



OVEREDUCATION AND JOB MOBILITY: EVIDENCE FROM YOUNG RECENT UNIVERSITY GRADUATES IN CATALONIA



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Resumen

En este artículo analizamos el efecto de la movilidad laboral sobre la probabilidad de sobre-educación en las primeras etapas de la vida laboral para una muestra de recién graduados en Cataluña. Utilizamos datos de corte transversal de la Agencia de Calidad Universitaria en Cataluña (AQU), con información sobre todos aquellos individuos que se graduaron en el curso académico 1997-1998 en las siete universidades públicas catalanas. Los resultados muestran que la movilidad laboral, medida por el número de empleos que ha tenido el individuo, aumenta el riesgo de sobre-educación. Sin embargo, dicho riesgo es menor cuanto mayor es la proporción de contratos permanentes anteriores al empleo actual. Finalmente, encontramos que estos efectos de la movilidad laboral sobre la probabilidad de sobre-educación se observan tanto para hombres como para mujeres.

Palabras clave: *Búsqueda de empleo, sobre-educación, movilidad laboral.*

Clasificación JEL: *I21, J24, J60.*

Abstract

This paper focuses on how job mobility affects the likelihood of over-education among recent higher education graduates in Catalonia at the early stage of their working life. To this end, we use cross-sectional survey data provided by the Quality Assurance Agency for the University System in Catalonia (AQU), covering all those individuals who graduated in the 1997-1998 academic year from one of the seven public Catalan universities. The results show that job mobility, measured as the number of jobs held by the individual, increases the likelihood of over-education. However, the incidence of over-education falls in relation to the proportion of permanent contracts prior to the current employment. Finally, we find that the effects of job mobility on over-education hold for both male and female graduates.

Key words: *Job search, over-education, job mobility.*

JEL Classification: *I21, J24, J60.*

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1. Introduction

Most research on over-education is motivated by the concern that improvements in the educational qualifications of the labour force may have outpaced the growth in jobs for highly educated workers. This phenomenon appears to have grown in importance since the mid-1980s in some European countries. Spain is no exception; over the last few decades, the proportion of highly educated workers in this country has increased dramatically (Dolado et al., 2000), but the unemployment rate remains one of the highest in the OECD area. It would appear that the increase in the supply of highly educated workers has not been matched by an equal increase in the supply of skilled jobs, thus creating a situation of over-education. As a result, there is some evidence of crowding-out, with highly educated workers displacing lower-skilled workers among whom unemployment rates have increased.

One explanation for the over-education phenomenon is that it is part of a career path, the process of entering the labour market, and that it often characterizes the first stages of an individual's working life. On starting their professional careers workers may take jobs for which they are over-educated and later move to jobs that better match their educational qualifications. This is the main idea behind the job-matching theory (Jovanovic 1979a, 1979b; Sicherman, 1991), and the occupational mobility theory (Rosen, 1972; Sicherman and Galor, 1990). Indeed, a common finding in the literature on over-education is that younger workers are more likely to be over-educated than older workers (see, for instance, Groot, 1996; Groot and Maasen van den Brink, 1997), perhaps because in general young people have greater difficulty in obtaining employment. This phenomenon has also been latent in the Spanish labour market over the last few decades, with young workers temporarily accepting jobs for which they are over-educated while they continue to look for more suitable ones (Dolado et al, 2000; Alba and Blázquez, 2004).

The job-matching and the occupational mobility theories suggest that job mobility reduces the likelihood of over-education. Of course, this may be the case when workers voluntarily leave their current jobs in pursuit of a better matching, but when job mobility is involuntary, for example because of dismissal or the end of temporary contracts, job mobility does not necessarily lead to a lower risk of over-education. This point raises the following questions which we will try to address in this paper. *Does job mobility in general decrease the risk of over-education? Or is it only when workers voluntarily change jobs that the risk of over-education is reduced?* In particular, we provide a more in-depth analysis

of the effects of job mobility on the occurrence of over-education by considering the number of jobs already held, the proportion of permanent contracts prior to current employment, and the type of contract held in the current job as explanatory factors. The number of jobs (measuring the number of times the individual has changed employer) is an indicator of job mobility in general, either voluntary or involuntary. The proportion of permanent contracts prior to the current job can be considered a good indicator of voluntary job mobility, since the main reasons for involuntary job mobility are either the end of a temporary contract or dismissal. In the first of these cases, obviously workers on temporary contracts are obliged to change job when their contract expires. As regards the second, dismissals, it should be noted that the Spanish labour market has been characterized by a lack of flexibility in recent years, with high hiring and firing costs being responsible for the high unemployment rates. In this respect, the labour market reforms were intended to increase flexibility, but the persistence of large differences between temporary and permanent employees regarding firing costs means that dismissals are clearly less likely among permanent workers. For both these reasons, a worker with a high proportion of permanent contracts over the total number of jobs (prior to the current job) is very likely to have changed jobs voluntarily. Therefore, we use “proportion of permanent contracts, prior to current job, over the total number of jobs” as a proxy for voluntary mobility.

In this article, we estimate a probit model for the probability of being over-educated, including the “number of jobs” and the “proportion of permanent contracts prior to current employment” as explanatory variables, among other personal and job characteristics. We use a fairly homogeneous sample of individuals, specifically those who graduated in the 1997-1998 academic year from one of the seven public Catalan universities. This enables us to examine the employment situation of these graduates in 2000, after several years in the labour market.

Our results reveal that job mobility, measured as the number of jobs held by an individual, increases the likelihood of over-education. However, when job mobility is voluntary (reflected by the proportion of permanent contracts prior to the current job), the probability of over-education is significantly reduced. Separate analysis of males and females reveals that these effects are significant for both genders. Finally, gender differences are also observed vis-à-vis the effects of the branch of work activity and the field of study on determining over-education.

The paper is structured as follows. The next section provides a short review of previous research. Section 3 describes the data set. Section 4 shows the econometric strategy. Section 5 presents the empirical

evidence, and Section 6 summarizes the main conclusions that can be drawn from the study.

2. Previous literature

The literature on over-education has grown rapidly since Freeman's (1976) seminal work (see the overview by Sloane, 2004). One of the aspects of the over-education phenomenon that deserves special attention is its relationship with job mobility.

From a theoretical point of view, this relationship has been addressed from different perspectives.² On the one hand, the insider-outsider theory (Lindbeck and Snower, 1988) and the wage efficiency theory (Weiss, 1990) suggest that, since voluntary job mobility is low, over-education is likely to become a permanent phenomenon. But on the other hand, the job-matching (Jovanovic, 1979 a, b; Sicherman, 1991) and the occupational mobility theory (Rosen, 1972; Sicherman and Galor, 1990) suggest that over-education represents a poor match for workers because they are educated to perform higher-level jobs; over time, they are expected to improve their job match and, therefore, over-education will be temporary. These latter theories have been supported by a considerable amount of empirical work in the literature of over-education. For Sicherman (1991), over-education is part of a career mobility process: workers temporarily accept jobs for which they are over-educated while they acquire skills that may help them in their future careers. Alba-Ramírez (1993) showed that over-educated workers experience higher turnover rates than other comparable workers. Groot (1996) and Groot and Maassen van den Brink (2000) also found evidence in favour of the career mobility or insertion hypothesis. Robst (1995) showed that over-educated workers are more likely to move to better paid jobs over time; however, contrary to the career mobility hypothesis, these workers were less likely to state that the skills they acquire would help them in their future jobs. Analysing the effects of over-education and training on promotion within the firm, Dekker, de Grip and Heijke (2002) found that over-education had a positive effect on the likelihood of promotion to a higher-level job. Similarly, Alba-Ramírez and Blázquez (2004) found that when workers' formal training or education is to a great extent related to job characteristics, over-educated workers have higher expectations of promotion, although they tend to change jobs as time passes and it becomes more unlikely that their expectations will be fulfilled.

² See García Serrano and Malo (1996) for a more detailed description of the theories that explain the relationship between job mobility and educational mismatch.

However, other studies reject the career-mobility hypothesis. Dolton and Vignoles (2000), for instance, showed that over-education seems to be a long-lasting problem for a significant proportion of university graduates. The same conclusion was reached by Büchel and Mertens (2004), who found that over-educated workers were less likely to experience upward occupational mobility than suitably allocated workers.

As we noted above, the relationship between over-education and job mobility has often been the subject of study, but to the best of our knowledge the effect of voluntary job mobility on the risk of over-education has not been analysed in depth. In this paper we try to fill this gap using a sample of university graduates on whom we have information for three years after their graduation. The next section aims to provide a more detailed description of the database.

3. The data

The empirical analysis is based on a data set provided by the Quality Assurance Agency for the University System in Catalonia (AQU). This representative survey was conducted in 2001 and covered all individuals who graduated in the 1997-1998 academic year from Catalonia's seven public universities. Its main aim was to analyse the position of university graduates in the labour market.

In Catalonia there are twelve universities, seven of which are public, four private and one virtual. The vast majority of the country's university students (nearly 80%) graduate from one of the seven public universities. The survey was posted to 20,335 graduates, of whom 5,287 returned a completed questionnaire.

For the purposes of our study, we excluded all individuals over 34 (around 7%), i.e. those students who were older when they graduated and may already have had a great deal of work experience. After discarding for age and missing observations, we obtained a final sample of over 3,900 individuals. The selected sample included both males and females. We were aware that sample selection might pose a problem with regard to gender since women devote more time to child-care activities, and therefore less time to work; however, this was unlikely given that our sample included only young individuals (from 23 to 33 years old, mean age 27), whereas the average age at which highly educated women in Spain have their first child is around 33.5.

The questionnaire collected data on aspects such as job status, work experience, current employment characteristics, type of contract, training assessment, academic studies, the relationship between job and

studies, and certain personal details such as gender and age. We also considered information related to past job experience as a determinant of the current job situation.

Women responders accounted for 58.92% of the final sample, a proportion very close to the percentage of female graduates in that same year in Catalonia (58.59%). Graduates mainly had a qualification in an area in the social sciences and a master's degree with a pass/very good final grade. Most of them obtained their first job through personal networking, and a high percentage had already left this first job. Finally, more than 50% had a permanent contract and worked in a firm with over 500 or between 11 and 50 employees in Barcelona.

Generally speaking, two types of educational mismatch can be defined: "objective" and "subjective"³. Objective definitions can be further divided in two ways. First, over-education can be assessed by comparing years of education with the average educational level in the worker's current occupation; workers are considered as over-educated if they have more than the average years of education for their occupation plus one standard deviation (Groot and Maassen van den Brink, 1997; Verdugo and Verdugo, 1989). Second, workers can be classified as over-educated by comparing their actual educational level against the job-level requirements (Hartog and Oosterbeek, 1988; Thurow and Lucas, 1972).

The subjective definitions are based on individual workers' self-reports of their level of skill utilization. A subjective definition can be ascertained by asking workers directly whether they are over-educated or under-educated for the work they do. However, they can also be asked what minimum education is required for their job, and then the self-reported level of required education can be compared with the workers' actual educational level. Many authors in the literature on over-education have used a subjective definition (Duncan and Hoffman, 1981; Sicherman, 1991; Cohn and Kahn, 1995; Rumberger, 1987; Hartog and Oosterbeek, 1988; Alba-Ramírez, 1993; Alba-Ramírez and Blázquez, 2004).

The data set used in this paper contains several questions that allow us to assess the type of job match from a subjective perspective. Workers are classified into different categories according to their responses to the following two questions:

³ The work of Hartog (2000) summarizes different over-education rates obtained by previous studies that used either objective or subjective definitions. A summary of studies on educational mismatch can be also found in Blanco (1997).

1. *Was the educational level you attained required in order to obtain your current job?* The possible answers are:
 - a. Yes, a specific field of university education was required
 - b. Yes, but only university education was required
 - c. No
2. If the answer to the previous question was:
 - a. Yes: *Do you think the responsibilities that your job involves match the educational level initially required?* The possible answers are “yes” and “no”
 - b. No: *Do you think a university degree is necessary for the responsibilities that your job involves, although it was not one of the job requirements?* The possible answers are “yes” and “no”

Based on the responses to these two questions, interviewees who reported that the level of education they attained was not required to obtain their job and who also thought that the job did not require it (workers answering “no” to the first and second questions) were defined as over-educated. Thus, 13.81% of the restricted sample reported over-education. These frequencies are close to the ones reported in the CHEERS project⁴ for Spain, and so the possible distortion caused by the fact that over-educated workers are probably less likely to complete a questionnaire was avoided. Table 1 shows descriptive statistics for both over-educated and non-over-educated graduates, and also divides the sample according to gender. The results display frequency differentials regarding field of studies, type of degree, and final grade. Therefore both educational characteristics and educational achievement appear to condition mismatch three years after the students graduate. However, the time taken by graduates to find their first job did not seem to be an underlying factor for dissimilarities in mismatch frequencies.

⁴ The CHEERS report (Careers after Higher Education: a European Research Study) is a European Graduate Survey. See Schomburg and Teichler (2006).

Table 1: Descriptive statistics for those reporting over-education, by gender (M: male; F: female)

	Not over-educated (N=4203)		Over-educated (N=672)	
	M.	F.	M.	F.
Number of jobs	2.28	2.49	2.64	2.63
Proportion of permanent contract jobs prior to current job	0.20	0.19	0.17	0.16
Currently with a permanent contract	0.55	0.46	0.40	0.41
Individual features				
Age	27.19	26.21	27.49	26.50
Doing further training	0.60	0.65	0.62	0.58
Time spent looking for first job				
Before graduating	0.52	0.46	0.54	0.46
Month following graduation	0.15	0.13	0.13	0.08
[1 - 3) months	0.16	0.17	0.15	0.16
[3 - 6) months	0.08	0.10	0.06	0.12
[6 - 12) months	0.06	0.09	0.07	0.10
More than a year	0.04	0.05	0.05	0.07
How first job was obtained				
through personal networks & self-employed	0.40	0.38	0.54	0.41
through jobs listings in the press	0.27	0.21	0.14	0.21
through public entry examination	0.09	0.13	0.12	0.11
through agencies	0.09	0.13	0.18	0.19
through university careers' office	0.15	0.16	0.02	0.07
Field of study				
Humanities	0.07	0.13	0.34	0.28
Social Sciences	0.32	0.55	0.37	0.59
Experimental Sciences	0.09	0.09	0.09	0.08
Medical Sciences	0.04	0.11	0.00	0.02
Science	0.48	0.11	0.19	0.04
Degree obtained				
'Diplomatura' (equiv. to B.A.)	0.15	0.32	0.21	0.35
'Llicenciatura' (equiv. to Master's)	0.37	0.57	0.60	0.61
Engineering	0.43	0.09	0.18	0.04
University grade				
Pass ('aprovat')	0.16	0.17	0.24	0.20
Pass- very good ('notable')	0.64	0.64	0.58	0.66
Very good -Excellent	0.17	0.18	0.17	0.14
Excellent	0.02	0.02	0.01	0.00
Branch of work activity				
Agriculture and Fisheries	0.02	0.02	0.02	0.02
Energy	0.04	0.01	0.03	0.02
Chemical industries	0.05	0.04	0.03	0.01
Metal industry	0.07	0.03	0.06	0.03
Transport equipment	0.04	0.01	0.04	0.02
Food and beverage	0.02	0.02	0.04	0.05
Textiles and clothing	0.01	0.01	0.01	0.03
Wood, paper and plastics	0.02	0.02	0.06	0.04

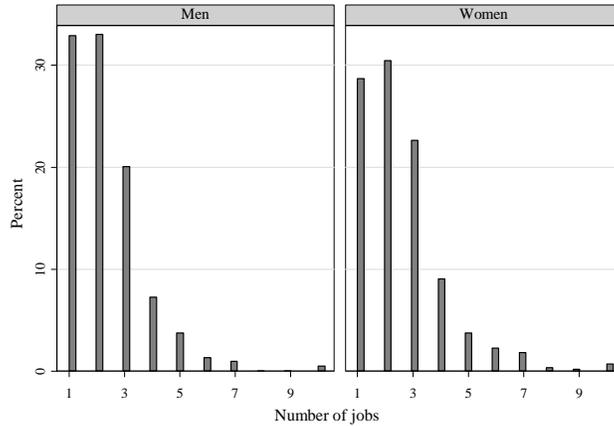
Construction	0.09	0.04	0.02	0.03
Commerce	0.02	0.02	0.07	0.08
Transport and hotel services	0.02	0.01	0.11	0.08
Technological communications	0.11	0.04	0.06	0.09
Mass media communications	0.03	0.04	0.06	0.03
Financing institutions	0.09	0.10	0.05	0.08
Services to firms	0.09	0.08	0.07	0.07
Public administration	0.05	0.05	0.13	0.12
Health services	0.04	0.12	0.01	0.06
Other branches	0.04	0.04	0.05	0.06
Establishment size				
Less than 10 =1	0.15	0.20	0.25	0.28
Between [11-50]	0.21	0.27	0.18	0.22
Between [51-100]	0.11	0.13	0.12	0.10
Between [101-250]	0.12	0.08	0.11	0.11
Between [251-500]	0.08	0.06	0.09	0.05
More than 500	0.32	0.27	0.24	0.23
Working Region				
Barcelona region	0.71	0.69	0.67	0.65
Tarragona province	0.09	0.08	0.09	0.12
Girona province	0.07	0.10	0.10	0.14
Lleida province	0.05	0.06	0.08	0.06
Rest of Spain	0.04	0.04	0.02	0.02
In the EU	0.02	0.02	0.03	0.02
Outside the EU	0.01	0.01	0.01	0.00

Next, focusing strictly on job mobility, our sample frequencies appear to be conditioned by two features. On the one hand, it is well known that job mobility is lower in Europe than in the US. Nevertheless, according to the CHEERS project, Spanish graduates have a higher average number of jobs than other European countries (though it must be stressed that these figures correspond to the 1994/1995 cohort). Only three European countries show a higher average: Italy and the Netherlands (2.5), and the United Kingdom (2.6). And on the other hand, younger people are more likely to change job more often, as job changes occur more frequently in the early stages of professional careers. This feature is particularly relevant to this paper, since we focus solely on recent graduates, and it is also supported by Neal's (1999) conclusion that complex job changes are more likely to occur early in a worker's career, while later changes are simpler. Thus the higher number of jobs could be due, for instance, to the individual's interest in being employed in a specific branch of work activity. It is also reasonable to assume that a greater number of jobs would be a consequence of over-education in earlier jobs. In fact, as we mentioned in the introduction, the Spanish economy

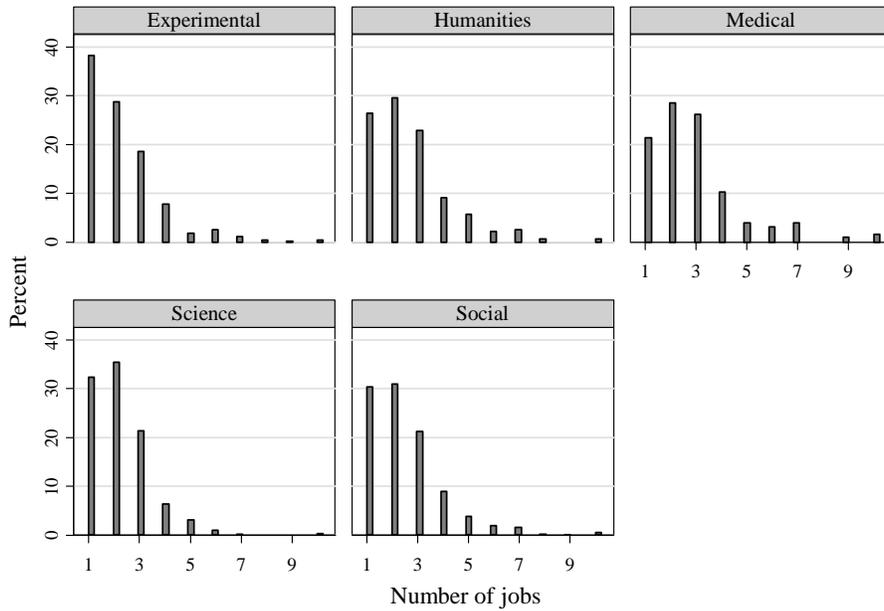
shows one of the highest percentages of over-educated graduates among EU countries.

Figure 1: Number of jobs by gender and main fields of study

1a. Gender



1b. Studies



Only three years after graduation, our sample shows an average of 2.43 jobs. This shows that graduates in Catalonia change jobs more frequently than their average European counterparts. However, the samples are not strictly comparable because of the period analysed and the peculiarities of each specific labour market. These figures are higher among the interviewees who report over-education (see Table 1). Certain aspects of the job mobility distribution are worth noting. Breaking down the data by gender, we found that the average number of jobs was 2.31 and 2.51 for men and women respectively (see also Figure 1a), and that the proportion of permanent contracts prior to current employment was slightly higher among males, though the difference was not statistically significant (0.19 for males and 0.18 for females). Finally, males were more likely to have a permanent contract three years after graduation than females (50% vs. 42%).

Figure 1b shows that graduates' field of study is an important factor in explaining job mobility dissimilarities. This finding is corroborated by examining the average number of jobs based on field of study: Humanities (2.64), Social Sciences (2.43), Experimental Sciences⁵ (2.26), Medicine (2.90) and Science⁶ (2.19). Nevertheless, in all fields the average number of jobs is close to that recorded in the CHEERS project.

4. The number of job changes and the quality of the matches

If the supply of highly educated workers is not matched by an equal increase in the supply of skilled jobs, graduates will accept jobs for which they are mismatched while they continue to search for a more suitable job. In this case, we would expect voluntary job mobility to positively affect the chances of getting a better job match. This is the argument that underlies the core of this paper. Thus, graduates enter the labour market by taking jobs whose educational requirements do not match their qualifications, but these jobs provide them with the skills needed to perform higher-level, better-suited jobs. Over time, these workers are expected to improve their job match, thereby reducing the risk of over-education, either through promotion or by changing firm (Jovanovic, 1979).

⁵ This includes Biology, Physics and Chemistry.

⁶ This category considers the following subfields of studies: Agricultural Studies, Architecture, Engineering, Marine Studies and Technological Studies.

Alba-Ramírez and Blázquez (2004) find evidence that over-educated workers in Spain are more likely to have shorter job tenures than appropriately qualified workers. These authors also show that over-educated workers whose formal training or education is very closely related to their work are more likely to change firms after three years' tenure, presumably because their upgrading expectations within the firm have not been met. This finding suggests that workers, and in our case graduates, may pursue job match quality by means of a large number of job changes. We will therefore explore the ways in which the number of jobs affects the quality of the matches. Furthermore, since the number of jobs does not clarify whether the worker changed jobs voluntarily, we will try to account for the different effects of voluntary and involuntary job mobility by looking at the proportion of permanent contracts prior to the current job over the total number of jobs. As we mentioned above, this is a good proxy for voluntary job mobility in the case of the Spanish labour market since the higher cost of firing permanent employees than temporary employees makes dismissals significantly less likely among the former.

Therefore, we would expect skill-mismatch to be reduced by voluntary job mobility, but not reduced by general job mobility (number of jobs). In order to test this hypothesis, we estimate a probit model for the probability of mismatch in the current job. The probability of being over-educated is explained by equation (1):

$$P[m_i = 1] = x_i' \gamma + l_i' \beta + \varepsilon_i \quad (1)$$

where m_i denotes the over-education occurrence of individual i ; l_i represents individual employment characteristics; x_i refers to the covariates that condition the likelihood of mismatch; γ and β are the k-vectors of parameters; and ε is the error term. As control variables (xs) we include information on: (i) personal characteristics (age and gender); (ii) past job experience (time subjects spent looking for their first job, how they obtained their first job, the number of jobs and the proportion of permanent contracts prior to the current job since they graduated⁷); (iii) the characteristics of their present job (type of contract, size of establishment, type of work activity, work location and further training); and (iv) characteristics of educational attainment (specific field of study, the kind of degree obtained and their final grade). The survey indicates whether or not the graduates were over-educated for their current job, and

⁷ For those workers whose current job is their first job, this variable takes value zero.

also provides information on their history of job mobility, measured by the number of jobs and the proportion of permanent contracts. But it is not possible to examine, for instance, whether over-education affects job mobility or whether job mobility increases the probability of obtaining a better match for individuals who are initially seen as over-educated.

We include some of the above-mentioned labour characteristics, such as the time spent looking for their first job, since it is known that Spanish women are less likely to find a job as quickly as men (Lassibille et al., 2001) and this specific feature will not be reflected by the gender indicator. Additionally, by including the type of sector, we can monitor the sectors which show higher labour instability early on in graduates' careers, i.e. greater job mobility. Finally, we explore gender differences in the occurrence of over-education, since the significant determinants of the risk of over-education may differ between women and men. Indeed, differences due to gender are highly relevant (Joy, 2006) since women and men are concentrated in different occupations, and this is also relevant for our sample.

We used the Heckman approach to check for the effects of sample selection on the estimation results of the probit model, but found no evidence of bias. This may be explained by the fact that only 5.05% of the sample were unemployed (4.95% and 5.11% for men and women respectively). Over-education is thus a more widespread problem than unemployment for graduates in Catalonia.

5. Empirical evidence

Table 2 shows the results of the probit estimation. For ease of interpretation, we report marginal effects instead of coefficients. Column (1) shows empirical evidence for the whole sample, while the columns 2 and 3 break down the results by gender. Our results show that job mobility (the number of jobs) and the quality of these job changes, i.e. the proportion of permanent contracts prior to current job, present statistically significant relations with over-education: the number of jobs is positively associated, and the proportion of permanent contracts, as we expected, is negatively associated. Therefore a high number of job changes does not help Catalan graduates to overcome over-education, but the quality of these jobs seems to be a positive factor; in fact, the magnitude of its effect is considerably higher. Specifically, the number of jobs increases the likelihood of over-education by 0.51%, while the proportion of permanent contract jobs prior to the current one reduces it by 4.06%. This suggests that the

incidence of over-education is reduced with job mobility only when workers change jobs voluntarily. Furthermore, we find that employees holding a permanent contract in their current job are 3.41% less likely to be over-educated than those holding a non-permanent contract.

Table 2: Probability of being over-educated

	All	Men	Women
Number of jobs	0.0051 (1.71)c	0.0078 (1.90)c	0.0027 (0.64)
Proportion of permanent contract jobs prior to current job	-0.0406 (-2.70)a	-0.0387 (-1.87)c	-0.0428 (-2.03)b
Currently with a permanent contract	-0.0341 (-3.45)a	-0.0300 (-2.11)b	-0.0381 (-2.78)a
Personal features			
Gender	0.0155 (1.61)		
Age	-0.0235 (-1.93)c	0.0066 (2.37)b	-0.1250 (-2.10)b
Squared age	0.0533 (2.32)b		0.2391 (2.21)b
Time spent looking for first job (ref. before graduating)			
Month following graduation	-0.0240 (-1.89)c	0.0017 (0.09)	-0.0405 (-2.03)b
[1 - 3) months	0.0090 (0.69)	-0.0001 (-0.01)	0.0138 (0.76)
[3 - 6) months	0.0144 (0.85)	-0.0374 (-2.60)a	0.0493 (2.13)b
[6 - 12) months	0.0130 (0.72)	-0.0199 (-1.05)	0.0333 (1.39)
More than a year	-0.0062 (-0.31)	-0.0389 (-2.48)b	0.0109 (0.36)
How first job was obtained (ref. through university careers' office)			
through personal networks & self-employed	0.0628 (4.17)a	0.1147 (3.89)a	0.0487 (2.65)a
through jobs listings in the press	0.0415 (2.31)b	0.0440 (1.47)	0.0567 (2.49)b
through public entry examination	0.1056 (3.29)a	0.2126 (2.90)a	0.0729 (2.28)b
through agencies	0.1182 (4.21)a	0.2051 (3.09)a	0.1083 (3.87)a
Field of Study (ref. Social Sciences)			
Humanities	0.1844 (6.92)a	0.3129 (5.22)a	0.1596 (6.33)a
Experimental Sciences	0.0113 (0.61)	0.0303 (1.01)	0.0077 (0.30)
Medical Sciences	-0.0838 (-10.42)a	-0.0582 (-6.01)a	-0.1007 (-4.63)a
Science	-0.1229 (-1.47)	-0.6377 (-5.45)a	0.9803 (1.43)
Degree obtained (ref. 'Llicenciatura'-equiv. Master's-)			
Architecture	-0.0795 (-7.32)a		-0.0828 (-1.74)c
'Diplomatura'(equiv. to B.A.)	-0.0515 (-0.41)	-0.1681 (-5.81)a	0.9999 (1.61)
Engineering	-0.1231 (-0.71)	-0.5531 (-4.94)a	0.9669 (1.52)

Grade obtained (ref. Pass- very good ('notable'))			
Pass ('aprovat')	0.0134 (1.07)	0.0365 (1.79)c	-0.0011 (-0.07)
Very good -Excellent	-0.0055 (-0.46)	-0.0063 (-0.40)	-0.0072 (-0.41)
Excellent	-0.0770 (-6.68)a	-0.0535 (-4.44)a	
Branch of work activity			
Agriculture and Fisheries	0.2312 (2.89)a	0.1578 (1.35)	0.2822 (3.43)a
Energy	0.2248 (3.08)a	0.0929 (1.17)	0.3337 (3.99)a
Chemical industries	0.0801 (1.66)c	0.1102 (1.50)	0.0240 (0.43)
Metal industry	0.2157 (4.10)a	0.1730 (2.37)b	0.2233 (3.93)a
Transport equipment	0.3450 (4.24)a	0.1838 (2.00)b	0.5275 (4.63)a
Food and beverage	0.2930 (4.53)a	0.2132 (2.01)b	0.3215 (5.16)a
Textiles and clothing	0.3293 (3.96)a	0.0215 (0.28)	0.5116 (6.10)a
Wood, paper and plastics	0.3099 (4.82)a	0.2450 (2.19)b	0.3335 (5.48)a
Construction	0.1607 (2.67)a	0.0262 (0.48)	0.2641 (3.64)a
Commerce	0.3761 (5.74)a	0.4002 (3.28)a	0.3825 (6.11)a
Transport and hotel services	0.4505 (7.23)a	0.3203 (3.08)a	0.4801 (7.42)a
Technological communications	0.2665 (5.75)a	0.0618 (1.31)	0.4191 (8.18)a
Mass media communications	0.1425 (3.10)a	0.1833 (2.18)b	0.1112 (2.41)b
Financing institutions	0.1156 (3.28)a	0.0356 (0.80)	0.1701 (4.42)a
Services to firms	0.1209 (3.51)a	0.0976 (1.75)c	0.1347 (3.77)a
Public administration	0.2597 (6.03)a	0.1787 (2.64)a	0.3052 (7.25)a
Health services	0.1291 (2.89)a	0.0486 (0.74)	0.1570 (3.60)a
Other branches	0.1685 (3.50)a	0.0823 (1.34)	0.2110 (4.18)a
Establishment size (more than 500)			
Less than 10 =1	0.0671 (3.43)a	0.0290 (1.11)	0.0879 (3.71)a
Between [11-50]	0.0101 (0.70)	-0.0156 (-0.94)	0.0215 (1.07)
Between [51-100]	0.0043 (0.26)	-0.0026 (-0.12)	0.0096 (0.40)
Between [101-250]	0.0300 (1.51)	-0.0001 (0.00)	0.0508 (1.85)c
Between [251-500]	0.0151 (0.72)	0.0633 (1.75)c	-0.0184 (-0.68)
Working Region (ref. Barcelona region)			
Tarragona province	0.0063 (0.40)	-0.0121 (-0.66)	0.0157 (0.72)
Girona province	0.0294 (1.65)c	-0.0126 (-0.67)	0.0509 (2.25)b
Lleida province	-0.0110 (-0.61)	0.0022 (0.08)	-0.0285 (-1.09)
Rest of Spain	-0.0484 (-2.87)a	-0.0365 (-1.80)c	-0.0531 (-1.56)

In the EU	0.0032 (0.10)	0.0184 (0.37)	-0.0121 (-0.26)
Outside the EU	-0.0204 (-0.43)	-0.0140 (-0.24)	-0.0334 (-0.28)
N	3,917	1,479	2,344
Wald χ^2	594.06 (0.00)	288.08 (0.00)	368.06 (0.00)
Pseudo-R ²	0.1978	0.2741	0.1917
Correctly classified	87.80%	90.33%	85.96%

Note: superscripts a, b, c denote statistical significance at 1%, 5% and 10%, respectively. t statistics are reported between brackets.

A separate analysis by gender reveals that the number of jobs was only significant in estimating over-education for males. However, voluntary job mobility seemed to reduce the likelihood of over-education for both genders, although the impact was slightly higher among females.

The estimation results suggest, therefore, that the incidence of over-education amongst graduates in Catalonia is significantly reduced by the proportion of good quality matches at the early stage of their working career. However, we found evidence that, in general, job mobility has a negative impact on the quality of the job match three years after graduating.

Our results also reveal significant effects of variables other than job mobility on the risk of over-education. All the economic branches display higher probabilities of becoming over-educated than our benchmark category, Education. Hence, the selection of a specific branch of work activity conditions the quality of the matches, e.g. the earnings profile (Parent, 2000). The magnitudes of the marginal effects are significantly higher in the female estimation. In only two branches – Chemical Industries and Mass Media Communications – were marginal effects notably higher for males than for females, and Commerce was the only branch in which females and males present similar marginal effects. For all other branches, females were significantly more likely to be over-educated than the benchmark group compared to males. For instance, the probability of over-education was more than 50 percentage points higher for females in the Transport Equipment branch than in those in the Education branch; for males, the difference was about 2%. Furthermore, after breaking down the data according to gender, the men's results were not statistically significant for Agriculture and Fisheries, Energy, Food and Beverages, Wood, Paper and Plastics, Transport and Hotel Services, Mass Media Communications, Public Administration and Health Services, whereas

the women's results were significant for all branches except Chemical Industries.

Characteristics of educational attainment are another important factor in explaining over-education. Covariates that play a significant role in affecting the probability of being over-educated include university grades and the field of study: final university grades represent a proxy for knowledge acquirement after graduation, while the field of study conditions labour enrolment. It is well known that Social Sciences graduates are more likely to find employment than Humanities graduates.

Firstly, Humanities graduates were 18% more likely to be over-educated than Social Sciences graduates; among males, the difference rose to 31.29%. Medical graduates were less likely to be over-educated than Social Sciences graduates. However, the magnitude of the marginal effects was higher among females. Among Science graduates, the relationship with over-education was not statistically significant in females, but was negative and significant for males. Experimental Sciences was the only field of study that did not show statistically significant differences in over-education compared to Social Sciences.

Turning to the effects of university grades, the results suggest that male graduates who obtained very good or excellent grades experience a lower risk of over-education. Furthermore, in males the lower the grade obtained, the higher the probability of being over-educated, but in females, the grade obtained did not play a role.

We found some interesting gender differences regarding the effect of the time spent looking for the first job on the incidence of over-education. Taking those who started looking before they graduated as the benchmark group, we found that male graduates who spent between 3 and 6 months looking for their first job and those who looked for over a year were roughly 3.74% less likely to be over-educated in their current employment. In contrast, female graduates presented two significant effects: firstly, those who spent between 3 and 6 months looking were 4.93% more likely to be over-educated than the benchmark; and secondly, women who found their first job within a month of graduating were 4.05% less likely to be over-educated in their current employment than the benchmark.

As regards the way they found their first job, we found that those who obtained their first job through a university careers' office were the least likely to be over-educated in their current employment. For instance, male graduates who got their first job by public entry examination were 21.26% more likely to be over-educated than those who did so via a university careers' office. This result may be due to the

high levels of temporary employment in Spain,⁸ which may have led some university graduates to train for certain public sector jobs which are less skilled but offer greater job security. For female graduates this effect was also positive and significant, though much smaller than for males (7.29%).

Finally, ageing was statistically significant for over-education, both in the whole sample analysis and the analysis broken down by gender.

6. Conclusions

The main aim of this paper was to analyse school-to-work transitions for recent university graduates in Catalonia (Spain). In particular, we examine how job mobility has affected the incidence of over-education for these workers at the early stage of their working life. Job mobility may reduce the risk of over-education if workers voluntarily leave their current job in pursuit of a better match, but it may increase the risk when the worker leaves the firm due to dismissal or because of the termination of a temporary contract.

Using a sample of individuals who graduated from the seven public Catalan universities in the 1997-1998 academic year, we examine the labour market situation and, in particular, the incidence of over-education among these workers in 2000. Our main findings suggest that only voluntary job mobility seems to significantly reduce the likelihood of over-education, while job mobility in general tends to increase the risk. This result is observed for both male and female graduates.

The analysis also reveals other interesting findings. First, the variable "sector" seems to play an important role in determining over-education, with the Education branch exhibiting the lowest incidence (as expected, since those seeking work in this sector must have appropriate qualifications). The effects appear to be greater for females. Field of study and ageing are also found to be of paramount importance in explaining over-education. Finally, the results suggest that those who obtained their first job through a university careers' office are the least likely to be over-educated three years after graduating.

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⁸ At the end of the 1990s, the rate of temporary employment in Spain was around 30%.

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