

THE TRANSITION FROM VOCATIONAL EDUCATION TO WORK: EVIDENCE FROM SPAIN*

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This paper analyzes the transition from vocational education to the first job in Spain using a micro-dataset on labor histories. Among the determinants of this transition, we investigate, for the first time, the role of workplace training, a mandatory module in Spain that can be validated with previous job experience. Applying duration techniques, and accounting for unobserved heterogeneity, we find that being female, finishing education older or having high-educated parents reduce the exit rate to employment. We obtain that workplace training is an important factor to reduce unemployment duration.

Key words: unemployment duration, labor market entry, workplace training, duration model.

JEL Classification: J13, J24, I20.

The transition from school to work is one of the most important events in the life of young people, since bad results in early working life can have negative consequences on later outcomes [see, for instance, Heckman and Borjas (1980), Gregg (2001), or Stewart (2007)]. However, access to the labor market is a difficult and uncertain process, as evidenced by the fact that the youth unemployment rate is systematically higher than the adult rate. Finding an adequate job depends on individual circumstances, labor market conditions and type of education path, general or apprenticeship, completed [see OECD (2000)]. Most governments give attention to apprenticeship schemes to improve the employability of young people and to facilitate the transition from school to work¹. According to Ryan (2011, p. 4), the concept of apprenticeship includes all “programmes of

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(1) For instance, the OECD is conducting several series of “Policy Reviews of Vocational Education and Training (VET)” (*Learning for Jobs*, and, recently, *Skills beyond School*) in different countries, with the objective of detecting strengths and challenges in their VET systems.

learning that combine part-time formal education with training and experience at the workplace, and result in an externally recognised vocational qualification". Apprenticeship paths improve the school-to-work transition by providing several advantages: they develop work-related knowledge and skills; they make learning more applied and relevant; and they allow young workers to acquire information and contacts in the labor market, helping the matching with employers [OECD (2000), Ryan (2011)]. Institutional characteristics of apprenticeship differ across countries. Some countries, such as Germany and Switzerland, present a more labor market oriented system. In others, such as Italy, UK and Spain, the apprenticeship path is not so connected to the labor market, and young people are less successful in the transition from school to work [see Brunello *et al.* (2007) and Ryan (2011)]. In Spain, recently, there is a debate about the necessity of enhancing the link between school and the labor market in order to provide young people with work-related skills and reduce the high youth unemployment rate (46.4% in 2011, while the European Union average is 21.4%)². In this context, it is important to obtain empirical evidence on labor market entry after completing apprenticeship education.

The objective of this paper is to analyze the transition from school to work of young Spanish people who have followed an apprenticeship path. Among the determinants, we investigate to what extent workplace training affects this transition. We conduct our analysis separately for *vocational high school* and *vocational college*, the two apprenticeship levels available in the Spanish schooling system. Since vocational college entails more years of education than vocational high school, we explore whether there are differences in labor market entry.

In Spain, vocational education is school-based. This means that most of the time is spent in the classroom to acquire technical knowledge, while practical skills are developed during workplace training, a mandatory module at the end of the program. However, the Spanish system allows recognizing the training module if an individual has previous work experience related to the program attended.

Although there is a broad literature analyzing the role of vocational education on the school-to-work transition, we focus on commenting the international studies closest to our paper, which are those analyzing the effect of workplace training and individual characteristics on labor market entry³. For Germany, Winkelmann (1996) finds that apprentices experience faster labor market entry, especially, those who trained in large firms. Euwals and Winkelmann (2004) show that a high proportion of apprentices obtain their first job in their training firm, staying longer in it compared with the apprentices hired by another firm. Parey (2009) finds that individuals who completed an apprenticeship path containing an extense period of workplace training have a higher probability of getting a job at the beginning of their labor careers

(2) A recent Royal Decree has better regulated the competences acquired with vocational degrees (RD1147, 2011). Likewise, the education reform proposed by the Spanish Government in September 2012, LOMCE (2012) introduces several measures to improve access to vocational education.

(3) For a cross-national comparison of the school-to-work transition, see Ryan (2001). In addition, see Ryan (1998) for a review of the merits of apprenticeship paths; Brunello *et al.* (2007) for a general review about the key facts and characteristics of education and training in Europe; and Ryan (2011) for a detailed analysis of the apprenticeship systems in UK, Italy, Germany and Switzerland.

compared to individuals who followed a full-time vocational education. For Norway, Askilden and Nilsen (2005) find empirical support for the hypothesis that firms train workers based on long-term investment considerations. Finally, for Switzerland, Bertschy *et al.* (2009) show that students who performed better (measured through PISA scores) in vocational education are more likely to find an adequate job.

In the Spanish literature, few papers analyze the entrance of young people into the labor market. Alba (1996) studies the transition from unemployment to employment for a pool of young workers, showing that vocational education is an explanatory variable that increases the probability of finding a job. Lassibille *et al.* (2001) analyze the school-to-work transition for school leavers, finding that those with vocational or university education present the highest probability of having a job six and eighteen months after leaving school. Blazquez-Cuesta and Garcia-Perez (2007) estimate the effect of the decentralization of education expenditure on the transition separately for people with university and non-university education, with the result that higher expenditure reduces the time spent in finding a job. Albert *et al.* (2008) look at the transitions to find the first significant and non-significant job, showing that a higher educational investment increases the probability of obtaining the former. Corrales-Herrero and Rodriguez-Prado (2012) examine the entry of people with vocational lower-secondary education using a cluster analysis to compare labor trajectories. Finally, Marcerano-Gutierrez and Vignoles (2012) investigate the probability of getting a job from different vocational programs, finding a lower probability for workers with higher levels of vocational qualification. However, to the best of our knowledge, no previous study has analyzed the determinants of the duration to find a first job for Spanish youths who have completed vocational high school or vocational college, investigating the role of workplace training and comparing its effect in the two levels of vocational education. Our contribution is to fill this gap in the literature and to provide a new country-specific study of the role of workplace training on the school-to-work transition.

We use a unique micro-dataset (Survey on Education and Labor Market Transitions) on schooling and labor histories elaborated by the Spanish Statistics Institute in 2005. It contains representative samples of individuals who completed vocational high school or vocational college in the school year 2000/2001. The design of this dataset is adequate to analyze the transition from apprenticeship paths to work, comparing also the two vocational levels. All the people in the sample finished their vocational education in the same year (2001) and they are observed at the beginning of their labor careers, over a period of four years after completing vocational high school or vocational college.

We study the transition by looking at the number of months it took to find a first job and a first “significant” job (a more stable job, lasting at least six consecutive months). To investigate to what extent workplace training affects the transition to work, we construct a set of variables indicating whether an individual took or recognized this module with previous labor market experience. Our analysis also takes unobserved heterogeneity into account by following the standard nonparametric approach proposed by Heckman and Singer (1984).

Results show that empirical hazards to the first job (significant or not) present a decreasing pattern, similar in the two levels of vocational education. Individuals who did not take the training have the slowest exit rate to both types of job. Findings from

estimation show that being female, finishing vocational education older, and having high-educated parents, increase unemployment duration. Taking the training module increases the exit to employment in vocational high school and vocational college. Importantly, results hold after controlling for unobserved heterogeneity.

The rest of the paper is organized as follows. The next section provides an overview of the Spanish education system. Section 2 describes the dataset. Section 3 presents the duration analysis and Section 4 shows the results. Finally, Section 5 concludes.

1. SPANISH EDUCATION SYSTEM

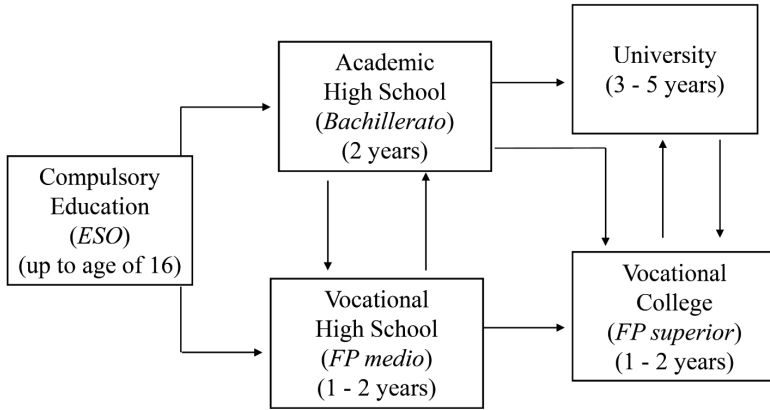
In this section, we briefly comment on the main characteristics of the Spanish education system [for a detailed description see, for instance, EURYDICE (2011)]. Compulsory schooling covers ten years, up to the age of sixteen, when young people can proceed to post-compulsory secondary education (high school) or can enter the labor market (see Figure 1). At the high school level, an individual can choose between academic and vocational high school. After completing upper secondary education, a person decides whether to continue her studies in university or in vocational college (tertiary education). Access to vocational college is direct from the academic track while passing a specific training course is required from the vocational track. The schooling system allows attending academic high school after completing the vocational track and university after graduating from vocational college⁴.

Both in vocational high school and vocational college, education is school-based, with part of the time spent acquiring technical knowledge in the classroom and part spent in workplace training to develop work-related skills. Programs are offered in a wide range of fields, including, for example, agriculture, forestry and fishery, manufacturing, health, building, clerical support, ..., and they are nationally recognized. The duration of the programs ranges between 1200 and 2000 hours of study (equivalent to around 1-2 years), where the training takes place at the end of the program through a mandatory three month module. Nevertheless, individuals who certify one year of full-time labor market experience related to the program are exempt from the training module. Trainees do not receive any salary during the workplace training, with the exception of small payments to cover traveling expenses. It is important to highlight that vocational schools have agreements with local employers to take trainees; therefore, students do not have to search for training positions by themselves [see Field *et al.* (2012) for more details on the Spanish vocational system].

In Figure 2, we present the distribution of the educational levels of people aged 20-29 over the period 2001-2010. The distribution of schooling levels is quite stable across that decade and vocational education is attained by around 20% of young people.

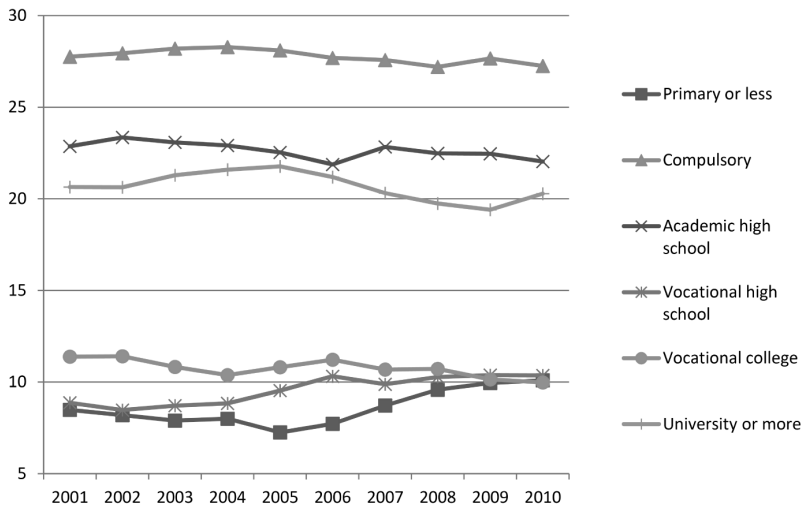
(4) The schooling system shown in Figure 1 is ruled by the Law (*Ley Orgánica General del Sistema Educativo*) passed in 1990, which reformed upper secondary education.

Figure 1: SCHOOLING LEVELS IN POST-COMPULSORY EDUCATION IN SPAIN



Source: Own elaboration.

Figure 2: SCHOOLING ATTAINMENT OF PEOPLE AGED 20-29 (%)



Source: Own elaboration based on data from the Spanish Labor Force Survey.

2. DATA DESCRIPTION

The data we use come from the Survey on Education and Labor Market Transitions, produced by the Spanish Statistics Institute in 2005⁵. This survey contains representative samples of people who completed vocational high school or vocational college in the school year 2000/2001. It provides information on education and labor decisions over four years, from June 2001 (graduation from vocational education) to July 2005 (moment of the interview). The dataset contains three types of information:

- Personal characteristics. Individuals report date of birth, gender, mother and father's education and province of residence.
- Education. Individuals indicate the age at which they finished vocational high school or vocational college, the program field completed and the type of school attended (private, semi-private or public)⁶. Related to workplace training, the survey asks individuals whether this was their first labor market experience. In addition, the dataset provides information on educational histories for the next years.
- Work. On a monthly basis, all individuals are asked about their employment or nonemployment status. If they work, they report whether the job is part-time or full-time. In addition, a questionnaire on the job characteristics is replied to by individuals who are in either of the following situations: they work in a full-time job at the moment of the interview or they worked in a full-time job in the same firm for at least six consecutive months in the past. Individuals have to fill in as many questionnaires as times they are in either of the previous situations. The questions about the job refer to the activity of the firm, occupation, net monthly wage on an interval basis, type of contract, hours worked, required degree, starting and finishing dates, and the method that the individual used to find the job.

Workplace training is a compulsory module included in both levels of vocational education. However, educational authorities can recognize this module if the individual certifies at least one year of previous labor market experience related to the content of the program. If not, the student must take the training module. The survey asks individuals whether they took workplace training and, if so, whether this was their first labor market experience. We exploit this information to construct the following three mutually exclusive variables:

- First training: equal to one if an individual took the training module, and this was her first labor market experience.
- Previous training: equal to one if an individual took the training module, and she has previous labor market experience.

(5) *Encuesta de Transición Educativo-Formativa e Inserción Laboral*.

(6) Semi-private schools (*colegios concertados*) are private institutions publicly-funded through agreements with educational authorities. Therefore, individuals can attend vocational education free of charge in both public and semi-private schools.

- No training: equal to one if an individual did not take the training module because she could certify enough previous labor market experience related to the vocational program.

Initial sample sizes are 7, 615 and 11, 244 individuals with vocational high school and vocational college, respectively⁷. As we analyze the school-to-work transition of people with vocational high school or vocational college as their maximum schooling level, we restrict the sample to individuals who do not attend further education in order to avoid misleading results that do not reflect the true returns of the transition from vocational education to work. This approach is usually adopted in previous works [see Winkelmann (1996), Lassibille *et al.* (2001), Euwals and Winkelmann (2004), Hanushek *et al.* (2011), Marcerano-Gutierrez and Vignoles (2012)]. Therefore, we eliminate individuals who continue in education in the school year 2001/2002 (1,297 and 3,977 for vocational high school and vocational college, respectively) and those who reenter the education system after leaving school in 2001 (around 10% of the remaining sample). Final sample sizes are 5,725 individuals with vocational high school and 6, 408 individuals with vocational college. We have checked that the distribution of observed characteristics of the sample after dropping individuals in further education is similar to the distribution of observed characteristics before dropping those individuals⁸.

Table 1 contains a description of the two final samples. The proportion of women is higher in vocational college. Individuals who obtain a vocational high school diploma are younger, although this is not surprising, given that vocational college entails more years of education (see Figure 1). More than 70% of the sample completed a vocational program in a public school, whereas only 2-6% attended a private one⁹. Parents present a low schooling attainment, especially mothers (note that the percentage of people who report not knowing parents' education is not negligible, although it is lower in vocational college). Around 3% of individuals did not take workplace training in vocational high school, while the percentage is higher in vocational college (12%). The proportion of individuals for whom the training was her initial labor market experience is higher in vocational high school than in vocational college (49% and 41%, respectively). However, the percentage of people who completed this module having previous experience is similar in both levels (around 48%). 31% and 35% of people with vocational high school have followed a program in Manufacturing and Clerical and Transportation, respectively, while 40% with vocational college have completed a program in Social Services.

Table A.1 describes the characteristics of individuals according to whether they take or recognize the workplace training. Students for whom this module is their first labor market experience are proportionally younger and women. The percentage finishing vocational high school in a public school is lower with respect to students

(7) After dropping 21 individuals who report having completed vocational high school under 17 or vocational college under 18, since they are measurement errors according to the entry ages for these educational levels.

(8) This analysis is available upon request.

(9) This is in line with the percentages of public and private schools offering vocational education in 2001 [see the statistics available at the website of the Spanish Ministry of Education, <http://www.educacion.gob.es/horizontales/estadisticas>].

Table 1: SAMPLE DESCRIPTION

	Vocational High School		Vocational College	
	Mean	Std. dev.	Mean	Std. dev.
Female	0.45	0.50	0.50	0.50
Age when finished education	20.13	1.40	21.53	1.18
Type of school:				
Public	0.73	0.44	0.75	0.43
Semi-private	0.25	0.43	0.19	0.39
Private	0.02	0.13	0.06	0.23
Father's education:				
Compulsory or less	0.65	0.48	0.65	0.48
High school	0.11	0.32	0.14	0.35
Tertiary	0.07	0.26	0.11	0.31
Don't know	0.16	0.38	0.10	0.30
Mother's education:				
Compulsory or less	0.72	0.45	0.73	0.44
High school	0.10	0.30	0.13	0.34
Tertiary	0.04	0.19	0.06	0.23
Don't know	0.14	0.34	0.08	0.28
Workplace training:				
First training	0.49	0.50	0.41	0.49
Previous training	0.48	0.50	0.47	0.50
No training	0.03	0.16	0.12	0.32
Program field:				
Agriculture-Fishery	0.03	0.16	0.01	0.12
Manufacturing	0.31	0.46	0.23	0.42
Building	0.05	0.22	0.06	0.24
Clerical and Transportation	0.35	0.48	0.28	0.45
Social services	0.27	0.44	0.41	0.49
Region:				
Northwest	0.08	0.27	0.10	0.29
Northeast	0.12	0.32	0.14	0.35
East	0.17	0.37	0.15	0.36
Centre	0.47	0.50	0.47	0.50
South	0.16	0.37	0.15	0.35
N	5,725		6,408	

First training: Training as first labor market experience. Previous training: Training having previous labor market experience. Northwest: Galicia, Asturias, Cantabria. Northeast: Basque Country, La Rioja, Navarra, Aragon. East: Catalonia, Valencia, Balear Islands. Centre: Madrid, Extremadura, Castilla-Leon, Castilla-La Mancha. South: Andalusia, Canary Islands, Ceuta-Melilla, Murcia.

Source: Own elaboration.

who had previous labor market experience. In vocational college, individuals with recognized workplace training finished proportionally more in semi-private schools. We do not observe any clear pattern for parents' education or important differences by program field.

One potential limitation of this survey for our analysis is that it does not contain information on grades. However, the age when a student finished education can be used as proxy for performance. In the Spanish schooling system, an individual who completes education without delays is between 17 and 18 years old in vocational high school and between 19 and 20 years old in vocational college (depending on whether they took a program of one or two years). In Table 2, 90% (80%) of individuals completed vocational high school (vocational college) when they were over 18 (20), indicating that they finished with a delay. However, this delay may be a consequence of bad performance or a result of a previous schooling career interruption. Unfortunately, we cannot distinguish perfectly between these situations because the database does not have enough information. Nonetheless, most individuals who attend vocational education have already finished previous schooling levels with one or two years of delay [see Lopez-Mayan (2010) for more discussion on this]. This evidence implies that individuals will be around 19-20 and 21-22 years old if they complete vocational high school or vocational college without delay, respectively. In line with this, Table 2 shows that about 50% of students finished vocational education at those ages, suggesting they performed well during vocational studies.

Table 2: PERCENTAGE OF STUDENTS BY AGE WHEN FINISHING EDUCATION

	Vocational High School	Vocational College
17	0.94	–
18	10.41	0.16
19	24.21	4.00
20	27.41	16.60
21	19.32	26.86
22	11.65	28.23
23	5.80	23.28
24	0.17	0.47
25	0.09	0.41
N	5,725	6,408

Source: Own elaboration.

3. DURATION ANALYSIS

The dataset contains information on monthly employment over a period of four years following graduation from vocational high school or vocational college. As an indicator of the quality of the transition we consider the duration to find the first full-

time job (more than twenty working hours per week), measured by the number of months¹⁰. We distinguish the duration to find two types of first jobs: the first job and the first “significant” job. The latter is a full-time job that lasts at least six consecutive months and, thus, is a more stable job. The concept of first significant job was established by Eurostat in the European Union Labor Force Survey ad-hoc module 2000 on the entry of young people into the labor market. The Spanish Statistics Institute adopted this concept in the Survey on Education and Labor Market Transitions.

3.1. A first look at the duration data

Before specifying the econometric model, we descriptively explore the duration patterns observed in the data.

In Table 3, we show that the percentage of individuals who do not find a job between 2001 and 2005 is small (for the significant job it is a bit higher). Percentages for women are higher, especially with respect to finding a significant job. For 71% of individuals in both types of vocational education, the first significant job is also the first job. The remaining 29% had a previous first job lasting less than six months. Therefore, most individuals find a job and, remarkably, for most of them, the first job is significant.

Table 3: PERCENTAGE OF STUDENTS WHO DO NOT FIND A JOB

	Vocational High School		Vocational College	
	Women	Men	Women	Men
First job	3.02	1.31	2.57	1.16
N	78	41	83	37
First significant job	7.31	3.37	6.32	3.43
N	189	106	204	109

Source: Own elaboration.

In Table 4, we present the distribution of individuals by the year when they find each type of first job. The main aspect to highlight is that two years after completing education, most people had found a job (the percentages are 90% for first significant job and 95% for first job). Individuals with vocational college education seem to be more successful, since they present higher percentages in the first year compared to individuals with vocational high school education.

The average duration is around 3.8 and 6 months to find the first and the first significant job, respectively. In Table 5, we explore, for each vocational level, whether

(10) As we look at young people who do not continue in education, we focus on full-time instead of part-time jobs.

Table 4: PERCENTAGE OF STUDENTS BY YEAR WHEN FINDING A JOB

	Vocational High School		Vocational College	
	First job	First significant job	First job	First significant job
2001	68.44	57.72	80.47	67.12
2002	25.81	31.16	14.11	22.81
2003	3.69	7.00	3.50	6.46
2004	1.84	4.11	1.61	3.56
2005	0.21	0.02	0.32	0.05
Total	100	100	100	100
N	5,606	5,430	6,288	6,095

Source: Own elaboration.

there are differences in the average duration after splitting the sample according to training. Individuals who took the training module having previous experience present the lowest average duration in finding both types of jobs. Moreover, students who did not take the training have the highest average duration to get the first significant job, especially in vocational high school (around 5 months). Distinguishing also by the age when individuals finished education, a clear decreasing or increasing age pattern in average duration is not observed. This suggests that completing vocational education on time does not provide any advantage for finding a job. Nevertheless, we have to be cautious in drawing this conclusion since age is a proxy for performance, as discussed in the preceding section.

Finally, to get an idea of the patterns of unemployment duration, we obtain non-parametric Kaplan-Meier estimates of the survival function. These empirical hazards show the proportion of the number of exits from unemployment in each month with respect to the total population still unemployed at the beginning of that month.

Figure 3 shows the empirical hazards to the first job and to the first significant job. Regarding the latter, the patterns are quite similar between vocational high school and vocational college: the hazard rate falls very quickly from the first to the sixth month and, then, falls slowly and monotonically. The same behavior is observed in the exit to the first job although, in this case, the hazard falls even more quickly during the first six months. We have computed the log-rank test for the equality of the survival functions. In both types of job, we cannot reject the hypothesis that the survivor functions for vocational high school and vocational college are the same¹¹.

In addition, we obtain Kaplan-Meier estimates distinguishing by training (Figures 4 and 5). Individuals who took the training having previous experience present

(11) For the first job, the log-rank test statistic is $\chi^2_1 = 0.02$ with a p-value of 0.88; and for the first significant job, the test is $\chi^2_1 = 1.51$ with a p-value of 0.21.

Table 5: AVERAGE NUMBER OF MONTHS TO FIND A JOB

		A. First job					
		Vocational High School		Vocational College			
		First Training	Previous training	No training	First Training	Previous training	No training
Full sample*:		4.54 (7.28)	2.93 (5.47)	4.99 (8.09)	4.56 (7.37)	3.23 (5.80)	3.77 (6.52)
By age on finishing education:							
17		6.23	4.50	12.50	-	-	-
18		4.55	3.19	8.77	1.00	1.80	9.67
19		3.83	2.86	4.41	4.57	3.57	5.32
20		4.73	2.66	3.65	4.36	3.70	3.64
21		4.65	3.06	4.00	4.51	3.09	3.46
22		5.41	2.95	7.40	4.52	3.10	3.87
23		4.79	3.24	4.30	5.08	3.32	3.53
24		9.00	2.13	-	1.60	2.24	3.00
25		15.50	4.67	-	1.50	1.43	1.00
N		2,741	2,730	135	2,586	2,991	711

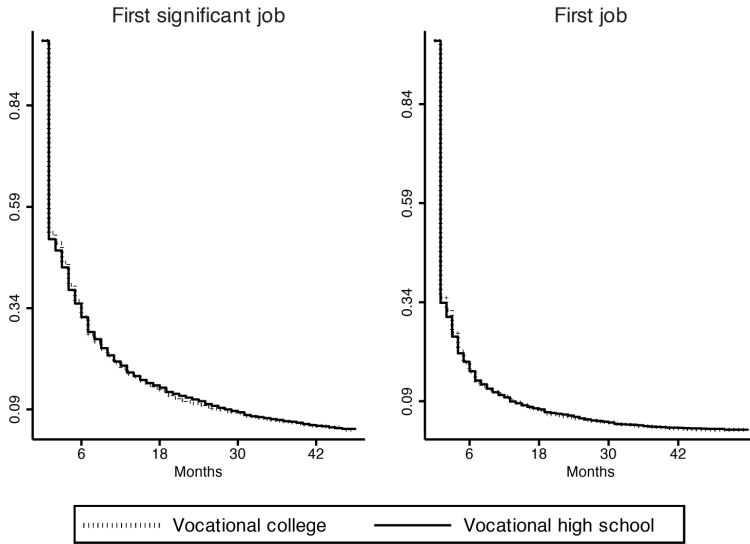
*Standard deviation in parenthesis. First training: Training as first labor market experience. Previous training: Training having previous labor market experience. Source: Own elaboration.

Table 5: AVERAGE NUMBER OF MONTHS TO FIND THE JOB (continuation)

		B. First significant job					
		Vocational High School			Vocational College		
		First Training	Previous training	No training	First Training	Previous training	No training
Full sample*:		6.54 (8.77)	5.37 (7.83)	8.04 (10.51)	6.42 (8.48)	5.53 (7.95)	6.54 (8.56)
By age on finishing education:							
17		7.74	8.72	1.00	–	–	–
18		6.09	5.04	9.23	1.00	4.00	11.50
19		5.72	5.08	8.90	6.11	5.70	7.84
20		7.06	4.90	7.78	6.06	5.69	5.86
21		6.64	5.61	5.12	6.59	5.54	7.01
22		7.05	5.82	13.71	6.28	5.58	7.26
23		8.12	6.46	4.89	6.97	5.46	4.93
24		9.00	3.00	–	4.10	5.06	3.00
25		15.50	4.67	–	3.25	2.08	9.25
N		2,633	2,668	129	2,494	2,919	682

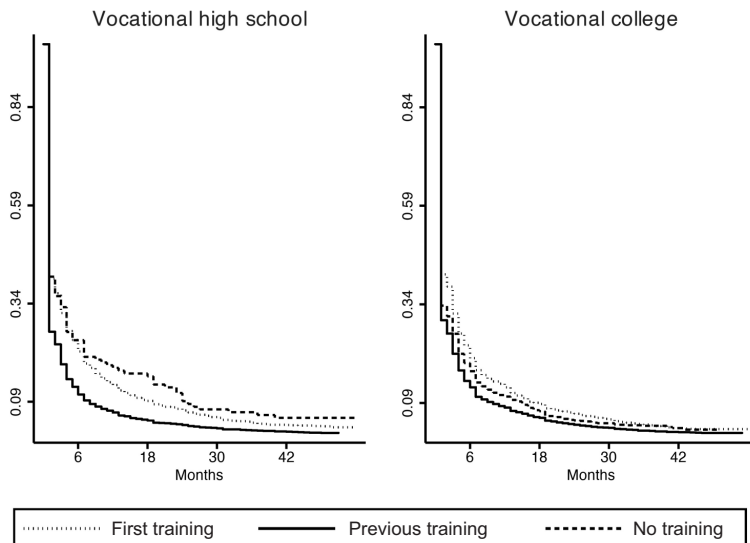
*Standard deviation in parenthesis. First training: Training as first labor market experience. Previous training: Training having previous labor market experience. Source: Own elaboration.

Figure 3: KAPLAN-MEIER EMPIRICAL HAZARD TO THE FIRST SIGNIFICANT JOB AND TO THE FIRST JOB



Source: Own elaboration.

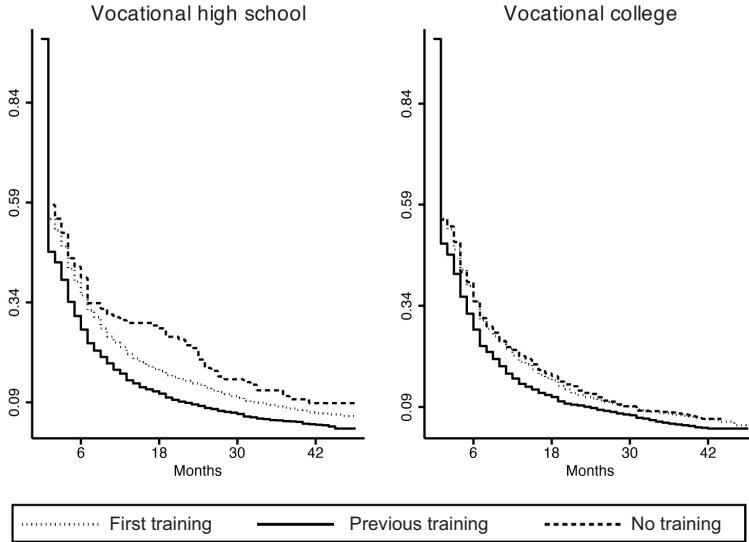
Figure 4: KAPLAN-MEIER EMPIRICAL HAZARD TO THE FIRST JOB, BY TRAINING



Note: First training: Training as first labor market experience. Previous training: Training having previous labor market experience.

Source: Own elaboration.

Figure 5: KAPLAN-MEIER EMPIRICAL HAZARD TO THE FIRST SIGNIFICANT JOB, BY TRAINING



Note: First training: Training as first labor market experience. Previous training: Training having previous labor market experience.

Source: Own elaboration.

the quickest fall in the hazard rate, while individuals who did not take the training have the slowest exit rate. These differences by training are more pronounced in vocational high school. According to the log-rank tests, we can reject the hypothesis that the survivor functions are the same in each Kaplan-Meier estimation¹².

All figures show a clear negative duration dependence in both vocational levels, with differences by training. However, these patterns are obtained without controlling for other variables. Thus, the next step in the analysis is to estimate an econometric model that controls for observed and unobserved characteristics to get the true state dependence and the effect of workplace training on unemployment duration.

3.2. Duration model

We analyze the determinants of the hazard rate from unemployment to the first (significant or not) job by estimating a duration model. We use a discrete-time model

(12) In the first job, the log-rank test statistic is $\chi^2_2 = 130.23$ (p-value = 0.00) for vocational high school and $\chi^2_2 = 67.62$ (p-value = 0.00) for vocational college. In the first significant job, the log-rank test statistic is $\chi^2_2 = 645.25$ (p-value = 0.00) for vocational high school and $\chi^2_2 = 268.41$ (p-value = 0.00) for vocational college.

since, in our data, exit to employment occurs in continuous time although we only observe time at one-month intervals [see Lancaster (1990) and Jenkins (1995, 2005) for the basic features of such models]. Let T be a discrete duration random variable indicating number of months and taking values $\{1, 2, 3, \dots\}$ with probability mass function:

$$p(t) = Pr(T = t), \quad t = 1, 2, \dots$$

and cumulative distribution function:

$$F(t) = Pr(T \leq t) = p(1) + p(2) + \dots + p(t)$$

The hazard function is

$$\begin{aligned} h(t) &= Pr(T = t | T \geq t) = \frac{Pr(T = t)}{Pr(T \geq t)} = \frac{Pr(T = t)}{1 - Pr(T \leq t - 1)} \\ &= \frac{p(t)}{1 - p(1) - \dots - p(t - 1)} = \frac{F(t) - F(t - 1)}{1 - F(t - 1)} \quad \text{for } t > 1 \end{aligned}$$

and $h(1) = p(1) = F(1)$. The hazard gives probabilities of exit to employment defined over the surviving population at each time. The hazard function conditional on covariates is given by $h(t, X) = Pr(T = t | T \geq t, X)$ and we consider a complementary log-log (cloglog) specification:

$$h(t, X) = 1 - \exp[-\exp(\beta'X + c(t))]$$

The cloglog is a proportional hazard model, where $c(t)$ is the baseline hazard function which summarizes the pattern of duration dependence and is not affected by individual covariates X . We assume that duration dependence is characterized by $c(t) = r \log t$. Thus, the hazard function is given by

$$h(t, X) = 1 - \exp(-\lambda t^r), \quad \lambda = \exp(\beta'X)$$

As Jenkins (2005) points out, this is the discrete-time analogue to the continuous-time Weibull model. The parameter r determines whether the hazard is increasing ($r > 0$), decreasing ($r < 0$), or constant over time ($r = 0$), similarly to the shape parameter in a Weibull model¹³. The cloglog model is adequate for our data because of the monotonic and decreasing hazard rates, shown in Figures 3-5.

Regarding the explanatory variables, we consider several individual and schooling characteristics. We control for personal and family attributes, such as gender, age when a person completed the program to capture performance in vocational education (see discussion in Section 2), schooling attainment of both parents, and a residence regions dummy. We include the three training variables in order to estimate to what extent workplace training affects unemployment duration. We also consider the type of school (private, public or semi-private) where the individual attended vocational edu-

(13) In the Weibull specification, the hazard function is $h(t, X) = p t^p - 1$, where $\lambda = \exp(\beta'X)$ and p is the shape parameter.

cation, and the program field completed. Finally, although individuals finished vocational studies in the same month (June 2001), we also control for the quarterly unemployment rate of young people (less than 26 years old) to consider the possible effect of the business cycle. These data are obtained from the Spanish Labor Force Survey 2001-2005.

One of the main issues concerning the estimation of hazard regressions is unobserved heterogeneity. Ignoring unobserved individual characteristics may bias the estimates of the effect of observed explanatory variables in the hazard function and may introduce spurious negative duration dependence. For instance, it is not random who has job experience related to the program attended that can be used to validate workplace training. Maybe some individuals working in an occupation can decide to enroll in a related vocational program to improve their skills. This unobserved heterogeneity may introduce selection bias in the estimation. We deal with this issue by controlling for the broad set of explanatory variables explained above, which includes gender, age and parents' education, potential variables affecting previous labor decisions. Indeed, Table A.1 shows that individuals taking training as their first labor market experience are proportionally younger and women, while there is no clear pattern for parents' education. In addition, we account for unobserved heterogeneity in the estimation following the approach proposed by Heckman and Singer (1984). We assume that unobserved heterogeneity follows a "mass point" distribution that takes on two different values (μ_1 and μ_2) with probabilities p_1 and p_2 , respectively¹⁴. Broadly speaking, this means that, in the population, there are two types of individuals differing in unobserved characteristics such as their ability or motivation to find a job, to progress in education or to enroll in a vocational program. Estimates are obtained by maximizing a finite-mixture likelihood function where μ_1 , μ_2 , p_1 and p_2 are additional parameters.

4. RESULTS

We estimate three specification models (M1, M2 and M3), which consider different sets of explanatory variables. M1 includes female, age when an individual finished education, type of school and training variables. Specification M2 adds parents' education and M3 also controls for the type of program field¹⁵. Then, we estimate the specification with all covariates and accounting for unobserved heterogeneity. All tables report the baseline hazard estimates associated with a change in the value of one of the covariates. These hazard ratios have the virtue of being easy to interpret: those greater than one indicate that a one unit increase in the covariate raises the baseline hazard (lower expected duration), while those less than one indicate a decrease in the hazard to find a job (greater expected duration).

Tables 6 and 7 contain the hazard ratio estimates from the duration model to find the first job and the first significant job, respectively, for the three specifications, without accounting for unobserved heterogeneity. For vocational high school and vocational college, the estimated effects of covariates common to the three specifications

(14) We have estimated assuming also a three mass point distribution, but the likelihood hardly improves.

(15) All specifications include a regional dummy. For brevity, we do not report the estimates in tables, although they are available upon request.

Table 6: HAZARD RATIO ESTIMATES (FIRST JOB)

	Vocational High School			Vocational College		
	M1	M2	M3	M1	M2	M3
Female	0.76*** (0.02)	0.74*** (0.02)	0.79*** (0.02)	0.78*** (0.02)	0.77*** (0.02)	0.79*** (0.02)
Age when finishing education	0.97*** (0.01)	0.97*** (0.01)	0.97*** (0.01)	1.03** (0.01)	1.03*** (0.01)	1.03*** (0.01)
Duration dependence	0.40*** (0.01)	0.40*** (0.01)	0.40*** (0.01)	0.38*** (0.01)	0.38*** (0.01)	0.38*** (0.01)
<i>Type of school (ref.: Semi-private):</i>						
Private school	0.87 (0.09)	0.88 (0.09)	0.92 (0.10)	0.79*** (0.05)	0.82*** (0.05)	0.87** (0.05)
Public school	1.10*** (0.03)	1.09*** (0.03)	1.10*** (0.03)	0.96 (0.03)	0.95 (0.03)	0.95* (0.03)
<i>Workplace training (ref.: No training):</i>						
First training	1.30*** (0.12)	1.27*** (0.11)	1.26*** (0.11)	0.89*** (0.04)	0.89*** (0.04)	0.92** (0.04)
Previous training	1.68*** (0.15)	1.64*** (0.15)	1.65*** (0.15)	1.02 (0.04)	1.03 (0.04)	1.06 (0.04)
<i>Parents' education (ref.: Compulsory or less):</i>						
Upper secondary (father)		0.96 (0.04)	0.97 (0.04)		0.96 (0.04)	0.96 (0.04)
Tertiary (father)		0.82*** (0.05)	0.83*** (0.05)		0.85*** (0.04)	0.86*** (0.04)
“Don’t know” (father)		0.81*** (0.05)	0.82*** (0.05)		1.00 (0.07)	1.00 (0.07)
Upper secondary (mother)		0.87*** (0.04)	0.87*** (0.04)		1.05 (0.04)	1.05 (0.04)
Tertiary (mother)		0.90 (0.07)	0.89 (0.07)		0.88** (0.05)	0.89* (0.05)
“Don’t know” (mother)		1.14* (0.08)	1.15** (0.08)		0.93 (0.07)	0.93 (0.07)
<i>Program field (ref.: Agriculture-Fishery):</i>						
Manufacturing			1.21** (0.11)			1.24** (0.13)
Building			1.55*** (0.16)			1.57*** (0.18)
Clerical and Transportation			1.20** (0.10)			1.16 (0.12)
Social services			1.06 (0.10)			1.04 (0.11)

Table 6: HAZARD RATIO ESTIMATES (FIRST JOB) (continuation)

	Vocational High School			Vocational College		
	M1	M2	M3	M1	M2	M3
Youth unemployment rate	1.17***	1.17***	1.18***	1.36***	1.36***	1.36***
Constant	0.04*** (0.02)	0.04*** (0.02)	0.03*** (0.01)	0.00*** (0.00)	0.00*** (0.00)	0.00*** (0.00)
Regional dummy	Yes	Yes	Yes	Yes	Yes	Yes
Log-likelihood	-11602.97	-11579.81	-11561.15	-13263.71	-13247.70	-13215.67
Observations	27,258	27,258	27,258	30,591	30,591	30,591
N	5,606	5,606	5,606	6,288	6,288	6,288

Dependent variable: number of months to find the first job after completing vocational education. Significance levels: *** 1%; ** 5%; * 10%. Standard errors in parenthesis. First training: Training as first labor market experience. Previous training: Training having previous labor market experience.

Source: Own elaboration.

remain after including additional variables. Therefore, from now on, we only comment on the results corresponding to the third specification (M3).

In both types of jobs, women are around 20-25% more likely than men to be unemployed longer and this effect is similar across types of vocational studies. The age when an individual finishes education reduces the exit to employment in vocational high school by about 3%. On the contrary, it increases the hazard by 3% in vocational college, although only for the first job.

From a policy perspective, the most relevant covariates are type of school (public, semi-private and private) and workplace training. Attending a private school reduces the probability of exiting to both types of jobs by around 10-13% with respect to attending a semi-private school, although the effects are only significant for vocational college and first job. Individuals who have completed vocational high school in a public school are 10% more likely to find a job faster than those who attended a semi-private one. This positive effect is not observed in vocational college. In order to interpret these results, note that the type of school may account for both differences in school quality and family income. For instance, the negative effect of private schools may capture that their students are likely to come from high income households and they do not need to find a job so quickly as students from low income households. Another possibility is that private schools are of lower quality than public schools and this may imply a lower exit to employment. It is more likely that the type of school captures the quality effect because we control for parents' education, which is a proxy for household income. Indeed, individuals whose parents have upper secondary or tertiary education (high-income households) present lower hazard ratios. This result is in line with Dustmann (2004).

Table 7: HAZARD RATIO ESTIMATES (FIRST SIGNIFICANT JOB)

	Vocational High School			Vocational College		
	M1	M2	M3	M1	M2	M3
Female	0.72*** (0.02)	0.71*** (0.02)	0.75*** (0.02)	0.78*** (0.02)	0.77*** (0.02)	0.80*** (0.02)
Age when finishing education	0.97*** (0.01)	0.97*** (0.01)	0.97** (0.01)	1.01 (0.01)	1.01 (0.01)	1.01 (0.01)
Duration dependence	0.38*** (0.01)	0.38*** (0.01)	0.38*** (0.01)	0.35*** (0.01)	0.35*** (0.01)	0.35*** (0.01)
<i>Type of school (ref.: Semi-private):</i>						
Private school	0.89 (0.10)	0.91 (0.10)	0.95 (0.11)	0.81*** (0.05)	0.84*** (0.05)	0.90 (0.06)
Public school	1.09*** (0.03)	1.09*** (0.03)	1.09*** (0.04)	1.00 (0.03)	1.00 (0.03)	1.00 (0.03)
<i>Workplace training (ref.: No training):</i>						
First training	1.16 (0.11)	1.15 (0.10)	1.14 (0.10)	1.10** (0.05)	1.10** (0.05)	1.14*** (0.05)
Previous training	1.40*** (0.13)	1.39*** (0.13)	1.38*** (0.13)	1.18*** (0.05)	1.18*** (0.05)	1.23*** (0.05)
<i>Parents' education (ref.: Compulsory or less):</i>						
Upper secondary (father)		0.94 (0.04)	0.94 (0.04)		0.98 (0.04)	0.98 (0.04)
Tertiary (father)		0.93 (0.06)	0.93 (0.06)		0.88*** (0.04)	0.88*** (0.04)
“Don't know” (father)		0.84** (0.06)	0.84** (0.06)		1.01 (0.07)	1.00 (0.07)
Upper secondary (mother)		0.98 (0.05)	0.99 (0.05)		1.02 (0.04)	1.02 (0.04)
Tertiary (mother)		0.86* (0.07)	0.86* (0.07)		0.87** (0.06)	0.88** (0.06)
“Don't know” (mother)		1.11 (0.08)	1.11 (0.08)		0.93 (0.07)	0.94 (0.07)
<i>Program field (ref.: Agriculture-Fishery):</i>						
Manufacturing			1.20** (0.11)			1.13 (0.13)
Building			1.50*** (0.16)			1.42*** (0.17)
Clerical and Transportation			1.16* (0.10)			1.07 (0.12)
Social services			1.06 (0.10)			0.95 (0.10)

Table 7: HAZARD RATIO ESTIMATES (FIRST SIGNIFICANT JOB) (continuation)

	Vocational High School			Vocational College		
	M1	M2	M3	M1	M2	M3
Youth unemployment rate	1.32*** (0.03)	1.32*** (0.03)	1.33*** (0.03)	1.52*** (0.04)	1.52*** (0.04)	1.52*** (0.04)
Constant	0.00*** (0.00)	0.00*** (0.00)	0.00*** (0.00)	0.00*** (0.00)	0.00*** (0.00)	0.00*** (0.00)
Regional dummy	Yes	Yes	Yes	Yes	Yes	Yes
Log-likelihood	-13857.70	-13848.69	-13834.67	-15706.38	-15695.11	-15664.78
Observations	44,732	44,732	44,732	49,923	49,923	49,923
N	5,430	5,430	5,430	6,095	6,095	6,095

Dependent variable: number of months to find the first job after completing vocational education. Significance levels: *** 1%; ** 5%; * 10%. Standard errors in parenthesis. First training: Training as first labor market experience. Previous training: Training having previous labor market experience.

Source: Own elaboration.

Regarding workplace training, students in vocational high school taking training are more likely to exit to employment than individuals who have validated it. The effect is significant and big, especially for individuals taking workplace training having previous labor market experience (in this case, the hazard rate to employment increases by 65% and 38% to the first job and to the first significant job, respectively). In vocational college, workplace training also reduces a unemployment duration to the first significant job by 23% and 14% with and without previous experience. However, for the first job, training increases unemployment duration for individuals who did not have previous labor market experience.

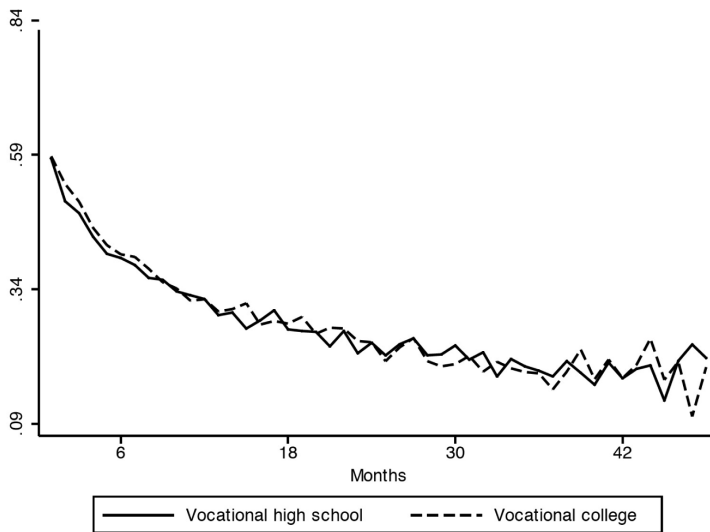
The type of program field also plays a role in finding a job. Completing a program in Building or Manufacturing reduces the expected duration by 55-57% and 21-24%, respectively, with respect to Agriculture and Fishery. Clerical and Transportation also decreases duration, although the effect is only significant in vocational high school. We do not find evidence that completing a program in Social Services affects the hazard rate. The first significant job presents similar results, although Building is the only field with a significant effect in vocational college.

Finally, the unemployment rate presents an unexpected positive sign on the exit rate. However, when we control for unobserved heterogeneity, this variable is not significant for the first job, and, for the first significant job, the effect is still positive but very small (Marcerano-Gutierrez and Vignoles (2012) also find that the unemployment rate increases the hazard rate to the first significant job). This positive effect of the youth unemployment rate may capture the economic growth of these years (2001-2005), which attracted many young people to enter into the active population and to start searching for a job. Therefore, the negative relationship between the youth unemployment rate and the unemployment duration may reflect the dynamic labor

market of this period, with high rates of job creation and transitions from unemployment to employment that would push young people to get a job more quickly.

Using the estimates from Table 7, we predict the survival function to the first significant job separately for each type of vocational education (Figure 6), and distinguishing by training (Figure 7). Figures show a good fit of the corresponding empirical hazards (see left panel of Figure 3 and Figure 5, respectively). There is some noise in the predicted hazards when the number of months to find a job is high. This is likely due to the few observations with this huge duration (see Table 4).

Figure 6: PREDICTED SURVIVAL FUNCTION TO THE FIRST SIGNIFICANT JOB

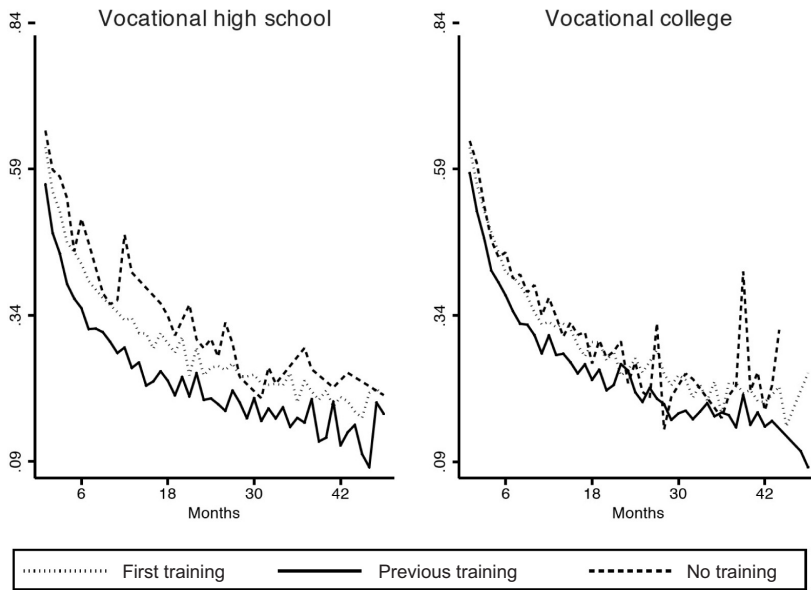


Source: Own elaboration.

4.1. Unobserved heterogeneity

Tables 8 and 9 report the results from the specification including all covariates and controlling for unobserved heterogeneity. The proportion of type two individuals in the population (p_2) is estimated around 60% and 40% for first job and first significant job, respectively. According to the estimates of μ_1 and μ_2 , individuals of type one need more time to find a job than individuals of type two, although the effect is small (see last rows of Tables 8 and 9). This means that individuals of type one have unobserved characteristics, such as innate ability or motivation, that increase their unemployment duration. For the first significant job, estimates of μ_1 and μ_2 may also capture the effect of having previous labor market experience in the first job (this is the case for 29% of individuals who had a first job before the first significant job, see Section 3.1).

Figure 7: PREDICTED SURVIVAL FUNCTION TO THE FIRST SIGNIFICANT JOB, BY TRAINING



Note: First training: Training as first labor market experience. Previous training: Training having previous labor market experience.

Source: Own elaboration.

Including unobserved heterogeneity allows estimating the true effect of $\log t$, the “duration dependence”. The hazard ratio estimate of this variable is higher once unobserved heterogeneity is accounted for, increasing from 0.40 to 0.78 for the first job, and from around 0.35 to 0.70 for the first significant job. This indicates that lack of control for unobserved heterogeneity downwardly biases the negative duration dependence.

Regarding the rest of covariates, the estimates of female are similar to those obtained without accounting for unobserved heterogeneity. The age when an individual finished education also reduces the exit to employment although only in vocational high school (in vocational college estimates are not significant). The positive effect of attending vocational high school in a public school is robust to control for unobserved heterogeneity. The estimates of parents’ education are similar in magnitude, although there is a loss of significance in some cases. The effect of Building remains positive and high after controlling for unobserved heterogeneity. This can be explained by the expansion of the construction sector in Spain between 2000 and 2007 due to the housing bubble.

With respect to workplace training, accounting for unobserved heterogeneity reinforces the positive effect found previously. Moreover, the negative impact of training as first labor market experience found in Table 6 for vocational college disappears.

Table 8: HAZARD RATIO ESTIMATES WITH UNOBSERVED HETEROGENEITY (FIRST JOB)

	Vocational High School	Vocational College
Female	0.74*** (0.04)	0.80*** (0.04)
Age when finishing education	0.94*** (0.01)	0.99 (0.02)
Duration dependence	0.77*** (0.02)	0.78*** (0.02)
<i>Type of school (ref.: Semi-private):</i>		
Private school	0.84 (0.14)	0.90 (0.08)
Public school	1.13** (0.06)	1.00 (0.05)
<i>Workplace training (ref.: No training):</i>		
First training	1.37* (0.23)	1.01 (0.07)
Previous training	2.08*** (0.35)	1.20*** (0.08)
<i>Parents' education (ref.: Compulsory or less):</i>		
Upper secondary (father)	1.00 (0.07)	0.90 (0.07)
Tertiary (father)	0.94 (0.09)	0.79*** (0.06)
“Don’t know” (father)	0.75*** (0.07)	0.88 (0.10)
Upper secondary (mother)	0.81*** (0.06)	1.13 (0.09)
Tertiary (mother)	0.87 (0.11)	0.93 (0.08)
“Don’t know” (mother)	1.26** (0.12)	1.01 (0.12)
<i>Program field (ref.: Agriculture-Fishery):</i>		
Manufacturing	0.99 (0.13)	1.08 (0.19)
Building	1.44** (0.24)	1.82*** (0.35)
Clerical and Transportation	1.03 (0.14)	1.00 (0.17)

Table 8: HAZARD RATIO ESTIMATES WITH UNOBSERVED HETEROGENEITY (FIRST JOB) (continuation)

	Vocational High School	Vocational College
Social services	0.94 (0.13)	0.90 (0.15)
Youth unemployment rate	1.04 (0.03)	1.06 (0.04)
<i>Unobserved heterogeneity:</i>		
Constant type 1 (μ_1)	0.14** (0.11)	0.05*** (0.04)
Constant type 2 (μ_2)	3.29 (2.64)	1.41 (1.23)
Probability type 2 (p_2)	0.61	0.59
Regional dummy	Yes	Yes
Log-likelihood	-10118.07	-11539.22
Observations	27,258	30,591
N	5,606	6,288

Dependent variable: number of months to find the first job after completing vocational education. Significance levels: *** 1%; ** 5%; * 10%. Standard errors in parenthesis. First training: Training as first labor market experience. Previous training: Training having previous labor market experience.

Source: Own elaboration.

Therefore, our analysis shows strong evidence of workplace training as a way of improving the transition from both types of vocational education to work. This means that initial training helps to increase the exit rate to the first full-time job and also to the first significant job (more stable job). From these results, recognizing workplace training with previous labor market experience is not an appropriate educational policy.

4.2. Job characteristics

Although the objective of this paper is to analyze the duration to find the first job from vocational high school and vocational college, in this subsection we go one step further and explore whether there are differences in job characteristics, such as wage, type of contract, occupation, etc. We do this using the information on the first significant job provided by the survey. Unfortunately, we cannot do the same for the first job because the dataset does not report this information for all full-time jobs that lasted less than six months.

In Table 10 we present, for vocational high school and vocational college, the distributions of wage, type of contract, occupation, activity sector, required degree, and method to find the job, both for the full sample and after conditioning on train-

Table 9: HAZARD RATIO ESTIMATES WITH UNOBSERVED HETEROGENEITY (FIRST SIGNIFICANT JOB)

	Vocational High School	Vocational College
Female	0.75*** (0.03)	0.83*** (0.03)
Age when finishing education	0.96*** (0.01)	1.00 (0.02)
Duration dependence	0.73*** (0.02)	0.69*** (0.02)
<i>Type of school (ref.: Semi-private):</i>		
Private school	0.78 (0.13)	0.87 (0.08)
Public school	1.10** (0.05)	1.00 (0.05)
<i>Workplace training (ref.: No training):</i>		
First training	1.24* (0.15)	1.16** (0.07)
Previous training	1.53*** (0.19)	1.25*** (0.08)
<i>Parents' education (ref.: Compulsory or less):</i>		
Upper secondary (father)	1.06 (0.07)	0.98 (0.05)
Tertiary (father)	0.93 (0.08)	0.86** (0.06)
“Don't know” (father)	0.86* (0.08)	1.04 (0.10)
Upper secondary (mother)	0.93 (0.07)	1.04 (0.06)
Tertiary (mother)	0.84 (0.09)	0.89 (0.08)
“Don't know” (mother)	1.11 (0.11)	0.99 (0.10)
<i>Program field (ref.: Agriculture-Fishery):</i>		
Manufacturing	1.22* (0.15)	1.13 (0.17)
Building	1.62*** (0.24)	1.45** (0.24)

Table 9: HAZARD RATIO ESTIMATES WITH UNOBSERVED HETEROGENEITY (FIRST SIGNIFICANT JOB) (continuation)

	Vocational High School	Vocational College
Clerical and Transportation	1.22* (0.15)	1.06 (0.16)
Social services	1.15 (0.14)	0.92 (0.14)
Youth unemployment rate	1.08** (0.04)	1.14*** (0.04)
<i>Unobserved heterogeneity:</i>		
Constant type 1 (μ_1)	0.04*** (0.03)	0.01*** (0.01)
Constant type 2 (μ_2)	4.01 (9.04)	0.82 (4.08)
Probability type 2 (p_2)	0.41	0.38
Regional dummy	Yes	Yes
Log-likelihood	-13399.48	-15276.93
Observations	44,732	49,923
N	5,430	6,095

Dependent variable: number of months to find the first job after completing vocational education. Significance levels: *** 1%; ** 5%; * 10%. Standard errors in parenthesis. First training: Training as first labor market experience. Previous training: Training having previous labor market experience.

Source: Own elaboration.

ing. We also report the average number of months working in the first significant job. We calculate this average employment duration distinguishing whether the first significant job had expired (*past job*) or not (*current job*) at the moment of the interview. The average duration is around 17 months in past jobs and 40 months in current jobs for the two vocational levels. Individuals who took the workplace training with previous labor market experience present the highest average duration in employment.

Employees who did not take workplace training have a higher percentage of permanent contracts and a lower share of fixed-term ones than individuals who took training, although the differences are small. In the full sample, the percentage of permanent contracts is 6% for individuals with vocational high school and 5% for individuals with vocational college. To provide a deeper insight into the pattern of the exit rate to each type of contract, in Figure 8, we show the Kaplan-Meier empirical hazard rates to the first significant job by type of contract. The patterns are quite similar between vocational high school and vocational college, although the hazard rates fall more quickly in the first six months for the latter. Surprisingly, individuals who

Table 10: CHARACTERISTICS OF FIRST SIGNIFICANT JOB (% , EMPLOYEE WORKERS)

	Vocational high school			Vocational college				
	First training	Previous training	No training	Full sample	First training	Previous training	No training	Full sample
<i>Average duration*</i> :								
Past job	17.64	17.98	16.22	17.78	17.39	17.95	16.72	17.58
N	1280	1429	67	2776	1184	1459	352	2995
Current job†	39.91	41.24	40.50	38.74	41.39	42.01	40.10	41.54
N	1232	1105	53	2390	1214	1346	297	2857
<i>Type of Contract:</i>								
Permanent	5.53	5.92	9.17	5.81	4.75	4.21	5.39	4.56
Fixed-term	41.13	41.48	36.67	41.19	45.62	45.31	40.21	44.89
No contract	2.03	2.68	1.66	2.34	2.34	1.82	3.08	2.17
Other	29.22	30.23	30.00	29.73	25.06	29.77	28.52	27.70
Don't know	22.09	19.69	22.50	20.93	22.23	18.89	22.80	20.68
<i>Monthly wage**:</i>								
< 433.55	6.65	5.56	9.17	6.17	6.26	4.24	5.55	5.21
433.55 to 750	35.43	32.68	27.50	33.89	33.53	30.12	29.89	31.50
750 to 1000	14.81	20.32	21.66	17.67	17.64	21.60	18.80	19.67
1000 to 1250	2.31	5.09	4.17	3.72	3.21	5.88	7.24	4.94
> 1250	0.48	1.23	2.50	0.90	0.66	1.18	0.77	0.92
<i>Don't know</i>								
Occupation†:	40.32	35.12	35.00	37.65	38.70	37.00	37.75	37.76
White-collar	28.47	21.98	29.17	25.30	60.76	55.61	42.37	56.26
Blue-collar	71.54	78.02	70.83	74.70	39.24	44.38	57.63	43.75

First training: Training as first labor market experience. Previous training: Training having previous labor market experience. *In months. †Current job: a job that has not expired at the moment of the interview. **In euros. ‡White-collar: Managers and Professionals; Technicians and associate professionals; Clerical support workers. Blue-collar: Service and sale workers; Skilled agricultural; Craft and related trade workers; Plant and machine operators; No qualified occupations. Source: Own elaboration.

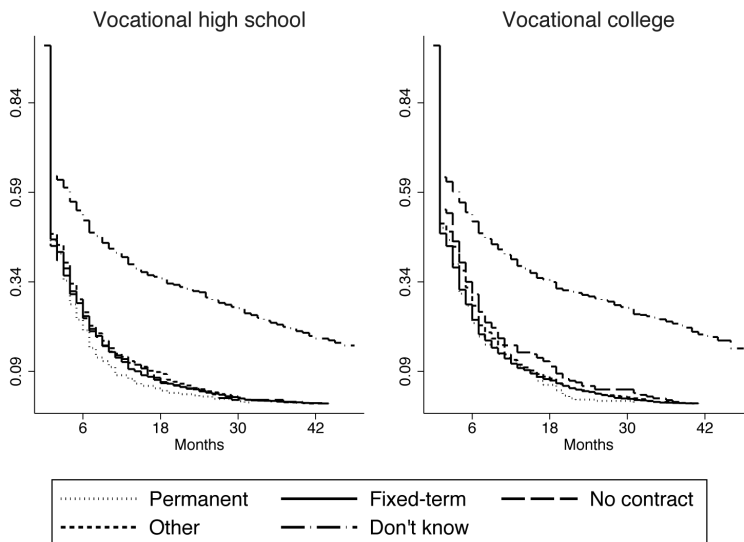
Table 10: CHARACTERISTICS OF FIRST SIGNIFICANT JOB (% , EMPLOYEE WORKERS) (continuation)

	Vocational high school			Vocational college				
	First training	Previous training	No training	Full sample	First training	Previous training	No training	Full sample
<i>Required degree:</i>								
Compulsory	6.37	5.76	10.00	6.16	3.96	3.17	4.47	3.64
Academic high school	0.56	0.47	0.00	0.50	2.04	1.93	1.23	1.9
Vocational high school	49.60	47.51	47.50	48.52	8.67	8.73	13.25	9.21
Vocational college	3.07	3.24	0.83	3.10	53.04	52.76	40.52	51.52
University	2.70	2.33	0.00	2.46	1.67	1.85	1.39	1.73
Not required	36.27	38.95	38.33	37.63	28.23	29.77	37.29	29.97
Don't know	1.43	1.74	3.33	1.63	2.38	1.78	1.85	2.03
<i>Sector:</i>								
Agriculture-Fishery	1.51	2.01	0.83	1.74	0.96	1.00	1.08	0.99
Manufacturing-Extraction	22.57	23.91	26.67	23.33	22.06	23.53	23.27	22.90
Construction	11.62	14.21	14.17	12.95	6.55	8.63	12.02	8.15
Commerce	26.23	22.81	21.67	24.45	19.56	17.50	16.64	18.25
Hotel industry	4.02	9.27	10.00	6.74	3.71	5.17	7.40	4.82
Services	16.28	12.79	11.67	14.46	29.86	28.31	27.43	28.84
Education-Health	10.23	7.62	10.00	8.94	10.30	7.99	5.86	8.70
Other	7.52	7.38	5.00	7.39	7.01	7.88	6.32	7.35
<i>Method to find the job:</i>								
Training firm	23.49	23.64	-	23.02	24.15	26.60	-	22.64
Employment office	6.25	5.56	9.17	5.98	6.46	7.66	10.63	7.50
Informal network	33.08	35.60	45.83	34.61	25.81	27.56	41.45	28.38
Direct contact with firms	20.02	19.26	30.00	19.88	19.93	18.07	26.35	19.75
Other	17.16	15.94	15.00	16.51	23.64	20.11	21.57	21.72
N	2,512	2,534	120	5,166	2,398	2,805	649	5,852

First training: Training as first labor market experience. Previous training: Training having previous labor market experience.

Source: Own elaboration.

Figure 8: KAPLAN-MEIER EMPIRICAL HAZARD TO THE FIRST SIGNIFICANT JOB, BY TYPE OF CONTRACT



Source: Own elaboration.

report not knowing their type of contract have the quickest exit rate. For the other four contracts (permanent, fixed-term, no contract, and other contract), we can reject the hypothesis that the survivor functions are the same in each Kaplan-Meier estimation¹⁶. From this evidence, we conclude that people who find a permanent first significant job present the highest non-employment duration.

With respect to wages, Table 10 shows that taking the training is related to lower earnings, although no clear pattern appears. However, we have to be cautious with our conclusions given the high percentage of individuals (37%) who report not knowing their wage.

Up to now, no large differences in job characteristics have been observed between vocational high school and vocational college. However, a clear difference emerges in occupation: individuals with vocational high school are relatively more employed in blue-collar jobs (75%) than individuals with vocational college (44%). Since we do not control for type of field, this difference may be attributed to the different range of programs offered in each vocational level. By training, we do not find differences in vocational high school while, in vocational college, taking the training implies being relatively more employed in white-collar occupations (around 56-61%).

(16) The log-rank test statistic is $\chi^2_3 = 8.20$ (p-value = 0.04) for vocational high school and $\chi^2_3 = 11.87$ (p-value = 0.01) for vocational college.

With respect to the required degree for the job (compulsory, academic high school, vocational high school, vocational college or university), around 30% and 38% of the individuals with vocational high school and vocational college, respectively, obtain a job that does not require any degree. Half of the individuals find a job whose requirements matched the vocational degree attained. However, individuals who did not take training are relatively more overeducated, especially in vocational college, where only 41% find a job requiring a vocational college degree. This proportion is 53% among students who did not validate training. Moreover, 13% of the individuals not taking training have a job that only required vocational high school, compared to a proportion of 9% among those completing workplace training. Students who take this module are likely to get a job in the training firm. Workers with recognized training are more likely to get a job through informal networks or direct contact with firms, which highlights their networks and/or their previous labor market experience. It is plausible that employers use the period of workplace training to screen trainees and to learn about their skills and productivity. Based on this, they may decide to hire trainees after workplace training. This evidence reinforces our conclusion that recognizing training is not an appropriate educational policy. Workplace training not only provides individuals with labor skills but can also improve the matching process between employer and workers, reducing the proportion of overeducated workers.

Finally, people with recognized training are employed more in Manufacturing-Extraction, Construction and the Hotel industry. Individuals with training as first labor market experience work more in Commerce, Services, and Education-Health.

In Tables 11 and 12, we explore in more detail the average duration of the first significant job. Table 11 reports the percentage of individuals with a significant job lasting, one year or less, between one and two years, or more than two years. 80-90% of workers present a duration of the current job of more than two years while, for past jobs, this percentage is only 21-25%. In addition, the highest percentage of jobs that lasted one year or less is found among individuals who did not take the training, especially in vocational high school. For jobs with a duration above two years, the highest percentage is for individuals who took the training having previous experience.

Table 12 shows the average employment duration according to the characteristics of the first significant job (contract, wage, occupation and sector). We do not observe many differences in the average duration between vocational high school and vocational college. In both types of education, the highest average duration is observed for individuals with a permanent contract, with a monthly wage between 750 and 1000 euros, and working in Manufacturing or Construction. The only difference is observed in occupation: the largest duration is for blue-collar workers in vocational high school and for white-collar workers in vocational college. By workplace training, some differences appear by type of contract and wage. For workers with a permanent contract, the largest duration is observed among those who took the workplace training with previous labor market experience. For workers without a contract, the highest average duration is found among people with recognized training. Looking at the wage distribution in vocational high school, the greatest average duration is observed at the top for individuals recognizing the training and at the bottom for individuals taking the workplace training with previous labor market experience. In vocational college, the largest duration is for the latter across the whole wage distribution.

Table 11: FIRST SIGNIFICANT JOB DURATION (% EMPLOYEE WORKERS)

	Past job			Current job*				
	1 year	1-2 years	> 2 years	Individuals	1 year	1-2 years	> 2 years	Individuals
<i>Vocational high school:</i>								
First training	39.14	36.96	23.90	1280	3.33	9.01	87.66	1232
Previous training	38.77	36.19	25.04	1429	2.81	5.23	91.96	1105
No training	52.24	26.87	20.89	67	3.77	13.22	83.01	53
<i>Vocational college:</i>								
First training	42.15	34.12	23.73	1184	3.21	5.26	91.53	1214
Previous training	38.79	35.78	25.43	1459	2.30	5.49	92.21	1346
No training	42.33	34.66	23.01	352	3.37	9.10	87.53	297

*Current job: a job that has not expired at the moment of the interview. First training: Training as first labor market experience. Previous training: Training having previous labor market experience.

Source: Own elaboration.

Table 12: AVERAGE DURATION OF FIRST SIGNIFICANT JOB (IN MONTHS)

	Vocational high school			Vocational college			
	First training	Previous training	No training	First training	Previous training	No training	Full sample
<i>Type of Contract:</i>							
Permanent	43.21	45.11	43.00	42.74	45.19	43.20	43.88
Fixed-term	42.58	43.47	43.64	43.31	44.22	42.53	43.68
No contract	41.24	42.85	45.00	42.54	40.35	45.30	42.09
Other	41.77	43.15	43.06	42.62	43.49	43.29	43.15
Don't know	37.11	39.68	34.56	39.30	39.56	37.84	39.24
<i>Monthly wage*:</i>							
< 433,55	41.84	42.44	40.36	43.77	44.34	42.19	43.80
433,55 to 750	42.41	43.78	42.61	42.72	43.67	42.98	43.18
750 to 1000	42.74	43.88	43.88	43.37	44.72	43.76	44.12
1000 to 1250	42.36	43.47	48.00	44.01	44.19	43.28	43.99
> 1250	38.83	44.61	46.00	39.50	44.76	42.80	43.02
Don't know	39.28	40.90	38.02	40.87	41.31	39.52	40.92
<i>Occupation†:</i>							
White	40.99	41.38	40.74	42.51	43.17	41.23	42.71
Blue	41.21	43.08	41.65	41.72	43.01	42.22	42.42
<i>Sector:</i>							
Agriculture-Fishery	39.53	42.24	44.00	39.74	42.21	42.86	41.31
Manufacturing-Extraction	42.28	43.50	44.53	43.43	44.05	41.99	43.57
Construction	43.36	44.48	42.94	43.85	43.93	42.40	43.66
Commerce	41.36	42.10	39.23	41.70	42.67	41.63	42.14
Hotel industry	39.39	42.69	36.08	40.20	43.06	40.38	41.70
Services	40.33	41.76	44.57	42.11	43.00	41.89	42.51
Education-Health	38.82	40.42	39.58	40.72	42.34	39.95	41.38
Other	39.75	42.80	35.83	42.13	41.51	43.24	41.91
N	2,512	2,534	120	2,398	2,805	649	5,852

First training: Training as first labor market experience. Previous training: Training having previous labor market experience. *In euros. †White-collar: Managers and Professionals; Technicians and associate professionals; Clerical support workers. Blue-collar: Service and sale workers; Skilled agricultural; Craft and related trade workers; Plant and machine operators; No qualified occupations.

Source: Own elaboration.

5. CONCLUSIONS

This paper studies the duration (measured by the number of months) to find the first job and the first significant job (a job lasting at least six months) for people who have completed vocational high school or vocational college in Spain. By each vocational level, we analyze, for the first time, whether the module of workplace training included at the end of vocational programs affects the school-to-work transition. This module is mandatory, although the Spanish system recognizes it by certifying enough previous work experience related to the content of the program. We also explore the effect of individual, family and school characteristics.

Accounting for unobserved heterogeneity, we find that the workplace training has an important role in increasing the hazard rate to the two types of jobs, especially when training is combined with previous labor market experience. This positive effect is larger in vocational high school than in vocational college. Being female, finishing vocational education older or having high-educated parents reduce the exit to employment. Attending vocational high school in a public school reduces unemployment duration, while attending a private one does not have significant effects.

We also explore the characteristics of the first significant job. We do not find large differences between the two vocational levels, except in occupation, where the proportion of blue-collar workers is higher in vocational high school than in vocational college. In addition, we find evidence that taking the workplace training improves the matching with employers since trainees are likely to get a job in the training firm and they are less overeducated in the workstation. Convalidating the workplace training is related to lower average employment duration.

From a policy perspective, in many countries, and Spain is not an exception, the school-to-work transition is a central issue. Based on the evidence from labor-oriented education systems (such as the German scheme), the Spanish government is trying to improve the link between school and the labor market. We obtain that initial training helps to increase the exit rate to a first job and to improve the matching with employers. Therefore, recognizing the workplace training with previous labor market experience is not an appropriate educational policy. Furthermore, additional information regarding the benefits of taking the workplace training might help as well. This policy recommendation is in line with the OECD report by Field *et al.* (2012), which highlights that reinforcing workplace training is still a challenge for the Spanish vocational system.

Since our analysis studies the beginning of labor careers, a related question is whether the advantages of workplace training persist later in life in Spain. Ryan (2011) notes that apprenticeship paths may produce limited gains in later labor careers because vocational skills become obsolete faster. Regarding this, Hanushek (2011) finds that individuals with vocational education experience worse employment outcomes as they become older relative to individuals with general education. Other possible problems related to vocational schooling are that trainees can be considered “cheap labor”, reducing the learning content of the workplace experience; or difficulties to merge theory and practice into a coherent whole may appear [Ryan (2011)]. However, clarifying these effects requires data on later labor careers and more information about the tasks carried out during workplace training. Due to the lack of this type of data, these remain important questions to be analyzed in future research.

Table A.1.: MEAN OF VARIABLES BY TRAINING

	Vocational high school			Vocational college		
	Total	First training	No training	Total	First training	No training
Female	0.45	0.53	0.44	0.50	0.60	0.43
Age when finished education*	20.13 (1.40)	19.93 (1.35)	20.17 (1.46)	21.53 (1.18)	21.34 (1.18)	21.40 (1.26)
<i>Type of school:</i>						
Public	0.73	0.71	0.79	0.75	0.75	0.72
Semi-private	0.25	0.28	0.20	0.19	0.19	0.24
Private	0.02	0.02	0.01	0.06	0.06	0.03
<i>Father's education:</i>						
Compulsory or less	0.65	0.67	0.65	0.65	0.67	0.66
High school	0.11	0.11	0.11	0.14	0.13	0.13
Tertiary	0.07	0.06	0.12	0.11	0.10	0.09
Don't know	0.16	0.16	0.12	0.10	0.10	0.11
<i>Mother's education:</i>						
Compulsory or less	0.72	0.74	0.73	0.73	0.74	0.75
High school	0.10	0.10	0.12	0.13	0.12	0.12
Tertiary	0.04	0.03	0.05	0.06	0.05	0.04
Don't know	0.14	0.13	0.11	0.08	0.09	0.09

*Standard deviation in parentheses. First training: Training as first labor market experience. Previous training: Training having previous labor market experience.
Source: Own elaboration.

Table A.1.: MEAN OF VARIABLES BY TRAINING (continuation)

	Vocational high school				Vocational college			
	Total	First training	Previous training	No training	Total	First training	Previous training	No training
<i>Workplace training:</i>								
First training	0.49	-	-	-	0.41	-	-	-
Previous training	0.48	-	-	-	0.47	-	-	-
No training	0.03	-	-	-	0.12	-	-	-
<i>Program field:</i>								
Agriculture-Fishery	0.03	0.22	0.19	0.14	0.21	0.23	0.20	0.13
Manufacturing	0.31	0.33	0.25	0.37	0.28	0.32	0.24	0.27
Building	0.05	0.15	0.16	0.18	0.12	0.12	0.12	0.14
Clerical and Transportation	0.35	0.18	0.23	0.19	0.15	0.13	0.17	0.18
Social services	0.27	0.13	0.16	0.12	0.24	0.20	0.27	0.28
<i>Region:</i>								
Northwest	0.08	0.11	0.13	0.11	0.14	0.13	0.16	0.12
Northeast	0.12	0.10	0.06	0.11	0.10	0.13	0.07	0.08
East	0.17	0.14	0.19	0.27	0.15	0.11	0.17	0.18
Centre	0.47	0.17	0.16	0.19	0.15	0.18	0.11	0.18
South	0.16	0.48	0.46	0.32	0.47	0.44	0.50	0.43
N	5,725	2,821	2,762	142	6,408	2,648	3,033	727

*Standard deviation in parentheses. First training: Training as first labor market experience. Previous training: Training having previous labor market experience.

Source: Own elaboration.



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RESUMEN

Este artículo analiza la transición desde la formación profesional hacia el primer empleo en España, usando micro-datos de historiales laborales. Entre los determinantes de esta transición investigamos, por primera vez, la realización de las prácticas en la empresa. En España, las prácticas constituyen un módulo obligatorio de la formación profesional para los estudiantes, pero pueden convalidarse si el estudiante tiene experiencia laboral previa. Aplicando técnicas de estimación de duración, y teniendo en cuenta la heterogeneidad no observada, encontramos que ser mujer, terminar formación profesional con más edad, o tener padres con educación superior, reduce la tasa de salida hacia el empleo. Hallamos que el módulo de prácticas profesionales es un factor importante para reducir la duración en el desempleo.

Palabras clave: duración desempleo, entrada al mercado laboral, prácticas profesionales, modelo de duración.

Clasificación JEL: J13, J24, I20.