

**EDUCATION AND LABOUR MARKET TRANSITIONS AMONGST  
COMPULSORY EDUCATION GRADUATES AND SCHOOL DROPOUTS.**ALBERT VERDÚ, Cecilia\*  
DAVIA, María A.

---

**Abstract**

This paper intends to describe the diversity of paths followed by young people who either drop out or finish compulsory education in Spain. To that aim we deploy optimal matching analysis to analyse a sample of youngsters drawn from a longitudinal data-set (ETEFIL-2005). Their trajectories in the education system and the labour market are clustered into six different patterns. The profiles of youths following each of the broad types of trajectories are described. Academic attainment in compulsory education is found to be very relevant in the determination of the trajectories followed. Social background is crucial for both initial academic results and final educational outcomes. JEL codes: I21 (Analysis of Education), J24 (Human capital, skills), J21 (Labour Force and Employment).

Keywords: school-to-work transitions, compulsory education, youth labour markets.

---

**1. Introduction.**

This paper entails to contribute to the literature on school dropout and early school leaving with a dynamic view of these phenomena. This approach contributes to our understanding of both issues, since they are dynamic in nature. From an individual perspective, school-to-work trajectories among the least qualified of the education system are a good proving ground to observe social risks amongst the least qualified. In the knowledge society education and training have a leading role in social integration. Poorly qualified individuals are expected to face social exclusion inasmuch they lack basic skills. Moreover, from a social point of view, trajectories not linked to the education system among low qualified youths represent a challenge for the development of an economic and social model based in human capital improvements. School dropout and early school leaving are dynamic processes which are part of the school-to-work trajectories among the least qualified. Youths will decide on their education and employment careers from the foreseen returns to and opportunity costs of persisting in the education system. The opportunity costs of education are defined by job opportunities and expected wages in the labour market if they leave education. Labour market and education trajectories are more than the result of these decisions, since they are also affected by two further elements: early educational achievements and family background.

From the human capital approach (Becker, 1964), it is expected that youths with acceptable academic records will be more able to study, will have shown more skills to succeed in the education system and will be more prone to undergo longer education

---

\* Cecilia Albert Verdú, Departamento de Fundamentos de Economía e Historia Económica. Universidad de Alcalá. María A. Davia, Departamento de Economía Española e Internacional, Econometría e Historia e Instituciones Económicas. Universidad de Castilla-La Mancha

trajectories. Moreover, family background has a role in determining early academic achievement, and it is a key input in the demand for education. Successful students are more prone to have support from their families to pursue education. We may therefore expect more employment-oriented trajectories amongst two types of youths: those with poor initial academic records and those with disadvantaged family background and particularly low parental education attainment.

The Spanish governments made a very relevant effort in the 1990s to widen compulsory, free education up to the age of 16. This effort guarantees open access to education to every young person regardless her family background. Nevertheless, this initiative has not been fully successful due to the difficulties for a relevant proportion of students either achieving a compulsory education certificate or pursuing post-compulsory education. Spain registers one of the highest levels of early school leaving in the European Union and, what's more, they are persistently high. As a result, Spain maintains one of the highest proportions of low educated young people<sup>†</sup> in the OECD. In fact, in 2005, this was just 21 per cent in 19 European countries in the OECD compared to 36 per cent in Spain (OECD, 2007). By the same token, Eurostat statistics show that early school leaving<sup>‡</sup> was 30.8 percent in Spain in 2005, well above the European (EU-25) average, 15.5 percent.

School dropout and early school leaving have been enhanced by the high opportunity cost of undergoing education in an economy which is particularly specialised in labour-intensive activities. The building and hostel sectors created a wealth of job opportunities for low qualified workers during the economic boom at the beginning of the 2000s. Young early school-leavers and school dropouts did not suffer then systematically higher unemployment risks than their more educated counterparts. But when the economic crisis has severely hit the building sector, manufacturing and services, low qualified youths have been among the most vulnerable groups.

In order to approach school dropout and early school leaving in a dynamic way, we describe the main trajectories of young compulsory education graduates and school dropouts in Spain in the first half of the 2000s. Youngsters will be classified according to their initial academic achievements and will be followed during three years on a monthly basis. The school leavers survey deployed here (ETEFIL-2005, *Encuesta de Transición Educativo-Formativa e Inserción Laboral*, Survey on the Transition from Education/Training and Labour Market Insertion) is the most recent at hand and has been designed to evaluate the education and labour market trajectories of non-university graduates in Spain.

The empirical strategy will consist on the description of trajectories through a data-reduction technique which is becoming increasingly popular in the study of school-to-work transitions: optimal matching analysis (OMA hereinafter). This has meant a methodological challenge as well: moving from event history models (aimed at

---

<sup>†</sup> It is measured as the percentage of people aged 25 to 34 with an education level ISCED (International Standard Classification of Education) of 2 or less. ISCED levels 0-2 are pre-primary, primary and lower secondary education (OECD Education Outlook, 2007).

<sup>‡</sup> This is a the Structural Indicator for the European Union published by Eurostat, which is measured as the percentage of the population aged 18-24 with at most lower secondary education and not in further education or training.

analysing transitions) into OMA (aimed to analyse trajectories). An increasing number of papers address school-to-work trajectories with this methodology in different disciplines (Halpin and Chan, 1998; Scherer, 2001; Schoon *et al*, 2001; McVicar and Anyadike-Danes, 2002; Brzinsky-Fay, 2007 and Quintini and Manfredi, 2009; Anyadike-Danes and McVicar (2010)).

The main results of the paper show that school-to-work trajectories are more diverse and the combination of education and work is more common than initially expected. With a combination of OMA and cluster analysis, six types of trajectories are identified: quick exit into work, return to education, persistence in education, gap year between education spells, combining education and employment and two years in education and ulterior employment. They will be described in detail and the profile of those in the most common trajectories will be studied with simple discrete-choice models. Moreover, academic results in compulsory education are found to be very relevant in the determination of the trajectories followed, and social background (measured through parental education attainment) is crucial for initial and final educational outcomes. Trajectories characterised by persistence in education tend to be more common among children of highly educated parents, natives and private and semi-private school attendees, whereas trajectories linked to the labour market and employment are more likely to be seen in youths with foreign background, low qualified parents and high preference for work and employment stability.

The contents of the paper go as follows: after this introduction and survey, Section 2 is devoted to the presentation of the data-set, Section 3 describes the empirical methodology, Section 4 shows some initial descriptive analysis and Section 5 gathers results for OMA and the profiles of the most common trajectories found. Section 6 concludes.

## **2. The data-set: Etefil – 2005.**

The data-set deployed, ETEFIL – 2005, is a joint venture of the Department of Education, the Department of Labour and the National Statistical Office in Spain. It consists on seven surveys which were simultaneously launched at seven target groups, all of which were non-university graduates, school leavers and school dropouts in the 2000-2001 academic year. Only compulsory education dropouts and compulsory education graduates are covered in this piece of research. The latter have been split into two groups; those who graduated at 16 (education is compulsory in Spain until that age), which will be labelled as *successful* graduates and those who graduated at a later age (the *delayed* graduates).

Table 1 shows population and sample sizes in each of the relevant groups. In the 2000-2001 academic year, more than 123,000 youngsters dropped out from compulsory education, most of which were men (65.4 percent). Amongst those who actually graduated in compulsory education we find that 18.4 percent of them finished with delay. This problem is more common for men (20.8 percent) than for women (16.4 percent). This delay reduces the success of youth at post-compulsory (both general and, particularly, vocational) qualifications; in fact, many students who graduate with delay in compulsory education do not go any further in the education system.

Table 1: Groups of school-leavers and school dropouts by gender and parental education attainment; Incidence of delay in finishing compulsory education.

	<b>Distribution of groups</b>			
	<b>Dropout</b>	<b>Delay</b>	<b>Success</b>	<b>% Delay</b>
Total (population)	123,522	63,024	278,906	18.4
Total (sample)	3,012	1,504	6,594	
<b>Gender (distribution)</b>				
Men	65.4	52.3	45	20.8
Women	34.6	47.7	55	16.4
Total	100	100	100	-
<b>Highest education attainment of one of the parents (distribution)</b>				
Unknown	22.6	12.1	6.4	29.8
Below compulsory	16.2	10.3	5.9	28.4
Compulsory	43.3	43.9	36.6	21.3
Secondary	11.7	19.5	20.9	17.4
Higher education	6.3	14.2	30.1	9.6
Total	100	100	100	-
Source: ETEFIL-2005, INE				

Table 1 also reflects inequality of opportunities in the Spanish education system, since the proportion of highly qualified parents is higher among youths with the higher education achievements<sup>§</sup>. This trend points at the considerable influence of family background in education attainment, even from the very basic levels.

The survey is provided with a calendar file which covers from the month when the youth leaves or finishes compulsory education up to the month of the interview. The interviewee reports, on a monthly basis, whether s/he was in education, in training, looking for a job or working more or less than 20 hours per week. These activities are not mutually exclusive and may happen at the same time. The combination of statuses enables up to 14 different plausible situations in every month, which have been summarised here as follows in order to ease the statistical analysis and to avoid the detection of too many types of atypical trajectories:

- ✓ To work, and not to study.
- ✓ To study, and not to work.
- ✓ To study and work.
- ✓ To be unemployed (being in no job, no education and looking for a job).
- ✓ To be inactive (being in no job, no education and not looking for a job).

Youths are potentially followed during up to 54 subsequent months, but observed trajectories differ in length due to differences in both the month of entry in the calendar file and the month of the interview (the fieldwork took place between April and July 2005). In order to set an equal-length observation window for all

<sup>§</sup> The percentage of youth who do not know their parents' education attainment is higher for school dropouts than for the rest. This group follows a very similar pattern to the ones observed in children of low qualified parents, which may mean that many of the parents whose education attainment is unknown are actually low qualified.

interviewees we have restricted it to the first 36 months after (compulsory) education is finished or abandoned since all of them report, at least, information for 36 months in the calendar file.

### 3. The empirical strategy: optimal matching analysis.

Optimal matching analysis (OMA) is one type of sequence analysis. A sequence is a list of ordered elements, such as statuses or events; their positions are fixed and ordered by elapsed time. This technique shares features with cross-section time series and survival data, but several differences hold as well: OMA treats each data sequence as a whole rather than stochastically generated from point to point as in time series or event history analysis (MacIndoe and Abbott, 1994). It is as if one were comparing many time series to one another as whole units. The researcher is interested not only in the events but in the sequential character of all elements together (Brzinsky *et al*, 2006). OMA has been used in Biology in the study of distances between DNA sequences (Abbot and Tsay, 2000) and in Computing Science in the analysis of string editing, which has several applications, such as plagiarism detection. Common applications of OMA in Social Sciences since it was introduced in Sociology by Abbot and Forrest (1986) are career analyses, particularly school-to-work transitions (Halpin and Chan, 1998; Scherer, 2001; Schoon *et al*, 2001; McVicar and Anyadike-Danes, 2002; Brzinsky-Fay, 2007; Quintini and Manfredi, 2009; Anyadike-Danes and McVicar (2010)). It has recently been also deployed to describe female family and professional careers, as a result of cross-classifying events from family and work spheres of life (Hynes and Clarkberg, 2005; Aassve *et al*, 2007; Huang and Sverke, 2007).

Optimal matching analysis intends to find common patterns between sequences in order to summarise the very diverse information they are able to provide for. To that aim, OMA generates, through an algorithm, a distance matrix\*\* that will be the input in a data-reduction technique, typically cluster analysis, from which a limited number of patterns will be described; it is therefore a pattern-search technique. The typology resulting from the cluster analysis may be as well input for multivariate analysis, either as a dependent or an independent variable; namely, the researcher may be interested in the likelihood of experiencing a given type of trajectory or in the outcomes of different types of trajectories.

Optimal matching algorithms measure distances between trajectories in terms of three elementary operations that turn one sequence into another: replacement, insertion and deletion (*indel*). The minimum combination of replacement and *indel* operations necessary to transform one of a pair of sequences into another is called Levenshtein distance. Both replacement and *indel* operations imply costs that weight the different operations. The problem is that assignment of costs to operations may hardly ever be

---

\*\* The distance matrix (Quintini and Manfredi, 2009) is a symmetric matrix where rows ( $i$ ) and columns ( $j$ ) represent the individuals in the sample and each cell  $a_{ij}$  contains the distance between the sequence of individual  $i$  and that of individual  $j$ . The cells on the diagonal of the matrix contain only zeros because they represent the distance between an individual's sequence and itself (the very same sequence).

driven from theory, and it needs to be done in a meaningful manner. A common strategy (used here) is to compute the replacement cost matrix from the element-to-element transition rates in the data sequences. This idea was suggested by Rohwer and Pötter (2005). With this system, deletion and insertion are set with a reference unitary cost and substitution costs are defined as inversely proportional to transition frequencies from each state. This means assuming that less frequent transitions are more *costly* than more frequent ones. The replacement cost between two statuses will be higher in a given moment of time the smaller the likelihood to transit from one to the other in that given moment of time<sup>††</sup>.

Moreover, the relationship between replacement costs and *indel* costs is very relevant as well. If it is well defined it will contribute to the algorithm to reach the minimum cost to transform one sequence into the other. *Indel* costs are here, as recommended by prior empirical analysis (Blair-Loy, 1997), fixed in one tenth of replacement costs. The standard optimal matching algorithm is named after Needleman and Wunsch, and it has been implemented here thanks to the availability of SQ-ados, a bundle of STATA programs created by Christian Brzinsky-Fay, Ulrich Kohler and Magdalena Luniak (Brzinsky-Fay *et al*, 2006).

Once the distance matrix is ready, a weighted average linkage hierarchical agglomerative algorithm is applied to group trajectories into clusters. Weighted average linkage algorithm is a variation of average linkage algorithm. The latter uses average dissimilarity of observations between the two groups<sup>‡‡</sup>, and simulation studies report that it works well for many situations and is reasonably robust (Hamilton, 2006). In weighted average linkage, when two groups of unequal size are merged, they are given equal weighting regardless of how many observations there are in each group. As a consistency check<sup>§§</sup> average linkage algorithm was implemented as well and results are quite similar between both algorithms. Weighted average linkage was preferred to average linkage since it provided more evenly balanced in size groups which eased the multivariate analysis developed in the final part of Section 5.

---

<sup>††</sup> Following Rohwer and Pötter (2005) approach deployed, among others, by Aassve *et al* (2007), let  $a$  and  $b$  be two states, and  $N_t(a)$  and  $N_t(b)$  be the number of individuals in state  $a$  at time  $t$  and in state  $b$  at time  $t$ ; let  $N_{t,t+1}(a,b)$  be the number of individuals at state  $a$  at time  $t$  and in state  $b$  at time  $t+1$ . The transition frequency from  $a$  to  $b$  over all time points  $t = 1, \dots, T$  is:

$$p_{t,t+1}(a,b) = \frac{\sum_{t=1}^{T-1} N_{t,t+1}(a,b)}{\sum_{t=1}^{T-1} N_t(a)}$$

The substitution cost between state  $a$  and state  $b$  is:

$$c(a,b) = \begin{cases} 1 - p_{t,t+1}(a,b) - p_{t,t+1}(b,a) & a \neq b \\ 0 & a = b \end{cases}$$

<sup>‡‡</sup> In doing so it lies between single linkage cluster analysis, based on the dissimilarity between the closest pair of observations between the two groups, and complete linkage cluster analysis, which uses the farthest pair of observations between the two groups. It therefore yields intermediate properties between single and complete linkage algorithms.

<sup>§§</sup> Consistency checks, not shown for reasons of space, are available from the authors upon request.

#### 4. Describing trajectories.

This section is aimed at describing the main features that may be directly seen from the inspection of the different spells or episodes in inactivity, unemployment, employment, education, and combination of education and work along 36 months upon finishing or leaving school. Table 2 displays the number of spells, the percentage of youths with at least one episode in each status and the average duration of episodes. It shows that unemployment and inactivity spells are far more frequent among school dropouts and *delayed* graduates than among those in the *successful* graduates group. About 40 per cent of school dropouts go through unemployment and inactivity, with an average duration of 5 months in each type of spell. While approximately one in five *delayed* graduates experience these statuses, their average duration is much smaller, less than two months. School dropouts tend to spend most of their time in employment and out of education; 84% of them experience at least one episode of only employment, with an average duration of 20 months. As for *delayed* graduates, 53.4 percent register at least one employment spell, and 39.2 percent of them register at least one spell of work while in education.

Table 2: Incidence and average duration of spells (during 36 months).

	Dropout	Delay	Success
Number of episodes			
Inactive	0.4	0.2	0.1
Unemployed	0.7	0.3	0.1
Employed, not in education	1.2	0.7	0.2
Student, not in employment	0.3	1.1	1.3
Student and in employment	0.2	0.6	0.6
Percentage of youths with at least one episode			
Inactive	35.8	19.1	6.9
Unemployed	44.6	23.5	6.1
Employed, not in education	84.2	53.4	14.7
Student, not in employment	24.4	81.1	95.3
Student and in employment	16.1	39.2	33.3
Duration of episodes (months)			
Inactive	5.1	1.9	0.7
Unemployed	5	1.8	0.5
Employed, not in education	20.2	9	1.9
Student, not in employment	4.2	19.8	30.1
Student and in employment	1.5	3.5	2.8

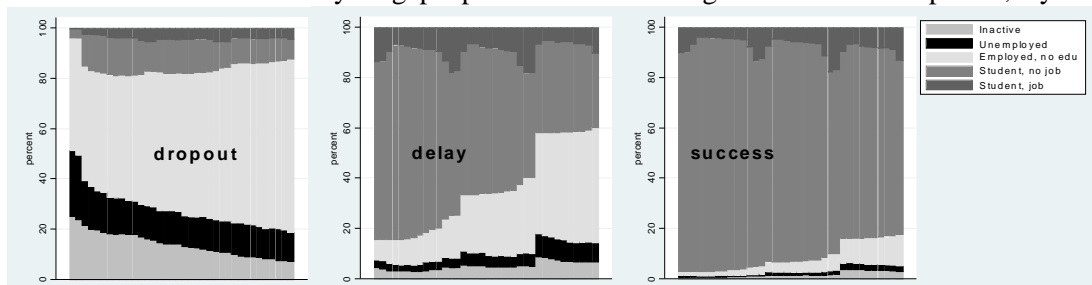
Source: ETEFIL-2005, INE.

The most likely status for both *delayed* and *successful* graduates is education, but it is more common among the *successful* ones, with 95 percent following at least one episode of 30 months in average, which means that many of them will spend the whole observation period in education and not working. Nevertheless, one in three will

experience at some extent at least one (rather short) event of education and work. For youths in the *delayed* graduates group, the incidence of “education, no job” is somehow smaller and education episodes are one year shorter in average, whereas combination of school and work is more frequent. We may conclude that school dropouts are characterised by work-related trajectories which are not exempt from (rather short) unemployment and inactivity spells. Those in the *delayed* graduates group tend to continue in education during less than two years in average, and sometimes combine it with work. These youths do report jobs, presumably at the end of the observation period. The *successful* graduates tend to remain in education and most of the contact they report with the labour market takes place while in education

Panel 1 describes the proportion of young people in different statuses along the 36 months of observation: it may be seen that nearly 50 percent of school dropouts fall into unemployment or inactivity right after dropping out school, but they eventually move into employment. There is a minority of youths who return to education and the proportion of those in education is by far the smallest of the three groups, but still noticeable. By the end of the observation period more than 70 percent of youths are employed and do not take part in education. The *delayed* graduates group is characterised by a decreasing proportion of people in education, which shrinks at the end of every academic year (particularly after the second one) and by a considerable rate of entry into employment. The incidence of unemployment and inactivity is quite low here, and a noticeable proportion of youngsters combine education and work, particularly during summer. The same trend is registered among the *successful* graduates group during summers, but the proportion of those in education and not in employment is much higher and more stable than in the *delayed* graduates group. Hardly one out of ten of the *successful* graduates has left education and entered employment by the end of the observation period.

Panel 1: Distribution of young people in statuses along the observation period, by

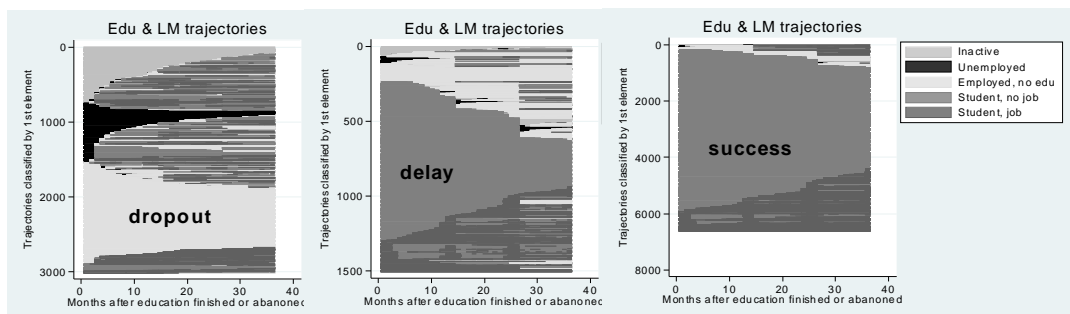


Source: ETEFIL-2005, INE.

Panels 1 and 2 are quite consistent with each other; the first one describes the (vertical) distribution of the sample across states in every month, whereas the second one describes trajectories, but not individuals (many individuals may register the same trajectory), made up by horizontal lines. Each line is a trajectory made up of 36 points, whose colours represent statuses. Trajectories are ordered by the initial status. The first figure of Panel 2 describes trajectories in the *dropouts* group. Nearly 50 percent of

them start in either inactivity or unemployment, and then move towards an array of statuses, but mainly work and education. More than half of the trajectories are defined by remaining most of the time in employment and not in education, and some of them end up in unemployment. Finally a very tiny share of trajectories are characterised by being not in employment and in education during the whole observation period<sup>\*\*\*</sup>.

Panel 2: Trajectories, graphed as sequence index plots, during 36 months, by group



Source: ETEFIL-2005, INE.

Youths in the *delayed* graduates group tend to start in education and progressively transit into employment. About 10 per cent of trajectories start in employment, and there are some spells of inactivity and unemployment at the beginning of each of the three years observed; these spells are likely to coincide with the end of every academic year and act as *stepping stones* into employment. An increasing proportion of youth combine education and work, and by the third year of observation some of these study and employment spells become only employment spells. The proportion of fully in education trajectories is much smaller than amongst those in the *successful* graduates group. In the *successful* graduates group transitions into employment during the observation period are scarce, and working while in education is more common than only employment spells.

## 5. Results from optimal matching analysis.

Once OMA on the previously described trajectories has been implemented, the grouping of trajectories from the distance matrix through the weighted average linkage algorithm has conformed six clusters. This section is aimed at describing those clusters of trajectories and identifying the personal and family characteristics of young people in every cluster. To that aim, the analysis will end with the estimation of binomial and multinomial probits to disentangle the profiles of youths following the most common types of trajectory in every group.

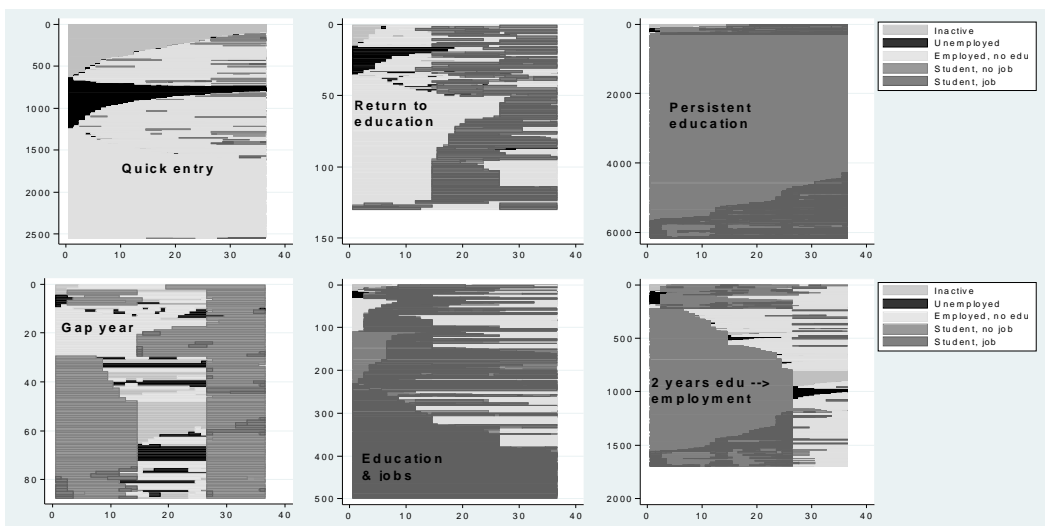
The outcomes of the OMA analysis are a set of 6 clusters that will be labelled as follows: quick exit into work, return to education, persistence in education, gap year

<sup>\*\*\*</sup> In the figure every line represents an individual trajectory. Areas that seem to be monochrome may indeed refer to many similar ones, which look basically the same except for a few months (which are represented by a few points of the line and therefore, hardly noticeable).

between education spells, combining education and employment and two years in education and ulterior employment. These clusters are characterised by the combinations of spells described in Panel 3 and in Table 3.

Panel 3 displays the sequence plots corresponding with the six clusters. The graphical representation of the clusters will show both the incidence of different kinds of episodes and the order in which these episodes are registered. It is precisely with the help of sequence index plots that we may effectively label the clusters.

Panel 3: Results of the cluster analysis (weighted average hierarchical algorithm): trajectories defined through clusters.



Source: ETEFIL-2005, INE.

The first cluster is defined by employment, either from the beginning of the observation window or after an initial spell of inactivity or unemployment. It has been labelled quick entry into work. The second one (return to education) is defined by some time (typically a year) in employment and then combination of employment and education. The third one is characterised by persistence in education, usually not combined with employment, although such possibility increases during the period. This cluster will be labelled “persistence in education”. The fourth cluster (gap year between education spells) is characterised by two periods of education and, in between, one interruption in the form of employment, unemployment or inactivity. The fifth one is featured by a combination of education and work most of the time, which sometimes ends in only employment; it is called here combining education and employment. The final cluster (two years in education and ulterior employment) consists on one or two years of education (sometimes combined with work as well) and (usually) a direct transition into only employment. It is important to remind that the theoretical duration of both general and vocational programmes of upper secondary education, is just of two years. Moreover, the most common destination of upper secondary general education graduates is pursuing higher education, whereas most of upper secondary vocational training graduates tend to transit into the labour market (Albert *et al*, 2009).

Table 3 confirms and completes the picture provided in Panel 3, and it displays the number of episodes, the proportion of youths with at least one episode and the average duration of effective episodes in the different types of trajectory. It does, therefore, not consider the order in which the episodes are observed, but it quantifies the trends appreciated in Panel 3.

Table 3: Spells and episodes in the six relevant clusters of trajectories.

	Quick entry	Return to education	Persistence in education	Gap year between studies	Education & work	Two years education → employ
<b>Number of episodes</b>						
Inactive	0.4	0.2	0.0	0.6	0.1	0.4
Unemployed	0.7	0.4	0.0	0.5	0.2	0.6
Employed, not in education	1.3	1.7	0.0	0.8	0.9	1.0
Student, not in employment	0.0	0.3	1.4	1.8	0.6	1.1
Student and in employment	0.0	1.1	0.6	0.5	1.2	0.5
<b>Percentage of youths with at least one episode</b>						
Inactive	35.4	18.6	2.8	54.0	8.5	37.5
Unemployed	42.4	31.0	3.0	34.5	14.3	41.0
Employed, not in education	89.6	99.2	2.9	67.8	62.4	80.0
Student, not in employment	2.7	21.7	100.0	100.0	42.1	100.0
Student and in employment	0.8	99.2	32.4	37.9	100.0	35.3
<b>Duration of episodes (months)</b>						
Inactive	5.9	0.6	0.3	5.3	0.4	3.2
Unemployed	5.6	2.1	0.1	2.9	0.8	2.9
Employed, not in education	24.3	20.0	0.1	7.5	10.6	9.5
Student, not in employment	0.2	0.9	33.4	19.0	2.2	18.8
Student and in employment	0.0	12.3	2.0	1.3	22.1	1.7

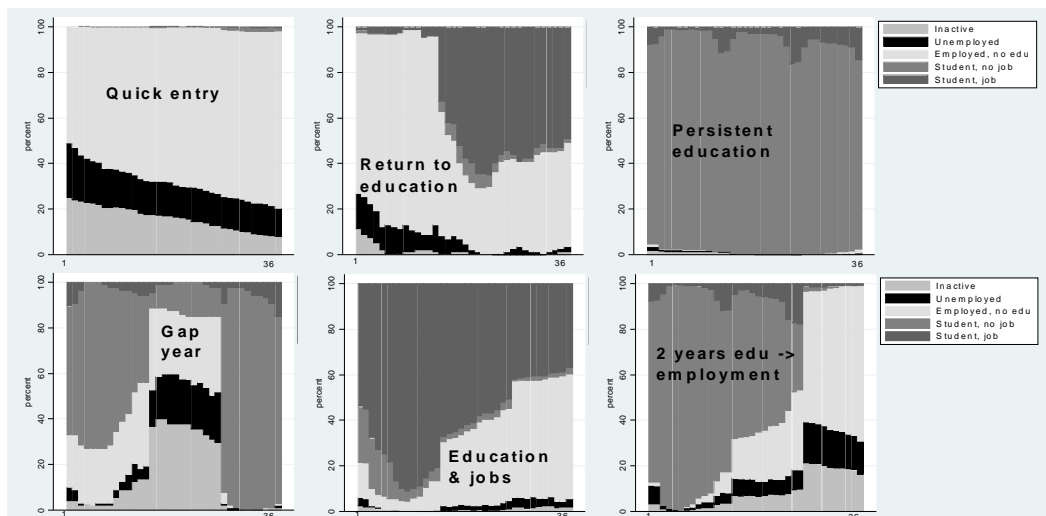
Source: ETEFIL- 2005, INE.

The cluster labelled as “quick entry” is characterised by a relevant number and duration of employment episodes, but it is not exempt from unemployment and inactivity spells as well (which last, in average, half a year). The return to education trajectory will as well register several types of episodes, but in all cases there is at least one of work both with and without education at the same time. The cluster of persistence in education is clearly featured by a unique, very long spell of education with no employment. The gap year cluster differs from the first one in the relevance of episodes of only education, the fact that there are, in average, two spells of them, and

the combination of these spells with all sorts of episodes. The education and jobs cluster is basically a combination of education and jobs with either only education spells or only employment spells. Finally, the two years in education and ulterior jobs is characterised as well by presence of only education and education with employment, but less frequent unemployment and inactivity spells than in previous clusters, such as in the gap year cluster.

Panel 4 confirms the classification with the distribution of young people in the different statuses along 36 months. Both pictures are consistent, but Panel 3 displays trajectories and Panel 4 refers to the distribution of youths across states along time.

Panel 4: Main statuses in the different clusters along the observation period.



Source: ETEFIL-2005, INE.

Table 4: Distribution of trajectory types across groups.

	DROPOUT	DELAY	SUCCESS	Total	N
Quick entry	71.78	14.76	2.50	22.94	2,549
Return to education	3.75	0.27	0.18	1.16	129
Persistence in education	10.29	37.97	80.07	55.45	6,161
Gap year between studies	0.76	0.93	0.76	0.78	87
Education & work	4.25	7.91	3.79	4.47	497
Two years education --> employment	9.16	38.16	12.69	15.18	1,687
Total	100	100	100	100	11,110
Number of observations	3,012	1,504	6,594	11,110	

Source: ETEFIL-2005, INE.

Table 4 shows how unevenly the different clusters are distributed across groups. It shows that most school dropouts (about 72 percent) belong to the quick entry track, those in the *delayed* graduates group are split into persistence in education and two

years in education and ulterior employment, (with nearly 40 percent of them in each group) and many of them also follow the quick entry track (about 15 percent). Finally, 80 percent of *successful* graduates are classified in the persistence in education trajectory, with 13 percent going through two years in education and ulterior employment.

As for the description and validation of clusters, Table A (in the Annex) describes the profiles of youths in each cluster in terms of personal and family characteristics. Women account for more than 50 percent in cluster 3 (persistence in education) only, whereas cluster 1 (quick entry) and 2 (return to education while in employment) are typically found in males. There is a higher proportion of private and semi-private schools attendees in the clusters related to education (cluster 3, persistence in education, and 4, gap year between studies) than in the rest, whereas students from public schools account for most of the observations in cluster 1 (quick entry) and 2 (return to education while in employment). Parental education attainment is higher among youths in cluster 3 (persistence in education) and 4 (gap year between studies), the ones more related to education, and lower for those in cluster 1 and 2 (the very employment-intensive ones) and cluster 6 (two years in education and ulterior employment). The priorities youth report to have pursued during the five years prior to the survey are consistent with the track followed: those in trajectories linked to employment (1, 2, 5 and 6) report a higher preference for job stability than those in education related trajectories (3 and 4), who prioritised pursuing a higher level of education. Those in cluster 5 (combining education and employment) are split between those prioritising education and those preferring a stable job, with 36 percent in each category, which is consistent with the simultaneity of education and work in this cluster.

Youths were also asked about how important different issues were for them, and in order to rank them they had to assign 10 points among five different issues<sup>†††</sup>. Interestingly enough, family is ranked as the most important single aspect in the survey, well above work and education. Youths in cluster 1 (quick entry) tend to prefer work slightly over their counterparts in cluster 3 (persistence in education), but differences in values across clusters are not as pronounced as they were in priorities.

Table 5 displays the results of the multivariate analysis developed to disentangle the profiles of those in the most common trajectories across groups. The unbalanced distribution of youths across clusters shown in Table 4 hinders the estimation of multinomial probits with six different categories in each sub-sample, but we may still identify the main characteristics of each cluster and the profiles of young people in the main clusters of every group of youngsters. Therefore, in the case of school dropouts, a binomial probit shows the profile of those in the cluster 1 (quick entry into jobs track) versus the rest; for *delayed* graduates group we estimate a multinomial probit where cluster 3 (persistence in education) and cluster 6 (two years in education and ulterior employment) are compared to the rest; for the *successful* graduates group the binomial probit model identifies the likelihood of experiencing cluster 3 (persistence in education) as opposed to any other type of trajectory.

---

<sup>†††</sup> Namely, they were asked about how relevant work, education or training, social participation, family and leisure were for them.

Table 5: Binomial Probit and multinomial probit analysis.

	<b>DROPOUT</b>	<b>DELAYED</b>		<b>SUCCESS</b>
	Quick entry	Persistence in education	Two years in education → employm.	Persistence in education
Women	0.019** (0.008)	0.087 (0.129)	0.192 (0.121)	0.006 (0.007)
Age	0.006 (0.005)	-0.138 (0.102)	-0.155* (0.092)	-0.150*** (0.006)
Unknown level of education	0.088*** (0.010)	-0.229 (0.200)	-0.421** (0.180)	-0.059*** (0.013)
Secondary education attainment	-0.362*** (0.015)	0.693*** (0.217)	0.724*** (0.208)	0.168*** (0.010)
Vocational post-compulsory train.	-0.321*** (0.017)	-0.090 (0.226)	-0.015 (0.208)	0.208*** (0.011)
Higher education attainment	-0.343*** (0.019)	0.802*** (0.257)	0.486** (0.243)	0.273*** (0.009)
Foreigner	0.840*** (0.051)	-0.698 (0.515)	-2.919*** (0.698)	-0.654*** (0.039)
(Semi)private school	-0.059*** (0.012)	0.142 (0.166)	0.022 (0.156)	0.145*** (0.007)
To get a job	0.109*** (0.017)	0.148 (0.353)	0.038 (0.290)	-0.610*** (0.022)
To get an adequate job	-0.479*** (0.018)	0.724** (0.347)	0.055 (0.292)	-0.153*** (0.020)
To get a stable job	0.147*** (0.014)	-0.114 (0.311)	-0.236 (0.252)	-0.676*** (0.018)
Certain education attainment	-1.300*** (0.020)	2.394*** (0.316)	-0.250 (0.275)	1.260*** (0.016)
Other priorities	-0.192*** (0.017)	1.005*** (0.373)	0.184 (0.330)	0.231*** (0.020)
All issues are equally relevant	0.008 (0.012)	-0.181 (0.202)	0.061 (0.189)	0.040*** (0.011)
Leisure time is more relevant	0.199*** (0.015)	-0.073 (0.208)	-0.326 (0.209)	0.111*** (0.012)
Social participation is more relev.	0.013 (0.029)	0.170 (0.436)	0.254 (0.397)	0.316*** (0.022)
Work is more relevant	0.254*** (0.014)	-0.415* (0.238)	-0.339* (0.205)	-0.018 (0.012)
Family is more relevant	-0.020* (0.011)	-0.153 (0.170)	-0.017 (0.156)	-0.000 (0.008)
Training is more relevant	0.234*** (0.033)	0.895* (0.468)	0.353 (0.456)	0.208*** (0.016)
Number of observations	3,012	1,504	1,504	6,594
-2LL	-72,560	-52,347		-142,861

Note: The region (autonomous community) has been controlled for as well. The reference category is a man with low-educated (up to compulsory education) parents, Spanish born. He has attended compulsory education in a public school and prioritised organising his life outside employment, upon leaving school. He neither reported a particular issue as more relevant than the others mentioned in the table, nor he considered all of them as equally important.

Source: ETEFIL-2005, INE.

Female school dropouts are more likely to be in cluster 1 (quick entry) than men. Those with low educated parents, foreigners and public schools attendees are also more likely to be in this track. Those who prioritized finding any job or a stable job upon leaving school, and those who have strong preference for work, education and leisure, are more likely to be in this cluster.

Those in the *delayed* graduates group are more likely to be in cluster 3 (persistence in education) or in cluster 6 (two years in education and ulterior employment) when having mid-qualified parents compared to children of low qualified parents (which are reference category). Foreigners are less likely than natives to be in cluster 6 and those who prioritised adequate jobs or the achievement of a certain level of education are more prone to be in cluster 3, whereas no clear pattern as regards priorities is seen in cluster 6.

Finally, *successful* graduates are more likely to be in the persistence in education cluster the more qualified their parents are, foreigners are less likely to follow that track than natives, those from private and semi-private schools are more likely to be in the persistence in education track. Youths are more likely to be in this track when they show a clear preference for education, leisure and even social participation, but not work.

## Conclusions

This piece of work has described the main trajectories followed by youths who either finished or dropped out from compulsory education in the academic year 2000-2001, during three years upon graduation or dropout. To this aim optimal matching analysis has been implemented on a sample extracted from a Spanish school leavers survey, ETEFIL-2005. The main patterns found were labelled as quick exit into work, return to education, persistence in education, gap year between education spells, combining education and employment and two years in education and ulterior employment.

The descriptive analysis points at the relevance of parental background in the likelihood of both succeeding in compulsory education and continuing in education upon graduation. Trajectories characterised by persistence in education tend to be more linked to children of highly educated parents, natives and private and semi-private school attendees, whereas trajectories related to the labour market and employment are more likely to be registered by youths with low qualified parents and high preference for work and job stability.

The optimal matching analysis has shown nuances that are not easy to find at first sight, such as the gap year in education and more frequent combinations of school and work that initially expected.

We have detected a considerable group of youngsters who fail at school and go directly or after some time of unemployment or inactivity into employment. This does not

necessarily mean that they have successful trajectories since we do not observe the type of jobs they get. School dropouts are job-hungry and hardly return to the regular education system. As a result they remain low qualified in the long term. Most policies addressed at school dropouts in Spain try to keep them in the classroom. But, since these youngsters are so much employment-oriented maybe the training should move to the workplace. Keeping them at school is really difficult since they are very much attracted by wages, no matter how low they are. This conclusion confirms the relevance of the already implemented measures by the National Institute for Qualifications (*Instituto Nacional de las Cualificaciones*) since 2002. This institution assesses and certifies training provided in the workplace so that young school dropouts get at least basic qualification certificates that help them to find new jobs later in their careers. This may help prospective employers to get a better idea of their human capital and potential. Specific training should not be provided to qualified workers only. School dropouts also deserve and need high quality training in the workplace since they will rarely return to the classrooms.

The time period of our study (2001-2005 approximately) is very relevant for the analysis of the school-to-work transitions of the least qualified. It shows the main trajectories in the education system and in the labour market when there are job opportunities for them. It is not long enough to allow observing how these educational and employment decisions vary in the new economic context, though. The study of these transitions in the new scenario characterised by economic crisis is a natural extension of this work in the future, when the relevant information will be available. At any rate, we are also aware than many of the observed transitions from school into employment in 2001-2005 among dropouts have turned into transitions into unemployment; unemployment rates have dramatically increased during the economic crisis among low qualified young workers. As a response, they may either derive towards marginality or back to school. In any event, the education system should be ready to face the challenge of recovering them.

## REFERENCES

- Albert, C. L. Toharia y M. A. Davia (2009) La transición de la educación secundaria (obligatoria y no obligatoria) al mercado laboral, *Papeles de Economía Española*, 119, 156-171.
- Aassve, A. Billari, F.C. and Piccarreta, R. (2007) Strings of Adulthood: A Sequence Analysis of Young British Women's Work-Family Trajectories, *European Journal of Population*, 23, 369-388.
- Abbott, A. and J. Forrest (1986) Optimal Matching Methods for Historical Data, *Journal of Interdisciplinary History*, 16, 473-96.
- Abbott, A. and A. Tsay (2000) Sequence Analysis and Optimal Matching Methods in Sociology, Review and Prospect, *Sociological Methods Research*, 29, 3-33.
- Anyadike-Danes, M. and D. McVicar (2010) My Brilliant Career: Characterising the Early Labour Market Trajectories of British Women from Generation X, *Sociological Methods and Research*, 38, 482-512.

Becker, G. S. (1964) *Human Capital: A Theoretical and Empirical Analysis, with Special Reference to Education*, New York: *National Bureau of Economic Research*.

Blair-Loy, M. (1997) Career patterns of executive women in finance: an optimal matching analysis, *American Journal of Sociology*, 104, 1346-1397.

Brzinsky-Fay, C., U. Kohler and M. Luniak (2006) Sequence analysis with Stata, *The Stata Journal*, 6, 435-460.

Brzinsky-Fay C. (2007) Lost in Transition? Labour Market Sequences of School-leavers in Europe, *European Sociological Review*, 23, 409-422.

Halpin, B. and T. Chan (1998) Class Careers as Sequences: An Optimal Matching Analysis of Work-Life Histories”, *European Sociological Review*, 14, 111-130.

Hamilton, L.C. (2006). *Statistics with STATA*, updated for version 9, Belmont (California), Brooks/Cole-Thomson Learning, cop.

Hynes, K and M. Clarkberg (2005) Women’s Employment Patterns During Early Parenthood: A Group-Based Trajectory Analysis, *Journal of Marriage and Family* 67, 222-239.

Huang, Q and M. Sverke (2007) Women’s occupational career patterns over 27 years: Relations to family of origin, life careers, and wellness, *Journal of Vocational Behavior*, 70, 369-397.

Huang, Q., B.M. El Khouri, G. Johansson, S. Lindroth and M. Sverke (2007) Women’s career patterns: a study of Swedish women born in the 1950s, *Journal of Occupational and Organizational Psychology*, 80, 387-412.

McVicar, D. and M. Anyadike-Danes (2002) Predicting Successful and Unsuccessful Transitions from School to Work by Using Sequence Methods, *Journal of the Royal Statistical Society. Series A (Statistics in Society)*, 165, 317-334.

MacIndoe, H. and A. Abbott (2004) Sequence Analysis and Optimal Matching Techniques for Social Science Data, in: Hardy, M. and A. Bryman (eds) *Handbook of Data Analysis*, London: Sage Publications, pp. 387-406.

OECD (2007) *Education at a Glance, 2007. OECD Indicators*. Paris: Organisation for Economic Co-operation and Development.

Quintini, G and T. Manfredi (2009). Going separate ways? School-to-work transitions in the United States and Europe. *Social, Employment and Migration working papers* No. 90. OECD.

Rohwer, G. and U. Pötter (2005) *TDA user’s manual*. Bochum: Ruhr-Universität-Bochum.

Scherer, S. (2001). Early Career Patterns: A Comparison of Great Britain and Germany, *European Sociological Review*, 17, 119-144.

Schoon, I., A. McCullough, H. Joshi, R. Wiggins, and J. Brynner (2001). Transitions from School to Work in a Changing Social Context, *Young*, 9, 4-22.

## ANNEX

Table A: Distribution of personal and family characteristics across clusters.

	Quick entry	Return to education	Persistence in education	Gap year between studies	Education & work	Two years education → employ
Women	0.367	0.339	0.548	0.456	0.467	0.459
Foreigners	0.014	0.000	0.004	0.005	0.015	0.007
Type of School						
Private and semiprivate schools	0.154	0.074	0.411	0.374	0.266	0.255
Public schools	0.846	0.926	0.589	0.626	0.734	0.745
Parents education attainment						
Unknown parental education	0.231	0.133	0.061	0.082	0.146	0.123
Parental education: up to compulsory	0.615	0.647	0.404	0.428	0.504	0.575
Parental education: general secondary post-compulsory	0.068	0.079	0.143	0.139	0.126	0.118
Parental education: vocational training	0.050	0.062	0.117	0.136	0.119	0.090
Parental education: university	0.036	0.079	0.275	0.215	0.104	0.094
Priorities during last 5 years						
To get a job	0.156	0.126	0.018	0.057	0.064	0.115
To get an adequate job	0.073	0.068	0.031	0.040	0.077	0.132
To get a stable job	0.556	0.393	0.051	0.158	0.359	0.415
To get a certain education attainment	0.025	0.182	0.846	0.591	0.369	0.171
Organize her life outside work	0.091	0.132	0.019	0.081	0.055	0.071
Other priorities	0.100	0.098	0.036	0.073	0.075	0.097
Values: what is more relevant						
Other combination of values	0.286	0.273	0.289	0.379	0.300	0.289
All issues are equally relevant	0.164	0.168	0.133	0.122	0.132	0.152
Leisure time is more relevant	0.112	0.090	0.101	0.034	0.115	0.096
Social participation is more relevant	0.021	0.020	0.027	0.023	0.012	0.021
Work is more relevant	0.144	0.108	0.080	0.130	0.126	0.111
Family is more relevant	0.259	0.336	0.302	0.277	0.293	0.307
Training is more relevant	0.015	0.004	0.068	0.035	0.022	0.024
Number of observations	2,549	129	6,161	87	497	1,687

Source: ETEFIL-2005, INE.