

THE EFFECTS OF THE LEVEL OF EDUCATION ON YOUTH UNEMPLOYMENT DURATION*

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The aim of this paper is to determine how education has an effect on the probability of young unemployed people to find a job, by using a regional dataset provided by the Public Employment Service from the region of Asturias for the period 2009-2012. The outcomes show that university degrees do not make employability easier, in general, during the recent economic crisis. Moreover, vocational training increases the probability of getting a job for both genders, whereas the knowledge of English and French languages has a positive effect mainly in the case of women. Finally, unemployment benefits discourage unemployed from getting a new job, mainly for women.

Key words: level of education, youth unemployment.

JEL classification: J21, J24.

Spain shows a high level of youth unemployment (population between 16 and 25 years old) compared to the European average. This gap was already present before the recent economic crisis. However, it is because of this crisis that youth unemployment proportions have reached alarming levels. Particularly and during the hardest times of the crisis, youth unemployment rate reached around 55% of working population both in Spain and in Asturias (according to the Economically Active Population Survey-EPA for the third quarter of 2013) versus 23.5% of the European average (as provided by EUROSTAT). Such figures further doubled the values corresponding to the immediate moment prior to the outbreak of the economic crisis (21.8% in Spain and 22.2% in Asturias during the first quarter of 2008).

It has been believed that this high youth unemployment rate is partly due to the presence of a remarkable educational mismatch for this segment of the population, which was worsened by the real estate boom period prior to the crisis. During this

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booming phase, many young people dropped school to work in low qualified jobs, especially in the construction sector. When the crisis burst and the sector dramatically reduced its demand, many young people became unemployed and without enough education to successfully apply for other alternative jobs. Particularly, job destruction in the construction sector between 2008 and 2012 meant 41% out of the total jobs lost by young male in Spain. Additionally, the greatest job destruction was found in low or intermediate qualified sectors (Rocha, 2013). In summary, the problem of the falling job demand that Spain underwent during the economic crisis was worsened by the incorporation of a group of low qualified young unemployed people who urgently needed to be qualified again. Therefore, it is interesting to know how education has an effect on the young people probability of leaving the unemployment and find a job. Nevertheless, there are not so many papers that analyse this topic. In an article published in 1995, Ahn and Ugidos, used data from the 1985 Living and Working Conditions Survey and concluded that university education “substantially increases the probability of getting a job in case of women, but the education variable does not significantly affect the probability of being employed in case of men” (p. 264)¹. These favourable differential effects for women were also observed by Albert, Toharia and Davia (2008) in a paper based on information regarding 16-35 year-old young people corresponding to the 2000 European Labour Force Survey. On the other hand, Salas-Velasco (2007) revealed great differences between northern and southern European countries (Spain and Italy) in terms of university students’ probability of getting their first job in a paper that compares several European countries. Such probability is clearly lower in southern countries.

Therefore, and despite most public opinion has spread the idea that university education does not guarantee employability or, in other words, that the University “manufactures unemployed people”, there are not enough recent papers available so as to allow us to give an answer to this issue at national or regional levels. In this sense, this research estimates the effects of different levels of education on a young unemployed person’s probability of getting a job based on a sample of unemployed people in the Principality of Asturias. When defining variables, special attention is given to university education, while distinguishing the effects of the different fields of knowledge on employability: arts, health, science, humanities, social and legal sciences and technical degrees.

The database has been provided by the Public Employment Service of the Principality of Asturias (SEPEPA) for 2009-2012, and contains detailed information on the level of education and on the time young job seekers have been unemployed. As it can be understood, this analysis seems to detect certain level of mismatch between

(1) See, Ahn and Ugidos (1995a). On the other hand, there are many papers that have used regional databases or those provided by universities. We may mention, for example, the paper by Lorences, Felgueroso and García (2005) on University of Oviedo graduate employability, García Laurre (2000) in case of Navarra, Gil (1999) for the Canary Islands, Vidal *et al.* (2001) for the case of León and Albert, García-Serrano and Toharia (2008) for the University of Alcalá. García Montalvo (2001) paper turns out to be a very interesting precedent, where the Spanish situation is compared to that of other European countries. Finally, González-Betancor, Dávila and Gil (2004) and López-Mayán and Nicodemo (2014) carried out their own research in relation to vocational training graduate employability.

university studies and the Asturian labour market during the recent economic crisis. This paper does not only analyse the level of education, but also the effects of age, working experience, nationality, foreign language command, the industry the person is seeking a job in and the unemployment benefits this person may receive.

The paper is structured as follows. Section 1 describes the database used in the research. Section 2 estimates a duration model to know the determinants of the probability of getting a job. Finally, section 3 summarizes the main conclusions of the research.

1. DATABASE DESCRIPTION

1.1. The data

In order to study the effects of education on the length of young people unemployment periods, this research shall use the databases provided by SEPEPA, in relation to the job seeker records and labour contracts signed. The Job Seekers file registered at Public Employment Offices provides information on all individuals that are presented as job seekers on the last day of each month. Out of all seekers, we have selected those registered unemployed individuals who presented a new employment request between March and September 2009, and who belong to the traditionally defined group of young people. In this respect, while the age of 25 is established by the Economically Active Population Survey as the age limit to calculate youth unemployment rate, this research has used two different age ranges in order to define the group of young people; those between 16 and 25 years and those between 16 and 30 years, thus carrying out different estimates for each case. Defining young unemployed people as those up to 30 years old comes from the need to count on a period of time long enough for university graduates (some finish their studies close to the age of 25) to register their employment requests at the Public Employment Service, as the rest of younger unemployed people with lower level of education do. Every member of this group was followed up on a monthly basis until October 2012. This file provides personal data such as age, gender, nationality, working experience, level of education, language command, the industry the person is seeking a job in and the unemployment benefits this person may have received.

On the other hand, thanks to the Recorded Contracts file (which is linked to the previous one by means of a common identification code) we know the specific date on which the person found a job and stopped, thus, the employment request. This allows calculating the duration (in days) of the unemployment period underwent by the individual².

The first of the two samples used in this research (young people between 16 and 25 years) is made up of 15,510 unemployed people out of whom 6,795 are women and 8,715 are men. The second one (young people between 16 and 30 years) comprises 28,302 unemployed people, being 13,131 women and 15,171 men. As it has been pointed out, they are young people who presented a new employment request

(2) In relation to the contract file, we must point out that it only offers information on working contracts signed, so that it excludes those individuals who became civil servants (quite a few during the crisis period for sure) and self-employed.

between March and September 2009 (that is, the vast majority in spring or summer that year). Alternatively, we could have used the sample of all young people who are already registered as unemployed instead of the new ones. However, a sample like this would be less appropriate for the targets the research is aimed at, because the estimated effects of education on their probability of leaving the unemployment could be influenced by the existence of long previous unemployment periods underwent during each and every reference months. If all unemployed people considered in the research acquired (for the first time or once again after a working period) this condition during the months analysed, there would not be an immediately previous unemployment record that could negatively affect exiting this situation, due to hysteresis, professional decapitalization and adaptation processes.

As referred previously, this database allows following up all young unemployed people on a monthly basis. This way, we may know when they find a job. For example, for the 16-25 year-old young people sample, out of the total 8,715 (6,795) male (female) who presented a new employment request between March and September 2009, 7,064 (5,475) found a job between April 2009 and October 2012.

1.2. The variables

In order to know the effect of the determinants of the probability of getting a job and, particularly, the role of education, this research estimates duration and survival models. These models calculate the probability of an individual getting a job, which is conditioned by the time such person has been looking for a job. The variables included in the model meant to explain unemployment duration are the following:

a) Personal characteristics (age and nationality)

Before dealing with age and nationality, it is necessary to point out that the characteristic “gender” is not included among the explanatory variables, as it has been decided to split the sample of unemployed people into two subsamples, men and women, with separated estimates for each case. Neither the behaviour of both genders in the labour market nor the way firms treat workers from both genders has traditionally been considered homogenous. There is a lot of literature on labour discrimination and on participation differences based on these facts [see for example Becker (1985) and Blau, Winkler and Ferber (2014)]. If we focus on the analysis of the effects of education on the probability of leaving the unemployment, the obtained outcome for men and women may also be different mainly for two reasons. On the one hand, some degrees show certain level of specialisation by virtue of the gender (men and women are not equally distributed among university degrees. For example, the percentage of women in health sciences is higher). On the other hand, companies may also show their own preferences in terms of gender when hiring certain professional profiles. In this sense, carrying out the corresponding estimates by gender separately will allow discovering which levels of education better favour man and woman employability.

As far as the variable “age” is concerned, this is classified into certain intervals by means of dummy variables (age 16-20; age 21-25; and, for a wider sample, additionally, age 26-30). Age is considered when the individual registers as a new job seeker (it does change along the time). The probability of getting a job is initially expected to be higher for the eldest young people.

On the other hand, the “Spanish” variable is included in order to measure the effect of the nationality of the worker. This variable takes value 1 if the individual is Spanish and 0 otherwise. This variable is meant to let us know to what extent foreign unemployed young people face much more difficulties to get a job than the Spanish ones, given other personal characteristics.

b) Working experience

The database used shows information on the number of months of working experience in the six job positions the individual may state in his employment request. If the unemployed had more than six jobs, working experience would be underestimated. Nevertheless, given that the sample used is made up of young people with little working experience, this variable constitutes a good approximation to the total experience of the individual. Given the effect of the age, greater working experience (specific human capital) is expected to contribute to increase the probability of getting a job in any case.

c) Level of education

The level of education stated in the employment request is widely broken down. Generally speaking, an improvement of youth employability is expected as the level of education increases. The higher opportunity costs faced by qualified workers during the unemployment period shall cause a more intensive job search among graduates. However, it may also happen that labour demand is relatively limited for certain degrees (in relation to an increasingly greater supply), therefore we should expect data to determine the real effect of education on employability.

Most of previous papers refer to the education level through highly general categories, for example, high, medium and low qualification [García-Pérez (1997)] or, at its best, university studies are broken down into wide fields of knowledge [Albert, Toharia and Davia (2008)]. In this search, the reference category shall be to have “Advance levels (Baccalaureate) or less”. Given this reference category, it may be possible to know the effect of the following variables on the employability: “intermediate vocational training”, “higher vocational training” and “university education”. Within this last category six fields of knowledge are distinguished: “art university studies”, “health sciences”, “social and legal sciences”, “sciences”, “humanities” and “technical degrees”.

d) Language command

The database shall also provide information on foreign language command among unemployed. Four levels of language command are distinguished (none, elementary, intermediate and high) for the three relevant languages: English, French and German. The reference category in each case shall be not to have any level. It is undoubtedly expected that a higher knowledge of foreign languages shall increase the probability of getting a job.

e) Activity sector

The sector the individual is seeking a job in (where he may or may not accumulate certain working experience) is included as an item to control areas related to companies’ demand for labour. For example, the fact of applying for a job in a par-

particular sector would contribute to significantly improve the employability of the individual, should this sector be undergoing a booming phase. On the contrary, some sectors may exercise an opposite effect. Sectors are classified into four main categories: “agriculture”, “industry”, “construction”, and “services”, being the reference category “no sector is stated”.

f) Unemployment benefits and subsidies

Job seeker database offers information on the unemployment benefits and subsidies received by the unemployed person. Two dummy variables may therefore be defined: “contributory” (which comprises both contributory benefits and agricultural contributory ones), and “others” (which include subsidies and Active Insertion Income)³. These variables take value 1 if the unemployed person receives any benefit or subsidy of the type referred in each case. The reference category is “no benefit or subsidy is received”.

Benefit and subsidy expected effect on the probability of leaving the unemployed condition is not clearly obvious. The theory establishes that getting a benefit rises the reservation wage of the individual, which contributes to postpone exiting unemployment. However, it is also true that receiving unemployment benefits allows financing more efficient job search processes, thus facing travel or employment opportunity analysis costs which could be impossible to meet without such benefits. Generally speaking, empirical evidence indicates the existence of a negative relation between the fact of receiving unemployment benefits and the probability of getting a job, so that such likelihood will decrease because of the fact of receiving such benefit [see, for example, Alba and Freeman (1990); Ahn and Ugidos (1995b); Alba (1999); Bover, Arellano and Bentolila (2002); and Alba, Arranz and Muñoz (2007), for the Spanish case]. Nevertheless, there are also other papers which do not see this significant relation between both events [see, Hujer and Schneider (1989), in the German case; or Groot (1990), in the Dutch case]; and even some [as Wadsworth (1991), for the British case] state the opposite effect (the fact of receiving benefits may contribute to reduce unemployment duration). Recent papers published for the Spanish case state that measuring benefit effects mainly depends on the type, the duration and the amount of benefit received. Therefore, based on a factor mix, their effects will be more or less intense [see, for example, Arranz and Muro (2004); Arranz, García-Serrano and Toharia (2010); and Arranz and García-Serrano (2013)].

g) Seasonality control

The model includes a dummy variable to control whether the individual begins his unemployment period in a summer month (July, August and September) or in spring one (March to June). This variable allows us to take into account the presence

(3) Contributory benefits are the ones received when being made redundant, when terminating the contract, etc., whenever the worker has covered the minimum unemployment contribution period. Agricultural contributory benefits are those received by temporary workers included in the Special Social Security Agricultural System. Subsidies are assistance benefits, which normally allow the unemployed to receive some financial aid once the contributory benefit has ended. Finally, the Active Insertion Income is an assistance program for those unemployed people with special financial needs, who find it difficult to get a job.

of a potential seasonality that may affect unemployed people in a different way depending on the moment when they become unemployed. We should consider that the selected months do not exactly correspond to spring or summer (some of the individuals may have become unemployed during the first 21 days of March or the last 10 of September), but as a way to make things easier, all job requests are considered to belong to one of these two seasons.

Tables 1 and 2 show variable descriptive statistics for female and male samples. Referring to female samples in the first place (Table 1), we see that the average duration of unemployment periods is 309.5 days in case of 16-25 year-old young women (308.8 for those between 16 and 30 years); both groups lack prior working experience, particularly the youngest ones (11.2 months versus 19.9 when we take a wider sample); and around 93% of unemployed women are Spanish in both cases. As far as benefits are concerned, contributory ones are more frequent (17.6% for the youngest and 26.3% among unemployed between 16 and 30 years), followed at a great distance by the rest of benefits (subsidies and Active Insertion Income), between 6.1% and 6.8%, depending on the sample. In relation to the education level, it must be pointed out the high percentage of young people who only completed advanced levels or less: particularly, 64.5% of 16-25 year-old unemployed women and 58.4% for 16-30 year-old. Only 15% of women from the first sample have university studies, versus 21.6% from the second one. In all cases, university graduates (5-years or 3-years) in legal and social sciences prevail among unemployed women with university studies. A command of languages is not either frequent. English stands out as it is spoken at a certain level by 36.5% of 16-25 year-old unemployed women (40.7% for the 16 and 30-year group). French and German knowledge levels are almost irrelevant.

In case of men (Table 2), the greatest differences compared to women are education-related aspects. This way, 82.0% of unemployed men who are 25 years or less completed advanced levels or less. This amount decreases to 78.7% for the 16-30 year-old sample. In other words, the education level is much lower in case of young men. In fact, 3.8% of registered unemployed people between 16 and 25 years completed university studies (6.5% in case of 16-30 year-old men)⁴. Something similar applies to foreign language command. Particularly, only 17.2% of the youngest expresses to have some command of English (21.3% of the group between 16 and 30 years). Finally, it must be also pointed out the fact that receiving contributory benefits is much more frequent among men. Therefore, the percentage of those receiving benefits rises to 26% for 16-25 year-old men and 34% for 16-30 year-old men.

(4) There is no doubt that the reduced magnitude of this figure may indicate that the sample of registered unemployed with university studies is not completely at random. In fact, if these percentages are compared to the ones provided by the Economically Active Population Survey for the Spanish case (the data for Asturias is no available), we would observe that 17.7% of 16-29 year-old unemployed men have university studies (the data corresponds to the first quarter of 2014 and it is more than 10 points higher than the one obtained for the SEPEPA sample). In case of women, this figure rises to 29.5% (8 points higher). It must be taken into account that the fact of registering in the Public Employment Service is voluntary. This is an option that many university graduates may not use in case they find a job immediately after completing their studies, they do not trust the Public Employment Service as a means to find a job, or they just emigrate to find a job that matches their qualification. This lack of randomness further explains the final conclusions that may be reached from this research.

Table 1: VARIABLE DESCRIPTIVE STATISTICS (WOMEN SAMPLE)

	Between 16 and 25 years		Between 16 and 30 years	
	Mean	St. Dev.	Mean	St. Dev.
<i>Unemployment duration (days)</i>				
Days unemployed	309.478	323.070	308.844	326.633
<i>Personal characteristics</i>				
Age 16-20	0.250	0.433	0.129	0.336
Age 21-25	0.750	0.433	0.388	0.487
Age 26-30	–	–	0.483	0.500
Spanish	0.934	0.247	0.922	0.269
<i>Working experience (months)</i>				
Experience	11.255	15.762	19.916	24.811
<i>Level of education</i>				
Advanced levels or less	0.645	0.478	0.584	0.493
Vocational training Medium	0.089	0.285	0.088	0.284
Vocational training Higher	0.114	0.318	0.112	0.325
<i>University Studies</i>				
Arts	0.002	0.042	0.002	0.045
Health Sciences	0.053	0.225	0.048	0.213
Legal-Social Sciences	0.073	0.260	0.110	0.313
Technical Degrees	0.011	0.104	0.016	0.126
Humanities	0.005	0.072	0.016	0.127
Sciences	0.007	0.082	0.015	0.122
<i>Language command</i>				
No English spoken	0.635	0.481	0.593	0.491
Elementary English	0.166	0.372	0.173	0.378
Intermediate English	0.160	0.366	0.181	0.385
High English	0.039	0.193	0.054	0.225
No French spoken	0.892	0.310	0.890	0.313
Elementary French	0.056	0.230	0.056	0.230
Intermediate French	0.041	0.199	0.041	0.197
High French	0.010	0.101	0.014	0.116
No German spoken	0.985	0.120	0.978	0.147
Elementary German	0.010	0.102	0.015	0.122
Intermediate German	0.003	0.053	0.004	0.066
High German	0.001	0.036	0.003	0.052

Table 1: VARIABLE DESCRIPTIVE STATISTICS (WOMEN SAMPLE) (continuation)

	Between 16 and 25 years		Between 16 and 30 years	
	Mean	St. Dev.	Mean	St. Dev.
<i>Activity sector</i>				
No sector stated	0.193	0.395	0.128	0.334
Agriculture	0.003	0.058	0.005	0.069
Industry	0.030	0.169	0.038	0.191
Construction	0.011	0.104	0.016	0.124
Services	0.763	0.425	0.814	0.389
<i>Unemployment benefits and subsidies</i>				
None	0.762	0.426	0.669	0.471
Contributory	0.176	0.381	0.263	0.440
Other	0.061	0.240	0.068	0.252
<i>Quarterly summer dummy</i>				
Summer	0.483	0.500	0.478	0.500
<i>No. of Observations</i>	6,795		13,131	

Source: Own elaboration.

Table 2: VARIABLE DESCRIPTIVE STATISTICS (MEN SAMPLE)

	Between 16 and 25 years		Between 16 and 30 years	
	Mean	St. Dev.	Mean	St. Dev.
<i>Unemployment duration (days)</i>				
Days unemployed	314.590	309.985	304.071	305.048
<i>Personal characteristics</i>				
Age 16-20	0.319	0.466	0.183	0.387
Age 21-25	0.681	0.466	0.391	0.488
Age 26-30	–	–	0.425	0.494
Spanish	0.928	0.259	0.912	0.284
<i>Working experience (months)</i>				
Experience	14.884	17.992	24.048	27.394

Table 2: VARIABLE DESCRIPTIVE STATISTICS (MEN SAMPLE) (continuation)

	Between 16 and 25 years		Between 16 and 30 years	
	Mean	St. Dev.	Mean	St. Dev.
<i>Level of education</i>				
Advanced levels or less	0.820	0.384	0.787	0.384
Vocational training Medium	0.080	0.272	0.079	0.272
Vocational training Higher	0.063	0.242	0.069	0.242
<i>University Studies</i>				
Arts	0.001	0.028	0.001	0.031
Health Sciences	0.007	0.085	0.008	0.086
Legal-Social Sciences	0.013	0.112	0.027	0.162
Technical Degrees	0.013	0.111	0.021	0.142
Humanities	0.002	0.040	0.004	0.061
Sciences	0.002	0.043	0.005	0.070
<i>Language command</i>				
No English spoken	0.828	0.378	0.786	0.410
Elementary English	0.079	0.270	0.090	0.287
Intermediate English	0.071	0.257	0.091	0.288
High English	0.022	0.145	0.032	0.177
No French spoken	0.961	0.194	0.956	0.206
Elementary French	0.022	0.145	0.023	0.150
Intermediate French	0.011	0.103	0.013	0.112
High French	0.007	0.082	0.008	0.093
No German spoken	0.994	0.076	0.991	0.093
Elementary German	0.003	0.059	0.006	0.074
Intermediate German	0.001	0.039	0.002	0.043
High German	0.001	0.030	0.001	0.036
<i>Activity sector</i>				
No sector stated	0.146	0.353	0.099	0.298
Agriculture	0.011	0.107	0.013	0.112
Industry	0.150	0.357	0.154	0.361
Construction	0.244	0.429	0.274	0.446
Services	0.449	0.497	0.461	0.498
<i>Unemployment benefits and subsidies</i>				
None	0.699	0.459	0.612	0.487
Contributory	0.260	0.439	0.340	0.474
Other	0.041	0.198	0.048	0.213
<i>Quarterly summer dummy</i>				
Summer	0.462	0.499	0.461	0.498
<i>No. of Observations</i>	8,715		15,171	

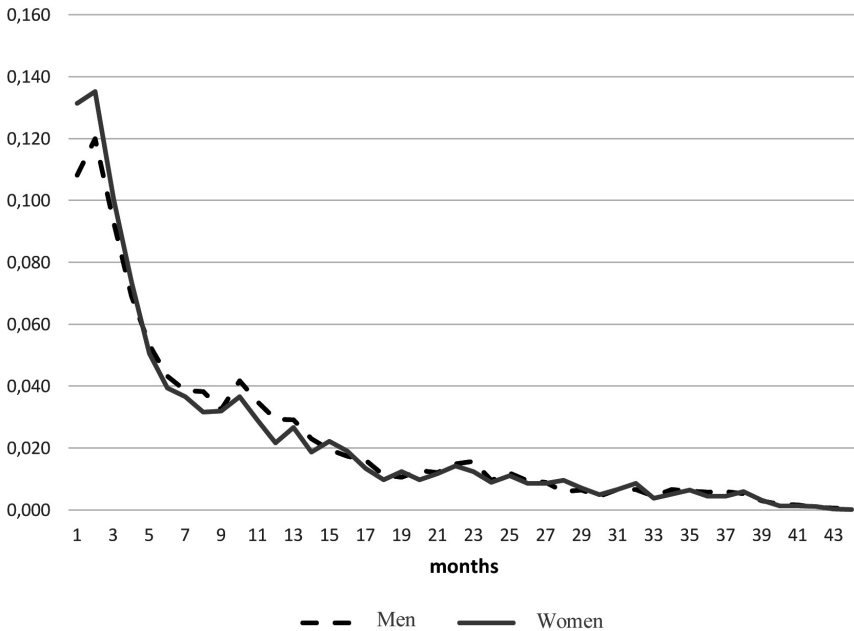
Source: Own elaboration.

2. UNEMPLOYMENT DURATION MODEL ESTIMATE

Duration models allow estimating a person's probability of getting a job, limited by the time he has been searching for a job. This paper shall estimate a one-exit model, where we analyse those elements determining the probability of getting a job versus not getting it, regardless the alternative situation to employment (inactivity or remaining unemployed)⁵.

There are lots of possible probability distributions for the estimation of a model that explains the probability of leaving the unemployment based on a set of variables. In this paper, unemployment exit rates show a steady decreasing trend (Figure 1) so that the most appropriate model is the one proposed by Gompertz (Stata Corp., 2001)⁶.

Figure 1: EMPIRICAL UNEMPLOYMENT EXIT RATES (KAPLAN-MEIER)
(SAMPLES OF MEN AND WOMEN BETWEEN 16 AND 25 YEARS)



Source: Own elaboration.

(5) One of the most popular models used is the Cox proportional hazard model [Cox (1972)], due to its great flexibility, as it does not impose any specific type of behaviour to the base hazard function, contrary to what happens in parametric models. Jenkins (2005) can be checked for a thorough duration model reference, and Stata, Cleves *et al.* (2010) as an example of timing.

(6) It would also be appropriate to estimate the Weibull model. There have been some attempts to estimate this model for all samples without reaching satisfying outcomes due to convergence problems.

On the other hand, this type of samples always present a certain bias derived from the presence of an unobserved heterogeneity. In order to correct this problem, we decided to estimate the Gompertz model while incorporating as a potential unobserved heterogeneity, the one corresponding to a Gamma variable with average 1 and variance θ , as well as the one corresponding to an Inverse Gaussian variable with average 1 and variance $1/\theta$ (Jenkins, 2005). The goodness of fit measurements are gathered in Table 3.

Table 3: GOODNESS OF FIT MEASUREMENTS (GOMPERTZ MODEL ESTIMATE) AND UNOBSERVED HETEROGENEITY TEST

	Women Between 16 and 25 years		Women Between 16 and 30 years	
	<i>Gompertz with gamma heterogeneity</i>	<i>Gompertz with inverse Gaussian heterogeneity</i>	<i>Gompertz with gamma heterogeneity</i>	<i>Gompertz with inverse Gaussian heterogeneity</i>
Chi ²	410.31 p = 0.000	418.72 p = 0.000	637.61 p = 0.000	651.68 p = 0.000
Log. Likelihood	-10,507.781	-10,502.798	-20,580.284	-20,580.732
AIC	21,065.6	21,075.56	41,222.57	41,223.46
H ₀ :β = 0	$\bar{\chi}^2 = 148.07$ p = 0.000	$\bar{\chi}^2 = 158.04$ p = 0.000	$\bar{\chi}^2 = 309.20$ p = 0.000	$\bar{\chi}^2 = 308.30$ p = 0.000
No. of Observations	6,795		13,131	
	Men Between 16 and 25 years		Men Between 16 and 30 years	
	<i>Gompertz with gamma heterogeneity</i>	<i>Gompertz with inverse Gaussian heterogeneity</i>	<i>Gompertz with gamma heterogeneity</i>	<i>Gompertz with inverse Gaussian heterogeneity</i>
Chi ²	522.09 p = 0.000	494.58 p = 0.000	724.44 p = 0.000	690.91 p = 0.000
Log. Likelihood	-12,925.468	-12,927.481	-22,937.703	-22,952.112
AIC	25,910.94	25,914.96	45,937.41	45,966.22
H ₀ :β = 0	$\bar{\chi}^2 = 114.22$ p = 0.000	$\bar{\chi}^2 = 110.20$ p = 0.000	$\bar{\chi}^2 = 179.24$ p = 0.000	$\bar{\chi}^2 = 150.42$ p = 0.000
No. of Observations	8,715		15,171	

Source: Own elaboration.

A commonly used selection criterion of the best model is the Akaike Information Criterion (AIC). This criterion proposes penalising each likelihood logarithm so that it shows the number of parameters being estimated for each model. Although the model that commonly presents the best fit is that whose likelihood logarithm takes the highest value, it is always preferable to choose the one that shows the lowest AIC value. Therefore, following the data stated in Table 3, the best estimates are those that include Gamma heterogeneity as their likelihood logarithms are higher or equal in relation to the estimates that include the Inverse Gaussian Heterogeneity and their AIC values are lower.

Tables 4 and 5 present the estimated effects of those variables affecting the probability of a young unemployed getting a job. Table 4 gathers estimates for two female samples (16-25 years - estimate I, and 16 -30 years - estimate II); while Table 5 equally refers to men (estimates III and IV). The first data column of each estimate states the so called hazard ratio instead of the estimated coefficient. All ratio values are positive, while being higher or lower than the unit. When the corresponding value of a specific variable is higher (lower) than one and significant, then we may state that a variable value increase rises (lowers) a person's probability of getting a job.

Table 4: ESTIMATES OF DURATION MODELS (GOMPERTZ) FOR NEW UNEMPLOYED BETWEEN 16 AND 25 YEARS AND BETWEEN 16 AND 30 YEARS (WOMEN SAMPLE)

	(I) Between 16 and 25 years		(II) Between 16 and 30 years	
	Hazard ratio	z	Hazard ratio	z
<i>Personal characteristics</i>				
Age 16-20	0.940	-0.96	1.078	1.16
Age 21-25	–	–	1.172	3.95*
Spanish	0.925	-0.78	0.923	-1.15
<i>Working experience (months)</i>				
Experience	1.011	6.34*	1.006	6.97*
<i>Level of education</i>				
Vocational training Medium	1.636	5.96*	1.462	6.12*
Vocational training Higher	1.359	3.85*	1.336	5.03*
<i>University Studies</i>				
Arts	2.162	1.29	1.172	0.42
Health Sciences	0.792	-1.93*	0.673	-4.21*
Legal-Social Sciences	1.438	3.60*	1.387	5.29*
Technical Degrees	1.024	0.10	1.031	0.21
Humanities	0.852	-0.49	0.877	-0.93
Sciences	1.204	0.65	0.709	-2.32*
<i>Language command</i>				
Elementary English	1.114	1.58	1.081	1.55
Intermediate English	1.065	0.83	1.080	1.46
High English	1.338	2.15*	1.143	1.52
Elementary French	1.225	1.86**	1.205	2.38*
Intermediate French	1.161	1.16	1.212	2.11*
High French	1.482	1.67**	1.027	0.17
Elementary German	0.850	-0.68	1.047	0.32
Intermediate German	0.510	-1.43	0.639	-1.61
High German	2.323	1.29	1.651	1.58

**Table 4: ESTIMATES OF DURATION MODELS (GOMPERTZ)
FOR NEW UNEMPLOYED BETWEEN 16 AND 25 YEARS AND
BETWEEN 16 AND 30 YEARS (WOMEN SAMPLE) (continuation)**

	(I) Between 16 and 25 years		(II) Between 16 and 30 years	
	Hazard ratio	z	Hazard ratio	z
<i>Activity sector</i>				
Agriculture	0.293	-2.28*	1.063	0.21
Industry	1.298	1.68*	1.831	5.57*
Construction	0.903	-0.42	1.635	3.21*
Services	2.280	10.94*	2.676	15.14*
<i>Unemployment benefits and subsidies</i>				
Contributory	0.684	-5.37*	0.733	-6.91*
Other	0.695	-3.63*	0.677	-5.49*
<i>Quarterly summer dummy</i>				
Summer	0.733	-6.07*	0.754	-7.78*
<i>Constant</i>				
Constant	0.002	-55.15*	0.002	-73.62*
<i>Log likelihood</i>	-10,507.781		-20,580.284	
<i>Theta</i>	1.314		1.413	
<i>No. of Observations</i>	6,795		13,131	

Note: Reference category – Age between 21 and 25 years (between 26 and 30 in estimate II), foreigner; advanced levels or less studies; no command of English, French or German; no sector stated in the request; no benefits or subsidies received; job request registered between March and June.

* and ** denote significance at the 5% and 10% levels.

Source: Own elaboration.

Table 5: ESTIMATES OF DURATION MODELS (GOMPERTZ)
FOR NEW UNEMPLOYED BETWEEN 16 AND 25 YEARS AND
BETWEEN 16 AND 30 YEARS (MEN SAMPLE)

	(I) Between 16 and 25 years		(II) Between 16 and 30 years	
	Hazard ratio	z	Hazard ratio	z
<i>Personal characteristics</i>				
Age 16-20	0.837	-3.42*	0.843	-3.21*
Age 21-25	–	–	1.083	2.21*
Spanish	0.963	-0.47	0.947	-0.94
<i>Working experience (months)</i>				
Experience	1.012	8.42*	1.007	9.75*
<i>Level of education</i>				
Vocational training Medium	1.505	5.70*	1.436	6.48*
Vocational training Higher	1.312	3.12*	1.211	3.03*
<i>University Studies</i>				
Arts	1.130	3.86*	5.937	4.28*
Health Sciences	1.259	0.88	0.762	-1.39
Legal-Social Sciences	0.958	-0.23	0.963	-0.37
Technical Degrees	0.843	-0.86	0.731	-2.71*
Humanities	0.412	-1.64**	0.808	-0.78
Sciences	0.468	-1.60	0.586	-2.34*
<i>Language command</i>				
Elementary English	1.125	1.48	1.116	1.94*
Intermediate English	0.949	-0.60	0.990	-0.16
High English	1.211	1.20	0.934	-0.68
Elementary French	1.148	0.96	1.036	0.33
Intermediate French	1.079	0.37	1.086	0.58
High French	1.262	0.93	1.070	0.39
Elementary German	0.883	-0.33	0.778	-1.12
Intermediate German	0.635	-0.87	0.580	-1.50
High German	1.541	0.65	2.292	1.87**
<i>Activity sector</i>				
Agriculture	2.434	4.35*	2.261	5.24*
Industry	2.240	9.15*	2.328	11.25*
Construction	1.914	7.80*	2.123	10.52*
Services	2.132	9.66*	2.317	12.12*

**Table 5: ESTIMATES OF DURATION MODELS (GOMPERTZ)
FOR NEW UNEMPLOYED BETWEEN 16 AND 25 YEARS AND
BETWEEN 16 AND 30 YEARS (MEN SAMPLE) (continuation)**

	(I) Between 16 and 25 years		(II) Between 16 and 30 years	
	Hazard ratio	z	Hazard ratio	z
<i>Unemployment benefits and subsidies</i>				
Contributory	0.925	-1.45	0.902	-2.69*
Other	0.874	-1.34	0.796	-3.12*
<i>Quarterly summer dummy</i>				
Summer	0.703	-7.60*	0.741	-8.85*
<i>Constant</i>				
Constant	0.002	-62.11*	0.002	-77.44
<i>Log likelihood</i>	-12,925.468		-22,937.703	
<i>Theta</i>	1.154		1.175	
<i>No. of Observations</i>	8,715		15,715	

Note: Reference category – Age between 21 and 25 years (between 26 and 30 in estimate IV), foreigner; advanced levels or less studies; no command of English, French or German; no sector stated in the request; no benefits or subsidies received; job request registered between March and June.

* and ** denote significance at the 5% and 10% levels.

Source: Own elaboration.

When analysing the determining factors of the probability a young unemployed woman getting a job (estimates I and II of Table 4), we observe that first of all, age does not establish significant differences within the group of 16 to 25 years old. However, in relation to the 16-30 year-old group, women within the gap 21 to 25 years are more likely to find a job than those within the reference category (between 26 and 30). In other words, young woman employability does not seem to always improve over the years, as it should be given that the expected increasing productivity during that stage of life. In practice, the specific difficulties to get a job which matched their education faced by university graduates during the period of financial crisis may explain why the probability of getting a job decreases from the age of 25 approximately. It is in this moment when many young people who completed their higher education studies become unemployed and actively search for jobs.

As far as nationality is concerned, being Spanish is not relevant in any case, whereas prior working experience is indeed, whose effect on the probability of getting a job is always positive. This is the expected outcome, given that working experience means a good approximation to the specific education of the worker (on-the-job training), which shall contribute to his productivity and improve his employability.

The effect of some variables stating the education level is quite surprising. As expected, having medium or higher vocational training significantly increases the probability of getting a job in comparison with other reference categories (advanced levels or less). On the other hand, university degree effects are not generally relevant. Legal-social sciences is the only exception and its effect on the probability of getting a job is always positive. Negative effects are even found in the fields of knowledge of health sciences or sciences in case of the 16-30 year-old woman sample. The cuts applied to the National Health Service during 2009-2012, which stopped new contracts and meant making redundant temporary workers, may explain the detected negative effects on health degree estimates.

As far as the command of foreign languages is concerned, the fact of having a high level of English or an elementary or high level of French does have a significant and positive influence on the probability of getting a job for the 16-25 female sample. Nevertheless, if we extend sample age limit to 30 years, English language stops being relevant, while an elementary or intermediate level of French does continue so.

In relation to the set of variables controlling the activity sector in which the person is searching a job, it generally seems that the fact of stating a specific sector significantly increases the probability of getting a job versus the reference category (no sector stated), except for the case of agriculture (for both female samples) and construction (for the 16-25 year-old sample). This mainly takes place because stating the sector in the job request presupposes that the person accumulates some working experience in such sector.

As for variables measuring unemployment benefit effects, it is observed that employability response when receiving benefits is always negative, regardless the sample used and the type of benefit (contributory or subsidy). This is a common outcome and is the consequence of the increase of the reservation wage due to this type of benefit.

Finally, both estimates show that presenting a job request during summer months exercises a negative and significant effect on the probability of getting a job versus doing it during the springtime. It is not easy to explain the reason why, but it may be because those who present the request in summer months are individuals who complete their studies at that time. They register as job seekers immediately as a way to try to get a job in the activity related to their education (highly qualified in most cases), although labour markets are not able to assimilate such requests very quickly.

On the other hand, Table 5 shows duration model estimates corresponding to 16-25 year-old man samples, (estimate III) and 16-30 (estimate IV). Many outcomes are similar to the ones obtained in Table 4 (nationality, experience, education, vocational training or seasonality dummy variable effects). However, important differences in relation to gender are found in others. This way, for example, as for the age, the outcomes show, as expected, how the probability of getting a job is lower for workers within the youngest segment (16 to 20 years). However, when using a widest sample of young people, the highest probability of getting a job found in the intermediate age group (21 to 25 years). In other words, age and employability relationship is an inverted "U" shape (the probability of getting a job is lower for the extremes ages than for intermediate ones).

On the other hand, there are substantial differences between women and men as far as the effect of university degrees is concerned. In case of men, only art uni-

versity education rises the probability of getting a job versus the reference category (advanced levels or less). The rest of degrees either lack significant effects or present negative effects in some cases (for the fields of sciences, technical and humanities in some samples)⁷. The effects of languages are also very varied and are absolutely irrelevant for the 16-25 year-old young people sample. On the other hand, they are only relevant in case of having an elementary level of English and a high level of German (a language that turns out to be highly demanded among engineering graduates) in the wider sample.

Finally, for the 16-25 year-old young male, whether receiving benefits or not is irrelevant when working out the probability of leaving the unemployment. However, the traditional negative effect is detected in the wider sample (up to 30 years old): if workers receive unemployment contributory benefits or subsidies, the probability of getting a job decreases.

In summary, the outcomes of the aforementioned analysis seem to reveal a certain mismatch between university studies in Asturias and youth employability in the labour market, at least during the analysed financial crisis period.

3. CONCLUSIONS

This research is aimed at knowing how the levels of education have an effect (particularly, university education) on a young unemployed person's probability of getting a job. The idea that university education does not guarantee employability has become increasingly popular in our country. However, more research is necessary to provide more evidence in this respect. In this sense, the main contribution of this paper consists on the estimate of the effects of different education levels (breaking down university studies by fields) on a young unemployed person's probability of getting a job, using a job seeker and registered contract database provided by the Public Employment Service of the Principality of Asturias for the period 2009-2012. This database refers to every 25 year-old or younger (alternatively 30 or younger) unemployed person, who was registered and presented a new job request between March and September 2009. These people were followed up until October 2012. Thanks to these data, different duration models for men and women have been estimated separately.

Estimate outcomes show that university education did not generally have a positive effect on youth employability during the analysed crisis period, compared to the reference category effect (advanced levels or less). Just the fact of having a degree in legal-social sciences, in case of women, or in the field of arts, in case of men, seems to improve employability versus the reference category. Even some fields such as sciences or health degrees have some negative effects depending on the samples used (they are less likely to exit unemployment in the short-term). Therefore, it seems that holding a university degree does not guarantee getting a job during the deep eco-

(7) It is quite common to find differences by gender in the effects of university education on the probability of getting a job. See, for example, Ahn and Ugidos (1995a) and Albert, Toharia and Davia (2008). Besides, these differences are also observed in other fields of education. For example, Clemente *et al.* (2014) and Cueto *et al.* (2010) have seen that employability improves more in case of women than in men as far as vocational training courses are concerned.

conomic crisis underwent in Asturias, between 2009 and 2012. This all can lead us to believe that there is some mismatch between the university education offered and Asturian labour market needs. However, we should have studied labour markets closer to full employment in order to clearly verify this hypothesis. The presence of youth unemployment rates close to 50% during the analysed period is an exceptional fact that limits the scope of the conclusions reached based on the available data.

Moreover, it has been proved that vocational training has a positive and significant effect on the probability of getting a job, both for men and women, and that foreign language command is not equally relevant for both genders and for both age brackets considered. This way, for example, having a high level of English and French has a significant effect on employability in case of 16-25 year-old women but not in case of men. On the other hand, French language seems to be more useful in terms of employability for the 16-30 year-old woman sample, whereas certain levels of English and German seem to be so, in case of men.

Additionally, as expected, accumulated working experience contributes to increasing the probability of getting a job in any case. Finally, outcomes show that receiving contributory benefits and subsidies has normally a negative effect on the probability of getting a job, especially in case of women.

As a final thought, we should add that spreading the outcomes obtained herein to the rest of Spain would be quite risky. It must be taken into account that The Principality of Asturias is a small region (a little bit more than a million inhabitants) with a little dynamic labour market. From the moment the industrial restructuring was carried out in the 80s, the region has witnessed a constant leakage of population and employment, especially severe during the recent economic crisis. Regional unemployment rate is slightly below the national average because the restructuring was mainly performed by means of early retirements, giving place to a gradually decreasing of the activity rate. Therefore, for example, only Andalusia and Extremadura had a lower employment rate than the Asturian one, during the second quarter of 2012. In this same quarter, the activity rate in Asturias was the lowest in the country. These data clearly show the special employability difficulties really faced by Asturian workers and, particularly, those who hold a university degree.



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RESUMEN

El objetivo de esta investigación consiste en conocer los efectos de la formación sobre la probabilidad de que un joven desempleado encuentre trabajo. Para ello se utiliza una base de datos de desempleados de ámbito regional facilitada por el Servicio Público de Empleo de Asturias para el periodo 2009-2012. Los resultados indican que, en general, la formación universitaria no fue una garantía para elevar significativamente la probabilidad de conseguir empleo durante la fase más fuerte de la crisis económica. Por su parte, la formación profesional eleva la probabilidad de conseguir un empleo para ambos géneros, y el conocimiento de idiomas extranjeros (inglés y francés) tiene un efecto positivo fundamentalmente en el caso de las mujeres. Finalmente, se ha observado que las prestaciones por desempleo desincentivan la obtención de un empleo para ambos sexos, pero especialmente en el caso de las mujeres.

Palabras clave: nivel de formación, desempleo juvenil.

Clasificación JEL: J21, J24.

