Evidence on Graduate Over-education in Europe: Underutilization of Educational Skills and Unrealized Expectations

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Abstract – Using data from a European research project called CHEERS (Careers after Higher Education: a European Research Study), this paper explores the degree of over-education among young European graduates. Though a considerable body of work on over-education exists, most of the research has been based on the underutilization of workers' educational skills. However, this paper also investigates the incidence of over-education based on an alternative subjective measure: unrealized expectations – when an individual's expectations concerning the labour market benefits from an investment in schooling are not realized.

Keywords: Over-education, graduate labour market, ordered logit model

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1. Introduction

According to "human capital theory", education enhances workers' productivity that is reflected in higher individuals' earnings.[1] Nonetheless, the significance of the investment in education depends on the extent to which the individuals are matched in their jobs. It might be expected that job tasks converge to education levels, being graduates employed in occupations for which a degree is required. However, we may find situations in which graduates are employed in jobs for which their current university qualifications appear not to be required. This phenomenon has been labelled as "over-education" (or surplus schooling), and it can be considered a source of inefficiency on the labour market because over-educated workers have inferior labour market performance, both in terms of earnings and job satisfaction (Groot, 1996; Groot and van der Brink, 1997; Battu *et al*., 1999, 2000).[2]

Over-education as a phenomenon is not new. Two seminal books addressed the problem of over-education three decades ago: *The Great Training Robbery* (Berg, 1970), and *The Overeducated American* (Freeman, 1976). The latter pointed to the post-1960s decline in the returns to a college education; the former noted that for a long time people have been getting more education than they needed to perform their jobs. Subsequent literature emerged drawing attention to the existence of over-education on the labour market

[1] See Becker (1964) and Mincer (1974).

[2] Battu *et al.* (1999, 2000) use a survey of graduates to examine the determinants of over-education in the U.K. They find earnings premium and higher levels of job satisfaction for those who are in a job which requires a degree.

(Rumberger, 1981; Tsang y Levin, 1985; Sicherman, 1991). In this literature, over-education has commonly been defined in one of the three ways (Rumberger, 1981):

"Definition 1: Overeducation exits when the pecuniary return to a particular level of schooling falls below its historically high level or declines relative to all other investments" (page 8).

"Definition 2: Overeducation exists when an individual's expectations concerning the labor market benefits from an investment in schooling are not realized" (page 10).

"Definition 3: Overeducation exists for those individuals in the labor force who are employed in jobs that do not make full use of their education" (page 15).

Though a considerable body of work on over-education exists, most of the research has been based on the underutilization of workers' educational skills (definition 3). However, this paper investigates the incidence of over-education based on the second and third definitions introduced. Specifically, our concern is to explore the degree of over-education among European graduates.[3]

2. Explanations and Consequences of Over-education

Previous research has considered several reasons for observing over-educated workers. Freeman (1976) is among the first to address this issue when he observed the demand for college graduates was not keeping pace with the increasing supply of college graduates. Thus not all individuals with a college education were able to find jobs which required a college education.

Neoclassical economists such as Freeman (1976) view the surplus of educated workers as the result of a temporary disequilibrium in the market for educated labor. "Neoclassical economic theory" assumes that the demand for education is responsive to anticipated rates of economic return (which are declining) and that the equilibration of supply and demand is nevertheless assured in the long run. However, alternative models – e.g. "job-screening model" or "job-competition model" – give reasons to believe that over-education of the educated labor force will persist in the future.

[3] With a few exceptions – like Battu *et al*. (1999, 2000) or Dolton and Vignoles (2000) –, graduate studies of the extent and consequences of over-education are practically nonexistent.

The "job-screening model" emphasizes the role of educational credentials in the process of occupational selection on the labor market which is characterized by imperfect information (Spence, 1973). According to this view, as long as employers continue to allocate preferred jobs to those who are relatively better educated, there will be constant pressure for increased education, independent of the skill requirements of jobs or changes in the rate of economic return. Alternatively, the "job-competition model" argues that employers use education as a proxy for the amount of training they have to invest in an employee: the greater the education, the less training required (Thurow, 1975).[4] So, employers hire the most educated applicant regardless of the job's requirements; therefore, workers may not fully utilize their education.

Another plausible explanation of over-education is found in the "internal labor markets theory" (Doeringer and Piore, 1971). According to this approach, large firms hire workers from the outside labor market for so-called "entry-level jobs";[5] the reminder of the jobs are internally allocated by the firm as workers progress along well-defined promotion ladders by acquiring job-related skills, many of which are firm-specific in nature. Nonetheless, an ILM can never be completely insulated from conditions in the external labor market. Changes in the external labor market are signalled to the firm by changes in the hiring standards at ports of entry. In this model, one consequence of the increased supply of college educated workers is that employers will raise the minimum educational requirements for the entry jobs that which is necessary to satisfactorily perform the work, suggesting that the skills of this highly educated group are being underutilized. However, this model predicts that when these over-educated workers gain enterprise-specific skills they will be readily promoted to higher-level jobs improving their job match.[6]

The most common consequence attributed to over-education is a projected increase in levels of job dissatisfaction and worker discontent. Advanced education, by raising workers' expectations for interesting and challenging work, is claimed to result in increased frustration and dissatisfaction when those expectations are not fulfilled.

[4] In Thurow's model people compete for jobs on the basis of the costs of training them for the jobs – assuming that training costs are borne by the employer.

[5] These jobs (ports of entry) are near the base of the job hierarchy.

[6] So, over-education will be a temporary mismatch.

Reviewing the early literature on job dissatisfaction, Berg (1970) concluded that over-education is one of the strongest and most consistent causes of dissatisfaction among workers in low-skilled occupations.

3. Measurement of Over-education

3.1. Over-education: Unrealized Expectations

This definition of over-education is based on the degree to which individuals realize their career expectations by participating in the educational system. Expectations may vary among individuals, reflecting individual variations in tastes, aspirations, and circumstances. They may be related to earnings, the status of jobs, or even particular jobs that an individual may expect after investing in a particular amount or kind of schooling.

This definition uses an individual standard. This feature makes it intuitively appealing since there is no reason one should expect two individuals with similar educational backgrounds in similar objective situations to feel the same about their positions on the labour market. It is more likely that their expectations are quite different and, hence, their reactions to similar objective situations are different as well. For some, expectations may focus on pecuniary benefits; for others, they may be related to the type of job or the perceived status of the job (Rumberger, 1981).

Methodologically, it is obvious that this definition presents problems of measurement. The most straightforward way to measure over-education by this definition is to ask everyone to evaluate themselves. But that may not be the most valid measure of unrealized expectations. Since expectations change over time, when is the time to measure unrealized expectations? Perhaps several measures would have to be employed over a period of time in order to account for changes in expectations.

3.2. Over-education: Underutilization of Educational Skills

This definition of over-education is based upon the utilization of educationally developed skills within the labour market. This definition is derived from the popular notion that employers hire persons with particular skills, abilities, and attributes that they feel are necessary to perform efficiently in particular job settings. More simply, every job on the labour market may require a minimum set of worker’s characteristics. Contrasting the skill requirements of jobs and skill attainments of workers in those jobs leads to another measure of over-education: individuals whose educational skills exceed those required to

perform their jobs adequately.[7] Three measures of over-education are used in the literature. The first one would be to ask workers directly about the relationship between their education and the education required in their job (subjective measure). The second approach is to compare the education level of the worker with their job level (objective measure). Finally, an alternative third measure is the standard deviation measure, which involves taking the average of the actual levels of education for individuals in a particular occupation, with over-education defined as a level of actual education more than one standard deviation above the mean.

This definition, that measures directly the utilization of educational skills for each worker in the labour market, also has disadvantages. Conceptually, it restricts itself to one particular outcome of education – an array of cognitive skills and abilities. Methodologically, measuring a discrepancy in skills presents problems. First, it requires that the skill requirements of every job be determined. One difficulty in doing this is differentiating between the general skill requirements of a job and its specific skill requirements. Job-specific skills are usually acquired through on-the-job training, while only the general skills required for jobs are acquired through schooling. The second methodological problem is that of assessing the general skills of workers. Most individual survey data only contain a worker's educational attainment. Somehow educational attainment must be translated into similarly defined skill requirements of jobs. In summary, although there is definite intuitive appeal to this notion of over-education, there are formidable problems in evaluating it.

4. Data and Measures

The data used in our research are taken from the CHEERS Graduate Survey conducted in 1999 by researchers from eleven European countries and Japan. This survey is based on personal interviews of approximately 37,000 university graduates who were surveyed about four years after graduation.[8]

[7] A worker is considered to be over-educated if he or she has more education than is required for his or her job.

[8] A representative sample of individuals who graduated between Fall 1994 and Summer 1995 was intended to be drawn. The questionnaire addressed the socio-biographic profile of the graduates, their study experiences and self-perceived competences acquired, their employment, work and careers since graduation

From these data, two (subjective) measures of over-education are considered in this work. The first measure (unrealized expectations) takes individuals' responses to the following question in the master questionnaire:

F5. "*Taking all aspects into account, to what extent does your current work situation meet the expectations you had when you started your study.*"[9]

The second measure (underutilization of educational skills) takes graduates' responses to the question:

F1. "*If you take into consideration your current work tasks altogether: To what extent do you use the knowledge and skills acquired in the course of study (you graduated from 1994 or 1995)?*"[10]

The distribution of responses is given in Table 1.[11] Using both measures, around 18 per cent of graduates are classed as over-educated.[12] Using definition 2, females appear more likely to be over-educated. However, male graduates are found to have a higher probability of being over-educated than females according to definition 3.

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and the links they perceive between education and work (Teichler, 2002; Schomburg and Teichler, 2002). More details at: http://www.uni-kassel.de/wz1/tseregs.htm.

[9] Graduates were asked to rank their answers from 1 = "Much better than expected" to 5 = "Much worse than expected"; higher rankings indicated that they felt over-educated.

[10] Graduates were asked to rank their answers from 1 = "To a very high extent" to 5 = "Not at all"; again, higher rankings indicated that they felt over-educated.

[11] We only consider European countries.

[12] Proportion of graduates who gave scores of 4 or 5.

Table 1. Extent of graduate over-education using subjective measures (%)

Current work situation meeting expectations at time of enrolment				Use of knowledge and skills acquired in reference study			
	Total	Males	Females		Total	Males	Females
Expectation score				Matching score			
1 (Much better than expected)	11.16	10.29	11.94	1 (To a very high extent)	23.32	20.55	25.77
2	31.51	33.00	30.19	2	30.87	31.52	30.35
3	38.51	39.84	37.27	3	27.87	28.97	26.89
4	12.97	12.07	13.80	4	14.58	15.71	13.59
5 (Much worse than expected)	5.85	4.80	6.80	5 (Not at all)	3.35	3.25	3.41
n	26603	12521	14023		28922	13555	15303

5. The Econometric Model

In order to analyze the probability of a graduate being over-educated, using both definitions, we use an "ordered logit model".[13] The dependent variable referring to the over-education is dealt with as a qualitative (polythomic) variable, such that the model to be estimated is (Greene, 1997):

$$Y^* = \beta' X + \varepsilon$$

where: *X* is the vector of regressors (including the constant) that includes the observable characteristics of the individuals surveyed (education, occupation, etc.); the beta coefficient variable quantifies the impact of the regressors used; lastly, the term ε is a random disturbance, which follows a logistic distribution and represents certain non-observable factors. However, the variable *Y** is unobserved. What we do observe is (Greene, 1997):

$$\begin{aligned}
&Y = 0 \quad if \quad Y^* \le 0 \\
&Y = 1 \quad if \quad 0 < Y^* \le \mu_1 \\
&Y = 2 \quad if \quad \mu_1 < Y^* \le \mu_2 \\
&Y = 3 \quad if \quad \mu_2 < Y^* \le \mu_3 \\
&Y = 4 \quad if \quad \mu_3 < Y^*
\end{aligned}$$

This is a form of censoring. The μ coefficients are parameters that have to be estimated alongside the betas. The *Y* variable, which is an observed variable, takes, in our case, the following values:

Y = 0 if the interviewee rates 5 in F5/F1.

Y = 1 if the interviewee rates 4 in F5/F1.

Y = 2 if the interviewee rates 3 in F5/F1.

Y = 3 if the interviewee rates 2 in F5/F1.

Y = 4 if the interviewee rates 1 in F5/F1.

Using an "ordered logit equation", we regress these rankings on educational and work characteristics (current work). The explanatory variables are defined in the Appendix.

[13] The ordered nature of the dependent variable recommends an "ordered logit model" to be specified (McKelvey and Zavoina, 1975).

6. Empirical Findings

The full empirical results are reported in Tables 2 and 3. Table 2 (Table 3) provides estimated effects of individual and work characteristics on the probability of being adequately educated according to definition 2 (definition 3). Several alternative specifications have been tried to avoid multicollinearity.

The evidence in Table 2 shows that:

- Being a female certainly raises the probability of being over-educated.
- Field of study plays an important role when explaining job mach. Graduates from the social sciences, and arts and humanities enhance the probability of being over-educated. However, those individuals with law, health or business degrees are more likely to be adequately educated. Moreover, the findings confirm the crucial relationship of the expectations with the type of degree (long vs. short).
- Graduates with a higher quality college/university education and those having better high school grades are less likely to be over-educated.
- Parental education – whether one's father or mother has higher education qualifications – has a influence on the probability to be adequately educated.
- The fulfilled expectation of the graduates with respect to their occupational attainments (adequately educated) is determined, clearly, by the wage earned in the labour market after graduation.
- Those who are able to hold a regular full-time job do have higher probabilities of matching.
- Those who have received additional/further training are likely to have a match.
- As the working experience increases, so do the probability that the graduate is in a job for which he or she is adequately educated.
- The incidence of over-education varies by occupations. Thus, legislators, managers, professionals, service workers, and shop and market sales workers do have higher probability of matching than technicians. However, clerks are significantly more likely to be over-educated than the reference group.
- The underfulfilled expectations of the graduates with respect to their occupational attainments depend on the source of employment and industries. In the latter case, those who are working in business, education and health areas are consistently more likely to be adequately educated, and being in production activities raises the

probability of being over-educated. In the former case, job match is found to be more prevalent among graduates in either public sector or self-employment.

- Finally, the extent of the matching is likely to depend on the rate of unemployment of the country considered.

With regard to definition 3, the main conclusions – according to Table 3 – are the following ones:

- Consistent with the findings of Battu *et al.* (1999), graduates who have studied disciplines such as law and medicine are better matched. However, graduates holding a degree related with the social sciences are more likely to be over-educated. Furthermore, the length of the degree (TYPE_DEG) and university quality (IND_SEL) have both a significant effect on the probability of being adequately educated.[14] In addition, parental education (higher education qualification) influences on the probability of matching work to educational skills.
- Two sectorial dummies (EDUCAT & HEAL_SEC) appear to have a significant influence on the propensity to find a work match.
- Self-employed and public sector's workers enhance the probability of being adequately educated.
- Clerks, service workers, and shop and market sales workers are significantly more likely to be over-educated than technicians, while professionals report significantly higher levels of education to employment matching.
- We also observe an improvement in the job match over working experience – or holding a regular full-time job.
- The size of the firm appears to have a negative influence on the likelihood of being adequately educated. This result supports the "internal labour markets theory". If we consider, as in our case, "recent" college/university graduates, it is possible to find that a great proportion of them will be over-educated because they have to start working in "entry jobs" – that may do not match with their formal education . When

[14] The Table 3 shows a negative estimated coefficient associated with the latter variable; it comes to say that graduates who attended lower quality universities are found to have a lower probability of being adequately educated. See Robst (1995) with similar findings.

they gain experience and on-the-job training, they will be promoted to higher-level jobs improving their job match.[15]

- Finally, the extent of the matching is likely to depend on the rate of unemployment of the country considered. Graduates who live in countries with low rates of unemployment may have a greater opportunity to secure a match because of being in a labour market with more vacancies. When the rate of unemployment is high, there is an important competitiveness for the jobs, implying that several high school jobs to be filled by graduates, being these over-educated.

7. Conclusion

Using data from a European research project called CHEERS (Careers after Higher Education: a European Research Study), this paper explores the degree of over-education among young European graduates. Though a considerable body of work on over-education exists, most of the research has been based on the underutilization of workers' educational skills. However, this paper also investigates the incidence of over-education based on an alternative subjective measure: unrealized expectations – when an individual's expectations concerning the labour market benefits from an investment in schooling are not realized. The empirical results provide estimated effects of individual and work characteristics on the probability of being adequately educated according to both measures (underutilization of educational skills and unrealized expectations). The results show that the field of study plays an important role when explaining job mach. Graduates from the social sciences, and arts and humanities enhance the probability of being over-educated. However, those individuals with law, health or business degrees are more likely to be adequately educated.

[15] Sicherman (1991) finds that over-educated workers are more likely to be promoted than those with a good match.

Table 2. Determinants of the degree of fulfilled expectations of the graduates with respect to their occupational attainments (definition 2)

	(2.1.)‡		(2.2.)‡		(2.3.)†	
Variable	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic
Constant	1.6722**	25.103	3.3592**	35.727	3.0264**	31.256
ARTS_HUM	Reference		Reference		-0.23487**	-3.55
SOC_SC	1.61E-02	0.45	-7.75E-02**	-2.164	-4.37E-02	-0.639
BUSINESS	0.19665**	6.092	0.44973**	13.71	0.17597**	2.727
LAW	0.20533**	4.448	1.0103**	23.55	Reference	
NAT_SC	0.14198**	4.294	0.15247**	4.826	3.51E-02	0.537
ENGIN	0.14548**	4.233	0.35304**	10.149	2.38E-02	0.366
HEALTH	0.23298**	6.181	0.99414**	21.585	-2.71E-02	-0.375
ACAD_SEC	-2.51E-03	-0.093				
GRADES1	0.11454**	4.904				
GRADES2	Reference					
GRADES3	-1.45E-02	-0.568				
TYPE_DEG			5.28E-02**	2.301		
IND_SEL			-0.52831**	-20.185		
PAR_UNIV					8.07E-02**	2.995
FEMALE	-6.15E-02**	-2.849	-1.96E-02	-0.968	-3.75E-02	-1.316
MANAGERS					0.12549**	2.756
PROFESS					0.31951**	8.436
TECHNIC					Reference	
CLERKS					-0.45114**	-7.65
SALESWOR					0.20808**	2.426
OTH_OCCU					-0.97392**	-9.394
SIZE1					Reference	
SIZE2					-7.58E-02	-1.307
SIZE3					6.84E-02	1.317
SIZE4					-1.55E-02	-0.344
PRODUCT			-0.11066**	-2.567		
BUSIN			0.12761**	3.014		
PUBADMIN			Reference			
EDUCAT			0.76034**	18.56		
HEAL_SEC			0.65264**	12.865		
OTHER			6.95E-02	1.295		
PUBEMPL			0.32892**	8.835		
PRIVEMPL			3.10E-02	0.827		
SELFEMPL			0.39421**	8.01		
OTH_EMPL			Reference			
WEXPER			6.72E-03*	1.839		
WEXPER_2			4.97E-05	0.875		
TRAINING	0.12325**	5.987				
LN_WAGE	0.50542**	28.552				
REGFULL					0.33865**	8.361
UNEMP_PO	-5.34E-02**	-17.983	-2.41E-02**	-6.697	-6.71E-02**	-17.805
MU(1)	1.3733**	71.539	1.8727**	82.889	1.4863**	52.06
MU(2)	3.2215**	140.295	3.3394**	134.298	3.4194**	102.023
MU(3)	5.2059**	180.825	4.8556**	174.54	5.3858**	134.304
Observations	19984		22569		11856	
Log likelihood	-27347.29		-31986.01		-15955.27	

** Significance at 5% level * Significance at 10% level ‡ All respondents † Without self-employed

Table 3. Determinants of the degree of utilization of graduates' education on their jobs (definition 3)

	(3.1.)‡		(3.2.)†	
Variable	Coefficient	t-statistic	Coefficient	t-statistic
Constant	3.3847**	38.409	3.0767**	36.06
ARTS_HUM	Reference		Reference	
SOC_SC	-8.53E-02**	-2.54	-9.42E-02*	-1.909
BUSINESS	0.44512**	14.466	0.50484**	11.138
LAW	1.005**	24.971	0.85912**	13.446
NAT_SC	0.14929**	5.037	0.13237**	2.871
ENGIN	0.35004**	10.73	0.19233**	4.035
HEALTH	0.91373**	21.4	0.75514**	12.292
TYPE_DEG	4.03E-02*	1.874		
IND_SEL	-0.52689**	-21.461		
PAR_UNIV			4.83E-02*	1.893
FEMALE	-2.22E-02	-1.175	2.72E-02	0.998
MANAGERS			1.03E-02	0.233
PROFESS			0.41486**	11.459
TECHNIC			Reference	
CLERKS			-0.58507**	-9.996
SALESWOR			-1.5616**	-17.179
OTH_OCCU			-1.3059**	-12.766
SIZE1			Reference	
SIZE2			-0.11111**	-2.034
SIZE3			-0.20029**	-4.016
SIZE4			-0.24019**	-5.529
PRODUCT	-0.12499**	-3.093	-3.05E-02	-0.965
BUSIN	0.11447**	2.884	Reference	
PUBADMIN	Reference		0.12265**	2.525
EDUCAT	0.73934**	19.251	1.0744**	22.084
HEAL_SEC	0.68889**	14.564	0.77768**	13.6
OTHER	5.06E-02	1.005	6.20E-02	0.964
PUBEMPL	0.32557**	9.333		
PRIVEMPL	2.87E-02	0.816		
SELFEMPL	0.39138**	8.487		
OTH_EMPL	Reference			
WEXPER	5.92E-03*	1.729		
WEXPER_2	6.08E-05	1.141		
REGFULL			7.43E-02*	1.875
UNEMP_PO	-2.25E-02**	-6.695	-3.02E-02**	-8.417
MU(1)	1.8755**	88.461	2.0791**	63.031
MU(2)	3.3426**	143.305	3.5981**	99.981
MU(3)	4.8547**	186.112	5.22**	129.637
Observations	24401		12727	
Log likelihood	-34578.98		-17768.53	

** Significance at 5% level * Significance at 10% level

‡ All respondents † Without self-employed

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Appendix

- **ACAD_SEC**: A (0-1)-dummy with value 1 if the respondent attended an academic secondary education.
- Economic sector: (0-1)-dummies for the following industries:
    - **PRODUCT** (Production)
    - **BUSIN** (Business)
    - **PUBADMIN** (Public Administration)
    - **EDUCAT** (Education)
    - **HEAL_SEC** (Health)
    - **OTHER**
- **FEMALE**: A (0-1)-dummy with value 1 if respondent is female.
- Firm size: (0-1)-dummies for the number of people in the entire organization in which the graduate works:
    - **SIZE1** (1-25 employees)
    - **SIZE2** (26-99 employees)
    - **SIZE3** (100-499 employees)
    - **SIZE4** (500 employees or more)
- Higher education: (0-1)-dummies for the following degree subjects:
    - **ARTS_HUM** (Arts and Humanities)
    - **SOC_SC** (Social Sciences)
    - **BUSINESS**
    - **LAW**
    - **NAT_SC** (Natural Sciences)
    - **ENGIN** (Engineering)
    - **HEALTH**
- **IN_SEL**: Selectivity index (institution).[16]
- Type of employer: (0-1)-dummies for the following kind of current employer/institution:
    - **PUBEMPL** (Public employer)
    - **PRIVEMPL** (Private employer)
    - **SELFEMPL** (Self-employed)
    - **OTH_EMPL** (Other)
- **LN_WAGE**: Log of hourly gross wage (euros).

[16] University quality (IND_SEL) is the mean of ENTRGRAD by SRFIN, where ENTRGRAD represents the rating of grades in higher education entry (= 1, high; = 2, medium; = 3, low), and SRFIN is the institution of higher education. So, and considering the variable IND_SEL, the lowest rating is for higher quality universities; the highest rated universities are low prestige universities.

- Occupations: (0-1)-dummies for the following jobs:
    - **MANAGERS** (Legislators, senior officials, and managers)
    - **PROFESS** (Professionals)
    - **TECHNIC** (Technicians, and associate professionals)
    - **CLERKS**
    - **SALESWOR** (Service workers, and shop and market sales workers)
    - **OTH_OCCU**[17]
- **PAR_UNIV**: A (0-1)-dummy with value 1 if either of the parents of the graduate had been to University.
- Rating of grades in entry qualification: (0-1)-dummies for the grades prior to the University studies:
    - **GRADES1** (High)
    - **GRADES2** (Medium)
    - **GRADES3** (Low)
- **REGFULL**: A (0-1)-dummy with value 1 if currently holding a regular full-time job.
- **TRAINING**: A (0-1)-dummy with value 1 if the graduate receives additional/further education/training.
- **TYPE_DEG**: A (0-1)-dummy for the length of the degree (=1, long; = 0, short).
- **UNEM_PO**: Unemployment rate of population between 25 and 64 years old.
- **WEXPER** & **WEXPER_2**: Working experience and the square term (months).[18]

[17] Skilled agricultural, and fishery workers; craft and related trades workers; plant and machine operators, and assemblers; elementary occupations.

[18] Number of months in employment since graduation.