Why higher graduated regret their field of studies? Some evidence from Catalonia (Spain)

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Abstract:
The present paper focuses on transitions from school to work for recent higher education graduates in Catalonia (Spain). In particular, we concentrate on the relationship between mismatch and disappointing with the attended university career. For that purpose, we employ cross-sectional survey data provided by The Quality Assurance Agency for the University System in Catalonia (AQU), and covering all the individuals who graduated in the 1997-1998 academic year from one of the seven public Catalan universities. The results show that regretting results to be determined by mismatch besides other factors: personality, ageing, educational characteristics (such as final university grades or the specific field of study) and regretting the attended institution.

Key words: overeducation; regret; higher education
JEL codes: I21, J24, J44

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1. Introduction

The present analysis examines the interaction between regretting the specific attended university studies at short-term - specifically after three years of becoming graduated - and reporting labour market mismatch. Although this level of experience is short, at least, two advantages come from this kind of analysis. On one hand, short-term regret is more related to actions that is the rule for educational choices. On the other, regretting studies three years later to graduation involves a feeling of dissatisfaction at a time when opportunity to readdress human acquisition gains is yet possible. Hence, regret will persist meanwhile the opportunity for a change remains high (Roese and Summerville, 2005). Note that education is open in a long-learning society and younger people display less constrained choices.

Two issues should be highlighted from the present analysis. First, regretting university studies has appeared as a recent European educational failure. Up to this juncture, empirical literature has mostly focused on mismatch determinants - see Borghans and Golsteyn (2007) for the consequences of regretting on switching. Thus, to the best of our knowledge, this is the first analysis strengthening on the underpinning reasons for regretting university studies. Secondly, this kind of analysis is strongly relevant for the Catalan (Spanish) case. Those Spaniards who recently become higher graduated report greater regretting percentages than other European tertiary educated people. REFLEX project[1] report shows significant differences on European regretting rates. See figure 1 where higher graduated reported their answer to the following question: "Looking back, if you were free to choose again would you choose the same study programme?" From these figures we observe that Spain plays a leading role in this educational failure. Indeed, a 9% of Spanish higher graduated indicate that, looking back, they would

[1] The REFLEX project is financed as a Specific Targeted Research Project (STREP) of the European Union's Sixth Framework Programme. Indeed, REFLEX represents "The Flexible Professional in the Knowledge Society New Demands on Higher Education in Europe". Notwithstanding, closer figures can be obtained from CHEERS (Careers after Higher Education: a European Research Study) which is a European Graduate Survey.

decide not to study at all. This rate is five percent points above those countries with a considerably percentage.

[Insert Figure 1 here]

Our intention is to distinguish between labour and educational effects on regret. That is, we will explore those consequences arisen from either past educational characteristics or labour market insertion features. In doing so, two aspects have to be highlighted. First, we use a rather homogenous sample since we examine labour market transition for those who graduated in the 1997-1998 academic year from one of the seven public Catalan universities. Second, we examine the interrelation between labour market and educational choice accounting for subjective measures, since both measures are strongly correlated through personal core self-evaluations. Indeed, we estimate also considering endogeneity effects by means of a probit procedure with endogenous regressor that is completely observed.

The paper is structured as follows. The next section provides a brief analysis on the concept of regret, its relationship with overeducation. Section 3 describes the data set. Section 4 presents the econometric strategy while section 5 shows the empirical evidence. Finally, Section 6 summarises the main conclusions that can be drawn from the study.

2. What lies behind regretting university studies?

We are analysing the experience of regretting the attended field of studies at university. Hence, this measure will be conditioned to the general determinants of individual decisions about regretting. Two factors should be taken into account besides the distinction between rational and irrational components. First, this indicator is a subjective opinion about a taken action which is the decision of studying either a specific degree or a field of study. Note that the underpinning reasons of regret differ from action to inaction (Gilovich and Medvec, 1995). To a certain extent, we are analysing a mistake, i.e. bemoan a bad decision (action) when enrolling to university. Second, the analysis of regretting an action is also conditioned to its temporal pattern

(Gilovich and Medvec, 1994 and Gilovich, Medvec and Kahneman, 1998). Therefore, the regretting opinion depends on so far in time the decision was taken. Thus, long-term usually applies for regret not doing something whereas short-term is more related to regretting actions done. Our empirical approach analyses the experience of regretting an action in a short-term evaluation.

The choice of the field of studies, therefore, consists on a risky decision, i.e. an action made without advance knowledge of its consequences. Thus, uncertainty represents the major worry after graduating since university graduates do not know certainly which would be their transition to job market – for instance they know nothing about their future number of transitions, the quality of these transitions or the further human capital acquisitions in tenure. Furthermore, decisions regard educational choices are the most common regrets regardless of the distinction between actions or inactions - see Roese and Summerville (2005) for the American empirical evidence.

Since regret stems for a comparison between what occurs and what might have taken place, graduated individuals cognitive emotions would mainly rely on features related to the attended higher graduation studies (the specific field of studies or the final university grades). Notwithstanding, regretting university studies will be also subject to own labour market experience. The latter relies on short-term experiences in which people have identified the regrettable consequences. That is, those who are upset because he/she made a recent transition from university to work that didn't followed his/her expectations are more likely to report a greater disappointment with their studies.

Therefore, overeducation (the occupational field does not fit with the attended field of studies) is very closely related to regret the choice in higher education. In fact, mismatch will imply new quitting experiences. Nonetheless, regretting, maybe, would also consequence a willing to switch to a different occupational field. Likewise, job dissatisfaction predicts further quitting experiences even for influencing where the higher graduated search for (Delfgaauw, 2007). The switching decision from one field to another will involve a skill transferability loss when occupational fields do not show common skills. The degree of transferability depends on the initial and subsequent occupations (Shaw, 1987). This loss inflicts damage on higher graduate's human capital

(Borghans and Golsteyn, 2007) since graduated are not able to utilize their specific investment in schooling in employment. Moreover, further training would be required when switching to a different occupational field. On the opposite, a positive point of view rise through a revision of working transition decisions that would bring improvement in life circumstances since regret influences on behaviour (Zeelenberg, 1999).

Nevertheless, the present paper analyses regret accounting for the possible endogeneity of mismatch occurrence to achieve robustness. The later relies on questioning about regretting effects on mismatch. This would be a consequence of regretting studies (either the university degree or the specific field) over the period in which graduates are still finishing their university degree. Hence, some university students really bemoan their initial choice but thinks that it is so late to readdress the field. The final consequence is mismatch evidence since the higher graduated will look for a different occupational field. Moreover, regretting maybe occurs because of students were not enrolled in their first choice when enrolling in university. The econometric strategy seeks on mismatch effects on regretting because we are strictly only interested in regret determinants.

Furthermore, besides this above mentioned interrelation, personality traits would be under both domains. Therefore, responses will be highly correlated as a consequence of psychological personal characteristics when answering the questionnaire. Core-evaluations affect people's appraisal of themselves subconsciously. Thus, specific appraisals are conditioned by these deeper self-appraisals although individuals are not conscious of the influence of their self-evaluations on their perceptions about regretting or reporting: mismatch, health status, job satisfaction or the degree of well-being (Bono and Judge, 2003). Hence, individual evaluations in multiple domains are determined by core evaluations.

As a consequence, to a certain extent, people respond to several domains indicating their own preferences determined to retrospective evaluations of experiences. Thus, someone asked about his or her satisfaction with the attended studies would be conditioned by biased memories deteriorating remembered utility. Then, a bad or a good recent experience in any life dimension would be conditioning responses. For

instance, being promoted in one's job two years ago or during the month previous to the interview would cause workers to show a dissimilar evaluation of their work transition. Now, let's think about those who did not obtain a promotion contrary to their expectations, for instance during the fifteen days before the interview. A low self-steem would determine regret besides its obvious effect through reporting mismatch. Likewise, making choices can be also conditioned by the individual emotional state when the evaluation is made. Therefore, unobserved factors will be present when answering satisfaction domains throughout the questionnaire. Additionally, "focusing illusion" could be present. Schkade and Kahneman (1998) state that people exert themselves into the asked question when thinking about it. At this juncture, an exaggerated relevance would arise in those requested satisfaction domains. Therefore, even though we include a proxy to capture personality, we will undertake a simultaneous estimation procedure in order to detect the interrelation between mismatch and regret, since self-evaluations should be analysed simultaneously and not isolated.

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). The survey was conducted in 2000 and covered all the individuals who graduated in the 1997-1998 academic year from one of the seven public Catalan universities. The main aim of this survey was to study the position of the university graduates in the labour market. In Catalonia there are twelve recognized universities, seven are public, four are private, and one is virtual. Of the total number of university students, the vast majority (nearly 80%) graduates from one of the seven public universities. The survey was posted to 20,335 graduates of whom 5,287 returned a filled questionnaire. In order to increase the sample percentage a short telephone call survey was carried out, which increased the total number of respondents to 9,766. However, we cannot use these complementary data from the telephone survey since it did not include, among others, information on final grades. The telephone interview however has been very useful to examine whether our final sample is affected by attrition bias. Following a Heckman procedure, our findings show that our final sample is not biased. However, we do not know whether both samples

(post and telephone) could be hiding non attendance bias, although note that we had more than nine thousand individuals.

For our purpose, we eliminate all individuals older than 34 (about 7%), i.e. we exclude those students who graduated at an older age and may have already much working experience. After cleaning for age and for missing observations, we obtain a final sample of more than 3,500 individuals. The selected sample includes both males and females. In principle, a problem of sample selection could be possible since women are expected to dedicate less time to their jobs because they take more care tasks for the children. This possibility, however, is less plausible given that the present sample includes only young individuals (from 23 to 33 years old with an average age of 27) and the average age in which highly educated women in Spain have the first child is about 33.5. Even though, we should highlight that our results hardly change once we account for this age restriction. Therefore, we finally present results for the whole sample since they are rather more informative.

The questionnaire requests data and an evaluation of different aspects such as: status of position, work experience, current employment characteristics, contracts, training assessment, academic studies, the relationship between job and studies, earnings, and some individual characteristics such as gender and age. For wage levels, we measure the results at set intervals, which is a common means of grouping survey data. We also consider information related to past job experiences, since past behaviour is as important a determinant as the present situation.

The final sample consists of 58.92% of women which is very closer to the percentage of female graduates in that same year in Catalonia (58.59%). Higher graduated mainly attained social science studies and a Master degree with a pass-very good final grade, acceded by their own network to their first job, a high percentage already leaved their first job, more than 50% have a fixed contract, work in a firm with a size bigger than 500 or between 11 and 50 employees and work in Barcelona.

Now, we focus strictly on regretting percentages. Graduated in Catalan universities were asked specifically about: *If you had to begin again, would you choose the same field of study?* The possible answers were: Yes & No. Moreover, graduated people were

also questioned about repeating the same university in which the field of study was attended. Again, response was characterized by dichotomy. Indeed, the later question allows us to include a good instrument for the analysis of regretting studies. The shares in which people answered negatively to the first question were rather quite relevant. Thus, the percentage of people bemoaning their attended higher graduated studies rose to a 30.49% which was slightly greater for the age restricted sample (30.65%). Note that these figures are very similar to those shown in the introductory section for the Spanish case and far to other developed countries. On the contrary, the regretting percentage of those do not desiring to repeat the same institution only rise to a 15.92%. A common regretting question was not included into the questionnaire even though we can assure that both disappointing are evidenced for the 8.9% of the sample. Table 1 shows descriptive statistics for covariates, where higher graduated are classified into two groups based on reporting: no regret and regret. Our results show that women display a slightly higher regretting rate (29.56% and 31.33%, respectively). Based on the rest of covariates, the higher regret percentages appear for: those reporting mismatch, which would be explained below, those with a higher job mobility and low quality of job transitions, younger graduates, mainly having graduated in Social Sciences and with lower final university grades besides other factors related to either a few specific studies or branches of activity.

[Insert Table 1 here]

Furthermore, and regards mismatch, in general, we can distinguish two main types of definitions for educational mismatch: “objective” and “subjective” definitions: The subjective definitions are based on individual workers’ self-reports on their level of skill utilisation. A subjective definition can be derived asking workers directly whether they are over-educated or under-educated for the work they do. But, they also can be asked what minimum education is required for their job and then compare the self-reported level of required education with workers’ actual educational level. Many works in the literature of overeducation have used a subjective definition (Duncan and Hoffman, 1981; Sicherman, 1991; Cohn and Kahn, 1995; Rumberger, 1987; Hartog and Oosterbeek, 1988).

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 in different categories according to their responses to the following two questions:

1. *Was your attained educational level required in order to get your current job?* The possible answers are: Yes, a specific field of university education was required; Yes, but only university education was required & No.

2. If the answer to the previous question was:
    a. Yes: *Do you think job requirements adjust the required educational level?* The possible answer are "yes" and "no"
    b. No: *Do you think your job would require university level of education although it was not required to get the job?* The possible answer are "yes" and "no"

Based on the responses to these two questions we construct two definitions of educational mismatch. First, people reporting "no" to the first question, and "no" to the second question will be considered as being over-educated (we can call it *vertical mismatch*). And second, we will use the term *horizontal mismatch* for those workers answering "yes" to the first question and "no" to the second one.

We observe that a 32.76% of the restricted sample report mismatch. Among these, horizontal mismatch represents 18.95% whilst the rest (13.81%) is related to vertical mismatch. Since these frequencies are closely to the population ones, we would be avoiding attrition consequences because of the fact that those under mismatch might be more likely to not complete a questionnaire.

Table 2 shows descriptive statistics for covariates, where higher graduated are classified into three groups based on reporting: no mismatch, vertical mismatch and horizontal mismatch. Our results display frequency differentials when decomposing the sample by: gender, field of studies the studies degree and the final grades. Therefore, it seems that both educational characteristics and achievements condition mismatch three years after becoming graduated. On the contrary, time search for their first job and the branch of activity do not seem to be underpinning factors for dissimilarities in mismatch

frequencies. Even though we report descriptive characteristics for both mismatch possibilities, our empirical approach only stresses through analysing the impact of vertical mismatch, i.e. overeducation. The latter relies on twice factors: (i) it is obvious that vertical mismatch is a distressing labour market failure than horizontal one; (ii) horizontal mismatch has no effects on regretting rates for our sample based on preliminary empirical results.

[Insert Table 2 here]

Next to the observable objectively measurable individual, job and education characteristics, self-evaluation is determined by individuals' personality traits. Psychologists have long claimed that individual personality characteristics explain up to 80 percent of an individual self-reported satisfaction (Lykken and Tellegen, 1996). If the data is a panel, one can control for these by including individual effects. Since the present sample is cross-section, we need to find a more creative way to control for those psychological traits. The data set contains a set of questions indicating individual's perception of why they were selected for their present job. Here we use the answer to these questions, known as self-efficacy evaluation, to create a measure of individual personality by using factor analysis[2], as usual in the self-evaluation literature (see Bono and Judge, 2003). Note that this measure is highly correlated with self-esteem.

Therefore, responses will be highly correlated as a consequence of psychological personal characteristics when answering the questionnaire. Judge, Erez and Bono (1998) point out core self-evaluations represent an ability or skill factor. Then, individual self-steem would be under both domains of satisfaction. Therefore, core-evaluations affect people's appraisal of themselves subconsciously. Thus, specific appraisals are conditioned by these deeper self-appraisals although individuals are not conscious of the influence of their self-evaluations on their perceptions about health status, job satisfaction or their degree of well-being (Bono and Judge, 2003). Hence, individual evaluations in multiple domains are determined by core evaluations. The latter will give rise to self evaluations being analysed simultaneously and not isolated.

[2] The Kaiser-Meyer-Olkin measure of sampling adequacy indicated that multivariate analysis obtains excellent results (the factor accounted for 95% of the overall variability). Subsequently, we re-scaled the factor predictions to [0-1], since the individual opinions on the determinants of being contracted should not have a negative value, whilst 1 should represent being fully confident in themselves.

4. Econometric strategy

We will concentrate on examining the underpinning factors on reporting regret. Thus, we conducted an analysis where the endogenous variable is a dichotomous variable. However, as it has been already mentioned in the second section, regret and vertical mismatch are jointly determined through personality traits and unobserved factors. The latter relies on the fact that both indicators are a self-reported measure. As a consequence, we estimate through a probit procedure accounting for one endogenous regressor (vertical mismatch response) as expressed in equation (1). Indeed, we make use of a sequential two-step procedure in which we obtain standard errors of estimators using bootstrap technique (400 replications) proposed in Cameron and Trivedi (2005, p.561). Note that this procedure controls for the endogeneity of two related choices. The used method turns out to be inefficient when we lack valid instruments. Even though, through the empirical analysis, we are able to include relevant usual determinants of vertical mismatch occurrence. Note that different covariates can be included for each equation. Additionally, Currie and Madrian (1999) point to the presence of biased estimations for covariates when instrumentalizing self-reported measures using objective measures when the measurement error is correlated with these covariates. In this regard, as we mentioned before, we should highlight that we account for personality traits although we are conscious that unobservables effects can be there.

The true quality of both regret and vertical mismatch reporting correspond to two latent variables that cannot be observed directly and which account for individual preferences. As mentioned above, what we observe are two self-reported measures. Regards mismatch reporting, we will use the indicator for overeducation, i.e. vertical mismatch. Thus, $y^{*}_{1,i}$ is the latent variable for a negative cognitive emotion (regret) of the specific attended studies and $y^{*}_{2,i}$ denotes individual job vertical mismatch perception. These latent measures are conditioned to $x_{1,i}$ and $x_{2,i}$ which are the *k*-vector of explanatory variables and to each other, respectively, β, δ and λ are the *k*-vectors of unknown parameters and, finally, $\varepsilon_{1,i}$ and $\varepsilon_{2,i}$ represent the random error terms which are dependent and normally distributed. A Wald test reporting the statistical significance of

$\hat{\varepsilon}_2$ into the first equation will denote that endogeneity is present, i.e. the regret equation cannot be estimated separately through a binomial probit.

$$
\begin{aligned}
&y^*_{1,i} = x^{'}_{1,i}\beta + \lambda_1 y^*_{2,i} + \varepsilon_{1,i} \quad \textit{where} \quad y_1 = \begin{cases} 1 & \textit{if} \quad y^*_{1,i} > 0 \\ 0 & \textit{otherwise} \end{cases} \\
&y^*_{2,i} = x^{'}_{2,i}\delta + \varepsilon_{2,i} \quad \textit{where} \quad y_2 = \begin{cases} 1 & \textit{if} \quad y^*_{2,i} > 0 \\ 0 & \textit{otherwise} \end{cases}
\end{aligned}
\tag{1}
$$

For the purpose of exploring determinants in responding regret, we made use of a wide set of explanatory variables. Specifically, we introduced the following covariates for the vertical mismatch first-step equation: (i) individual characteristics (age in which we also considered a non-linear relationship and gender), (ii) transition particularities from studies to work (search time for their first job, number of jobs, the share of fixed contracts), (iii) present job features (branch of activity, establishment size, working region), (iv) final university grade as a proxy for ability at job. On the other hand, we include the next variables for the regretting equation: (i) individual characteristics (age in which we include a non-linear relationship, gender and personality traits predictions), (ii) educational attainment characteristics (final university grade and the specific field of study), (iii) job characteristics denoting the presence of non achieved expectations (salary records and job occupations).

5. Empirical evidence

Table 3 reports results for marginal effects considering two alternative specifications: a probit standard procedure and the above mentioned two-step probit procedure with an endogenous regressor. A Wald test reporting the statistical significance of $\hat{\varepsilon}_2$ into the first equation denotes that endogeneity is present, i.e. the regret equation cannot be estimated separately through a binomial probit or by means of a seemingly unrelated probit procedure. Even though results are quite similar we observe several differences in the marginal effects estimations. In particular, note that although mismatch is found to be determinant of regret as we expected in both estimation results, there appear three times a marginal effect from the two-step procedure. Thus, we have to note that the estimated coefficient related to mismatch is underestimated when we avoid the

endogeneity problem. On the contrary, the effects either of personality traits or regretting the specific tertiary institution results to be quite similar. At this point, note that both variables show the highest marginal effects as it can be seen in table 3. Hence, simultaneity should be accounted for so as to detect the real effect of mismatch on regretting the attended university studies.

Specifically regards regretting determinants, our results indicate that both educational and labour market features have consequences on regretting university studies besides other relevant aspects that later on need to be highlighted. On one hand, educational variables, as it was expected, plays a significant role. First, the specific field of studies has consequences on reporting regret. In fact, the higher statistically significant positive coefficients were found for those having attended: Tourism, Health 3-year degree studies, Philology, Pedagogy, Law, Physics and Mathematics, Communication and Comparative studies. To a certain extent, regret is more likely among higher graduated that provide general skills besides some specific field of studies. Second, we observe a logical finding. Those higher graduated who regret the specific attended tertiary institutions are more likely to regret the university studies (the marginal effect is one of the greatest). Hence, the experience at each institution constitutes a relevant factor. Third and finally, university final grades have a small effect. The greater final grade the lower probability to report regret. Even though, this variable shows a minor contribution since only the higher category results to be statistically significant compared to the most populated base category. Moreover, the variable appears to be non-statistically significant by means of the estimation procedure accounting for an endogenous regressor. Note that this result would indicate that higher human capital acquisitions during the tertiary educational period allow people to improve labour skills besides being more able to overcome bad labour market experiences.

[Insert Table 3 here]

On the other hand, labour market has consequences on reported regret. At this stage, we examined separately those statistically significant effects from: mismatch, job occupations and wages. Thus, either the greater mismatch or the lower salaries the higher reported regret. The first indicator denotes regretting studies as a consequence of the fact that job occupation does not fit with individual expectations. Indeed, we

additionally included the specific type of occupation. Note that, compared to other qualified occupations category, those working in Medical Care & Social Work, Design and Media and Teaching & Training occupations are more likely to do not regret their studies. Obviously, low-level qualified occupations display a significant positive coefficient. On the contrary, a higher probability is found for those enrolled in Logistics, Distribution & Marketing regards the base-category. Meanwhile, salary records consequences would indicate the arisen effect from unrealized initial monetary expectations. Therefore, while the second variable is affected by the expected socioeconomic individual status, the first one is closer to intrinsic expectations on the use of individual labour market capabilities.

Besides those above mentioned effects, we should also highlight two specific determinants. First, the probability of regret decreases with ageing (it is evidenced through a non-linear relation). Hence, the greater experience the lower regret to the specific field of studies. This fact could be related to the particularities of regretting an action at short term. Our result indicates the lower expectations from tertiary studies for those who are older. Second, personality traits results a cornerstone for both subjective measures. Thus, the more optimistic the lower either reported mismatch or the minor regret of the attended studies. Our results are robust to the omission of this variable.

We do not report comments for the mismatch analysis since this issue has been accounted for more generally by labour economic literature. Furthermore, the present sample has also been analysed by Blázquez and Mora (2007) to detect job mobility effects on mismatch evidence whereas other questions has been largely addressed through previous literature as it was commented before throughout section 3.

6. Discussion

Developed countries have increased notably their budgetary effort on education being accompanied by a further household monetary effort. These decisions rely on the positive aggregate economic consequences when improving human capital attainment levels besides other well known non-monetary benefits, for instance on individual self-assessed health status degree. As a consequence, some countries have boosted

extraordinarily the percentage of individuals with tertiary studies. In this regard, Spain represents a significant case. The later had recent consequences on excessive mismatch occurrences in the labour market (Dolado, Felgueroso and Jimeno, 2000). Notwithstanding, besides these negative effects on labour insertion, the share of people who regret of their attended field of studies has also increased. Note that regret will have direct consequences on individual well-being and life circumstances besides a loss of transferability of skills because of new searching job experiences in a different field occupation (Borghans and Golsteyn, 2007). Furthermore, regret influences on individual future behaviour (Zeelenberg, 1999).

Although younger cohorts are more likely to readdress their labour future occupation, the loss of skill will be considerable. Hence, public and private resources become inefficient. Nonetheless, the main worry is that people would have spent, at least, five years of their life being enrolled in some studies that do not fit with their own life expectations. As above mentioned, younger people would experience a future behaviour conditioned to this unsatisfactory decisions.

Hence, policy makers should readdress educational policies to correct this inefficiency. Positive effects from being conformed by higher educated citizen could be compensated in the future by means of the negative effects through either mismatch or regret. In accordance to Robst (2007), it is true that people should consider their likelihood to find a job related to their studies besides considering whether they are able to finish their degree choice (Montmarquette, Cannings and Mahseredjian, 2002). However, we go further on this. People could also regret their specific field as a consequence of a bad past educational choice. Furthermore, looking back, maybe, they would decide not to study at all or to enrol in vocational studies.

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Figure 1 Regretting university studies: an international comparison

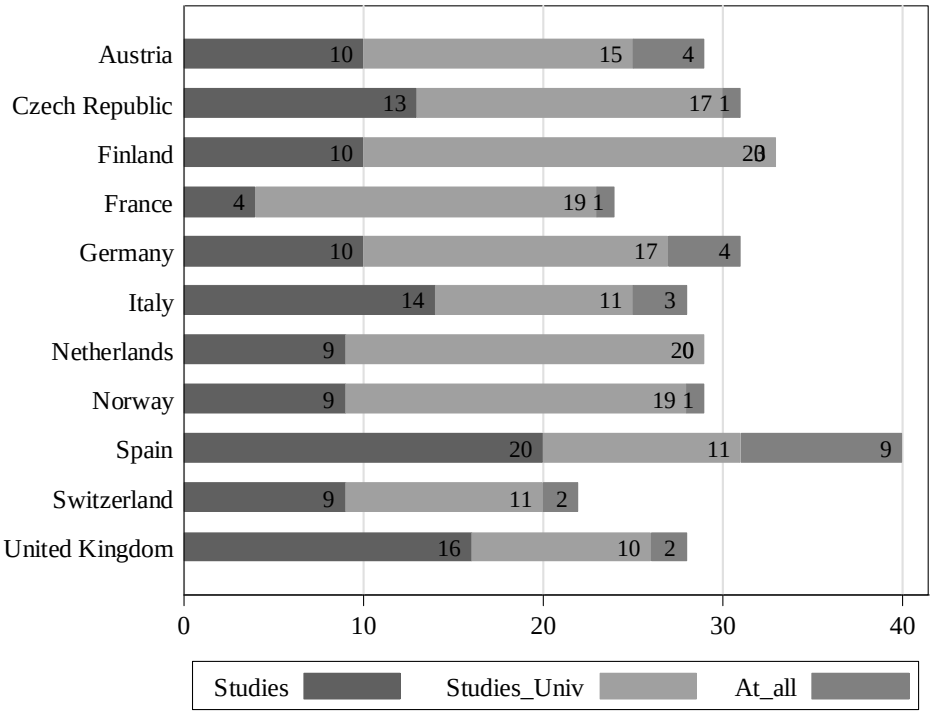

Table 1 Descriptive statistics for those reporting regret by gender

	No regret		Regret			No regret		Regret	
	Men	**Women**	**Men**	**Women**		**Men**	**Women**	**Men**	**Women**
Mismatch	0.255	0.445	0.244	0.509	**Specific degree of studies**				
Vertical mismatch	0.080	0.185	0.090	0.241	Agricultural	0.036	0.040	0.018	0.024
Horizontal mismatch	0.174	0.260	0.154	0.267	Architecture	0.049	0.019	0.023	0.017
					Fine Arts	0.006	0.002	0.013	0.011
Number of jobs	2.244	2.451	2.450	2.636	Biology and Nature	0.033	0.043	0.047	0.037
Share of fixed contract jobs	0.537	0.471	0.475	0.413	Communication	0.024	0.026	0.034	0.040
Individual features					Health 3-year degree studies	0.013	0.032	0.052	0.064
Age	27.163	27.334	26.182	26.280	Law	0.051	0.057	0.055	0.099
Doing further training	0.625	0.642	0.672	0.684	Economics and Business	0.086	0.066	0.106	0.064
Time search for their first job					Business 3-year degree	0.060	0.079	0.073	0.053
Before graduating	0.529	0.508	0.472	0.424	Civil Engineering	0.028	0.043	0.007	0.003
Next month ending university	0.161	0.124	0.126	0.108	Comparative studies	0.004	0.009	0.019	0.023
[1 - 3) months	0.154	0.181	0.167	0.183	Pharmacy and Sciences	0.009	0.004	0.027	0.021
[3 - 6) months	0.070	0.078	0.101	0.108	Philology 1	0.013	0.009	0.025	0.030
[6 - 12)	0.054	0.078	0.084	0.109	Philology 2	0.004	0.021	0.018	0.023
More than a year	0.033	0.031	0.049	0.067	Philology (rest)	0.000	0.002	0.003	0.001
Branch of activity					Philologist	0.002	0.002	0.007	0.009
Agricultural and fishing	0.027	0.014	0.018	0.025	Philosophy and Humanities	0.010	0.015	0.011	0.017
Energy	0.038	0.035	0.011	0.015	Physics and Mathematics	0.027	0.038	0.018	0.021
Chemical industries	0.052	0.037	0.037	0.029	Geography and History	0.038	0.085	0.036	0.053
Metal industry	0.084	0.053	0.029	0.031	Labour Relations and Labour Studies	0.018	0.042	0.048	0.050
Transport equipment	0.043	0.039	0.009	0.005	Medicine and Odontology	0.003	0.000	0.013	0.001

Food and beverage	0.021	0.031	0.027	0.031	Teacher training	0.028	0.034	0.134	0.129
Textiles and clothing	0.012	0.020	0.011	0.024	Art of navigation	0.002	0.000	0.000	0.000
Wood, paper and plastics	0.028	0.022	0.020	0.038	Pedagogy	0.003	0.009	0.030	0.031
Construction	0.084	0.076	0.037	0.031	Political and Administration Sciences	0.023	0.025	0.027	0.039
Commerce	0.017	0.045	0.021	0.035	Psychology	0.013	0.026	0.052	0.045
Transport and hotel services	0.017	0.049	0.019	0.028	Chemistry	0.017	0.034	0.027	0.032
Technological communications	0.104	0.112	0.045	0.065	Advanced technologies	0.241	0.155	0.037	0.033
Mass media communications	0.033	0.039	0.038	0.043	Information Systems	0.148	0.072	0.026	0.012
Financing institutions	0.089	0.071	0.098	0.089	Tourism	0.000	0.002	0.002	0.004
Services to firms	0.083	0.086	0.081	0.072	Own degrees	0.004	0.002	0.000	0.000
Public administration	0.055	0.059	0.059	0.080	Veterinary	0.007	0.008	0.011	0.012
Health services	0.035	0.043	0.122	0.092	**Field of studies**				
Other branches	0.034	0.043	0.036	0.052	Humanities	0.076	0.145	0.133	0.167
University grade					Social Sciences	0.306	0.366	0.560	0.554
Pass (‘aprovat’)	0.144	0.234	0.168	0.189	Experimental Sciences	0.078	0.115	0.092	0.090
Pass- very good (‘notable’)	0.637	0.625	0.631	0.656	Medical Sciences	0.032	0.043	0.103	0.099
Very good -Excellent	0.195	0.131	0.185	0.151	Science	0.508	0.330	0.112	0.090
Excellent	0.024	0.010	0.016	0.005	3-year degree	0.131	0.223	0.321	0.334

Table 2 Descriptive statistics for those reporting mismatch vertical-horizontal regards no reporting any mismatch by gender

	Vertical				Horizontal			
	No mismatch		Mismatch		No mismatch		Mismatch	
	Men	Women	Men	Women	Men	Women	Men	Women
Number of jobs	2.28	2.49	2.64	2.63	2.33	2.50	2.27	2.55
Share of fixed contract jobs	0.52	0.46	0.42	0.43	0.51	0.45	0.51	0.46
Individual features								
Age	27.19	26.21	27.49	26.50	27.20	26.24	27.34	26.33
Doing further training	0.60	0.65	0.62	0.58	0.60	0.63	0.64	0.70
Time search for their first job								
Before graduating	0.52	0.46	0.54	0.46	0.53	0.46	0.49	0.44
Next month ending university	0.15	0.13	0.13	0.08	0.15	0.12	0.12	0.12
[1 - 3) months	0.16	0.17	0.15	0.16	0.16	0.17	0.17	0.18
[3 - 6) months	0.08	0.10	0.06	0.12	0.07	0.10	0.09	0.10
[6 - 12)	0.06	0.09	0.07	0.10	0.06	0.09	0.08	0.10
More than a year	0.04	0.05	0.05	0.07	0.04	0.06	0.04	0.06
Field of studies								
Humanities	0.07	0.13	0.34	0.28	0.11	0.15	0.08	0.16
Social Sciences	0.32	0.55	0.37	0.59	0.32	0.56	0.33	0.56
Experimental Sciences	0.09	0.09	0.09	0.08	0.09	0.09	0.12	0.12
Medical Sciences	0.04	0.11	0.00	0.02	0.04	0.11	0.03	0.06
Science	0.48	0.11	0.19	0.04	0.45	0.10	0.44	0.10
3-year degree	0.15	0.32	0.21	0.35	0.17	0.33	0.13	0.27
University grade								
Pass (‘aprovat’)	0.16	0.17	0.24	0.20	0.16	0.16	0.23	0.21

Pass- very good (‘notable’)	0.64	0.64	0.58	0.66	0.63	0.64	0.64	0.64
Very good -Excellent	0.17	0.18	0.17	0.14	0.19	0.18	0.11	0.14
Excellent	0.02	0.02	0.01	0.00	0.02	0.01	0.02	0.01
Branch of activity								
Agricultural and fishing	0.02	0.02	0.02	0.02	0.02	0.02	0.01	0.01
Energy	0.04	0.01	0.03	0.02	0.03	0.01	0.06	0.01
Chemical industries	0.05	0.04	0.03	0.01	0.04	0.03	0.06	0.06
Metal industry	0.07	0.03	0.06	0.03	0.07	0.03	0.08	0.04
Transport equipment	0.04	0.01	0.04	0.02	0.04	0.01	0.04	0.01
Food and beverage	0.02	0.02	0.04	0.05	0.02	0.03	0.03	0.04
Textiles and clothing	0.01	0.01	0.01	0.03	0.01	0.01	0.02	0.02
Wood, paper and plastics	0.02	0.02	0.06	0.04	0.03	0.03	0.02	0.02
Construction	0.09	0.04	0.02	0.03	0.09	0.04	0.05	0.02
Commerce	0.02	0.02	0.07	0.08	0.03	0.03	0.01	0.03
Transport and hotel services	0.02	0.01	0.11	0.08	0.03	0.03	0.03	0.01
Technological communications	0.11	0.04	0.06	0.09	0.10	0.05	0.12	0.05
Mass media communications	0.03	0.04	0.06	0.03	0.04	0.04	0.02	0.02
Financing institutions	0.09	0.10	0.05	0.08	0.08	0.07	0.13	0.20
Services to firms	0.09	0.08	0.07	0.07	0.09	0.08	0.07	0.07
Public administration	0.05	0.05	0.13	0.12	0.06	0.07	0.03	0.05
Health services	0.04	0.12	0.01	0.06	0.04	0.12	0.04	0.06
Other branches	0.04	0.04	0.05	0.06	0.03	0.04	0.06	0.04

Table 3 Regret determinants: Vertical mismatch 1st step regression, probit estimation and probit with an endogenous regressor

Vertical mismatch (1st step)		**Regretting the field of studies**		
	Probit procedure by bootstrap		Probit	Probit with endogenous regressor
Number of jobs	0.0059 (0.00)c	Personality	-0.3582 (0.05)a	-0.3809 (0.05)a
Share of fixed contract jobs	-0.0272 (0.01)b	Regretting university	0.2724 (0.02)a	0.2648 (0.02)a
Personal features		Vertical mismatch / Vertical mismatch predictions*	0.0858 (0.03)a	0.2681* (0.08)a
Gender	0.0095 (0.01)	**Personal features**		
Age	0.0039 (0.00)a	Gender	-0.0046 (0.02)	0.0038 (0.02)
Degree obtained (ref. 'Diplomatura-equiv. to B.A.)		Age	0.0479 (0.02)a	0.0590 (0.02)a
Architecture	-0.0728 (0.02)a	Squared age	-0.0715 (0.03)a	-0.0907 (0.03)a
'Llicenciatura'-equiv. to Master	-0.4148 (0.05)a	**Grade obtained (ref. Pass- very good ('notable'))**		
Engineering	-0.8550 (0.06)a	Pass ('aprovat')	0.0306 (0.02)	0.0124 (0.02)
Field of Study (ref. Social Sciences)		Very good -Excellent	-0.0279 (0.02)	-0.0210 (0.02)
Humanities	0.1779 (0.02)a	Excellent	-0.1062 (0.05)b	-0.0627 (0.06)
Experimental Sciences	0.0000 (0.02)	**Specific degree of studies**		
Medical Sciences	-0.0905 (0.01)a	Agricultural	0.1221 (0.05)b	0.1329 (0.06)b
Science	-0.4813 (0.05)a	Architecture	-0.0382 (0.05)	-0.0243 (0.05)
Search time first job (ref. before graduating)		Fine Arts	-0.0019 (0.09)	-0.0370 (0.09)
Next month ending university	-0.0263 (0.01)b	Biology and Nature	0.0236 (0.05)	0.0066 (0.05)
[1 - 3) months	0.0064 (0.01)	Communication	0.1526 (0.06)a	0.1480 (0.06)a
[3 - 6) months	0.0175 (0.02)	Health 3-year degree studies	0.2103 (0.06)a	0.2192 (0.06)a
[6 - 12)	0.0162 (0.02)	Law	0.1444 (0.05)a	0.1629 (0.05)a
More than a year	0.0077 (0.02)	Economics and Business	0.0150 (0.04)	0.0047 (0.04)
Branch of activity		Business 3-year degree	0.0450 (0.04)	0.0000 (0.04)

Agricultural and fishing	0.2275 (0.07)a	Civil Engineering	0.1211 (0.07)c	0.1177 (0.07)c
Energy	0.2376 (0.07)a	Comparative studies	0.2249 (0.08)a	0.1477 (0.09)c
Chemical industries	0.0965 (0.05)b	Pharmacy and Sciences	0.0152 (0.06)	0.0290 (0.07)
Metal industry	0.2414 (0.05)a	Philology 1	0.0727 (0.07)	0.0101 (0.07)
Transport equipment	0.3719 (0.08)a	Philology 2	0.2257 (0.07)a	0.1939 (0.08)b
Food and beverage	0.3038 (0.06)a	Philology (rest)	0.2251 (0.21)	0.0935 (0.23)
Textiles and clothing	0.3492 (0.08)a	Philologist	0.0183 (0.09)	-0.0432 (0.09)
Wood, paper and plastics	0.3424 (0.06)a	Philosophy and Humanities	0.0467 (0.08)	0.0459 (0.08)
Construction	0.2159 (0.06)a	Physics and Mathematics	0.1727 (0.06)a	0.1624 (0.06)a
Commerce	0.3898 (0.06)a	Geography and History	0.1016 (0.05)b	0.0397 (0.05)
Transport and hotel services	0.4858 (0.06)a	Labour Relations and Labour Studies	0.1581 (0.05)a	0.0938 (0.05)c
Technological communications	0.2926 (0.05)a	Medicine and Odontology	-0.1430 (0.09)	-0.1217 (0.10)
Mass media communications	0.1669 (0.05)a	Teacher training	0.1615 (0.05)a	0.1526 (0.05)a
Financing institutions	0.1384 (0.04)a	Pedagogy	0.2052 (0.07)a	0.1852 (0.07)a
Services to firms	0.1290 (0.04)a	Political and Administration Sciences	0.1393 (0.06)b	0.0959 (0.06)c
Public administration	0.3265 (0.04)a	Psychology	0.0630 (0.05)	0.0432 (0.05)
Health services	0.1534 (0.05)a	Chemistry	0.1368 (0.06)b	0.1170 (0.06)b
Other branches	0.2085 (0.05)a	Information Systems	-0.0518 (0.04)	-0.0554 (0.04)
Establishment size (ref. >500)		Tourism	0.3841 (0.17)b	0.4024 (0.20)b
Less than 10 =1	0.0658 (0.02)a	Own degrees	0.0712 (0.23)	0.0166 (0.21)
Between [11,50]	0.0100 (0.01)	Veterinary	0.0802 (0.09)	0.1384 (0.09)
Between [51,100]	0.0030 (0.02)	**Wage (Euros/ year, gross) (ref. [18000 - 30000) Euros)**		
Between [101,250]	0.0295 (0.02)	Less than 9000 Euros	0.0523 (0.03)b	0.0552 (0.03)b
Between [251,500]	0.0131 (0.02)	[9000 - 12000) Euros	0.0208 (0.03)	0.0189 (0.03)
Working Region (ref. Barcelona region)		[12000 - 18000) Euros	0.0512 (0.02)b	0.0495 (0.02)b

Tarragona province	0.0151 (0.02)	More than 30000 Euros	-0.0035 (0.03)	-0.0054 (0.03)
Girona province	0.0360 (0.02)b	**Type of occupation (ref. other qualified occupations)**		
Lleida province	0.0001 (0.02)	Corporate Management	-0.0165 (0.05)	-0.0471 (0.05)
Rest of Spain	-0.0498 (0.02)a	Advising and Consultancy	-0.0288 (0.03)	-0.0276 (0.03)
In the EU	0.0015 (0.03)	Product Management	-0.0523 (0.04)	-0.0429 (0.04)
Outside the EU	-0.0289 (0.05)	Technical support	0.0570 (0.03)c	0.0544 (0.03)c
Grade obtained (ref. Pass- very good ('notable'))		Administration and Accountancy	-0.0046 (0.03)	-0.0069 (0.03)
Pass ('aprovat')	0.2638 (0.14)c	Medical Care and Social Work	-0.0638 (0.05)	-0.0837 (0.04)c
Very good -Excellent	0.1350 (0.06)b	Logistics, Distribution & Mark.	0.1496 (0.05)a	0.1550 (0.05)a
Excellent	0.2173 (0.14)	Teaching and Training	-0.0860 (0.03)a	-0.0683 (0.03)b
		Design and Media	-0.0851 (0.05)c	-0.0866 (0.05)c
		R&D	-0.0126 (0.04)	-0.0028 (0.04)
		Low-level qualified occupations	0.1085 (0.03)a	0.1195 (0.03)a
N	4,303	N	4,204	4,008
Wald χ^2	1,279.65 (0.00)	Wald χ^2	569.15 (0.00)	533.41 (0.00)
Pseudo R^2	0.1847	Pseudo R^2	0.1162	0.1159

Note: superscripts a, b, c denote significance at 1%, 5% and 10%. Standard deviations are reported in brackets. Remember we are reporting marginal effects instead of coefficients.