"Matching the supply of and demand for young people graduating from the vocational track in Spain"

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Abstract

There is particular policy interest in the extent to which education and training can affect the length of time take by young people to find a job and the quality of the job that the person can secure. We analyze the time taken by Spanish graduates from the different vocational tracks available to find a job and also estimate the wage differential earned by young people graduating from these different vocational tracks. To do this we use various quantitative models and make use of the first survey specifically designed to conduct this type of analysis (ETEFIL, 2005).

JEL Classification: J64, J24, I21, J31.

Keywords: Vocational education, vocational track, job search.

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1. Introduction.

There is widespread concern in many countries, including Spain, about the difficulties faced by young people in securing a good quality job and fears that young people lack the appropriate mix of skills required for the labour market. Given the high cost of the education investments made by families, firms and the government, there is particular policy interest in the extent to which different types of education and training can affect the length of time take by young people to find a job and the quality of the job that the person can secure. Commentators in Spain have been particularly concerned about whether the vocational supply of skills adequately matches demand. To address this apparent deficiency in the Spanish labour market recent policy developments have focused on making more appealing the vocational pathways available to Spanish youth, with the aim of increasing the supply of workers with vocational skills. For example, the Vocational Education Act of 2002 aimed to improve the match between the supply of and demand for vocational qualifications and also strengthen apprenticeship and training initiatives. Yet despite various policy efforts, enrolment in vocational education remains low in Spain in recent years, as discussed below. In this paper we aim to shed light on this issue by investigating the labour market value of different vocational pathways, assessing first, the extent to which the different vocational paths available to young people are associated with more or less rapid transition into permanent employment, and second, analysing the earnings differentials earned by graduates from the different vocational tracks.

As well as providing empirical evidence on transitions into work in the Spanish labour market, this paper aims to contribute to the substantial literature on transitions from education to employment.

This paper adds to the literature in a number of ways. Firstly, we examine the outcomes and transitions from vocational educational pathways specifically. Secondly, we focus on the time taken for a young person to secure his or her *First Significant Job* (FSJ), rather than simply unemployment durations. We do this because when young people attempt to enter the Spanish labour market for the first time, a high proportion of jobs potentially available to them are likely to be temporary and low quality (generally poorly paid). Likewise, moving jobs in early career

and taking short periods of inactivity may not be unusual and in essence may represent a hidden form of unemployment (Layard & Nickell, 1999).

The rest of the paper is organized as follows. The data, definitions of the variables analysed and some descriptive statistics are presented in Section 2. In Section 3, we show the econometric approaches used and report the main results. Section 4 concludes and discusses the main implications of our results from a policy perspective.

2. Data and variables.

The data used in this paper come largely from the Spanish Survey on the Transition from Education/Training to the Labour Market ("*Encuesta de Transición Educativo Formativa e Inserción Laboral*"), ETEFIL (2005)[1]. This is a nationally representative survey of Spanish youth, designed to shed light on the mechanisms that young people use to find a job. It is also the first major survey that specifically addresses the problematic transitions into work faced by Spanish vocational graduates. The sample includes individuals who finished their studies during the academic year 2000-2001 and respondents were interviewed in mid 2005. The full sample includes individuals who left secondary education with academic or vocational qualifications, as well as those who left without any qualifications at all (they may have continued studying in a different type of education though) and those who finished any "special" vocational training programs (i.e. programmes that exceed 100 hours in duration and are not taken along side a university degree). Although it is not a panel survey, the data contain a rich set of information on students' pathways.

The survey was conducted during the period April-July 2005, and the sample comprises 45620 observations. Only people under 25 by the end of 2001 (31st December) were surveyed, which means that the oldest respondent in 2005 was 29. The observations are stratified by educational routes.

We restrict the sample to those completing a vocational program, either a school-based vocational programme[2] or an apprenticeship-type vocational programme. Within the former there are two main subgroups of individuals: intermediate vocational students and higher

vocational students. Within the apprenticeship pathways, which are funded by the Spanish Department of Employment (INEM) and the European Social Fund) we may distinguish between those programs included in the National Plan for Vocational Training and Integration (FIP) and those in the so called *Escuelas Taller* and *Casas de Oficios* (ETCO) programme (this may be translated as Apprentice and Craft schools). Both programmes are aimed at easing the transition of young people and particularly the unemployed into a job; however, the latter is specifically designed to help very low skilled workers.

When we restrict the sample to young people following a vocational pathway, we are left with a total sample of 27794 youths. We further restrict the sample, excluding from the group of intermediate and higher vocational graduates those who then also undertook a FIP or an ETCO program between 2002 and 2005. This latter restriction is necessary since we cannot determine the time since completing education to finding a FSJ for these individuals as they essentially return to full time education. It is also likely that individuals who enrol in a FIP or an ETCO programme having already completed an intermediate or higher level vocational qualification do so because they face difficulties in the labour market or because they feel that they lack particular skills. If we are eliminating a lower productivity group from our sample, and if these individuals are unevenly distributed across the different vocational pathways, we may generate some biases in our estimates of the differential effectiveness of different vocational pathways. After this restriction, our final sample comprises 24481 respondents.

In general, we also need to add a word of caution about interpreting the results in this paper. We are able to explore the labour market experiences of graduates from the different vocational pathways. The analysis is necessarily descriptive however, since individuals' choice of pathway is likely to be endogenous. In the absence of experimental data or a natural experiment that produces exogenous differences in the vocational pathway chosen, we are unable to undertake a causal analysis. Despite this, our work can usefully inform policy-makers of the current situation in the labour market *vis a vis* the labour market success of different types of vocational graduate.

The key advantage of the data we use is that it contains detailed information on labour market events and job search activities that have occurred since the individual left full-time education, as well as information on the individual's current and previous job characteristics.

We estimate two different sets of models. Firstly, following the literature described earlier, we estimate a duration model of job search to explore the time taken to get into stable employment by individuals following different vocational pathways. Our distinctive contribution here is not only that we focus on vocational graduates, but also that our dependent variable is the length of time from the end of the person's full time education in 2001 until s/he finds a FSJ, as defined earlier in this paper. Our second model is a conventional wage equation, where earnings (banded) in the person's current job are regressed against a number of individual characteristics, including their vocational field of study.

Our main focus is on the role of type of vocational programme and field of study. We distinguish four distinct types of vocational programmes: intermediate vocational, higher vocational, apprenticeship programs and the workshop programs (ETCO and FIP, described earlier).

In the duration model, the time until the respondent found a FSJ may be right-censored due to the data sampling design, i.e. if the individual did not find a FSJ before mid 2005 we will treat the observation as right censored. For these observations the contribution to the likelihood function is the probability of not finding a FSJ within observed sample period[3].

For the wage equation model, the dependent variable is the person's wage in their FSJ and we will make use of an additional set of controls: namely, the number and length of training courses undertaken after graduation but before entering FSJ, working hours, job tenure, whether the worker's contract is permanent or not, firm size and the way in which their job search was conducted as a proxy for the person's social capital (e.g. their networks, role of family etc.). Variables indicating whether the individual is over qualified are also included, based on a subjective measure of over/under qualification (i.e. the individual's opinion about whether their qualifications match or are above (below) what is required to do their job).

3. Main results: empirical approach.

3.1. Duration models.

3.1.1. Non-parametric analysis:

We start by presenting a non-parametric unconditional analysis of duration (transition into FSJ). The median survival time before exit to a FSJ is 1.5 years (this figure is computed including those who find a FSJ immediately after finishing education, i.e. one month later), however when we restrict the sample focusing only on those who obtained a vocational qualification (before the end of 2001), the median survival time is just 6 months. In other words, 50% of those graduating from the vocational route find a FSJ within 6 months.

This is supported by Figure 2 which shows the path of the Kaplan-Meier survivor function and Nelson-Aalen cumulative hazard function for the period (and plots 99% confidence intervals at each point estimate; the Greenwood-type confidence intervals are very close to the survivor function which makes them difficult to observe).

- Insert Figure 2 here –

The left hand panel of Figure 2 illustrates the probability of remaining not in a FSJ through time (t); in this context, continued survival implies a negative situation where the individual remains unable to secure a FSJ. The right hand panel of Figure 2 shows the cumulative likelihood of a worker finding a FSJ given that he/she has not found one up to time (t) [4]. The hazard shows a peak just after graduation (left hand panel), which is consistent with findings in the previous literature that the hazard of finding a job is very high during the first few periods after leaving the educational system. This implies that the value of the cumulative *survival* function falls rapidly during the first months after leaving vocational education (left panel), reflecting the fact that many graduates find jobs immediately. Subsequently, the cumulative *hazard* increases at a decreasing rate up to approximately three and half years after leaving school (convex shape of the curve), holding constant from than point onwards[1]..

A priori we expect some differences in the duration to FSJ by gender, particularly given the large gap in the unemployment rates for female and male young adults. We also anticipate

[1]The estimated survival and cumulative hazard function are available upon request.

potential differences in the duration to FSJ by type of vocational program completed. In Figure 3, we show the (Kernel-smoothed) hazard function by gender and by vocational track.

- Insert Figure 3 here –

Figure 3 suggests that men progress more rapidly into a FSJ than women: in particular, men have a much higher probability of securing a FSJ in their first year after graduation. Nevertheless men and women's hazard rates converge by the end of the period, particularly from the third year onwards. The hazard rate for both genders is non-linear and does not exceed 6% at any time, This indicates that, at the peak of the hazard, there is a 6% chance of the youth exiting to a FSJ in any particular month, which is consistent with the results for other OECD countries (Serneels, 2001, suggested it stays mostly below 7%)[5].

The right hand panel of Figure 3 suggests that youths graduating from the intermediate vocational program have the highest probability of finding a FSJ. By contrast, higher vocational graduates and those who completed ETCO-apprenticeship programs have a somewhat lower risk of exiting to a FSJ. Young adults who have completed a FIP-training program have the lowest probability of exit to a FSJ at any point in time. Although these results are purely descriptive, it is of note that the FIP programme graduates do not exit quickly to a FSJ (partly reflecting issues around the selectivity of this group of young people).

Table 1 reports tests of whether the survival functions are equal for men and women, and across the different vocational tracks. Not surprisingly the tests suggest that we can reject the null hypothesis of equality. The Wilcoxon-Breslow test presented in Table 2 indicates that the survival functions are statistically significantly different across gender stratified by the vocational track followed. The log-rank, Tarone-Ware and Peto-Peto tests show virtually the same results.

- Insert Table 1 here –
- Insert Table 2 here –

Third, there is some evidence of negative duration dependence. The non-stratified kernel smoothed hazard rates show the same overall pattern as Figure 3. This is not presented for space reasons. This negative duration dependence is especially relevant between months 6-

12. It might be a sign that individuals who have not found a FSJ within 6 months may suffer from the stigma of not having exited to a FSJ. Alternatively, this could be capturing a negative selection effect with respect to unobserved characteristics (e.g. unobserved skills), that is, the negative duration dependence may be bogus, see Lancaster (1990). There is substantial evidence of negative duration dependence in the transition to employment (see for example, Abbring et al. (2001), for USA, Arumpalan et al. (1995 and Andrews *et al*. (2002), for UK, Alba-Ramirez (1998)[6], Cañada *et al*. (1998) and Gonzalez-Betancor *et al*. (2004), for Spain).

3.1.2. Semi-parametric/ parametric analyses:

In our semi-parametric analyses, we seek to take account of personal characteristics and duration dependence in our models. Specifically, we use the Cox proportional hazard (PH) model[7], as briefly presented in section 3.1. This model makes no assumptions about the nature or form of the hazard function, i.e. it estimates by partial likelihood the □coefficients without estimating the shape of the baseline hazard. The model does however, assume proportionality, i.e. that changes in levels of the independent variables will produce proportionate changes in the hazard function, independent of time[2]. This assumption holds across vocational tracks but not across gender. We overcome this by estimating separate proportional Cox hazard models by gender.

Table 3 displays the estimated coefficients[8] for several different specifications of a model, where the dependent variable is the time to a person's FSJ. We use Breslow's method for handling ties because the impact of ties is relatively low in our data, and, consequently, there are not substantial differences with other estimation methods. The model controls for age, nationality, parental education and region. Although our preferred specifications are estimated separately by gender, we start with a combined male/female sample, which allows us to look at the relationship between gender and time to a FSJ. Gender is significantly related to the time taken to secure a FSJ. Consistent with previous work, females take longer to find their first significant job than males (e.g. Genda & Kurosawa, 2000, and Lassibille *et al*. 2001). Older youth take less time to find a FSJ, whilst nationality is insignificantly related to the time to a

[2] Tests for whether this assumption holds are available from the authors upon request.

FSJ (perhaps unsurprisingly as by 2001 the immigration rate was still very low in Spain as compared to other EU countries). The influence of family background is somewhat perverse: youth with more highly educated parents take longer to exit into a FSJ as compared to parents with less than primary school education (the previous literature on this has not been conclusive, see Dolton *et al*. 1994, Nielsen *et al*. 2001, Andrews *et al*. 2002, and Corrales, 2005). This could be because greater parental wealth enables young people to take longer to enter their FSJ (they may undertake more protracted searches to maximise the quality of their job match, for example), although we are unable to verify this. Certainly young people in Spain (as in other Southern European countries) are now leaving the parental home at a later age than was previously the case (Aassve *et al*, 2002, and Chiuri & Del Boca, 2007). In fact by 2005 more than 70% of the population aged 15-29 were living at their parents' home. Lastly, the results indicate that region of domicile is also significantly related to time to a FSJ, as expected given the difference in regional unemployment rates across Spain.

Our main focus however is on the relationship between the type of vocational education acquired and the duration to a FSJ[9]. Those who completed higher vocational training (the reference group) take longer, holding everything else constant, to find a FSJ than those who graduate with an intermediate vocational qualification. This is of course counter-intuitive given that the latter requires (at least) two fewer years of education and training. Graduates with a higher vocational training qualification do however have an advantage over those who complete a FIP-training program: the latter take significantly longer to secure a FSJ. Males who take the ETCO apprenticeship route take less time to find a FSJ than those with higher vocational training, whilst females who take the ETCO courses take significantly more time to find a FSJ.

- Insert Table 3 here –

Those who take FIP training or ETCO training can also have other types of vocational and academic training. In the final two columns in Table 3 we split out the FIP and ETCO workers according to their previous level of education and training, namely below primary, primary, upper secondary, intermediate vocational or higher vocational. This allows for the fact that someone with ETCO training may also have an intermediate or higher level vocational

qualification. The results suggest that FIP students with intermediate vocational qualifications take a similar time to find a FSJ as compared to the base case of workers with higher vocational qualifications. Interestingly however, FIP students who already have a higher vocational qualification take longer to secure a FSJ as compared to those with just a higher vocational qualification. We suspect this is caused by the negative selection process into FIP, i.e. individuals with higher level vocational qualifications who then enrol in FIP have probably experienced problems integrating into the labour market already.

To test the robustness of the above results, we also estimated various parametric models, which make different assumptions about the underlying distribution of the hazard. Specifically, we undertook this modelling to test for the potential existence of duration dependence, i.e. the notion that the longer a worker takes to find a FSJ, the less likely he or she is to secure such a job in the next period (perhaps due to stigma effects). Additionally, we are also concerned that due to unobserved selection processes our results in Table 3 may be biased by unobserved heterogeneity. Table 4 below compares the results from various models, with and without accounting for unobserved heterogeneity. The results are qualitatively similar across the different models and in comparison with the Cox model in Table 3, namely that individuals with intermediate vocational qualifications take less time to secure a FSJ, whilst workers with FIP training take longer to secure a good job.

- Insert Table 4 here –

Table 4 provides some evidence of negative duration dependence (the value of parameter p for the Weibull distribution ($p<1$)). There is also evidence of unobserved heterogeneity, as the parameter theta (θ) is significantly different from zero. Even so, the hazard rates change very little, accordingly our results are similar to those discussed in our previous analyses.

The fact that intermediate vocational qualifications appear to be associated with more rapid transitions into a FSJ than higher vocational qualifications, might suggest some problem with the nature of higher vocational training in Spain. However, it is possible that higher vocational qualifications simply include a different mix of fields of study as compared to

intermediate qualifications. If higher vocational training tends to be in subject areas that are less in demand in the labour market, this may explain why individuals with higher vocational qualifications take longer to integrate properly into the labour market. We therefore investigate further the relationship between field of study and time to a FSJ, allowing for the level of qualification acquired (Table 5).

- Insert Table 5 here –

Table 5 compares the time to a FSJ for each combination of field of study and level of qualification by gender, with the base case being a worker with a higher level vocational qualification in the field of administration. Table 5 indicates that there are large significant differences across subject areas and qualification levels, in terms of the time taken to secure a FSJ. Almost without exception, males with intermediate qualifications take less time to a FSJ regardless of field of study as compared to males with higher level vocational qualifications in administration (the coefficient on arts and entertainment is insignificant). Females with intermediate qualifications in wholesale and retail trade also take less time to secure a FSJ compared to those with higher vocational qualifications in administration. By contrast females with intermediate qualifications in agriculture, forestry and fishing take significantly longer to secure a FSJ.

For females, those with higher level vocational qualifications in most fields (other than accommodation and food service, other services or water and energy) take significantly longer to secure a FSJ, as compared to those with higher level vocational qualifications in administration. For males, the pattern is more mixed. Males with higher level vocational qualifications in accommodation and food, manufacturing, water and energy, and wholesale and retail trade, take less time to secure a FSJ than males with higher level qualifications in administration. Equally males with higher level vocational qualifications in agriculture, arts and health fields take significantly longer to find a FSJ.

Moving down the table, we consider the time to a FSJ for those with FIP training. For females, FIP training in all fields is associated with a longer duration to a FSJ, with the exception of the fields of mining or other services (for which the coefficients are insignificant,

largely due to the very few females who take this type of training). Broadly, females who undertake FIP training take longer to get a FSJ, regardless of their field of study. The pattern is again more mixed for males. In many fields, such as administration, arts, and information, FIP training is associated with a longer duration to a FSJ. Equally, males with FIP training in manufacturing, professional and scientific fields and wholesale and retail trades, take less time to a FSJ.

Generally, for women, undertaking an ETCO apprenticeship is associated with taking longer to find a FSJ. The exceptions for women are in the fields of administration, arts and information. For males, generally ETCO apprenticeships appear to be associated with taking less time to find a FSJ, at least in construction, information, manufacturing, other services, professional and scientific and the energy and water fields.

3.2. Job Quality.

Thus far we have focused on the time taken to secure a FSJ. In this section we consider two other measures of job quality, namely wages and skill match. Table 6 shows the wage differences across field of study/ qualification level combinations for the person's FSJ. The dependent variable is net wage per calendar month in levels in the person's first significant job. The bounds for these net wage levels are: <433.55€, 433.55 - 749.99€, 750 - 999.99€, 1000 - 1249.99€, 1250 - 1499.99€, 1500 - 1999.99€, 2000 - 2499.99€, 2500 - 2999.99€ and >=3000€. The first specification shows wage differences across the different levels of qualifications. As we move from left to right across the table, Specification II separates out those with FIP or ETCO training according to prior educational achievement, specification III allows for field of study. In specification IV, we allow for skill mismatch, i.e. whether the qualifications required for the job exceed the individual's own level of qualification or whether s/he is over qualified.

Briefly, the results from table 6 indicate that, unsurprisingly, men earn significantly more than women. Older workers earn more, as do those working more hours. Workers in larger firms and those who undertake more training earn more. Parental education is largely positively

related to the individual's monthly wage, although only maternal education is significant. However, our interest is primarily in the coefficients on the qualification variables.

The coefficients from table 6 suggest that individuals with intermediate vocational qualifications earn less than those with higher vocational qualifications. This is perhaps reassuring. Even if individuals with higher vocational qualifications take longer to secure a FSJ (as suggested by the previous duration analysis), the value of higher vocational qualifications exceeds intermediate level qualifications. The results also suggest that workers taking FIP or ETCO training earn significantly less than workers with higher level qualifications. We are not claiming this is causal however, due to the negative selection into these programmes discussed earlier. Indeed this is obvious from Specification II, which allows for the previous qualification level of workers taking FIP and ETCO programmes. Specification II suggests that FIP and ETCO workers earn less even if they had other vocational qualifications previously. In fact almost regardless of prior qualification, a FIP or ETCO qualification is associated with earning less than those with higher vocational qualifications. For example, workers with ETCO qualifications and higher vocational qualifications earn significantly less than workers with just higher vocational qualifications. This might confirm that there is a selection process here, whereby individuals with previously high levels of vocational qualification then have difficulties in the labour market and enrol in FIP or ETCO. These individuals then go on to earn less in the labour market.

Our final specification includes controls for whether or not the person is over qualified for his or her job. Of course the quality of the job match achieved by a worker is in fact an outcome from that person's education investments, including their choice of subject area. So we might view whether or not the person is overeducated and any impact on wages arising from this as part of the negative or positive return to a given qualification and endogenous. In which case, specification III would be preferable. However, it is nonetheless of interest to investigate the impact of being overeducated on workers' wages and on the wage differences across qualification/ subject combinations. The variable signifying whether someone is over qualified in their job is highly negatively significant, i.e. overeducated workers earn significantly less

than adequately matched workers. Undereducated workers earn significantly more than adequately matched workers. This is consistent with a range of empirical evidence for Spain and other countries (see, e.g., Alba-Ramirez, 1994, or Dolton and Marcenaro, 2008). What is more striking, however, is that inclusion of these over qualification/ under qualification variables dramatically impacts on the value of the qualification/subject coefficients. Many coefficients become significant when previously they were not significant in the specification that did not control for overqualification (and vice versa); some even reverse sign. For example, workers with intermediate qualifications in human health appear to be very lowly paid compared to the base case of a worker with a higher vocational qualification in administration. Yet after we control for whether a worker is overqualified, this negative wage premium disappears. Equally workers with higher vocational qualifications in accommodation and food service earn significantly more than workers with a higher vocational qualification in administration and this gap virtually doubles once you control for whether or not workers are over/ under qualified for their jobs. Clearly this indicates that workers with qualifications in different fields have different propensities to be overeducated and that this will impact on the wage premium they earn for their qualification.

- Insert Table 5 here –

4. Conclusions.

The purpose of this paper was to describe the early labour market experiences of Spanish youth entering the labour market with different types of vocational education. Specifically, we focused on the time taken to secure a good quality permanent job, i.e. the time to a First Significant Job (FSJ). This analysis suggested that in fact workers with higher level vocational qualifications take longer to integrate into the labour market than workers with lower level qualifications, such as intermediate vocational qualifications. Given that workers with more educated parents also take longer to secure a FSJ, we interpret these findings to mean that more advantaged youth (with more educated parents and taking higher vocational qualifications) may be taking longer to secure a FSJ perhaps because they are extending their

job search to secure a higher quality job. In fact, our analysis of the impact of different types of vocational qualifications on workers' job quality (as measured by earnings) seems to confirm this. Although workers with higher vocational qualifications take longer to secure a FSJ, they do earn significantly more than workers with intermediate vocational qualifications, for example. This finding illustrates the importance of analysing many dimensions of job quality, rather than simply focusing on the duration of unemployment or under-employment for example. Likewise we found that over qualified workers were paid substantially less than adequately matched workers and that allowing for this skill mismatch radically altered the wage premia earned by workers with different qualifications. Subject areas where workers were more likely to be overeducated appear to pay relatively low wages but this partly reflects the fact that workers are over qualified.

Our duration analysis also clearly indicated that workers taking the special vocational training programmes, such as FIP and ETCO, fared poorly in the labour market: they took longer to secure a FSJ and earned significantly less when they did find such a job. We do not however, suggest that the relationship between having a FIP or ETCO qualification and poor labour market prospects is causal, as we found evidence of negative selection into these special vocational training programmes. It is more likely that low productivity individuals who find integration into the labour market difficult, end up taking these special programmes. Such individuals would have fared poorly in the labour market anyway. Without rigorous programme evaluation, it is impossible to say whether such programmes are being effective and such evaluation is urgently needed in the Spanish labour market.

Using detailed data on the field of study taken by each worker, we were also able to look within categories of qualification (i.e. within a more homogenous sample of young people) and describe the different labour market experiences of workers with qualifications in different fields of study. We found substantial differences in both the time taken to secure a FSJ and earnings, across different fields of study. In general, qualifications in industries in decline (e.g. agriculture) were less valuable than qualifications in service sector jobs (e.g. administration). It is perhaps of note that very few sectors of the labour market are occupationally regulated in

Spain, and as a result the link between the qualifications awarded to those in school-based vocational programmes and particular occupations is relatively loose. This may explain why some fields of study in major industries (e.g. arts and entertainment) appear to give relatively low labour market returns.

Despite being descriptive, this information should be useful to both policy-makers and youths themselves in helping them understand the relative demand for different qualifications and fields of study. In general terms, given the ongoing difficulties faced by Spanish youngsters in integrating into the labour market, it will certainly be of interest to understand the fate of workers with different combinations of vocational qualifications. Whilst the analysis cannot provide easy solutions to improve the effectiveness of the Spanish vocational training system, it does also illustrate the fact that special vocational programs (FIP and ETCO), despite being relatively high cost, are not associated with good labour market outcomes. A priority for the Spanish government is obviously to design programmes that can shorten the length of time taken to secure a good job, and to help workers improve the quality of their job match.

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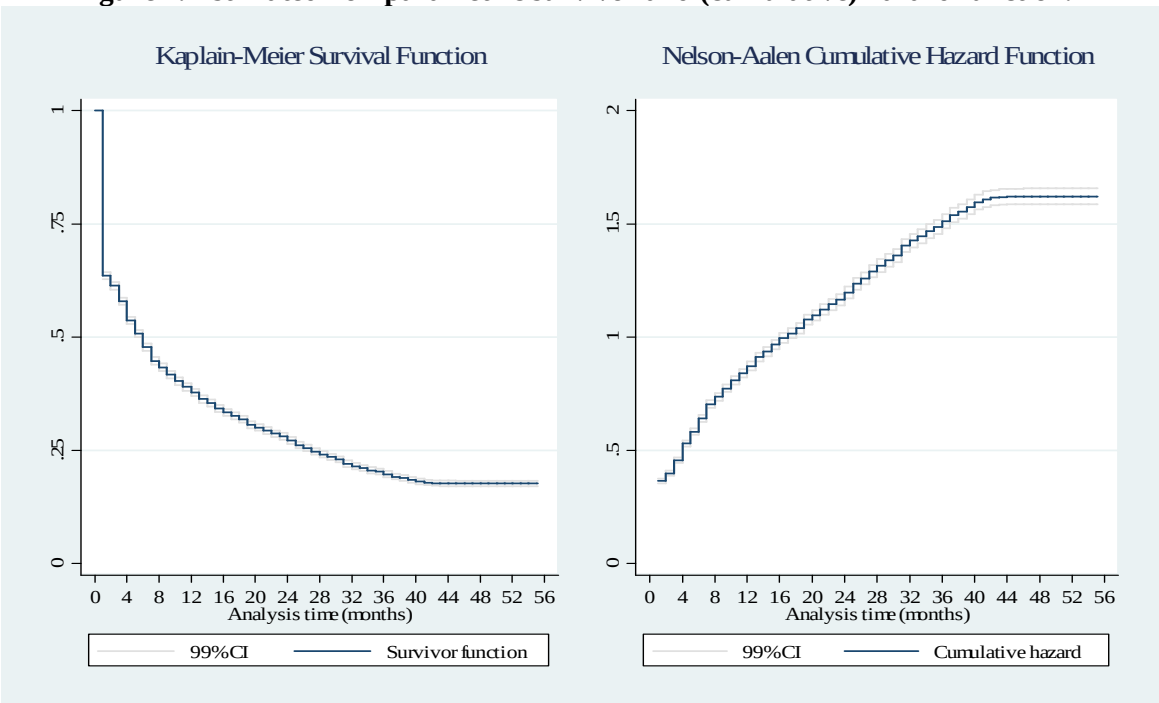
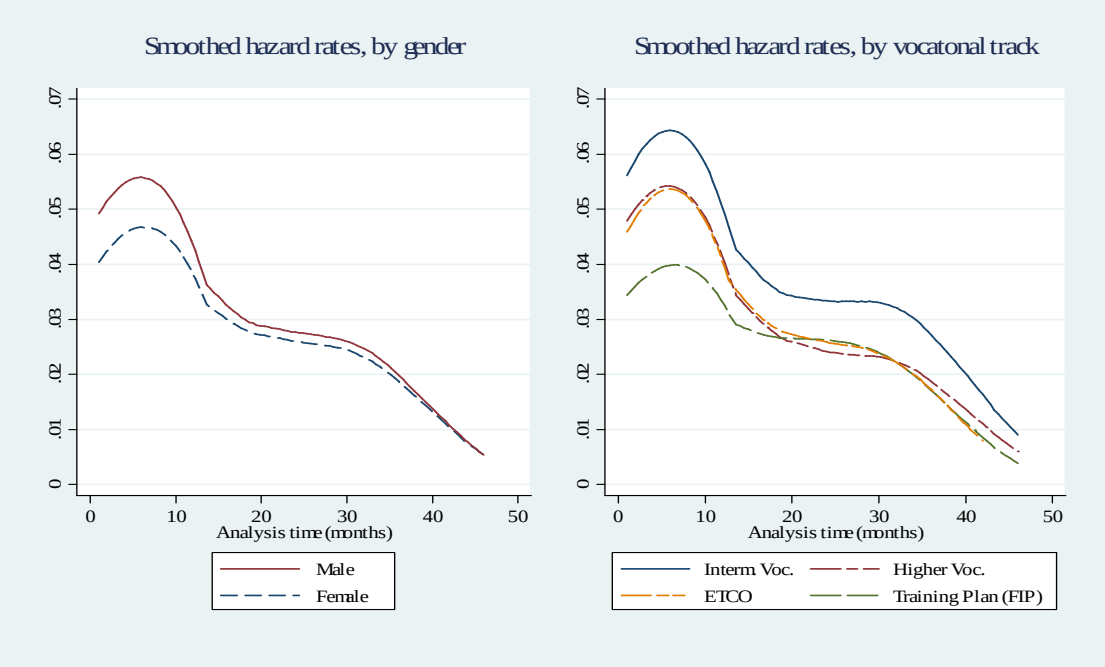
Figure 2. Estimated non-parametric survivor and (cumulative) hazard function.



Source: Authors' own calculations from ETEFIL (2005).

Figure 3. Kernel smoothed hazard rates, by gender and vocational track.



Source: Authors' own calculations from ETEFIL (2005).

Table 1. Tests for equality of survivor functions[10].

	Tests for equality of survivor functions			
Variables:	**Log-rank**	**Wilcoxon-Breslow**	**Tarone-Ware**	**Peto-Peto**
Gender	χ^2 (1)=162.56***	χ^2 (1)= 211.16***	χ^2 (1)=199.13***	χ^2 (1)=203.44***
	Prob.> χ^2 =0.000	Prob.> χ^2 =0.000	Prob.> χ^2 =0.000	Prob.> χ^2 =0.000
Vocational tracks	χ^2 (3)=630.42***	χ^2 (3)=664.90***	χ^2 (3)=678.89***	χ^2 (3)=672.28***
	Prob.> χ^2 =0.000	Prob.> χ^2 =0.000	Prob.> χ^2 =0.000	Prob.> χ^2 =0.000

Note: *** differences in survivor functions are significant at 1%
Source: Authors' own calculations from ETEFIL (2005).

Table 2. Tests for equality of survivor functions by gender (stratified).

	Strata			
	Intermediate Vocational	**Higher Vocational**	**ETCO-program**	**FIP-program**
Gender	χ^2 (1)= 68.97***	χ^2 (1)= 12.76***	χ^2 (1)= 68.02***	χ^2 (1)=117.92***
	Prob.> χ^2 =0.000	Prob.> χ^2 =0.000	Prob.> χ^2 =0.000	Prob.> χ^2 =0.000

Note: *** differences in survivor functions are significant at 1%
Source: Authors' own calculations from ETEFIL (2005).

Table 3. Estimates for Cox proportional hazard risks model.

	Specification I			**Specification II**	
	All	**Female**	**Male**	**Female**	**Male**
Gender (Male=1)	0.173***				
	(0.015)				
Age at completion of education	0.058***	0.073***	0.049***	0.074***	0.055***
	(0.004)	(0.007)	(0.006)	(0.007)	(0.006)
Nationality (Non-Spanish=1)	-0.123	0.010	-0.193	-0.003	-0.211
	(0.128)	(0.202)	(0.165)	(0.202)	(0.165)
Mother highest level of education:					
Primary	0.033	0.038	0.027	0.042	0.035
	(0.029)	(0.043)	(0.040)	(0.043)	(0.040)
Secondary (academic track)	-0.052	-0.006	-0.088*	0.000	-0.074
	(0.039)	(0.058)	(0.053)	(0.058)	(0.053)
Vocational Intermediate	0.025	-0.009	0.047	-0.009	0.057
	(0.049)	(0.073)	(0.067)	(0.073)	(0.067)
Vocational Higher	-0.151**	-0.080	-0.223**	-0.075	-0.196**

	(0.069)	(0.098)	(0.096)	(0.098)	(0.096)
University degree (short)	-0.296***	-0.309***	-0.288***	-0.290***	-0.272***
	(0.061)	(0.094)	(0.080)	(0.095)	(0.080)
University degree (long/PH/Master)	-0.362***	-0.452***	-0.305***	-0.439***	-0.283***
	(0.066)	(0.109)	(0.083)	(0.109)	(0.083)
Father highest level of education:					
Primary	-0.040	-0.001	-0.081*	-0.005	-0.075*
	(0.030)	(0.044)	(0.042)	(0.044)	(0.042)
Secondary (academic track)	-0.131***	-0.055	-0.194***	-0.051	-0.185***
	(0.039)	(0.057)	(0.053)	(0.057)	(0.053)
Vocational Intermediate	-0.144***	-0.104	-0.179***	-0.100	-0.173***
	(0.049)	(0.074)	(0.066)	(0.074)	(0.066)
Vocational Higher	-0.118**	-0.051	-0.169***	-0.054	-0.154**
	(0.050)	(0.078)	(0.065)	(0.078)	(0.065)
University degree (short)	-0.288***	-0.234***	-0.336***	-0.232***	-0.315***
	(0.057)	(0.089)	(0.074)	(0.089)	(0.075)
University degree (long/PH/Master)	-0.260***	-0.207***	-0.303***	-0.197**	-0.276***
	(0.050)	(0.079)	(0.065)	(0.079)	(0.065)
Qualification completed in 2001:					
Intermediate Voc	0.263***	0.210***	0.309***	0.211***	0.319***
	(0.020)	(0.029)	(0.028)	(0.029)	(0.028)
FIP – training program	-0.160***	-0.233***	-0.092***		
	(0.021)	(0.030)	(0.029)		
ETCO-apprenticeship programs	0.014	-0.186***	0.175***		
	(0.028)	(0.044)	(0.037)		

Table 3. (continued)

Access via for those with FIP:					
Below Primary				-0.311***	0.010
				(0.097)	(0.073)
Primary or Lower Secondary				-0.159***	0.015
				(0.041)	(0.036)
Upper Secondary				-0.391***	-0.385***
				(0.045)	(0.048)
Intermediate Vocational				-0.030	0.104
				(0.062)	(0.066)
Higher Vocational				-0.220**	-0.009
				(0.095)	(0.091)
Access via for those with ETCO:					
Below Primary				-0.293***	0.180***
				(0.101)	(0.064)
Primary or Lower Secondary				-0.214***	0.206***
				(0.055)	(0.044)
Upper Secondary				-0.120	-0.011
				(0.106)	(0.121)
Intermediate Vocational				-0.011	0.202
				(0.101)	(0.136)
Higher Vocational				-0.114	0.164
				(0.169)	(0.220)
Regions (Autonomous Communities):					
Aragon	0.283***	0.387***	0.166**	0.383***	0.159**
	(0.052)	(0.079)	(0.069)	(0.079)	(0.069)
Asturias	0.141***	0.138*	0.112	0.134*	0.098
	(0.050)	(0.073)	(0.068)	(0.073)	(0.068)
Balearics Islands	0.401***	0.554***	0.197*	0.556***	0.190*
	(0.074)	(0.099)	(0.110)	(0.099)	(0.110)
Canary Islands	0.068	0.156**	-0.035	0.151**	-0.037
	(0.047)	(0.066)	(0.066)	(0.067)	(0.066)
Castilla Mancha	0.189***	0.201***	0.155**	0.215***	0.145**
	(0.045)	(0.066)	(0.061)	(0.066)	(0.062)
Catalunya	0.185***	0.310***	0.056	0.306***	0.050
	(0.032)	(0.047)	(0.044)	(0.048)	(0.044)
Valencia	0.110***	0.207***	0.004	0.204***	0.002
	(0.034)	(0.049)	(0.047)	(0.049)	(0.047)
Madrid	0.298***	0.407***	0.182***	0.408***	0.174***
	(0.026)	(0.037)	(0.035)	(0.038)	(0.035)
Murcia	0.189***	0.131	0.206***	0.137	0.196***
	(0.056)	(0.085)	(0.074)	(0.085)	(0.074)
Navarra	0.329***	0.224**	0.351***	0.228**	0.350***
	(0.065)	(0.108)	(0.083)	(0.108)	(0.083)
Basque Country	0.243***	0.262***	0.186***	0.256***	0.173***
	(0.039)	(0.062)	(0.051)	(0.062)	(0.051)
La Rioja	0.174	0.266*	0.066	0.254*	0.059
	(0.107)	(0.154)	(0.149)	(0.154)	(0.149)
Ceuta	0.305*	0.471**	-0.060	0.475**	-0.080
	(0.173)	(0.203)	(0.335)	(0.203)	(0.335)

Observations	*20997*	*10069*	*10928*	*10069*	*10928*
LR χ^2	1170.76***	691.25***	525.83***	729.28***	601.21***

Data source: ETEFIL (2005). Dependent variable: time (months) up to FSJ. Only regions with significant coefficients are reported (to conserve space).
Baseline case: Spanish woman, mother and father lower than Primary education, with Higher Vocational completed in 2001, living in Andalusia. Standard errors in brackets. *** significant at 1%, ** significant at 5%, * significant at 10%.

Table 4. Parametric models of the hazard of finding a FSJ.

	Not accounting for unobserved heterogeneity			Accounting for unobserved heterogeneity			
	Exponential	**Gompertz**	**Weibull**	**Exponential**	**Gompertz**	**Weibull**	**Cox (PH)**
Qualification completed in 2001:							
Intermediate Voc	0.454***	0.309***	0.336***	0.451***	0.308***	0.335***	0.369***
	(0.020)	(0.020)	(0.020)	(0.020)	(0.020)	(0.020)	(0.021)
FIP – training program	-0.189***	-0.206***	-0.178***	-0.194***	-0.208***	-0.181***	-0.184***
	(0.021)	(0.021)	(0.021)	(0.021)	(0.021)	(0.021)	(0.022)
ETCO-apprenticeship programs	0.052*	-0.006	0.024	0.064**	-0.004	0.028	-0.015
	(0.028)	(0.028)	(0.028)	(0.029)	(0.028)	(0.029)	(0.062)
Full controls including gender, age, parental education	✓	✓	✓	✓	✓	✓	√
Region dummies:	✓	✓	✓	✓	✓	✓	√
Constant	-5.075***	-3.635***	-3.404***	-4.924***	-3.588***	-3.343***	
	(0.100)	(0.100)	(0.101)	(0.141)	(0.115)	(0.118)	
Observations	20997	20997	20997	20997	20997	20997	20997
LR χ^2	2744.23***	1700.75***	1741.45***	2592.23***	1638.56***	1671.88***	1125.23***
Γ		-0.071***			-0.071***		
Ln (p)			-0.480***			-0.479***	
P			0.619***			0.620***	
1/p			1.616***			1.614***	
Ln (θ)				-4.306***	-5.648***	-5.432***	
Θ				0.0134***	0.0035***	0.0043***	

Note: The log-logistic and log-normal models have not been reported to conserve space, but results are very similar to those shown for the exponential, gompertz and weibull distributions. The estimates of the generalized gamma distribution did not converge. Standard errors in brackets. *** significant at 1%, ** significant at 5%, * significant at 10%.

Table 5. Estimates for Cox proportional hazard risks model.

	Specification III	
	Female	**Male**
Gender and Nationality	√	√
Age at completion of education	√	√
Mother and Father highest level of education:	√	√
Regions (Autonomous Communities)	√	√
Intermediate Voc.:		
Accommodation and food service activities	0.090	0.457***
	(0.101)	(0.110)
Administrative and support service activities	0.209***	0.333***
	(0.055)	(0.091)
Agriculture, forestry and fishing	-0.487*	0.473***
	(0.270)	(0.115)
Arts, entertainment and recreation	0.167	0.126
	(0.193)	(0.163)
Construction	1.181	0.465**
	(1.002)	(0.228)
Human health and social work activities	0.091	0.441***
	(0.057)	(0.144)
Information and communication	0.062	0.357***
	(0.113)	(0.108)
Manufacturing	-0.028	0.584***
	(0.102)	(0.073)
Mining and quarrying	-	-
	-	-
Other service activities	0.212***	0.820**
	(0.071)	(0.384)
Professional, scientific and techn. act..	0.241*	0.402**
	(0.131)	(0.157)
Water and energy supply	-0.011	0.559***
	(0.449)	(0.076)
Wholesale and retail trade; repair of vehic.	0.132*	0.591***

	(0.079)	(0.076)
Higher Voc.:		
Accommodation and food service activities	-0.101	0.279**
	(0.077)	(0.117)
Administrative and support service activities	reference	reference
	reference	reference
Agriculture, forestry and fishing	-0.620***	-0.320**
	(0.227)	(0.127)
Arts, entertainment and recreation	-0.505***	-0.543***
	(0.140)	(0.116)
Construction	-0.413***	-0.194*
	(0.114)	(0.099)
Human health and social work activities	-0.294***	-0.261**
	(0.050)	(0.119)
Information and communication	-0.129*	0.112
	(0.068)	(0.071)
Manufacturing	-0.221***	0.266***
	(0.077)	(0.074)
Mining and quarrying	-	-
	-	-
Other service activities	-0.107	0.041
	(0.067)	(0.122)
Professional, scientific and techn. act..	-0.171*	0.145
	(0.097)	(0.139)
Water and energy supply	-0.375	0.174**
	(0.291)	(0.076)
Wholesale and retail trade; repair of vehic.	-0.208**	0.278***
	(0.081)	(0.079)

Table 5. (continued)

	Specification III	
	Female	**Male**
FIP :		
Accommodation and food service activities	-0.348***	-0.024
	(0.100)	(0.143)
Administrative and support service activities	-0.292***	-0.217**
	(0.060)	(0.110)
Agriculture, forestry and fishing	-0.517***	-0.013
	(0.171)	(0.132)
Arts, entertainment and recreation	-0.423**	-0.377**
	(0.193)	(0.163)
Construction	-1.123***	0.138
	(0.356)	(0.099)
Human health and social work activities	-0.352***	-0.115
	(0.076)	(0.150)
Information and communication	-0.509***	-0.262***
	(0.069)	(0.081)
Manufacturing	-0.232***	0.290***
	(0.074)	(0.076)
Mining and quarrying	0.985	0.514*
	(1.002)	(0.288)
Other service activities	-0.105	0.194
	(0.082)	(0.145)
Professional, scientific and techn. act..	-0.501***	0.442***
	(0.171)	(0.164)
Water and energy supply	-0.813**	0.233**
	(0.381)	(0.092)
Wholesale and retail trade; repair of vehic.	-0.156*	0.345***
	(0.082)	(0.085)
ETCO :		
Accommodation and food service activities	-0.290**	-0.420
	(0.140)	(0.359)
Administrative and support service activities	-0.893	-
	(1.003)	-
Agriculture, forestry and fishing	-0.283***	0.050
	(0.099)	(0.120)
Arts, entertainment and recreation	0.289	0.478
	(1.004)	(0.365)
Construction	-0.377***	0.305***
	(0.111)	(0.081)
Human health and social work activities	-0.321***	0.232
	(0.087)	(0.210)
Information and communication	-0.101	0.454***
	(0.158)	(0.153)

Manufacturing	-0.383***	0.324***
	(0.092)	(0.082)
Mining and quarrying	-	0.532
	-	(0.414)
Other service activities	-0.286**	0.539***
	(0.130)	(0.162)
Professional, scientific and techn. act..	-1.048**	0.959**
	(0.502)	(0.414)
Water and energy supply	-0.382	0.446***
	(0.246)	(0.119)
Wholesale and retail trade; repair of vehic.	-	-
	-	-
Observations	9368	10139
LR χ^2	648.51***	765.59***

Data source: ETEFIL (2005). Dependent variable: time (months) up to FSJ.
Baseline case: Spanish woman, mother and father lower than Primary education, with Higher Vocational completed in 2001, living in Andalusia with an Administrative Field in Higher vocational.
Standard errors in brackets. *** significant at 1%, ** significant at 5%, * significant at 10%.

Table 6. Returns to vocational qualifications.

	Specification I	Specification II	Specification III	Specification IV
	All	All	All	All
Gender (male==1)	0.915***	0.918***	0.816***	0.813***
	(0.024)	(0.024)	(0.029)	(0.029)
Age at completion of education	0.040***	0.034***	0.031***	0.032***
	(0.007)	(0.007)	(0.007)	(0.007)
Agreed working hours	0.026***	0.027***	0.029***	0.029***
	(0.002)	(0.002)	(0.002)	(0.002)
Surplus working hours	0.012***	0.013***	0.015***	0.016***
	(0.002)	(0.002)	(0.002)	(0.002)
Firm size:				
11-49 employees	0.121***	0.122***	0.112***	0.118***
	(0.027)	(0.027)	(0.028)	(0.028)
50 or plus emploees	0.285***	0.284***	0.254***	0.264***
	(0.026)	(0.026)	(0.028)	(0.028)
Number of language courses	0.087***	0.079***	0.080***	0.073**
	(0.028)	(0.028)	(0.029)	(0.029)
Number of other (no regulated) courses	0.069***	0.069***	0.060***	0.055***
	(0.015)	(0.015)	(0.017)	(0.017)
Mother highest level of education:				
Secondary (academic track)	0.155***	0.144***	0.122**	0.124**
	(0.055)	(0.055)	(0.057)	(0.058)
University degree (long/PhD/Master)	0.170*	0.163	0.215**	0.215**
	(0.102)	(0.102)	(0.106)	(0.106)
Qualification completed in 2001:				
Intermediate Voc	-0.112***	-0.124***		
	(0.028)	(0.028)		
FIP – training program	-0.225***			
	(0.031)			
ETCO – apprenticeship program	-0.399***			
	(0.042)			
Access via for those with FIP:				
Below Primary		-0.423***	0.349	0.323
		(0.095)	(0.368)	(0.369)
Primary of Lower Secondary		-0.312***	0.539	0.506
		(0.040)	(0.358)	(0.358)
Upper Secondary		-0.086*	0.745**	0.732**
		(0.052)	(0.362)	(0.363)
Intermediate Vocational		-0.222***	0.670*	0.657*
		(0.066)	(0.363)	(0.364)
Higher Vocational		-0.004	0.933**	0.916**
		(0.090)	(0.372)	(0.372)
Access via for those with ETCO:				
Below Primary		-0.383***	-0.345	-0.350
		(0.083)	(0.641)	(0.643)
Primary of Lower Secondary		-0.403***	-0.339	-0.338
		(0.052)	(0.640)	(0.641)
Upper Secondary		-0.367***	-0.382	-0.322
		(0.133)	(0.655)	(0.657)
Intermediate Vocational		-0.559***	-0.600	-0.577
		(0.117)	(0.644)	(0.645)
Higher Vocational		-0.457**	-0.437	-0.403
		(0.181)	(0.669)	(0.671)
Required qualifications:				
Overqualified				-0.312***
				(0.027)
Underqualified				0.170***
				(0.060)

Table 6. (continued)

	Specification I	Specification II	Specification III	Specification IV
Vocational fields:				
Intermediate Voc - Accommodation and food service	0.226**	0.213**	0.108	0.440***
	(0.098)	(0.098)	(0.138)	(0.149)
Intermediate Voc - Construction	0.911**	0.893**	-0.909	1.332***
	(0.429)	(0.429)	(1.154)	(0.473)
Intermediate Voc.: Human health and social work	-0.228***	-0.244***	-0.316***	0.052
	(0.075)	(0.076)	(0.083)	(0.220)
Intermediate Voc.: Manufacturing	0.125*	0.102	-0.208	0.315***
	(0.068)	(0.068)	(0.148)	(0.100)
Intermediate Voc.: Professional, scientific and tech. Act.	0.261*	0.331**	0.276	0.527***
	(0.133)	(0.134)	(0.185)	(0.200)
Intermediate Voc.: Energy, Electricity, gas, Water	0.058	0.042	-0.049	0.234**
	(0.075)	(0.075)	(0.542)	(0.102)
Higher Voc.: Accommodation and food service	0.248***	0.273***	0.235**	0.461***
	(0.092)	(0.092)	(0.113)	(0.162)
Higher Voc.: Entertainment and recreation	-0.528***	-0.516***	-0.387*	-0.425**
	(0.146)	(0.146)	(0.229)	(0.198)
Higher Voc.: Construction	0.341***	0.291***	0.485***	0.356***
	(0.099)	(0.099)	(0.161)	(0.137)
Higher Voc.: Human health and social work activities	-0.141**	-0.120*	-0.178**	0.032
	(0.067)	(0.067)	(0.074)	(0.206)
Higher Voc.: Information and communication	0.230***	0.220***	0.318***	0.356***
	(0.062)	(0.062)	(0.097)	(0.097)
Higher Voc.: Manufacturing	0.358***	0.346***	0.405***	0.504***
	(0.066)	(0.066)	(0.109)	(0.102)
Higher Voc.: Other service activities	-0.323***	-0.320***	-0.409***	-0.081
	(0.088)	(0.088)	(0.102)	(0.179)
Higher Voc.: Professional, scientific and technical	0.404***	0.406***	0.448***	0.427**
	(0.106)	(0.106)	(0.136)	(0.174)
Higher Voc.: Energy, electricity, gas and water supply,	0.319***	0.313***	1.218***	0.470***
	(0.075)	(0.075)	(0.355)	(0.103)
Higher Voc.: Wholesale and retail trade and repair of motor v.	0.243***	0.242***	0.163	0.437***
	(0.071)	(0.071)	(0.118)	(0.106)
FIP: Accommodation and food service activities	-0.712*	-0.686*	-1.524	-0.816**
	(0.375)	(0.376)	(1.065)	(0.412)
FIP: Administrative and support service activities	-0.894**	-0.886**	-1.786*	-0.929**
	(0.361)	(0.361)	(1.056)	(0.386)
FIP: Agriculture	-0.754*	-0.756*	-2.037*	-0.621
	(0.391)	(0.391)	(1.098)	(0.407)
FIP: Human health and social work activities	-0.976***	-0.974***	-1.826*	-1.117***
	(0.369)	(0.370)	(1.061)	(0.422)
FIP: Information and communication	-0.803**	-0.772**	-1.594	-0.766**
	(0.360)	(0.360)	(1.057)	(0.366)
FIP: Manufacturing	-0.680*	-0.681*	-1.869*	-0.525
	(0.358)	(0.359)	(1.060)	(0.362)
ETCO: Construction	0.199	0.164	-2.260**	0.227
	(0.640)	(0.641)	(1.090)	(0.794)
ETCO: Human health and social work activities	0.018	-0.015	-2.158**	0.401
	(0.649)	(0.650)	(1.082)	(0.838)
ETCO: Information and communication	-0.045	-0.050	-1.960*	-0.191
	(0.651)	(0.653)	(1.087)	(0.815)
ETCO: Manufacturing	0.088	0.046	-2.303**	0.131
	(0.640)	(0.641)	(1.085)	(0.794)
Observations	9220	9220	9220	9220
LR χ^2	2676.87***	2703.19***	2869.86***	3017.10***

Note: Only significant coefficients are reported.
Base case: Spanish female, with mother and father with lower than Primary education, who has a higher vocational qualification in the administration field completed in 2001, living in Andalusia. For the models that also control for skill mismatch, the base case is an individual in a job which matches their qualification level. All models also control for nationality, number of training courses taken since 2001, parental education, other qualifications acquired, region.
Standard errors in brackets. *** significant at 1%, ** significant at 5%, * significant at 10%.

[1] Commissioned by the Ministries of Education and Science, Work and Social Affairs and INE.

[2] These occupationally oriented vocational programs include practical work experience as part of a student's programme of study. However, this training often occurs at the person's place of study, rather than a workplace.

[3] It is assumed that this censoring is independent of the hazard rate, after controlling for other factors.

[4] Risks sum up to time (t).

[5] Nonetheless comparisons are constrained as our definition of FSJ is more restrictive that the commonly used definition of employment (namely finding any job).

[6] He reports negative duration dependence for young men, but not for women.

[7] Van den Berg (2001) stressed the risk of obtaining bias estimates if wrong parametric assumptions are imposed to estímate duration models. Nevertheless we run different parametric models that may be obtained from the authors on request. The results of these parametric models do not vary substantially from the ones reported here.

[8] We provide the coefficients. The odds ratios may be easily obtained from the following identities:

$$\log\left(\frac{P(y=j)}{P(y=i)}\right) = x(\beta_j - \beta_j) = \left(\frac{P(y=j)}{P(y=i)}\right) = e^{(x(\beta_j - \beta_j))}$$

[9] The relationship between the vocational qualification acquired and time to a FSJ could be blurred if significant numbers of youth return to do further study or training in the intervening period. To control for this, we limited the sample to those who did not increase their education level over the period. Results did not change substantially.

[10] We also computed tests (log-rank, Wilcoxon-Breslow, Tarone-Ware and Peto-Peto) for the trend of the survivor function across the four vocational programs, all of them rejecting the hypothesis of equality of the survivor function over the period.