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## **Abstract**

This paper examines the impact of an academic degree and field of study on short and long-term unemployment across Europe (EU15). Labour Force Survey (LFS) data on over half a million individuals are utilised for that purpose. The harmonized LFS classification of level of education and field of study overcomes past problems of comparability across Europe. The study analyses (i) the effect of an academic degree at a European level, (ii) the specific effect of 14 academic subjects and (iii) country specific effects. The results indicate that an academic degree is more effective on reducing the likelihood of short-term than long-term unemployment. This general pattern even though it is observed for most of the academic subjects its levels show significant variation across disciplines and countries.

## **1. Introduction**

It is a well-established fact that higher education is associated with low levels of unemployment. In particular, graduates have historically been enjoying higher employment rates than individuals with lower levels of education (OECD, 2000, ILO, 1996). Nickell (1972) was the first to propose a theoretical framework for the lower incidence of unemployment among graduates. In general, higher education leads to accumulation of human capital, which is linked with higher productivity. Firms are keen to maintain high levels of productivity, thus they would be reluctant to dismiss employees with high skills. Besides, signalling theory (Spence, 1973) argues that graduates complete their degrees due to superior innate capabilities. Hence, academic degrees act as a signal of such abilities, and employers are more keen to hire such workers.

However, over the last decades the number of graduates entering the labour market has increased significantly (OECD, 2006). The rapid expansion of higher education has produced an unprecedented number of high skilled workers whose employment prospects have become more uncertain than used to be a few decades ago. Finding employment has become more difficult than ever and graduate unemployment is rising fast (OECD, 2006). For instance, Moreau and Leathwood (2006) observe an upward trend on graduates' unemployment in most European countries, and predict that the trend will be rather persistent. The key point of the above is that the low rates of unemployment for graduates can not be taken for granted anymore.

Moreover, the rates of graduate unemployment across Europe are far from homogenous (OECD, 2006). The European higher education area has traditionally been rather nationally focused, with distinctive institutional and operational differences (Hulsman and Kaiser, 2002). This heterogeneity can, to a certain extent,

explain differences in the employment prospects of graduates (Teichler, 2000). Further, employment prospects may also vary across fields of study. As Teichler (1999) points out there is a rising mismatch between the demand for and the supply of some specific types of degrees, which creates various imbalances in the European graduate labour market.

A number of previous studies have analysed the employment situation of graduates across Europe. Nevertheless, most of these focus on particular countries. Such studies include: Jones et al (1987) and Woodley & Brennan (2000) for the UK; Plumper and Schneider (2007) and Schomburg (2000) for Germany; Paul and Murdoch (2000) for France; Moscati and Rostan (2000) for Italy; Gines et al (2000) for Spain; Cardoso and Ferreira (2008) for Portugal; and Livanos (2009) for Greece.

However, there are also a few studies doing cross-European analysis. Ehlert and Cordier (2002), for example, compare the issue for several European countries, but do not provide a unified analysis. More recently, Schomburg and Teichler (2006) provide a thorough comparative analysis examining the employment situation of over 40,000 graduates across Europe through a self-conducted survey. Their analysis does not focus only on unemployment, but on a rather broad set of issues related to employment, such as job satisfaction and occupational destination of graduates. Schomburg and Teichler (2006) observe intense diversity on competences, mainly fostered by differences in the higher education system of each country. For instance, some countries place their emphasis on a broad basis of knowledge, while others focus on direct preparation for professional life. Thus, the transition to the labour market is rapid in some countries (e.g. United Kingdom, Norway), while the searching period is longer in others (e.g.. Spain, Italy)

The present paper investigates the effect of higher education and the field of study on the likelihood of short and long-term unemployment. Economists distinguish between short and long-term unemployment and highlight that both their causes and effects vary considerably (Topel, 1984). Lucas and Prescott (1974) argue that short-term unemployment is caused by mobility and search costs as well as other barriers to instantaneous arbitrage. Long-term unemployment, on the other hand, is generally determined by factors such as: private search and turnover decisions made by workers and firms; sectoral shocks to labour demand; and labour market interventions, such as unemployment insurance. Thus, the impact of higher education on the two types of unemployment is expected to vary significantly across countries and fields of study.

The present study utilizes data on more than 700,000 individuals across Europe (EU15). This data is used to investigate the impact of higher education and the field of study on the likelihood of unemployment. This investigation is made possible due to the recent availability of micro-data from the European Labour Force Survey (EU-LFS). The definitions of levels of education and academic fields are harmonised, and based on UNESCO's (2006) International Standard Classification of Education (ISCED). The harmonisation of educational levels and types of education largely overcomes the comparability problem that has limited previous studies (Teichler, 2000). Thus, this study utilises for the first time a common dataset across Europe in order to explore the links between education and the labour market, and to provide a set of results capturing national and fields of study effects.

The remaining of this paper is structured as follows. Section 2 introduces the dataset and the methodology utilized for the analysis, Section 3 and 4 present the results of the empirical analysis, and Section 5 discusses the results and outlines the main conclusions of the study.

## **2. Empirical methodology**

### *2.1. Data*

This study makes use of micro-data from the 2005 European Union's Labour Force Survey (EU-LFS). The LFS is a household sample-survey that is designed to obtain labour market information on individuals. It is conducted at a quarterly basis in all EU member states. The sample of the survey varies across countries. The level of comparability of the data gathered in EU member states is high due to the collection of the same information, the use of common definitions and classifications, and the centralized co-ordination by Eurostat<sup>1</sup>.

Data from 15 member states<sup>2</sup> are used for the spring quarter of 2005. The spring quarter is used since it is considered to be more indicative of the labour market situation of an individual, and it is the one used officially for comparisons over time. Graduate is considered someone with high level of educational attainment as defined by the International Standard Classification of Education (ISCED 1997).

The dependent variable identifies the employment situation of an individual. That is: employed, short-term unemployed and long-term unemployed. Employed is considered someone if during the week of the survey worked for at least one hour. Unemployed is someone that did not work during that week but was actively seeking for employment. As long-term unemployed is counted someone that was looking for a job for twelve months or more, while someone that was looking for less than this period is considered as short-term unemployed.

The independent variables examined include information on: gender, marital status, age-group (5-year age bands), educational level, and field of education. Regarding the

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<sup>1</sup> For a full description of the LFS data see European Commission (2006).

<sup>2</sup> That is EU15, including the member countries in the European Union prior to the accession of ten candidate countries on 1<sup>st</sup> May 2004.

educational level, the variable refers to the highest level of education successfully received and distinguishes three levels of education: lower secondary education of second stage of basic education or below (low), secondary or post-secondary non-tertiary education (medium), and tertiary education and above (high). As regards the field of study, this variable distinguishes 15 fields of study, listed in Table 2.

In 2005 most of the European economies were going through a period of weak growth, largely dampened by high oil prices, cautious spending by households, and moderate investment (United Nations (UN), 2006). However, despite the moderate rates of growth, employment rose about 1%, mainly due to public policies aiming to boost part-time employment and self-employment (UN, 2006). Due to the raise of precarious employment and the weakness of economic growth, unemployment rates were contextually high in EU-15 (8.9%).

Table 1 shows the sample distribution, the share of graduates (% HE) and rates of short and long-term unemployment by country. The share of graduates across Europe was 20.7% of total population. However, this share varies across countries, ranging from 9.65% in Portugal to 30.7% in Denmark

**[Insert Table 1 here]**

Table 1 indicates that graduates have lower rates of both short and long-term unemployment than the full sample. However, there is significant variation across Europe. In general the rates of graduate unemployment remain at quite low levels, and in most cases below 5%. Exceptions are most Southern European countries, i.e. Greece, Spain, and France (7.7%, 7%, and 6.5% respectively) as well as Denmark and Germany (6.4% and 5.2% respectively).

Table 2 shows the frequencies of the rest variables at a EU15 level. Regarding the fields of study, the most popular across Europe are, by far, *social, business and law*

(27.7%). Very popular also are: *engineering* (16%), *health and welfare* (15.5%), and *education science* (12.6%). On the other hand the least popular fields of study are: *computer use* (0.4%), *science* (1%), and *mathematics and statistics* (1.2%).

**[Insert Table 2 here]**

## 2.2. Model specification

The effect of an academic degree on the employment situation is estimated with the following basic model:

$$P(S_{i,j})=k+\sum X_i+C_i+E_H+E_L+e_i \quad [1]$$

Where  $P(S_{i,j})$  is the probability of the employment status  $j$  (employed, ST unemployed or LT unemployed) of the individual  $i$ , who resides in country  $C_i$ .  $E_H$ , and  $E_L$  are dummy variables for individuals with high and low level of education respectively. The reference category is medium level education  $E_M$  (which is the largest category).  $K$  is the constant term,  $X_i$  is the set of explanatory variables, and the  $e_i$  is the error term.

The results are obtained through the use of a multinomial-logistic regression method (M-Logit). The M-Logit methodology provides  $(j-1)$  sets of coefficients comparing the percentage change between all categories of the dependent variable. The categories are not scaled, which implies assuming that LT unemployment is an independent category of ST unemployment.

M-Logit estimation requires the choice of a reference category for the dependent variable. In this analysis, ST unemployment is set as reference category. The choice of the reference category does not alter the results. ST unemployment has been chosen because it is the only category with direct transition to the other two categories; an individual can not transit from employment to LT unemployment without spending a year in ST unemployment. Hence, the two sets of estimated coefficients (employment



to ST unemployment, and LT unemployment to ST unemployment) capture the likelihood of transition between subsequent categories.

A number of changes are introduced to the basic specification of model [1] in order to estimate subject and national effects. In order to capture the national effect, the multiplicative term between the higher education dummy and the country dummies  $E_H * C_i$  is introduced.

$$P(S_{i,j}) = k + \sum X_i + C_i + E_H + C_i * E_H + E_L + e_i \quad [2]$$

The coefficient for the UK is used as the reference. The rest of the multiplicative coefficients show the country specific difference to this UK reference coefficient. Positive coefficients show a higher probability for that country while negative coefficients represent lower probabilities.

Finally, in order to estimate subject effects, we introduce 13 dummy variables ( $\sum A_i$ ) in Equation [1] representing the 14 academic subjects<sup>3</sup>. We use the largest academic subject [social studies, business and law] as the reference group.

$$P(S_{i,j}) = k + \sum X_i + C_i + E_H + \sum A_i + E_L + e_i \quad [3]$$

The coefficient for the higher education dummy  $E_H$  captures the effect on employability of the reference group against the medium education level. The individual effect of the remaining subjects is given by the sum of the coefficient for higher education and the parameter of each subject-dummy variable. Results for Equation [3] are listed in Table 5.

### 3. Level of education and unemployment in Europe.

The coefficients presented in Table 3 show how a unitary increase of the explanatory variable affects the chances of an individual being in each category of the dependent

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<sup>3</sup> We exclude *general programmes* from the analysis as the category is rare for graduates (0.7%) and the contents included rather ambiguous.

variable compared to ST employment. The results of the econometric analysis (Table 3) are robust ( $\chi^2 p > .000$ ) and most of the coefficients are statistically significant at the 1% level.

**[Insert Table 3 here]**

Starting with the level of education, we find that individuals holding academic degrees have higher chances (0.89) (than those having medium education) of being employed rather than ST unemployed. The results also show that graduates are less likely to be in LT unemployed than non-graduates. However, the impact of higher education on LT unemployment is more moderate (-.10). This means that higher education significantly improves the employment prospects of graduates in Europe, as it reduces both the likelihood and duration of unemployment. This is of great importance as even though there are several signals of diminished graduate employability across countries (OECD, 2006).

Regarding those who have low level of education, it is found that they have higher chances of employment (.51) than those with medium education. This might be explained by the positive relationship between education and reservation wages, where low educated individuals could be prepared to accept any type of work rather than remaining unemployed, whereas more educated individuals might have a higher reservation wage and reject some non satisfactory job offers (Bloemen and Stancanelly, 2001).

Gender is another factor that affects the labour market situation of the individual. It is found that males are better off in the labour market. In particular, females have both lower chances of employment (-.37) than males as well as higher chances of looking for work longer (.07). Regarding age-group, it is found that the older the individual is the higher are the chances of being employed rather than unemployed. However, older

individuals even though they have higher chances of employment, once they are found outside the world of work, it is more difficult to find employment and thus have higher chances of being long rather than short-term unemployed.

Finally, the labour market situation of the individual varies greatly according to the country of residence. In general UK residents are found to be in a better labour market situation than their counterparts from other countries. In particular, residents of countries other than the UK have lower chances of employment (with a few notable exceptions, i.e. Ireland, Italy, Luxemburg, Netherlands and Portugal) and they are more likely to stay unemployed for a longer time than UK residents. Labour market structures of the UK, where firing and hiring practices are more flexible (Nickell, 1997), may lay behind this result.

#### **4. National and field of study effects.**

##### *4.1. National effects.*

Table 4 shows the results of equation [2], including country\*higher education dummies. The coefficients for the remaining of explanatory variables included in Equation [2] are not listed in Table 4, as they remain practically unchanged to the estimation shown in Table 3. The coefficients of Table 4 assess the multiplicative effect between the higher education and country. For instance, a coefficient of -0.7 for Greece suggests that a graduate in Greece is more likely to be ST unemployed than employed, compared to a graduate in the UK, which is set as the reference category.

As a general comment, the results show that graduates in the UK have, in general, better chances of employment than short-term unemployment than graduates in other countries, as most of the country specific coefficients are negative. Further, the only countries where the employment prospects of graduates are found to be in some way

superior to the UK are Belgium and Ireland, regarding ST unemployment, and Germany, Ireland and Italy regarding LT unemployment. On the other hand, poor are the employment prospects for graduates from Greece, Portugal, Luxemburg and Sweden.

**[Insert Table 4 here]**

Countries where graduates do not have any significant differences with the UK are: Austria, Netherlands, and Spain. It is important to recall that coefficients are measuring the change on the likelihood on unemployment in relative terms. This means that a reduction on the rate from 10% to 5% in one country should bear the same estimate than a change from 2% to 1% in other country. This could explain the fact that high unemployment countries, such as Spain, and low unemployment countries such as the UK, are found to be similar in terms of the effect of degrees on employability. Additionally, for the particular case of Spain, the recent economic growth of its economy has reduced the unemployment rate in an unprecedented pace and, in particular, the unemployment of graduates (Gines et al, 2000).

Finally, there are two countries with some particular results. First is the case of Italy, where the effect of an academic degree on reducing ST unemployment is much lower than in the UK (-1.06), while the effect on reducing LT unemployment is greater than average (-.517). This evidence is in line with the study by Moscati and Rostan (2000) that identifies much worse employment prospects for recent graduates (25-29 years) than for the next segment of graduates (30-34). This suggests that the transition from the university to the labour market in Italy is slower than in the rest of Europe

The second particular case is Finland. In this country, the effect of an academic degree on the ST unemployment is stronger (.43) while the effect on LT unemployment is positive (.90), which means that graduates are more likely to be into

LT unemployment than in the rest of Europe. Kivinen et al (2000) stress the relevance that the discontinuity of the welfare state had on graduates employment in this country. The reform of the system started in 1970's, and appeared as a real structural issue in the 1990's, when rates of unemployment for graduates started to grow rapidly.

#### 4.2. Field of study effects.

Table 5 shows the results of the last M-logit analysis, from equation [3] that includes 13 academic fields of study dummies in the model, setting *social business & law* as reference category. Similar to the case of national effects, only the coefficients of the academic subjects are listed in Table 5.

**[Insert Table 5 here]**

The results show that most of the fields provide similar employment chances to the reference category. As expected, the effect of the reference category is very similar to the average effect of an academic degree shown in Table 3 (i.e. increase in the likelihood of employment (0.83) and a more moderate reduction (-0.13) of the likelihood of LT unemployment). Other fields of study that provide "average" employment prospects are: *foreign languages, physics and chemistry, mathematics and statistics* and *computer science*.

At an EU15 level, the disciplines that are most effective on reducing the chances of unemployment are: *health and welfare, education* and *engineering*. The analysis shows that *health and welfare* degrees provide an over the mean employability. For these graduates, the likelihood of being employed is 0.54 times higher than probability of the reference group, and LT unemployment is -0.11 times less likely. This result unveils the strong potential and market value of such degrees. It also offer a clear guidance on how universities should develop their future academic offer in

order to effectively meet the actual demand for skills. For the case of *education* and *engineering*, the positive effect is limited to the ST unemployment, and indeed, the results show that an European engineer is more likely to suffer LT unemployment (.162). On the contrary, degrees on *science, biology & environment*, and *computer use* create less employability on the ST than the reference category, but are better off avoiding LT unemployment.

Finally, there are some fields of study whose effect on the employment situation is very limited. First, a degree in *humanities & arts* is less effective (-.19), on securing employment, relative to the reference category. However, no significant differences are found for the likelihood of LT unemployment. Second, a degree in *agriculture & veterinary* is found to create over the average LT unemployed (.42) but the positive effect on reducing ST unemployment is equal to the effect of the reference category.

## **5. Discussion of results and conclusions**

This paper used data on over half a million observations across 15 European countries (EU15) in order to investigate the impact of an academic degree as well as the field of study on the incidence of unemployment. In general, it was found that higher education increases the chances of employment. Similarly, higher education was also found to have a (more moderate) impact on avoiding LT unemployment. These findings provide a positive view about graduates' employability at a time that many country specific studies suggest the opposite.

At European level (EU-15), the effect of higher education on LT unemployment is both less intense and more homogeneous than on ST unemployment. The estimated magnitude of the LT coefficients is smaller and the cross country differences are also minor in this category. In particular, only graduates from Italy and Ireland were

found to be better off regarding the incidence of long-term unemployment than the reference country (UK). On the opposite, only Finland is found to be in a worse position than UK.

The weak and homogeneous (across European countries) effect of higher education on LT unemployment comes by no surprise as degrees may be of special value in the early stages of the professional career, where any other labour market signal is unavailable (Spence, 1973). As tenure increases, workers' performance in the labour market may create other signals and the value of the academic degree may fade away. This could explain the more moderate impact of higher education on reducing LT unemployment, which is also much more frequent on older workers than in young workers (Machin and Manning, 1998).

It was also found that the impact of higher education varies across member states. The countries where the impact of higher education on employment (relative to short-term unemployment) was found to be stronger were: Finland, Belgium, and the UK. On the other hand, graduates of Southern European countries, such as Italy, Greece, and Portugal seem to face problems in the labour market as their degree is not as effective on increasing the likelihood of employment. Notably, similar evidence was found for the case for countries, such as France, Luxemburg, Germany and Sweden where the quality and prestige of the higher education system is internationally recognised.

This evidence reveals some problems delaying the transition from the university to the labour markets in these countries. The temporal disequilibrium that affects ST unemployment is usually associated with some type of inflexibility in the labour markets (Nickell, 1997; Siebert, 1997). We believe that this explanation is more plausible than the effect of structural issues such as the lack of correlation between higher education and superior skills, that should also affect to LT unemployment, and

this is not what the analysis shows.

The observed cross national differences on the likelihood of employment may be explained by the level of labour market stratification. Shavit and Müller (1998) argue that the more stratified and more specific education is, the stronger the association between education and the employment status. According to this, transition to the labour market should be more successful in countries where stratification is higher. Gangl (2003) finds stronger stratification and specificity in Northern continental European countries and our results are in line with this findings, as we found that the risk of ST unemployment is generally higher in (less stratified) Southern European countries.

Turning to the field of study, the analysis revealed significant employment differences across different disciplines. In general, the majority of the fields share the “average” effect on reducing both the likelihood of ST and LT unemployment, with the effect on the latter being weaker. However, some subjects appear to be particularly effective on avoiding ST unemployment spells, these are: *education, engineering, health & welfare* and *services & tourism*. Others, instead, are particularly effective on preventing LT unemployment: *sciences, biology & environment, computer use* and *health and welfare*.

Interestingly, many of the degrees reducing LT unemployment, are in a worse position than average when avoiding ST unemployment- *sciences, biology and environment, computer use* .Higher ST unemployment and lower LT unemployment may be caused by the geographical distribution of the demand for these type of skills. Audretsch and Feldman (1996) show that some industries, requiring some specific knowledge, may concentrate in regional productive clusters. These clusters could be located, for example, in capital cities (i.e R&D or financial intermediation) or close to



some strategic natural resources. The geographical dispersion of the demand for skills may then slow down the job matching period and create some frictional ST unemployment for graduates from these areas.

Worryingly, *engineering* and *agriculture & veterinary* appear to generate over the mean LT unemployment, which may be the sign of some structural economic problems usually related with endemic labour market rigidities in Europe (Siebert 1997). In the case of *engineering*, the results may be explained by two labour market features described in the review of the manufacturing industry in Europe by Crouch et al (2001). First, strong geographical dispersion of the primary and secondary sector may help engineers to find jobs when leaving the university. The initial job matching period is therefore shortened and ST unemployment is lower in relation to other degrees. Second, the progressive grow of the tertiary sector and, chiefly, the globalisation of manufacturing may have affected negatively to the professional prospects of some engineers. Some industries, intensive in employing engineers, such as mining or ship building, have recently experienced periods of strong recession, which have surely affect the job prospects of many professionals.

Our findings could be of special interest for policy makers. The social request for policies to adapt higher education to the challenge of graduate's employability has intensified across Europe (Hulsman and Kaiser, 2002). Policy makers have taken this social demand into account and are now implementing the most ambitious programme of convergence in the history of European higher education (Bologna Process). This project of harmonisation affects to the curricular development, mobility schemes, and programmes. However, the reports of the Bologna Following Group (BFG) stress that the harmonisation of the higher education area is proven to be a difficult challenge (BFG, 2007). National differences on cultural, institutional and socioeconomic factors

make the convergence of European higher education very difficult (Heinze and Knill, 2008). Nevertheless, the identification of labour market trends across countries and fields of study, as were highlighted in this paper, could facilitate the orientation of such policies.

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**Table 1. Sample and Unemployment rates across Europe.**

<i>Country</i>	Total Sample				Graduate Sample			
	Obs.	Unemployment rate			%	Unemployment rate		
		ST	LT	Total	H.E.	ST	LT	Total
Austria	34,343	4.4	1.5	5.9	14.0	1.5	0.5	2.0
Belgium	19,098	4.8	5.6	10.4	27.1	2.3	2.2	4.5
Denmark	9,453	4.6	3.2	7.8	30.7	3.4	3.0	6.4
Finland	31,815	8.7	2.1	10.8	27.5	2.8	1.6	4.3
France	55,905	4.9	5.1	10.0	22.2	3.6	2.8	6.5
Germany	78,118	5.6	6.8	12.4	20.9	2.9	3.3	6.2
Greece	50,448	4.2	5.6	9.8	16.0	3.7	4.0	7.7
Ireland	59,414	2.9	1.5	4.5	24.2	1.9	0.5	2.3
Italy	114,930	2.9	4.2	7.0	9.67	2.9	1.2	4.1
Luxemburg	15,004	2.7	1.2	3.9	21.3	2.0	1.0	2.9
Netherlands	83,543	3.1	2.1	5.2	26.1	1.6	1.2	2.8
Portugal	31,287	3.7	3.5	7.2	9.65	2.4	2.0	4.5
Spain	101,259	6.4	3.5	9.9	24.3	4.4	2.7	7.0
Sweden	36,241	5.9	1.1	6.9	25.5	3.0	0.7	3.7
UK	74,030	4.0	1.1	5.1	25.5	2.1	0.6	2.7
<b>Total</b>	<b>775,700</b>	<b>4.5</b>	<b>3.4</b>	<b>7.9</b>	<b>20.7</b>	<b>2.8</b>	<b>1.9</b>	<b>4.7</b>

Source: EU-LFS micro data 2005, (2<sup>nd</sup> quarter)

Notes: The total sample included individuals with any level of qualification. The sample of graduates included individuals with high level of education only. H.E. is the share of graduates in the total population of each country.



**Table 2. Explanatory variables: Sample frequencies**

Variables	Frequency	Variables	Frequencies
<i>Gender</i>	<i>[% of total sample]</i>	<i>Higher education subject [% of graduates]</i>	
Female	50.8	No applicable	
Male	49.2	General programmes	0.7
<i>Marital status</i>		Education science	12.6
Single	37.4	Humanities & arts	8.2
Married	54.5	Foreign languages	2.5
Other	8.1	Social, business & law	27.7
<i>Age group</i>		Science	1.0
15-24	18.3	Biology & Environment	2.1
25-34	18.9	Physics & chemistry	2.6
35-44	23.2	Mathematics & statistics	1.2
45-54	21.1	Computer science	2.3
55+	18.3	Computer use	0.4
<i>Education level</i>		Engineering	16.1
Low	37.9	Agriculture & veterinary	2.16
Medium	41.2	Health & welfare	15.5
High	20.7	Services & tourism	3.9

Source: EU-LFS micro data, 2005 (2<sup>nd</sup> quarter)

**Table 3. The effect of an academic degree on unemployment: European Level.**

<i>Variables</i>	<i>P(employment   ST unemployment)</i>		<i>P(LT   ST unemployment)</i>	
Higher education	.89**	[.020]	-.10**	[.030]
Medium education	§		§	
Lower education	.51**	[.015]	.07**	[.022]
Female	-.37**	[.013]	.07**	[.020]
Single	-.12**	[.029]	-.08*	[.039]
Married	§		§	
Other	.35**	[.018]	-.29**	[.027]
15-24	-.92**	[.019]	-.80**	[.030]
25-34	§		§	
35-44	.46**	[.024]	.36**	[.030]
45-54	.81**	[.031]	.72**	[.034]
55+	.95**	[.031]	1.0**	[.042]
Austria	-.00	[.034]	.25**	[.077]
Belgium	-.26**	[.047]	1.4**	[.071]
Denmark	-.38**	[.061]	.78**	[.096]
Finland	-.86**	[.032]	-.16**	[.068]
France	-.22**	[.032]	1.27**	[.055]
Germany	-.41**	[.028]	1.48**	[.050]
Greece	-.11**	[.035]	1.54**	[.057]
Ireland	.42**	[.037]	.70**	[.067]
Italy	.37**	[.032]	1.62**	[.054]
Luxemburg	.30**	[0.06]	.43**	[.121]
Netherlands	.21**	[.033]	.90**	[.059]
Portugal	.31**	[.043]	1.26**	[.069]
Sweden	-.35**	[.027]	.74**	[.052]
Spain	-.47**	[.033]	.54**	[.077]
United Kingdom	§		§	

*Notes: no. of obs.: 542,512, Log-Likelihood: -164073.57, model Chi2 P> 0.000, standard errors in the parentheses*

*\* statistically significant at 95% level \*\* statistically significant at 99% level*

**Table 4. National effects on graduates' unemployment (M-logit)**

<i>Country</i>	<i>Employment</i>   <i>ST U</i>	<i>LT</i>   <i>ST U</i>
Austria	.173 [.146]	-.209 [.297]
Belgium	.228* [.125]	-.169 [.197]
Denmark	-.406** [.141]	.334 [.224]
Finland	.438** [.095]	.906** [.178]
France	-.304** [.083]	-.189 [.150]
Germany	-.254** [.079]	-.280* [.142]
Greece	-.703** [.091]	-.194 [.155]
Ireland	-.150 [.095]	-.705** [.198]
Italy	-1.06** [.087]	-.517** [.153]
Luxemburg	-.454** [.168]	.160 [.298]
Netherlands	-.113 [.087]	.009 [.158]
Portugal	-.502** [.143]	-.111 [.226]
Sweden	-.425** [.070]	.155 [.138]
Spain	.004 [.092]	.265 [.206]
<i>United Kingdom [Reference]</i>	<i>1.15** [.059]</i>	<i>-.088 [.124]</i>

Notes: \* statistically significant at 95% level \*\* statistically significant at 99% level , no of obs:542,512

Model Chi<sup>2</sup>: 000 , Log-Likelihood: -164073.57, standard errors in the parentheses

**Table 5. The effect of the academic subject on unemployment (M-Logit)**

<i>Academic Subject</i>	<i>Employment  ST unempl</i>	<i>LT ST unemployment</i>
Education science	.422** [.055]	.009 [.080]
Humanities & arts	-.194** [.041]	.095 [.060]
Foreign languages	.009 [.092]	-.010 [.130]
Science	-.152* [.085]	-.214** [.102]
Biology & Environment	-.304** [.103]	-.264** [.120]
Physics & chemistry	-.005 [.111]	.058 [.163]
Mathematics & statistics	.126 [.164]	-.071 [.247]
Computer science	-.157* [.078]	.380 [.110]
Computer use	-.508** [.096]	-.201** [.056]
Engineering	.337** [.068]	.162** [.036]
Agriculture & veterinary	-.010 [.025]	.423** [.094]
Services & tourism	.076* [.035]	.099* [.053]
Health & welfare	.547** [.039]	-.111* [.061]
<i>Social, business &amp; law</i>	<i>.834** [.022]</i>	<i>-.134** [.034]</i>

*[Reference]*

Notes: \* statistically significant at 95% level \*\* statistically significant at 99% level , no of obs:542,512

Model  $\chi^2:000$  , Log-Likelihood: -163707.88