in terms of IT-labour intensity. He has classified NACE sectors accordingly into four categories: IT producer – services; IT producer – manufacturing; dynamic IT user with a high and growing IT-labour intensity; and other IT-user industries. Supposedly, the latter sectors consist of lower IT users than the former. As a proxy for increasing demand of skills, we may assume that the higher the demand of IT skills in the sector, the higher the incidence of over-education in it, since its employers will tend to recruit more and more highly qualified personnel.

As an extension of JCT, *credentialism* attaches an even higher importance to credentials. Education does not matter here substantively, but as a signal of workers’ productivity (Arrow 1973). Credentialism thus regards over-education as an even more stable phenomenon (Thurow 1975; Hartog 1981).

Between supply- and demand-side explanations, *occupational mobility theory* is particularly interested in the workers’ correction of over-education through internal mobility (promotion) or external mobility (job change) (Sicherman and Galor 1990; Sicherman 1991). According to *occupational mobility theory*, “part of the return to education is in the form of a higher probability of occupational upgrading, within or across firms” (Sicherman and Galor 1990, 170-171).

³ Although they consider this argument, García-Serrano and Malo (2002) argue in the opposite direction: since it is well demonstrated that over-educated workers are less motivated and have a lower productivity than adequately educated workers, it might be that “firms’ promotions policy considers overeducation as a bad signal” (3).

Human capital theory, credentialism, job competition and occupational mobility theory usually overlook the mediating role of institutions (Müller and Gangl 2004; Wolbers 2002; Shavit and Müller 1998). Two institutional clusters may matter in this respect: the educational system and the labour market. Whether institutions matter has been analysed more for the educational system than for labour market regulation (Maurice *et al.* 1982; Müller and Shavit 1998; Breen 2005). Allmendinger (1989) concluded that a high standardisation and stratification⁴ of the system of education contribute to a better matching between offer and demand of qualifications at an aggregate level. Job competition theory should have a stronger explanatory power in lowly standardised and stratified systems of education: given an imperfect adjustment between skills and tasks performed within the occupation, employers would prefer the *least additional investment in human capital* to draw an optimal performance from their employees.

The current research is guided by the idea that it is not just the system of education, but also the frequency of temporary employment and the relative difficulty of attaining job security by turning a temporary contract into a permanent one⁵ what accounts for both different aggregate levels of over-education and, more specifically, different individual likelihoods of being over-educated. Due to the character of fixed-term contracts as stepping stones towards a more consolidated (and adjusted) position in the labour market, they might be more closely associated with over-education than permanent contracts.⁶ But the existence of a segmented labour market may modify this logic. Two alternative hypotheses could be formulated in such a scenario.

⁴ Standardisation marks the homogeneity of the degrees at a given level throughout a given state. Stratification relates to the number of tracks within the educational system, and the difficulty of crossing cross the barriers between them (Allmendinger, 1989).

⁵ According to Güell & Petrongolo (2003), though, the conversion from fixed-term to permanent contracts is still an area for further comparative research. Therefore, I give more importance to the frequency of temporary employment while acknowledging the importance of this conversion rate in order to reflect factors that may condition individual behaviour in the labour market and investment in human capital.

⁶ Among the few authors who have dealt with a possible association between over-education and type of contract, Verhaest and Omey (2004) formulated this hypothesis for a cohort of Flemish school leavers, without finding significant results.

On the one hand, temporary workers might be less likely to enjoy human capital investment from their employers and make their job fit with their initial training; conversely, permanent workers have both a higher probability of receiving further training and attaining a job match (Dolado 1999). Moreover, given that many temporary employees are new entrants into the labour market, they are usually more qualified than those in the primary segment. Over-education might thus be more likely among temporary workers than among those holding permanent contracts.

On the other hand, precisely because of the frequency of temporary employment in labour markets as the Spanish one (see below), job security might turn into an asset more valuable than in other labour markets. In such a case, human capital might be invested not in order to attain a *good match* between training and a job, but to be well placed in a competition for secure jobs, scarce and valuable as they are. Hence, we might paradoxically find that permanent workers are more likely to be over-educated than those with fixed term contracts.

Rent-seeking literature offers us a clue about the social mechanism leading to a positive association between temporary employment and over-education (Krueger 1974; Buchanan 1980). Just as restricted supply through licensing leads to wasteful competition for the scarce licenses that generate a rent to those who win a license (Foster 1981), restricted supply of high quality jobs leads to excessive competition for those jobs.⁷ The competition is excessive or wasteful because people compete for high quality jobs by educating themselves beyond the socially optimal level. While existing work has defined high quality jobs in terms of high salaries, I argue that, in a labour market where most jobs are precarious, permanent jobs are high quality jobs.

Even so, the question still arises regarding why employers would be interested in hiring over-educated workers, given the higher cost associated with this type of contract: why not

⁷ As Muysken and Weel (1999) state, “because of the excess supply of skilled workers they will always find someone either giving the best signal or on top of the queue. This in turn induces workers to even more invest in human capital to give an even better signal (...). *This mechanism enables us to explain in the context of a general equilibrium model a rising supply of skilled workers when wages are not increasing*” (5, my italics). But what is at stake in these authors’ argument are wages and employment, not job security.

offer lower salaries for more secure jobs? The credibility of becoming a permanent worker may act as a positive incentive for temporary employees, even if they are the majority of the workforce; this should compensate for the cost a new permanent job. Thus, there should be screening devices in order to fill these more favourable, scarce jobs, and education (even well above what is actually required) may work as this screening device. Finally, excessive education may act as a reserve of productivity purchased by the employer at a very *reasonable* price.

3. Data and methods

3.1. Data

The European Community Household Panel (ECHP UDB, 1994-2001) includes personal and household information for fifteen countries along eight waves, from 1994 to 2001, permitting both cross-sectional and longitudinal analyses of job mismatch.⁸ The longitudinal character of the ECHP is limited, though, due to the availability of key data for building some of the objective indicators considered in the study. Information on educational attainment⁹ was collected “only when the person enters the survey”, and it was not updated “until wave 5 (1998)”. The Description of Variables explicitly recommends using this variable “from wave 6 onwards”.¹⁰ Information on educational attainment is thus only reliable at the very beginning of the survey and from wave 6 onwards. Yet, one of the main independent variables to be included in the analysis (type of contract¹¹) was not collected precisely in the first wave. Strictly speaking, this might have limited the analysis to Waves 6

⁸ Alternative databases, like the 2000 EULFS and its ad-hoc module (‘From School to Work’) have other advantages, like larger national samples and a more detailed register of occupation and educational attainment. Yet, they lack the longitudinal character of the ECHP and its numerous shortcomings for cross-country comparison have been already pointed out by Ianelli (2002).

⁹ PT022 (“Highest level of general or higher education completed”).

¹⁰ ECHP UDB, “Description of Variables”, Doc.Pan.166/2003-12.

¹¹ PE024 (“What type of employment contract do you have in your main job”).

to 8, but educational attainment in Wave 1 may be regarded as a reasonable picture of educational attainment in Wave 2. Wave 2 has thus been also included in the analysis.

3.2. Country selection

The effect of temporary employment and labour market structure on the likelihood of being over-educated will be explored for three countries whose systems of education are fairly similar in terms of their standardisation and stratification, but whose rate of temporary employment differ: France, Italy and Spain.

Spain resembles France and Italy by being highly standardised educational systems, but having a medium level of stratification and a lower degree of occupational specificity, in regards to vocational training, than in Germany or Denmark.¹² Despite having similar educational systems, Spain's labour market regulation has been more open to "flexibility at the margins" than Italy's or France's (Toharia and Malo 2000, 307-309; Polavieja 2003; Polavieja 2006). Although fixed-term contracts have become a greater share of the total dependent population in the three cases, the level of temporary employment in Spain clearly stands out in relation to France and Italy; however, France experienced, along with the Netherlands and Greece, a steady increase throughout 1989 and the early 1990s. Italy showed much more stability.¹³

3.3. Measuring over-education

There are subjective and objective indicators of the adjustment between the main job carried out by the individual and the qualifications attained throughout her period of

¹² France and Italy occupy the same cell in the table cross-tabulating standardisation, stratification and prevalence of specific vocational training for thirteen countries (Müller and Shavit 1998, 14). Spain is not included in the comparative analysis, but the traits of the educational system are fairly similar to that of the French and Italian one in these respects.

¹³ For a comparative revision of the changes in employment regulation leading to these labour market structures in these countries and others, see Schöman *et al.* (1998).

education or training (Groot and Maassen van den Brink 2000). Subjective indicators consist of a workers' perception of the personal job match or they are drawn from a personal assessment of the educational level required to get one's job. They may be affected by psychological biases related to job satisfaction or to the progressive correction of cognitive dissonance by the individual *objectively* mismatched.

As for objective indicators, several possibilities have been suggested (Garcia Espejo 1999; Groot and Maassen van den Brink 2000). In some rare cases, scales have been set up in order to measure the logic, mathematical and linguistic skills required to perform some tasks. Such is the case of the General Education Development (GED) in the United States (Vaisey 2006). Yet, it is more common to attribute a level of education to each occupation, within the range of occupations that constitute the International Classification of Occupations (see Garrido, 1979, for the Spanish case). A third objective indicator of over-education commonly used is the so-called 'statistical method', according to which over-education occurs when the number of years of formal education is above one standard deviation from the mean or the mode of that occupation (Halaby 1994; Verdugo and Verdugo 1989).

Objective indicators of over-education have their own disadvantages. First, the same occupation or job may have different skill requirements at different times and institutional contexts. Second, "a particular occupation is likely to have different characteristics across industries, regions, firms, etc." (Alba-Ramírez 2001, 262). Finally, an objective indicator may not consider the existence of intra-occupational differences in skill requirements that might be important, especially in the case of some occupational categories (Hartog 2000; Madrigal Bajo 2003).

Among these objective indicators, the ECHP first offers the possibility of using the 'statistical method' mentioned above; that is, considering the mean and the standard deviation of the number of years of full-time education completed by workers in each occupation, and classifying them as over-educated if their years of education goes *above* one standard deviation from the mean. Beyond the shortcomings mentioned for objective indicators, two additional problems appear when trying to apply this method to the ECHP. First, the number of years completed in full-time education needs to be deduced from the age when individuals

recall having finished full-time education. Such age, as reported in the ECHP, turns out to be much higher than the theoretical age of finishing the corresponding studies provided by Eurydice (Eurydice, ISCMAP-OECD), thus leading to an over-estimation of the number of years of education. Second, the ‘statistical method’, conservative as it is in assessing over-education, may be problematic in its *distributional* character. Hypothetically, if over-education is acute in a given occupation, the distribution will be skewed, and the mean and standard deviation will seriously underestimate over-education.

These shortcomings elicit a new objective indicator, which is based on the ISCED (International Standard Classification of Education) level of educational attainment (instead of the number of years of full-time education) and is not affected by the distributional problems mentioned above:

*Thresholds for classifying individuals as over-educated or under-educated
according to the highest level of general education completed
Common criteria for all countries*

	OVER-EDUCATED
4 “Clerks”	ISCED 5-7 (Recognised third level)
5 “Service workers and shop and market sales workers”	ISCED 5-7 (Recognised third level)
6 “Skilled agricultural and fishery workers” (a)	---
7 “Craft and related trade workers”	ISCED 5-7 (Recognised third level)
8 “Plant and machine operators and assemblers”	ISCED 5-7 (Recognised third level)
9 “Elementary occupations”	ISCED 5-7 (Recognised third level) or ISCED 3 (Second stage of secondary)

Notes: a) “Skilled agricultural and fishery workers” have been excluded from the analysis, due to low frequency in all countries.

This criterion fairly coincides with the one that may be deduced from the correspondence between one-digit ISCO-88 classification and skill levels, presented by

Bergman *et al.* (2002). It also coincides with the analysis of over-education made by Dumont (2005¹⁴). Such an indicator reduces obviously the number of cases of over-education, but makes relatively sure that all those who have been classified as over-educated are really over-educated. It will be the objective indicator used here as the dependent variable.

3.4. Explaining over-education: Methods

As a logical consequence of the selection of this indicator, over-education is analysed only for occupations in which this phenomenon is fully discernible: clerks, service workers and shop and market sales workers, craft and related trades workers, plant and machine operators and assemblers and elementary occupations.

Multinomial logistic regressions were initially run for each country *and* wave, yielding very consistent results for the different independent variables.¹⁵ For this reason, beyond models run for each country, an interaction of country and type of contract were included in the last model. Given the consistency of the results across country and wave, the main analysis shown here is constituted by a random-effects (RE) logistic regression, pooling waves and countries together, so that the number of observations is maximised and results are more robust (Gujarati 2003, 638). The subsequent model applied to the data is the following:

$$y_{it} = \alpha + \beta'x_{it} + \mu_i + \varepsilon_{it},$$

where the i subscript refers to the different individuals in the sample and t refers to the different waves considered in the survey (ECHP) and $B'x_{it}$ captures the effects of K regressors, including time-constant ones). The individual effect (μ_i) is not considered to be fixed, but random. Unlike in the fixed-effects model, it is not part of the constant, but part of the error term, along with the normally distributed error ε_{it} . It is assumed

¹⁴ See also the correspondence between occupations and qualifications, established in the OECD (2006: 65).

¹⁵ Results will not be shown here for reasons of space. They are available upon request.

that $Cov(x_{it}, \mu_i) = 0$; that is, that there is not any correlation between the unobserved heterogeneity and the explanatory variables¹⁶. Random effects regressions were also run for each one of the countries, pooling the four waves considered.

3.5. Independent variables and hypotheses

Table 1 shows descriptive statistics of the independent variables included in the analysis. In regards to type of employment, the effect of holding a fixed-term job is assessed relative to having a permanent one. Individuals who are self-employed have also been included as a third, artificial category. The coefficient corresponding to these workers should also be interpreted in reference to holding a permanent contract.

As explained in the theoretical framework, internal and external mobility are supposed to correct over-education. External mobility was deduced from the question in the ECHP asking about the reasons for “stopping in previous job” in the two years prior to joining the survey. The reference category corresponds to those who changed job for any reason other than getting a better job. The second category corresponds to those who did not change their job. The third category corresponds to those who changed because “the interviewee obtained a better or more suitable job”. We may expect those who have changed their jobs to be less likely to regard themselves as over-educated. As there is not any explicit information about internal mobility in the ECHP, tenure, will be used as a proxy, since it is closely and positively related to it (Sicherman and Galor 1990).

¹⁶ The Hausman test, applied in order to compare random effects and fixed effects models applied to each one of the national samples, showed no correlation between the unobserved effects at the individual level and the explanatory variables. In this circumstance, random effects models provide more efficient estimators than fixed effects, without losing consistency. Moreover, random effects allow the estimation of time-invariant covariates, which is not possible with fixed effects models (Greene, 1997: 632-635).

Table 1
Descriptive statistics (mean or percentage) by wave and pooled sample
(Occupations 4, 6, 7, 8, 9)
(N in brackets)

	WAVE 2 (1995)	WAVE 6 (1999)	WAVE 7 (2000)	WAVE 8 (2001)	TOTAL
Overeducated	10.1% (13440)	11.4% (11271)	12.7% (10792)	13.6% (10453)	11.8% (45956)
Age1 (16-25)	15.5% (13440)	14.3% (11271)	14.4% (10792)	14.3% (10453)	14.7% (45956)
Age2 (26-35)	29.1%	30.8%	31%	30.8%	30.4%
Age3 (36-45)	26.6%	26.7%	26.6%	26.5%	26.6%
Age4 (45+)	28.6%	28%	28%	28.4%	28.2%
Female	37.5% (13440)	38.3% (11271)	39% (10792)	39.5% (10453)	38.5% (45956)
Cohabitation or marriage	69.2% (13440)	69.4% (11163)	69.6% (10669)	68.8% (10406)	69.3% (45658)
Children to look after	35.2% (13434)	34.2% (11266)	34.8% (10790)	33.8% (10450)	34.6% (45940)
Public sector	21.3% (12925)	20.2% (10856)	19.1% (10439)	18.2% (10068)	19.8% (44288)
Permanent contract	61.7% (13440)	63.7% (11271)	64.7% (10792)	64.5% (10453)	63.5% (45956)
Fixed-term contract	17.8%	17.8%	17.5%	17.4%	17.6%
Self-employed	14.3%	13.4%	13.1%	13.2%	13.6%
Tenure (less than 1 yr)	25.3% (13440)	31% (11271)	31% (10792)	33.5% (10453)	30% (45956)
Tenure (one to five years)	17.6%	18.8%	20%	20%	19%
Tenure (five years or more)	56.9%	50.2%	48.9%	46.5%	51%
No job change	51.6% (13440)	44.6% (11271)	43% (10792)	41.7% (10453)	45.6% (45956)
Other job change	33.5%	37.5%	38%	38.1%	36.6%
Job Change ("better job")	14.3%	17.4%	18.7%	19.8%	17.4%
Unemployt. Rate (lab.mkt entry)	6.8 (13440)	8.3 (11271)	8.5 (10792)	8.6 (10453)	8.02 (45956)

Missing (sector)	1.4% (13440)	1.1% (11271)	1.08% (10792)	1.3% (10453)	1.3% (45956)
Agriculture	3.1%	2.3%	2.4%	2.4%	2.6%
Mining & manufacturing	26.5%	26%	25.8%	24.9%	25.8%
Construction	10.5%	11%	11.5%	11.5%	11.1%
Distributive services	22.5%	23.7%	23.9%	24.4%	23.6%
Personal services	12.9%	12%	12%	12.4%	12.3%
Producer services	7%	7.2%	7.2%	7.4%	7.2%
Public administration	7.8%	8.5%	8%	7.6%	8%
Social services	8.1%	8.1%	8%	8.1%	8.1%
Firm size (not applicable) (1)	26.1% (13440)	24.7% (11271)	26.8% (10792)	27.7% (10453)	26.3% (45956)
No employees	7%	5.8%	5.5%	5.4%	6%
Firm size: 1-4 employees	19%	19.5%	18.5%	18.3%	18.8%
Firm size: 5-19 employees	17.3%	19%	18.8 %	18.3%	18.3%
Firm size: 20-99 employees	15.1%	15.8%	15.7%	16.2%	15.7%
Firm size: 100 employees or more	15.4%	15.2%	14.4%	13.8%	14.7%
Temporary employment * Italy	4% (512)	4.1% (441)	3.5% (365)	4.3% (427)	4% (1745)
Temporary employment * France	3.4% (429)	3.4% (360)	3.4% (353)	3.3% (333)	3.4% (1475)
Temporary employment * Spain	11.6% (1464)	11.2% (1200)	11.4% (1171)	10.6% (1058)	11.2% (4893)
Permanent employment * Italy	27.5% (3473)	27.2% (2906)	26.6% (2737)	25.5% (2536)	26.7% (11652)
Permanent employment * France	23.5% (2976)	22.8% (2435)	23.3% (2396)	24.2% (2407)	23.2% (10065)
Permanent employment * Spain	14.7% (1854)	17.2% (1842)	17.9% (1845)	18% (1798)	16.8% (7339)
Self-employment * Italy	9.6% (1216)	9.2% (981)	8.9% (914)	8.9% (881)	9.2% (3992)
Self-employment * France	1.35% (171)	1.2% (134)	1.2% (132)	1.2% (122)	1.3% (559)
Self-employment * Spain	4.3% (546)	3.7% (392)	3.7% (378)	3.8% (376)	3.9% (1692)

(1) Excluding France.

Apart from internal and external mobility, other controls were considered, corresponding to demand-side factors and the rate of unemployment at the moment of entering the labour market. The higher the unemployment rate, the more likely the individual is expected to accept a job below her educational attainment. As regards demand-side factors, sector and firm size were considered. Due to sample size restrictions, NACE sectors (*Nomenclature generale des Activitiés économique dans les Communautés Européennes*) have been collapsed into eight categories. In terms of Peneder's classification (see above) 'Agriculture' and 'construction' are supposed to be sectors with a low demand of skills. To a lesser extent, this is also the case for "Distributive services" (which includes wholesale and retail industry and transport, storage and communication) and "Personnel services" (which includes 'hotels and restaurants', in the more detailed classification available in the ECHP). "Mining and manufacturing" is possibly mixed, in the case of France, but also low-demanding in terms of IT skills in the Spanish and Italian cases. "Public administration", which includes Health and Education, is mixed, in Peneder's classification. Finally, "Public administration" and "Producer services" (including 'financial intermediation', 'renting' and 'business activities') should be clearly considered as categories that would be labelled as "dynamic IT user with high and growing IT-labour intensity".

Finally, in regards to firm size, and following the reasoning on internal labour markets made above, the bigger the company the more likely new employees are expected to occupy jobs below their educational attainment, expecting that promotions will correct this mismatch. Employers would expect that this mechanism acts as an incentive for the newly recruited worker.

4. Results

After an initial increase, from 'Age 1' (16-25) to 'Age 2' (26-35), age coefficients steadily decrease towards the reference category (highest age). The initial increase may be explained by the increase in education from Age 1 to Age 2, since training or education might have not been fully completed. From age 35 onwards, though, over-education clearly

declines. Quite remarkably, over-education decreases with age even after controlling for tenure: over and above tenure, labour market experience seems to contribute¹⁷ to reducing over-education.

In line with another analysis (Groot and Maassen van den Brink 2000), women are systematically more likely to be over-educated than men. Couple formation reduces, but does not suppress the statistical significance of gender in the cases of Italy and France. Both forming a couple and having children are negatively correlated with the dependent variable, possibly showing that individuals form a couple and have children when they obtain the highest return to their human capital investment.

For all the countries considered, working in the public sector increases the likelihood of over-education, relative to working in the private sector. Working in the public sector is generally considered more secure, and this interpretation coincides with results for the type of contract (see below).

As regards external mobility (job change) and tenure, the last RE logistic regressions expectedly show that those who have not recently changed their job are more likely to be over-educated than those who have done so. Quite surprisingly, though, the dummy corresponding to getting a “better job” is not statistically significant, relative to *involuntary* job changes. The former was supposed to capture a change aimed at getting a better match between occupation and training; it may be capturing a more *secure* job instead.¹⁸ Internal mobility, approximated through tenure, clearly reduces the likelihood of being over-educated, but only does so when tenure is longer than five years.

¹⁷ The reduction of over-education with age might also hide a cohort effect. A larger sample of over-educated workers would be necessary in order to disentangle a possible cohort effect from the pure effect of the workers’ labour market trajectory.

¹⁸ Country analysis (Table 4) reveals that getting a better job significantly decreases the likelihood of over-education in Italy, but not in Spain. Job change would thus have the expected effect of correction of over-education in the former, but not in the latter country, where it would prevail the idea that a better job is a more *secure* one.

Turning now to the main variable of interest for my research, holding a fixed-term contract seems to increase the likelihood of being over-educated. This may be a sign of the role of temporary contracts as stepping stones towards a more stable position in the labour market. It may also contradict the findings of Verhaest and Omey (2004), who did not find a significant effect of temporary work on over-education among Flemish school leavers.

Yet, prior country analyses (see Table 2) showed more heterogeneous behaviour among temporary employment. Having a fixed-term contract in Spain seems to have quite a different effect from the other two countries considered. Even controlling for external and internal mobility, being a temporary worker *in Spain reduces* the direct effect of temporary employment on the likelihood of being over-educated, relative to holding a permanent job. Thus, there are reasons to suspect that, in regards to their role in finding a match between education and jobs, fixed-term contracts do not mean the same thing in the three countries, no matter how similar their systems of education may be.

Table 2
Random-effects logistic regression
Pooled models (ECHP: Waves 2, 6, 7, 8)
Controls for age, gender, cohabitation or marriage, looking after children, tenure,
job change, unemployment rate and sector have been included in the model⁽¹⁾

	FRANCE		ITALY		SPAIN	
	Coeff.	Std.Err.	Coeff.	Std.Err.	Coeff.	Std.Err.
<i>Permanent contract (ref.cat.)</i>						
Fixed-term contract	-0.52	0.344	0.68**	0.284	-0.29**	0.138
Self-employed	-1.11	1.482	-0.15	0.376	-0.76**	0.333
Public sector	1.12**	0.371	1.46***	0.332	0.71**	0.256
<i>Ten01 (ref.category)</i>						
Tenure 1-5	0.29	0.260	0.02	0.223	0.03	0.146
Tenure 5+	-1.53***	0.323	-0.53**	0.263	-0.26	0.189
<i>Other job change (ref.category)</i>						
No job change	0.07	0.275	0.02	0.257	0.66**	0.161
Job Change ("better job")	-0.27	0.354	-0.81**	0.297	0.40**	0.165
Constant	-12.53***	0.879	-12.44***	0.727	-7.98***	0.430
/Insig2u	3.88		3.49		2.91	
Rho	0.93		0.90		0.84	
No. observations	12038		17907		14048	
No. groups	5198		7959		6869	
Wald Chi-square	352.99		266.90		538.21	

Note: ***= $p < 0.001$; **= $p < 0.05$; *= $p < 0.10$.

(1) Results for these covariates are not shown for reasons of space.

This suspicion led to the inclusion of interactions of country and type of contract in both the multinomial logistic regressions by wave (Table 3) and the RE logistic models in Table 4 (see last column). The analysis carried out by wave (Table 3) shows that, even after controlling for supply-side and demand-side factors, and for the mechanisms (internal and external mobility) to overcome over-education, having a temporary contract *in Spain* entails being *less* likely to be over-educated than holding a permanent contract, relative to being a temporary employee in France or Italy. The coefficients lose statistical significance and strength, but the finding is still significant and consistent across waves.

Table 3
Multinomial logistic regression by wave (Waves 2, 6, 7, 8)
Coefficients for the category of OVEREDUCATED (reference category: matched or adjusted)
The table just shows coefficients for type of contract, country and interactions of both.
Controls for age, gender, cohabitation or marriage, looking after children, tenure, job change, unemployment rate and sector have been included in the model⁽¹⁾

	Wave 2 (1995)		Wave 6 (1999)		Wave 7 (2000)		Wave 8 (2001)	
	Coeff.	Std.Err.	Coeff.	Coeff.	Std.Err.	Std.Err.	Coeff.	Std.Err.
<i>Permanent contract (ref.cat.)</i>								
Fixed-term contract	0.22	0.185	0.17	0.193	0.20	0.197	0.24	0.190
Self-employed	0.31**	0.159	-0.35	0.208	-0.24	0.198	-0.14	0.201
<i>Italy (ref.category)</i>								
France	1.007***	0.099	1.009***	0.109	1.01***	0.106	1.20***	0.108
Spain	1.21***	0.101	1.31***	0.104	1.27***	0.104	1.32***	0.110
<i>Fixed-term * Italy (ref.cat.)</i>								
Fixed-term * France	-0.56**	0.243	-0.11	0.259	0.18	0.251	0.014	0.247
Fixed-term * Spain	-1.04***	0.211	-0.60**	0.213	-0.43**	0.215	-0.38*	0.212
<i>Self-employt. * Italy (ref.cat.)</i>								
Self-employt. * France	-0.86**	0.403	---	---	---	---	---	---
Self-employt. * Spain	-1.00***	0.247	-0.40	0.287	-0.56*	0.282	-0.25	0.276
Constant	-3.55***	0.167	-3.97***	0.175	-3.839***	0.171	-3.99***	0.172
No. observations	12345		10325		9941		9660	
No. groups	2404.40		2972.64		2984.48		2869.59	
Wald Chi-square	0.13		0.17		0.17		0.18	

Note: ***= $p < 0.001$; **= $p < 0.05$; *= $p < 0.10$.

(1) Results for these covariates are not shown for reasons of space.

The last RE model in Table 4 includes interaction effects between country and type of contract. As before, having a temporary contract *in Spain* entails being less likely to be over-educated than holding a permanent contract, vis-à-vis what happens in the other two countries. Such a difference is statistically significant when compared with France and the reference country (Italy) *and* after controlling for the rest of the variables included in the analysis. Unlike the other two countries, working in Spain with a fixed-term contract *reduces* the likelihood of being over-educated, in relation to having a permanent contract and relative to the parallel comparison in the other two countries.

The effect of temporary work on the likelihood of over-education in Spain does not disappear when either the unemployment rate at moment of entry into the labour market or two important demand-side factors (sector and firm size) are included in the analysis. The sector certainly explains a good deal of the variation of over-education. Again, these results are quite consistent across country *and* wave.¹⁹ Relative to ‘mining and manufacturing’, over-education is more likely the more skill-demanding the sector. Thus, we find that coefficients are significant, positive and quite high for ‘producer services’ and ‘public administration’, all of which would be labelled as “IT users with a high and growing IT-labour intensity”. Here, employers are likely to hire workers whose education is above what is initially required for their work, since the growing IT-labour intensity may make them eventually more productive.

As regards firm size, the larger the firm, the more likely over-education is too, confirming the role of large firms as internal labour markets, with entry ports where the education/training requirements are below the ones held by the newly hired employee. Yet, temporary work still reduces the likelihood of over-education in Spain; in other words, human capital investment is, to some extent, exchanged for job stability, so that we paradoxically find more over-education among permanent workers than among temporary ones.

¹⁹ Results are not shown here for reasons of space. They are available upon request.

Table 4
Random-effects logistic regression
Pooled models (ECHP: Waves 2, 6, 7, 8)

	Mod.1		Mod.3		Mod.4		Mod.5 (1)		Mod.6	
	Coeff.	Std.Err.	Coeff.	Std.Err.	Coeff.	Std.Err.	Coeff.	Std.Err.	Coeff.	Std.Err.
Age1	3.46***	0.187	3.30***	0.196	2.87***	0.204	1.61***	0.233	1.50***	0.233
Age2	3.84***	0.148	3.67***	0.155	3.37***	0.162	2.14***	0.197	2.24***	0.199
Age3	2.49***	0.152	2.41***	0.157	2.26***	0.159	1.57***	0.168	1.81***	0.178
<i>Age4 (ref.category)</i>										
Female	1.00***	0.121	0.92***	0.128	0.91***	0.129	0.74**	0.126	0.48***	0.127
Cohabitation or marriage	-0.51***	0.117	-0.51***	0.120	-0.46***	0.123	-0.40**	0.124	-0.56***	0.128
Children to look after	-0.14	0.110	-0.20*	0.111	-0.17	0.113	-0.12	0.109	-0.09	0.112
<i>Permanent contract (ref.cat.)</i>										
Fixed-term contract			0.28**	0.112	0.15	0.195	0.50**	0.185	0.67**	0.243
Self-employed			-1.29***	0.197	-1.35***	0.195	-0.56*	0.292	-0.32	0.273
Public sector			0.88***	0.125	0.99***	0.128	0.85***	0.169	1.27***	0.177
<i>Ten01 (ref.category)</i>										
Tenure 1-5					0.08	0.111	-0.02	0.111	0.05	0.111
Tenure 5+					-0.74***	0.138	-0.93***	0.140	-0.74***	0.136
<i>Other job change (ref.category)</i>										
No job change					-0.08	0.128	0.39**	0.122	0.46***	0.121
Job Change (“better job”)					0.15	0.135	-0.12	0.138	-0.08	0.133
Unemployt. Rate (lab.mkt.entry)							0.14***	0.012	0.17***	0.013
(Missing)*							1.06**	0.439	0.36	0.450
Agriculture							1.10**	0.366	0.85**	0.332
<i>Mining & manufacturing (ref.cat.)</i>										
Construction							-0.27	0.193	-0.43**	0.191
Distributive services							0.72***	0.145	0.44***	0.144
Personal services							1.17***	0.183	0.92***	0.171
Producer services							2.45***	0.194	2.21***	0.190

Public administration							1.43***	0.241	1.26***	0.253
Social services							1.14***	0.230	0.77**	0.222
Firm size (not applicable)							0.97	0.162		
No employees							-0.02	0.286		
<i>Firm size: 1-4 employees (ref.cat.)</i>										
Firm size: 5-19 employees							0.53***	0.144		
Firm size: 20-99 employees							0.89***	0.155		
Firm size: 100 employees or more							1.53***	0.160		
<i>Italy (ref.category)</i>										
France									2.38***	0.186
Spain							2.43***	0.173	3.49***	0.194
<i>Fixed-term * Italy (ref.cat.)</i>										
Fixed-term * France									-0.22	0.344
Fixed-term * Spain							-1.29***	0.222	-1.47***	0.27
<i>Self-employt. * Italy (ref.cat.)</i>										
Self-employt. * France									-0.67	1.289
Self-employt. * Spain							-0.28	0.391	-1.18***	0.364
Constant	-8.64***	0.183	-8.59***	0.210	-8.05***	0.037	-11.32***	0.346	-11.90***	0.361
/Insig2u	3.20		3.19		3.18		3.29		3.32	
Rho	0.88		0.88		0.88		0.89		0.89	
<i>No. observations</i>	45642		43993		43993		42502		42502	
<i>No. groups</i>	20694		20026		20026		19948		19448	
<i>Wald Chi-square</i>	893.81		850.17		858.55		1302.17		1227.84	

Note: ***= $p < 0.001$; **= $p < 0.05$; *= $p < 0.10$.

(1) France is excluded from this model, due to the unsatisfactory quality of the firm size variable for the sample of this country.

4. Conclusions

Research on over-education faces a number of intrinsic limitations. Amongst them, the relationship between training and occupation may vary considerably within occupational groups, across countries and across time. For this reason, the indicator used here for assessing over-education is particularly and deliberately conservative, likely under-estimating over-education, and it does not consider over-education in the upper categories of the occupational scale, where over-education is more difficult to assess and possibly has a lower incidence. Despite these shortcomings, the ECHP offers us an opportunity to explore the *association* between a number of individual-level variables and over-education in different institutional settings (Alba-Ramírez and Blázquez 2003).

Among the two institutional clusters involved in the transition from school to work (system of education and labour market), the former has often been blamed for not *providing* human capital adequate to the requirements of the labour market. Less attention has been paid to the effects of temporary employment on the likelihood of being over-educated. The current research has yielded some preliminary findings in this respect.

Fixed-term contracts may conceivably act as stepping stones towards more stable positions in the labour market, so that holding a fixed-term contract increases the likelihood of being over-educated. Albeit not very consistently, this effect was found in Italy. This finding already contradicts Verhaest and Omeij's (2004) negative results of a possible association between over-education and type of contract. Yet, such an association between temporary employment and over-education, significant as it is, turns to be negative in a segmented labour market like the Spanish one.

Two hypothetical effects of temporary employment were initially considered for a labour market as the Spanish one. On the one hand, since a widespread increase in human capital investment may fill the secondary segment of the labour market with a more skilled workforce, over-education could be higher in this segment than in the primary one. Many young Spaniards enjoy a level of education much higher than their parents, but they are

disadvantaged by a labour market rife with temporary contracts. Reasonable as it might seem, this hypothesis has not been confirmed by the results.

According to the alternative hypothesis, given the size and importance of temporary employment in segmented labour markets such as the Spanish one, and the relative value of permanent employment, human capital would also be an investment for job security. According to their levels of human capital, workers are placed in the queue for better jobs, but better jobs mean here *secure* ones. Employers use human capital as a filter, and employees know human capital is an asset for getting a permanent job, if not one suitable to their training. In such a case, we may paradoxically find that temporary employment is significantly *less* associated with over-education than permanent employment. This is precisely what has been found in the Spanish case.

In theoretical terms, the behaviour of job candidates and employers in Spain could be explained as rent-seeking behaviour. In a context of scarce, valuable permanent jobs, competition among Spanish job candidates leads them to invest in human capital in excess of what they would invest if stable jobs were plentiful and employers did not use education as a filtering device. The excess in human capital investment arises both from workers who *trade* their human capital investment for *job stability* and from those crowded out of permanent jobs corresponding to their training by candidates with *excessive* human capital. Both in aggregate and individual terms, the final outcome may be sub-optimal.

Progressive de-regulation of the labour market may not be as important here as the *frequency* of temporary employment in a given labour market and the rate of conversion of fixed-term into permanent contracts, which in Spain is low and has decreased throughout the late 1980s and 1990s (Güell and Petrongolo 2000). As we have seen, temporary employment also increased in France and Italy, but not to the extent that it did in Spain, and not to the extent of conditioning the behaviour of individuals and employers. On the other hand, deregulation of the employment relationship as such is not the key issue; Britain and the US, where temporary and permanent employment are virtually equivalent, do not show as high an incidence of over-education, nor is this phenomenon so associated with temporary employment. Therefore, we might conclude that *de-regulation at the margin* (Toharia and

Malo 2000), and the subsequent creation of a segmented labour market, accounts for the difference in the Spanish case.

Valuable in itself, for both social and political reasons, the educational effort made by the Spanish society and its members in the recent decades might be partly wasted if the devaluating effects of temporary employment on the returns of education persist. It is not human capital investment, or the system of education, the one to blame, but the fact that such an effort was not consistent with a parallel and huge increase of temporary employment from the 1980s onwards.

If share of temporary employment is what really matters, a number of questions for further research immediately arise: what is the level of temporary employment that leads employees to seek a secure instead of suitable job and to use their human capital for this purpose? Conversely, what is the level of temporary employment at which employers use human capital as a filter in order to fill secure job vacancies? There are also questions regarding the *duration* and *social origin* of over-education. First, it may be interesting to know how long it takes to get an adequate match between training/education and jobs and what are the determinants of this final match; second, it is important to know if the social origin is *independent* from the above-mentioned competition for stable jobs. Are there workers from higher social origins that are able to hold out longer until finding a good job, *both* in terms of matching their educational background and job security?

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