

Higher Education Programme Characteristics and Graduates' Performance Issues

Abstract

This paper focuses on the efficiency by which the programmes of the higher education systems allocate their graduates over the various domains in the labour market and how these graduates perform in their jobs obtained. For that purpose, we consider selected characteristics of the study programme and modes of teaching in relation to graduates' performance, as well as the changes in those factors that influence graduates' professional success. We make use of the macro-survey REFLEX (Flexible Professional in the Knowledge Society) performed among 40,000 European university graduates. Results show that educational programs with a strong relation between learning and direct working experience acquisition provide a better link to occupations inside their graduates' discipline-specific domain.

1 Introduction

In its general formulation the human capital theory treats education as an investment that may produce different types of returns (Becker, 1964). The relationship between education and earnings has become a fundamental tool in research on earnings, wages and incomes in developed and developing economies. But, it was found that the explanatory power of the simple human capital earnings model increased as the non-wage variables were added into the earnings measure (Haveman and Wolfe, 1984; McMahon, 1998). That is, the importance of education increased when non-monetary benefits were taken into account (Duncan, 1976).

A way for considering both monetary and non-monetary benefits is through the analysis of job satisfaction. Locke defines job satisfaction as 'a pleasure or positive emotional state resulting from the appraisal of one's job or job experiences'. Satisfaction, according to different schools of thought, depends variously on the individual's expectations, needs (physical and psychological) and values (Locke, 1976; Landry, 2000). The analysis of job satisfaction may help to gain insight into the total effects of education investment on workers' well-being. As a matter of fact, survey responses on job satisfaction have been used in economic analysis as proxy data for utility from work, with job satisfaction being in turn a key determinant of total well-being for working individuals (Van Praag, 1991), leading to a rapidly increasing body of literature on the economics of happiness (Veenhoven, 1996).

However, if we want to examine the relationship between higher education (HE) and the labour market, we have to take into account the assignment theory (Sattinger, 1993), which takes explicit account the interaction between characteristics of the worker and characteristics of the job by addressing the issue whether the applicability of a person's knowledge and skills is context-specific (Giesecke and Schindler, 2008; Clegg, 2010). This theory shows how heterogeneous individuals are allocated to jobs that require varying qualifications on the basis of the qualifications that they possess. It is assumed

that the knowledge and skills which individuals possess give them comparative advantages in certain types of occupations (Van der Velden and Wolbers, 2007). Hence, graduates of some fields of education have better job opportunities in occupations strongly related to their field of education (Hartog, 2000; Heijke and Meng, 2006).

For our analyses, we follow the approach of the assignment theory and assume that the productivity (income and job satisfaction) of a particular graduate-job match is strongly influenced by the match between the job requirements and the graduate characteristics (Teichler, 2009). In other words, we break away from the homogeneity with respect to human capital taken for granted in the classical approach. However, we differentiate between two main market segments. A first market segment wherein importance is in particularly given to discipline-specific knowledge and hence wherein a strong link between the occupation and a particular educational programmes is assumed (the own discipline-specific job domain). The second main market segment discerned is characterized by a less strong link between the occupation and a particular educational programme (Barrie, 2006; Heijke and Meng, 2006). The locus of attention in this second segment is thereby rather on generic or general academic competencies than on a particular group of discipline-specific competencies (a generic job domain).

Therefore, in this paper, we will use those aspects of the academic environment such as the study provision and the study conditions in order to identify which HE programme characteristics contribute to a smooth integration of graduates to the labour market (Schomburg, 2007; Teichler, 2007). In addition, the modes of teaching and learning will be also taken into account in order to analyse if a more practice-oriented curricula, which should increase interaction between classroom and labour market (Teichler, 2009), help to solve the information asymmetry to the transition from school to labour market, and also contribute to a smooth integration of the graduates into the labour market.

2 Descriptive Data

The REFLEX survey is the source of the data for the present study (Allen and Van der Velden, 2011). Graduates in the year 2000 were surveyed in 2005, five years after graduation. We have information on around 2,600 graduates from each of 14 European countries (Italy, Spain, France, Austria, Germany, the Netherlands, United Kingdom, Finland, Norway, Czech Republic, Switzerland, Portugal, Belgium and Estonia), obtained from the responses to a written questionnaire on graduates' retrospective views of their HE experience.

Some questionnaire items, in particular six characteristics, are related to the description of the study programme, an aspect that the academic literature suggests should match closely to learners' needs, and the design of the study programme, which should take account of students' (as customers) perceptions of HE (Hill, 1995; Harvey, 1995). The respondents were asked to indicate, on a 1 to 5 scale where 1 is not at all and 5 very much, the extent these characteristic applied to the study programme they had followed. Table 1 presents the average ratings for these items by country.

The results show that, on average, the characteristic that received the highest rating was the programme being generally regarded to be demanding (rated 3.6), followed by programme having a broad focus. However, freedom in compose your own programme was rated low by several students.

Table 1. Description applied to the study programme by country

(scale from 1=not at all to 5=very much)

Items	IT	ES	FR	AT	DE	NL	UK	FI	NO	CZ	SW	PT	BE	EST	Total
The programme was generally regarded as demanding	4.0	3.7	3.5	3.8	3.7	3.0	3.7	3.5	3.6	3.6	3.8	3.8	3.6	3.2	3.6
Employers are familiar with the content of the programme	2.8	3.2	2.7	3.0	3.0	3.1	2.8	3.1	3.8	3.2	3.1	3.0	3.1	2.7	3.1
There was freedom in composing your own programme	3.0	2.9	2.4	2.9	3.0	2.9	2.5	3.1	2.5	2.4	2.6	2.1	2.7	2.7	2.7
The programme has a broad focus	3.6	3.6	3.0	3.8	3.7	3.7	3.6	3.7	3.6	3.5	3.6	3.4	3.7	3.6	3.6
The programme was vocationally oriented	2.7	2.7	2.3	2.7	2.8	3.5	2.6	3.6	3.6	3.5	2.8	3.3	2.8	2.5	3.0
The programme was academically prestigious	3.5	3.0	2.6	3.1	3.0	2.6	3.4	3.1	2.9	2.9	3.3	3.6	3.4	3.2	3.1

Source: Own elaboration, REFLEX data.

In terms of country differences, Finland, Norway, the Netherlands, Czech Republic and Portugal stressed practical learning/experience items, such as vocational orientation of the study programme, while graduates from Italy, Spain, France, Austria, Belgium, Germany, Switzerland, the United Kingdom and Estonia rated this item low. For the item freedom to combine different courses and choose among areas of specialization, the countries that were rated highest are Finland, Germany and Italy, with Portugal, Czech Republic and France allowing the least flexibility in terms of combining courses of study. Italian graduates evaluated their study programme as demanding and academically prestigious compared to the evaluations of Dutch graduates, who ranked their study programmes as less academically prestigious and less demanding.

Apart from general characteristics of the study programme, eleven items in the questionnaire are related to the modes of teaching and learning emphasized in the study programme, which the academic literature suggests provide useful information on the satisfaction of students with the learning experience (Sadlo and Richardson, 2003; Honkimäki et al., 2004; Diseth et al., 2010). Respondents were asked to rank the extent to which these modes of teaching and learning were stressed during HE, on a 1 to 5 scale where 1 is not at all and 5 very much. Table 2 presents the average ratings for these items by country.

In general, the items related to teaching, such as the teacher being the main source of information, regular attendance at lectures, development of socio-communicative skills through oral presentations from students in classes, and the items related to learning in groups as opposed to individual learning were rated quite high.

In terms of country differences, there seems to be a negative relationship between the extent to which the teacher is regarded as the main source of information and a larger role of project and problem-based learning. The ranking for project and problem-based learning as the dominant mode of teaching was generally ranked low except by students from Norway, the United Kingdom and Finland.

In terms of differences in course contents, we find a negative relationship between an emphasis on theories and paradigms versus an emphasis on facts and practical knowledge. HE in most of the countries analysed seems to lean towards the theoretical rather than the practical dimension. In the Czech Republic, HE seems to be predominantly theoretical. By contrast, France and the Netherlands are more practically than theoretically oriented.

What students learn is determined not only by the curriculum and mode of teaching, but also by the method of assessment. Multiple-choice question exams promote different

ways of learning to examination based on written assignments. Although there was a stronger emphasis on written assignments than multiple choice question exams in all the countries analysed, there would seem to be a trade-off between these methods. Written assignments are the dominant form of assessment in the United Kingdom. In Spain, the Netherlands and the Czech Republic the balance is tipped more in favour of multiple choice exams, although written assignments still dominate in these countries. In Belgium neither seems to dominate.

Table 2. Modes of teaching and learning emphasized in the study programme by country (*scale from 1=not at all to 5=very much*)

Items	IT	ES	FR	AT	DE	NL	UK	FI	NO	CZ	SW	PT	BE	EST	Total
Regular lectures attendance	3.9	3.0	4.1	3.9	4.0	3.5	4.4	3.7	4.2	4.0	4.3	4.0	4.4	4.6	3.9
Group assignments	2.5	2.9	3.2	3.1	3.0	3.7	3.0	3.4	3.3	3.0	3.0	3.5	3.0	2.9	3.1
Independent learning /participation in research projects	2.2	1.9	2.2	1.9	1.9	2.6	2.6	2.3	1.9	1.7	2.1	2.3	2.0	2.1	2.1
Internship, work placement	2.0	2.4	2.7	2.7	3.3	3.6	2.1	3.2	2.7	2.3	2.5	2.8	2.3	2.7	2.6
Facts and practical knowledge	2.4	3.0	3.2	3.1	3.2	3.5	3.4	3.4	3.2	2.8	3.1	3.1	3.3	3.4	3.1
Theories and paradigms	3.1	3.8	3.1	3.7	3.4	3.2	3.5	3.5	3.4	4.3	3.9	3.4	3.6	3.4	3.7
Teacher as the main source of information	3.8	3.8	3.5	3.5	3.3	3.1	3.2	3.2	3.0	3.6	3.6	3.6	3.8	3.7	3.5
Project and/or problem-based learning	2.5	2.7	2.4	2.8	2.8	2.9	3.1	3.0	3.0	2.5	2.8	2.9	2.1	2.2	2.7
Written assignments	3.1	3.1	3.5	3.8	3.6	3.1	4.2	3.8	3.6	3.2	3.3	3.5	2.9	3.5	3.3
Oral presentation by students	3.5	2.4	3.0	3.3	3.2	3.3	3.2	3.0	2.6	3.0	3.0	3.1	2.9	2.9	3.0
Multiple choice exams	2.0	2.9	1.6	2.0	1.9	2.9	1.7	1.6	1.3	2.8	1.9	2.1	2.4	2.3	2.3

Source: Own elaboration, REFLEX data.

Based on the characteristics of the academic environment and the differences among countries, we would expect to find differences in graduates' pay-offs, both monetary and non-monetary returns. Table 3 shows that the average income per hour was about 13.40€ per hour. Income was higher than average for graduates in Switzerland (18.82€ per hour), Germany (18.73€ per hour), Norway (17.05€ per hour) and Belgium (15.99€ per hour). Income was lower than average for graduates in Czech Republic, Estonia, Italy, Spain and Portugal. Within each country, hourly income is slightly higher for those working inside one's specific educational field (inside job domain) than those working outside job domain, except for Czech Republic and Switzerland. Bearing in mind that we were dealing with young graduates, these differences among both groups are a serious motive of concern.

In order to analyse graduates' self-assessed job satisfaction scores, respondents were asked in the REFLEX survey: "how satisfied are you with your current work? Respondents could choose between five different categories from 1 (very dissatisfied) to 5 (very satisfied). We can observe in Table 3 that the level of job satisfaction was quite similar across countries. This latter finding would be surprising if we expected graduate job satisfaction to be determined by similar academic environment and work situation characteristics across countries. Nevertheless, other factors were also influential.

Table 3. Monetary and non-monetary pay offs by country

Country	Income per hour (euro)			Job Satisfaction (scale 1 to 5)		
	Outside Job Domain	Inside Job Domain	Total	Outside Job Domain	Inside Job Domain	Total
Italy	8.96	10.44	10.23	3.26	3.69	3.63
Spain	8.69	11.15	10.71	2.98	3.87	3.71
France	12.22	14.82	14.25	3.55	3.92	3.84
Austria	13.10	14.86	14.56	3.74	4.06	4.01
Germany	16.93	18.97	18.73	3.51	3.91	3.86
The Netherlands	14.20	14.76	14.66	3.48	3.84	3.78
United Kingdom	13.81	15.47	14.94	3.49	3.85	3.73
Finland	13.02	13.90	13.81	3.47	3.74	3.71
Norway	16.96	17.05	17.05	3.64	3.98	3.95
Czech Republic	8.88	8.69	8.72	3.69	3.94	3.91
Switzerland	19.08	18.79	18.82	3.52	3.95	3.90
Portugal	11.71	12.43	12.39	3.23	3.69	3.66
Belgium	14.72	16.21	15.99	3.63	3.95	3.90
Estonia	8.76	8.85	8.84	3.82	3.89	3.88
Total	12.26	13.60	13.40	3.48	3.89	3.82

Source: Own elaboration, REFLEX data.

3 Methodology

We analysed the influence of programme characteristics on graduates' performance in two complementary ways, in terms of both graduates' income and job satisfaction. For income, we follow a conventional earning regression (natural logarithm of income). However, for job satisfaction, we use an ordered probit model in order to reflect its ordinal character (graduates' self-assessment of job satisfaction scores on a scale from 1 to 5) (Green, 1997).

Our data set involved fourteen European countries. We selected only individuals between 26 and 35 years of age that worked at least 10 hours per week either as employees or as self-employed workers. After deleting the outliers on the annual gross income variable and those individuals with missing values on their satisfaction scores, we were left with 20,283 micro data files that were used for our analysis. For carrying out regressions, data from each country was weighted by the proportion of HE students and the population of each country.

The explanatory variables were classified into three categories that represented diverse elements that could influence both income level and self-assessed job satisfaction scores: individual-specific characteristics (gender, age, parents' level of education), educational and academic environment factors (field of study, study programme description and modes of teaching and learning), and labour-market status variables (private *versus* public sector, permanent *versus* temporary contract, full-time *versus* part-time job, occupational titles, etc.). We construct dummies for the eight study fields of Education, Humanities, Social Sciences, Law, Natural Sciences, Mathematics, Engineering and Medical Sciences. In addition, we also take account of graduates' job characteristics and the appropriateness of the degree qualification for employment and work. We define the person as overeducated (undereducated) if his/her level of education is higher (below) than is required for the job. We measure over-education and under-education with dummy variables that take the value 1 if the respondent is over or undereducated. The same relationship is observed in the case of competencies. We also distinguish between universities and other HEIs to test for possible differences in the

effects of institution type on graduates' careers. Definitions and the descriptive statistics for all the variables are reported in Table 4.

Table 4. Descriptive statistics

Variables	Mean	Std. Dev.	Min.	Max
<i>Individual characteristics</i>				
Female	0.57	0.49	0	1
Age	29.83	2.21	26	35
Father's higher education	0.37	0.48	0	1
Mother's higher education	0.25	0.43	0	1
<i>Field of study</i> (ref. Social Science)				
Education	0.09	0.29	0	1
Humanities	0.10	0.30	0	1
Law	0.06	0.25	0	1
Natural Sciences	0.06	0.24	0	1
Mathematics	0.04	0.19	0	1
Engineering (agriculture included)	0.20	0.39	0	1
Medical sciences (veterinary included))	0.14	0.38	0	1
<i>Study programme description</i>				
It was regarded as demanding	3.59	0.92	1	5
Employers are familiar with the content	3.10	1.15	1	5
Freedom in composing the programme	2.67	1.16	1	5
It had a broad focus	3.55	0.98	1	5
It was vocationally orientated	3.06	1.20	1	5
It was academically prestigious	3.05	1.14	1	5
<i>Modes of teaching and learning</i>				
Lectures	3.89	1.05	1	5
Group assignments	3.07	1.13	1	5
Participation in research projects	2.07	1.09	1	5
Internship, work placement	2.63	1.38	1	5
Facts and practical knowledge	3.05	1.11	1	5
Theories and paradigms	3.66	1.07	1	5
Teacher as the main source of information	3.50	0.96	1	5
Project and/or problem-based learning	2.71	1.12	1	5
Written assignments	3.34	1.09	1	5
Oral presentation by students	2.99	1.12	1	5
Multiple choice exams	2.28	1.21	1	5
<i>Job characteristics</i>				
Private sector	0.57	0.49	0	1
Permanent contract	0.77	0.42	0	1
Full-time job	0.82	0.38	0	1
Size firm (<50 workers)	0.30	0.45	0	1
<i>Appropriateness of qualifications</i>				
Qualifications used at work	0.64	0.48	0	1
Under-educated	0.13	0.33	0	1
Over-educated	0.11	0.32	0	1
Deficit in competencies	0.22	0.41	0	1
Surplus in competencies	0.40	0.49	0	1
Universities vs HEIs	0.83	0.37	0	1
<i>Occupational titles</i> (ref. Professionals)				
Legislators, senior official and managers	0.07	0.26	0	1
Technicians and associate professionals	0.18	0.38	0	1
Clerks	0.04	0.19	0	1
Service workers and other occupations	0.02	0.15	0	1
<i>Country dummies</i> (ref. Germany)				
Italy	0.08	0.27	0	1
Spain	0.11	0.32	0	1
France	0.05	0.21	0	1
Austria	0.04	0.20	0	1

The Netherlands	0.09	0.29	0	1
United Kingdom	0.04	0.19	0	1
Finland	0.07	0.25	0	1
Norway	0.05	0.22	0	1
Czech Republic	0.20	0.39	0	1
Switzerland	0.13	0.33	0	1
Portugal	0.02	0.13	0	1
Belgium	0.04	0.19	0	1
Estonia	0.03	0.16	0	1

4 Results

We are in particular interested in the returns on different educational programme characteristics on the labour market in terms of both graduates' income (see Table 5) and job satisfaction (see Table 6). We separately analyse a series of estimation models in the two occupational domains distinguished, those working inside one's specific educational job domain (discipline-specific domain) and those working outside one's specific job domain (generic job domain).

Regarding income, we find that female graduates earned less than their male counterparts, and that age (capturing work experience) and father's educational level had a positive effect. The former variable (gender) has a greater effect in those working inside one's specific educational job domain; however the two later variables (experience and family educational background) have a greater effect in those working inside a generic domain.

When exploring the segmentation of the different educational field, we can see that graduates in Education, Humanities, Natural Science, Engineering and Medical Sciences earned less with respect to the reference category (Social Science). However, Mathematics graduates earned more. Comparing the results regarding the two occupational domains, one is tempted to suggest that there is a high likelihood for those graduates from Mathematics to work inside their own educational domain and therefore, they benefited from an income premium (due to their adequate competence match). Indeed, those graduate from Mathematics working inside one's domain increases income by 3 per cent.

Regarding the effects of the academic environment, results show that a well-designed degree programme, that is, academically prestigious, the flexibility to combine course and areas of specialization, and a programme whose content and objectives are known to employers, and which is seen as demanding, contributes to the earning differential (see the positive entry of these variables in Table 5 first two columns, and the neutral effect of these variables in Table 5 last two columns). Also, if the teaching and learning modes emphasize the teacher as the main source of information, this negatively influences the access to better job opportunities.

Those working in a private sector or with permanent contracts earned more compared to those working in public sectors or with temporary contracts. Negative effects were also found in full-time jobs and working in small firms. We found wages premiums for over-educated (and surplus in competencies) and wage penalties for under-educated (and deficit in competencies). Especially the negative effect of a surplus for someone who works in a job outside his/her field of study, then he/she will experience a surplus in competencies and a penalty in his/her wage.

Having followed university education rather than other HE institutions yielded an increase in income of around 4 percent, only for those working inside one's specific-field domain. With respect to occupational titles, both models provide evidence suggesting that individuals working in more demanding jobs had higher incomes. Finally, we can observe the earning differences in the European countries analysed in this study, in size as well as in composition. Compared to those graduates in Germany (the omitted category), graduates from Southern European countries earned less than those from Nordic European countries, with the exception of those graduated in Switzerland.

Table 5. Monetary returns of the educational programme for those graduates working inside and outside their own discipline-specific domain

Explanatory variables	<u>Inside Job Domain</u>		<u>Outside Job Domain</u>	
	Coef.	z-values	Coef.	z-values
<i>Individual characteristics</i>				
Female	-0.0833	-14.54	-0.0659	-4.62
Age	0.0109	7.73	0.0159	4.40
Father's higher education	0.0219	3.69	0.0433	2.68
Mother's higher education	0.0055	0.82	-0.0174	-0.99
<i>Field of study</i> (ref. Social Science)				
Education	-0.0520	-4.74	-0.0600	-2.20
Humanities	-0.0803	-7.02	-0.0834	-3.86
Law	-0.0179	-1.47	-0.0605	-1.77
Natural Sciences	-0.1071	-8.79	-0.0452	-1.70
Mathematics	0.0304	2.27	-0.0004	-0.01
Engineering (agriculture included)	-0.0439	-5.64	-0.0354	-1.75
Medical sciences (veterinary included))	-0.0744	-7.57	-0.1118	-3.03
<i>Study programme description</i>				
It was regarded as demanding	0.0100	2.92	-0.0014	-0.18
Employers are familiar with the content	0.0058	2.26	-0.0052	-0.82
Freedom in composing the programme	0.0112	4.48	0.0070	1.12
It had a broad focus	0.0022	0.82	0.0021	0.32
It was vocationally orientated	0.0011	0.39	0.0045	0.65
It was academically prestigious	0.0226	8.02	0.0178	2.56
<i>Modes of teaching and learning</i>				
Lectures	0.0051	1.81	-0.0031	-0.44
Group assignments	-0.0012	-0.42	-0.0119	-1.63
Participation in research projects	-0.0070	-2.52	-0.0113	-1.63
Internship, work placement	-0.0019	-0.79	0.0016	0.24
Facts and practical knowledge	-0.0046	-1.61	0.0028	0.40
Theories and paradigms	0.0018	0.63	0.0089	1.29
Teacher as the main source of information	-0.0093	-3.29	-0.0162	-2.27
Project and/or problem-based learning	0.0012	0.45	-0.0098	-1.36
Written assignments	-0.0025	-0.93	0.0034	0.47
Oral presentation by students	-0.0063	-2.27	-0.0073	-1.00
Multiple choice exams	0.0025	1.02	-0.0041	-0.62

Job characteristics				
Private sector	0.1031	16.59	0.0533	3.52
Permanent contract	0.1333	19.71	0.1130	6.43
Full-time job	-0.2772	-36.47	-0.1873	-9.67
Size firm (<50 workers)	-0.1239	-20.47	-0.1459	-9.13
Appropriateness of qualifications				
Qualifications used at work	0.0181	2.93	0.0737	5.10
Under-educated	0.0246	3.34	-0.0116	-0.47
Over-educated	-0.1335	-13.87	-0.1471	-8.91
Deficit in competencies	-0.0207	-3.03	-0.0109	-0.58
Surplus in competencies	-0.0011	-0.19	-0.0418	-2.54
Universities vs HEIs	0.0399	4.32	0.0253	0.94
Occupational titles (ref. Professionals)				
Legislators, senior official and managers	0.1168	11.53	0.0602	2.66
Technicians and associate professionals	-0.0592	-8.68	-0.0694	-4.10
Clerks	-0.2203	-14.55	-0.1959	-7.96
Service workers and other occupations	-0.1639	-7.78	-0.2223	-8.09
Country dummies (ref. Germany)				
Italy	-0.5511	-30.68	-0.5290	-10.44
Spain	-0.4542	-26.34	-0.4402	-9.00
France	-0.2561	-13.50	-0.2293	-4.30
Austria	-0.2546	-13.79	-0.2193	-4.11
The Netherlands	-0.1694	-10.14	-0.0934	-2.02
United Kingdom	-0.1424	-6.98	-0.0984	-1.96
Finland	-0.2713	-16.15	-0.1744	-3.38
Norway	-0.0709	-4.08	0.0426	0.68
Czech Republic	-0.7958	-48.63	-0.6746	-14.30
Switzerland	-0.0047	-0.32	0.1193	2.68
Portugal	-0.4470	-18.61	-0.4041	-4.70
Belgium	-0.0929	-4.69	-0.0227	-0.42
Estonia	-0.7772	-36.96	-0.7005	-12.64
Intercept	2.5798	47.05	2.4879	17.78
<i>Observations</i>	17,180		3,103	
<i>Prob > F</i>	0.0000		0.0000	
<i>R-squared</i>	0.5422		0.5419	

Regarding job satisfaction, Table 6 shows that women graduates reported higher levels of satisfaction with their job compared to men. There was a negative effect from age on job satisfaction, that is, that older graduates tend to be less satisfied with their jobs. However, family educational background was not found influence graduates' job satisfaction scores.

In terms of differences among educational fields, we find that graduates in Education, Humanities and Natural Science were more satisfied with their jobs than graduates from the Social Science (the reference category). In addition, a well-designed degree programme, that is, a broadly focused, academically prestigious, vocationally oriented programme and the flexibility to combine courses and areas of specialization, and a programme whose content and objectives are known to employers, and which is seen as demanding, attracts higher scores for job satisfaction. Also, if the teaching and learning modes emphasize the participation in research projects and learning in groups as opposed to individual learning assignments, this positively influences job satisfaction. However, the value of facts and practical knowledge negatively influences the level of job satisfaction for those working inside their own discipline-specific domain. It could be guessed that it seems that graduates are relatively less satisfied with their practical learning environment (facts and practical learning, problem-based learning, written

assignments, oral presentations, internships, etc.), which could have an influence on the employment experience.

Regarding job characteristics, as one might expect, graduates working in the public sector were more satisfied than those in the private sector, and those holding a permanent contract were also more satisfied than those holding a temporary contract. The use of the knowledge and skills that graduates acquired during their studies that they use at work and the match between the level of education attained and the level of education required in the job, raised job satisfaction very significantly. In addition, those working within their study domain and that graduated from a university rather than another type of higher education institution were more satisfied with their job.

With respect to occupational title, legislators, senior officials, managers, professionals, were more satisfied than their counterparts in elementary occupations; and with respect to the effect of the country dummies included as control variables, we find that graduates from Italy, Spain, the Netherlands, United Kingdom, Finland, Czech Republic, Portugal, Belgium and Estonia were less satisfied compared to graduates from Germany (the omitted category).

Table 6 (last two columns) provides the same information, job satisfaction, for those graduates working inside a generic domain. We can observe that the main results from Table 6 (first two columns) are missed. Only those graduated in Natural Science were more satisfied with their jobs compared to those graduated in Social Science (the reference category). Regarding academic environment related variable, it is only stressed the fact that employers were familiar with the content of the programme, and the modes of teaching and learning are not significant. However, the effects of job characteristics are as one might expect: graduates working in the public sector, holding a full-time job and permanent contract, as well as working in small-size firms are more satisfied with their jobs. In addition, overeducated graduates are by far less satisfied in their jobs than those in the right situation, and graduates who reported a surplus of competencies were also very dissatisfied compared to those with the right competencies for the job. Finally, compared to graduates from Germany (the omitted category), graduates from Portugal, Spain and Italy were the less satisfied with their jobs.

Table 6. Non-monetary returns of the educational programme for those graduates working inside and outside their own discipline-specific domain

Explanatory variables	<u>Inside Job Domain</u>		<u>Outside Job Domain</u>	
	Coef.	z-values	Coef.	z-values
<i>Individual characteristics</i>				
Female	0.0412	2.18	0.0055	0.13
Age	-0.0222	-4.80	-0.0092	-0.85
Father's higher education	0.0076	0.39	-0.0866	-1.81
Mother's higher education	-0.0257	-1.17	0.0282	0.54
<i>Field of study</i> (ref. Social Science)				
Education	0.1694	4.64	0.0711	0.87
Humanities	0.1362	3.60	0.0973	1.51
Law	-0.0030	-0.08	0.1618	1.59
Natural Sciences	0.0958	2.36	0.2295	2.89
Mathematics	-0.0064	-0.15	0.0588	0.48
Engineering (agriculture included)	-0.0016	-0.06	0.0220	0.37
Medical sciences (veterinary included)	-0.0174	-0.54	-0.0216	-0.20
<i>Study programme description</i>				
It was regarded as demanding	0.0218	1.92	0.0049	0.20
Employers are familiar with the content	0.0361	4.29	0.0423	2.25
Freedom in composing the programme	0.0170	2.06	-0.0020	-0.11

It had a broad focus	0.0271	3.02	-0.0025	-0.12
It was vocationally orientated	0.0217	2.40	0.01495	0.72
It was academically prestigious	0.0204	2.20	-0.0064	-0.31
Modes of teaching and learning				
Lectures	0.0145	1.55	-0.0160	-0.78
Group assignments	0.0268	2.87	-0.0171	-0.79
Participation in research projects	0.0257	2.79	0.0091	0.44
Internship, work placement	0.0043	0.54	0.0075	0.39
Facts and practical knowledge	-0.0196	-2.08	-0.0161	-0.76
Theories and paradigms	0.0179	1.90	0.0272	1.31
Teacher as the main source of information	0.0173	1.84	0.0131	0.62
Project and/or problem-based learning	-0.0118	-1.30	0.0179	0.84
Written assignments	0.0064	0.72	-0.0094	-0.44
Oral presentation by students	0.0148	1.61	-0.0183	-0.86
Multiple choice exams	0.0152	1.86	-0.0013	-0.07
Job characteristics				
Private sector	-0.1567	-7.61	-0.2687	-5.93
Permanent contract	0.1220	5.46	0.1965	3.75
Full-time job	-0.0152	-0.61	0.1190	2.07
Size firm (<50 workers)	-0.0294	-1.48	0.1106	2.34
Appropriateness of qualifications				
Qualifications used at work	0.6838	33.33	0.6979	15.86
Under-educated	0.0715	2.95	-0.0912	-1.25
Over-educated	-0.3641	-11.59	-0.5301	-10.69
Deficit in competencies	0.1073	4.77	0.0191	0.34
Surplus in competencies	-0.0192	-0.99	-0.1547	-3.16
Universities vs HEIs	0.1172	3.82	-0.0269	-0.33
Occupational titles (ref. Professionals)				
Legislators, senior official and managers	0.1858	5.57	0.1431	2.14
Technicians and associate professionals	0.0247	1.10	0.0407	0.81
Clerks	-0.0596	-1.21	-0.0295	-0.40
Service workers and other occupations	0.1261	1.80	0.0393	0.48
Country dummies (ref. Germany)				
Italy	-0.2588	-4.51	-0.3292	-2.21
Spain	-0.1107	-1.96	-0.3326	-2.29
France	-0.0901	-1.45	-0.0305	-0.19
Austria	0.0811	1.34	0.0927	0.58
The Netherlands	-0.2359	-4.43	-0.2269	-1.64
United Kingdom	-0.2831	-4.22	-0.2385	-1.60
Finland	-0.3828	-6.96	-0.1842	-1.21
Norway	-0.0409	-0.72	-0.0588	-0.32
Czech Republic	-0.0999	-1.87	0.0347	0.25
Switzerland	0.0066	0.13	-0.0275	-0.21
Portugal	-0.5349	-6.80	-0.5938	-2.32
Belgium	-0.1402	-2.15	0.0309	0.19
Estonia	-0.2554	-3.75	-0.1146	-0.69
<i>Observations</i>	<i>17,180</i>		<i>3,103</i>	
<i>Pro > χ^2</i>	<i>0.0000</i>		<i>0.0000</i>	
<i>Log likelihood</i>	<i>-21,091</i>		<i>-4,216</i>	

5 Conclusions

This paper tries to contribute to a better understanding of the role of HE in a number of European countries of their graduates transition from education to working life. The focus of the analysis is on the efficiency by which the educational programmes allocate their graduates over the various occupational domains in the labour market and how these graduates perform in their obtained jobs.

Based on the characteristics of the academic environment and the differences among countries, we expected to find differences in graduates' pay-offs, both monetary (income) and non-monetary (job satisfaction) returns. However, other factors were also influential such as those related to job characteristics. More in specific, we differentiated between those graduates working inside their own discipline-specific job domain and those working inside a generic job domain.

For those graduates working inside their own job domain, results show that a well-designed degree programme, that is, academically prestigious, whose content and objectives are known to employers, and which is seen as demanding contributes income premiums and attracts higher scores for job satisfaction. Also, if the teaching and learning modes emphasize the participation in research projects and learning in groups as opposed to individual learning assignments, this positively influences job satisfaction and negatively influences income.

However, for those graduates working outside their own job domain, results show that the design of the degree programme and the modes of teaching and learning do not have a direct impact on the graduates' pay-offs (income and job satisfaction).

Further analysis should be made in order to establish comparisons among each European country included in this study, and the identification of similarities and differences among Southern and Nordic European countries. For instance, the substantial variation among European countries in terms of learning environment could have an influence on the employment experience. In some countries, reputation plays a major role, in others its effect is marginal. In this context, further research is needed on the effect dominance of a specific mode of teaching and learning and its impact on the graduate labour market.

6 References

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