
School Dropout by Gender in the European Union: Evidence from Spain

Abandono escolar en función del sexo en la Unión Europea: evidencias sobre España

ANTONIO CASQUERO
TOMÁS

Universidad de Málaga
casquero@uma.es

JESÚS SANJUÁN SOLÍS

Universidad de Málaga
jsanjuan@uma.es

ANTONIO ANTÚNEZ
TORRES

Universidad de Málaga
aantunez@uma.es

Abstract: The aim of this paper is double, to describe the scope of high school dropout in Spain in comparative terms with Europe and to provide empirical evidence about its main determinants from a gender perspective. Using data from the Eurostat LFS for 1996-2009, the study makes evident a singularity for Spain: the important gender disparity at school. The multivariate statistical analysis shows that for females the academic performance, father's nationality and mother's educational level are the most determining factors in their education demand decisions. For males, father's occupation and labour market conditions are the most significant influences.

Keywords: high school dropout; lower secondary education; education demand; discrete choice models.

Resumen: El objetivo del artículo es doble, describir el alcance del abandono escolar temprano en España en términos comparados con Europa y aportar evidencia empírica sobre sus principales determinantes desde una perspectiva de género. Con datos de la LFS de Eurostat para el periodo 1996-2009, el trabajo muestra una singularidad para España: el comportamiento de hombres y mujeres con respecto al abandono escolar es muy diferente. En el ámbito de las decisiones individuales de demanda educativa, el análisis estadístico multivariante muestra que el rendimiento académico, la nacionalidad del padre y el nivel educativo de la madre, son los factores más relevantes entre las mujeres y la situación laboral de los padres entre los hombres.

Palabras clave: abandono escolar temprano; enseñanza secundaria; demanda de educación; modelos de elección discreta.

INTRODUCTION

The generalised expansion of education, the advances in equality between men and women and the increased proportion of women attending school are undeniable. Nevertheless, certain educational indicators vary significantly between countries, even those with similar levels of development. One example is the high and persistent early school dropout rate in some European countries, including Spain.

The early school dropout rate, defined as the percentage of the population aged 18-24 who have attained a maximum of lower secondary education and who are not pursuing further education or training, is a basic structural indicator of the success of education objectives established by the EU member states¹. These objectives are motivated by the enormous short-term repercussions of an inadequately qualified labour force. According to the latest available data, provided by the Eurostat *Labour Force Survey* (hereafter referred to as LFS), the school dropout rate in Spain was 31% in 2009.

The Spanish dropout rate is double the EU average and displays an upward trend, in contrast to the EU trend. In addition, this data raises two important gender-related points. First, throughout the EU, dropout rates are higher among males than females. Second, this gap has widened in Spain, while remaining constant in other EU countries.

School dropout and its multiple causes have generated research interest in distinct fields and disciplines. The psychological research model, which portrayed the individual as the cause of failure and school dropout, is no longer the exclusive explanation.

The literature on school dropout is composed of various lines of research which can be grouped under both sets of factors that predict whether students dropout of school: students' individual factors as attitudes, behaviors, performance, and factors associated with institutional characteristics as families, schools and communities. In this sense, early school dropout is a many-faced phenomenon and it would be far beyond the scope of this article to give a comprehensive overview of the existing literature (for an excellent review, see Rumberger and Lim, 2008).

1 Many different definitions of school dropout exist (see, for example, Fossey, 1996). School dropout/leaving school early has no universally accepted definition, but is typically understood as self-exclusion from school (not including transfers) before receiving a high school graduation diploma. In short, the term "early school dropout" includes all forms of leaving education and training before completing upper secondary education or equivalents in vocational education and training.

The dropout research is not a new domain but a really prolific and long-standing research interest. Less generically, much of the literature on school dropout concentrates on specific issues, such as satisfaction with the institution, educational inputs, compulsory education age (Pascarella, Smart and Ethington 1986; Cabus and De Witte, 2011); underperformance of students or impact truancy (McKenzie and Schweitzer, 2001; Lowe and Cook, 2003) or the area of residence (Gibbons, 2002; Lacasa, 2009). Similar studies have centred on those groups most at risk of self-exclusion, race, certain ethnic minorities or immigrants (Rumberger, 1983; Pereira, Harris and Lee 2006; Lofstrom, 2007).

It is in this context of individual education demand decisions or self-selection models, where this research fits², the education demand models are explored in the pioneering study Willis and Rosen (1979), in most recent by Bratti (2007) or De Witte (2010), among others. These studies calculate the risk of early dropout on the basis of family income, but include non-monetary variables, e.g., educational level of siblings and the educational level and employment situation of the parents. Research has shown that the latter variables have a greater explanatory power of school dropout rates. A second line of research, relates school dropout decisions to the socioeconomic environment of individuals and, more concretely, the employment opportunities during the transition from school to work. The paper by Coleman and Husen (1989) has been followed by more recent research, for example, Jenkins, Vignoles, Wolf and Galindo-Rueda (2003), who focus on dropout from continuous training. Sabia (2009) concludes that the labour force participation of youth who are students has no important impact on academic achievement; consequently, it does not affect students' decisions to abandon or remain in the education system.

This paper seeks to advance our understanding of the drop-out behaviour of students in upper secondary education. More specifically, our aims go through describing the situation of early high school dropout in Spain from a comparative perspective with Europe and, at the same time, providing empirical evidence of the causes that determine gender differences in Spain, that is, testing whether the individual education demand decisions vary according to gender. The probability for someone to continue their studies or not depends on a combination of explanatory factors acting simultaneously. In this sense, we make use of multivariate statistical tools to investigate these causes.

2 The multidimensionality of school dropout allows different explanatory models. Besides the used here, the other developed under the known theory of persistence (Tinto, 1975) deserves to be highlighted

The remainder of the paper is organised as follows. The next section presents a short comparative analysis of school dropout from EU versus Spain over time. The third section, describes the data, together with a discussion of the variables, justified by literature supporting, and presents the methodology based on a discrete choice model. The subsequent section presents estimates of the determinants of dropout probabilities. The final section draws some conclusions and policy implications.

INCIDENCE OF DROPPING OUT

The progressive increase in the educational level of the European population³ has advanced gender equality. However, this gradual reduction in the traditional disadvantage of women differs according to the country and time period analysed.

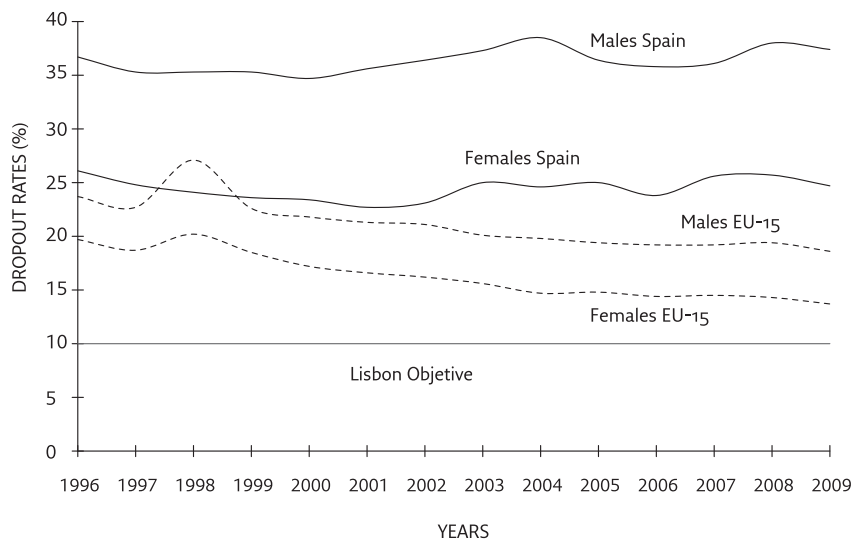
In contrast to most EU-15 countries, in the early 1980s Spanish women were still overrepresented among those with less than primary school education and significantly underrepresented in the population receiving to secondary or tertiary education. During the 1990s, coinciding with the generational turnover of younger female cohorts, gender differences in education declined substantially and Spain made substantial progress towards convergence with European educational levels. Due to this process of educational expansion, the greatest gender differences in education in Spain today affect the older population groups⁴, as a result of the educational choices made and high school dropout rates. This situation clearly produces discrimination against women in terms of access to certain occupations and salary.

Because adequate education is essential in today's society, the decision to abandon schooling upon completing the secondary stage is considered highly premature. Consequently, the school dropout rate is a basic concern of European education policy.

Eurostat defines early school dropout as the percentage of the population aged 18-24 with lower secondary education or less who are no longer pursuing education or training. It is one of the most significant indicators of social cohesion when

3 Strictly, Europe should be distinguished from the European Union (EU), but the terms are used synonymously here. Moreover, the EU-15 refers to a group comprising Belgium, Netherlands, Luxembourg, France, Germany, Italy, the United Kingdom, Ireland, Denmark, Greece, Spain, Portugal, Sweden, Finland and Austria. The EU-27 further includes Poland, Hungary, the Czech Republic, Slovakia, Romania, Bulgaria, Slovenia, Estonia, Latvia, Lithuania, Malta and Cyprus.

4 For age intervals close to pre-primary education, the net rates of schooling clearly exceed European averages.

Figure 1: School dropout by gender in Spain and EU-15

Source: Eurostat (2009)

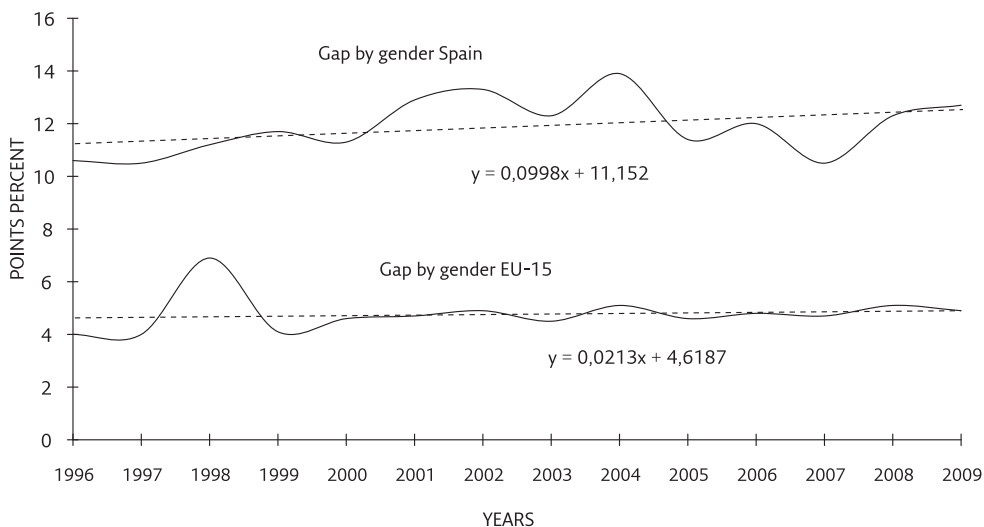
evaluating the achievement of educational objectives within the Social Policy Strategy established in the European Lisbon Agenda⁵.

In 2009, as Figure 1 shows, 31% of Spanish youths aged 18-24 abandoned the educational system without completing upper secondary studies, a dropout rate far above the EU-15 average of 17% (Eurostat, 2009)⁶. Furthermore, the average dropout rate in Europe has fallen gradually but continuously (by almost four percentage points) in the last decade, yet has remained constant in Spain.

Figure 1 also shows how the school dropout rate in Spain for both genders softly decreases from 1996 to 2001 and since this year it fluctuates around a constant figure. In contrast, the EU-15 exhibits a decreasing trend during all the analysed period for men and women. Moreover, figure 1 shows that the school dropout rate in Spain and the majority of EU-15 countries has affected males more

5 The EU Lisbon objectives, recently revised for 2012, state that 85% of Europeans aged 20-24 should complete upper secondary education and that early school drop out rates should fall to 10%. This must not be confused conceptually with school failure, or the incompleteness of compulsory lower secondary education.

6 The high rates of schooling in newer member EU countries mean that Spain is even further below the EU average.

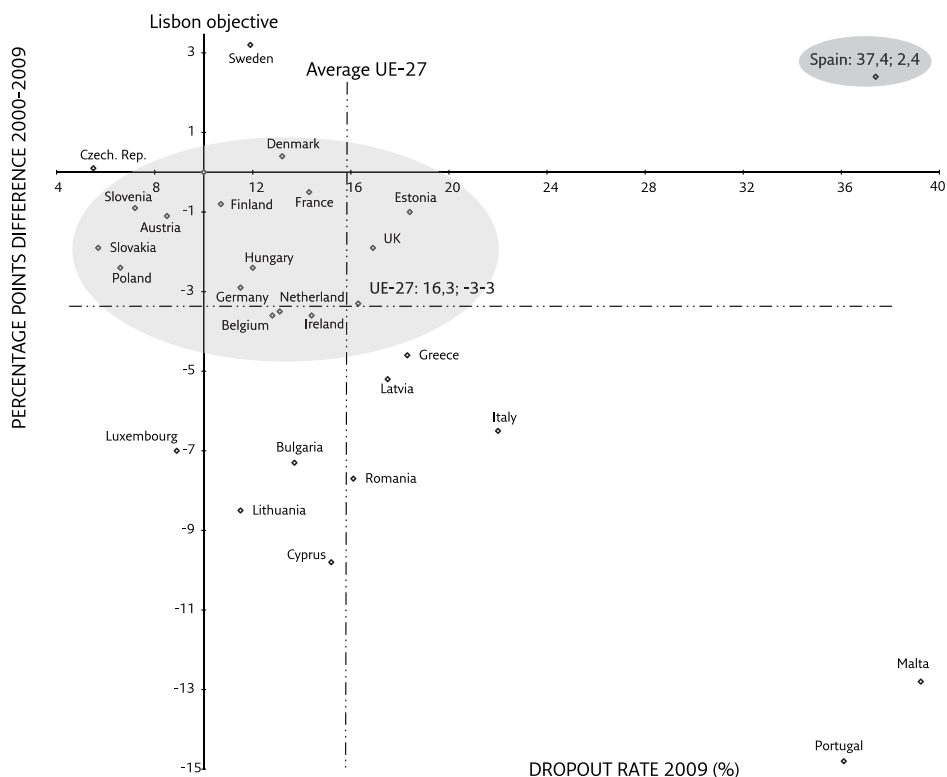
Figure 2: Trends school dropout by gender in Spain and EU-15

Source: Eurostat (2009)

severely than females for many years⁷; however, gender differences are much sharper in Spain. While the average EU-15 dropout gender gap ranges from four to five percentage points in the last decade, in Spain this gap has never fallen below 10 percentage points, reaching a maximum of 14 percentage points in 2004. Figure 1 shows that the school dropout rate, in both the EU-15 and Spain, is essentially a male problem and that changes in trends are unlikely in the short term.

Figure 2 shows the school dropout gap (male-female) and its fitted trend for Spain and for the EU-15. Two characteristics can be observed in that figure. First, the Spanish gap is more than the double than the EU-15 one. Second, the average annual growing of this gap is also bigger in Spain: 0,099 percentage points every year versus 0,021 percentage points obtained in the whole countries contained under EU-15.

⁷ The measurement and inter-country comparison of school dropout is complex, as its definition is determined by the structure of the different education systems. It is therefore advisable to make international comparisons between relatively harmonised countries, and to approach the results with a certain degree of caution. To make information comparable, in the year 2000 Eurostat modified its method for calculating the school dropout indicator, now calculated using annual averages instead of data collected in the second quarter as was previously done.

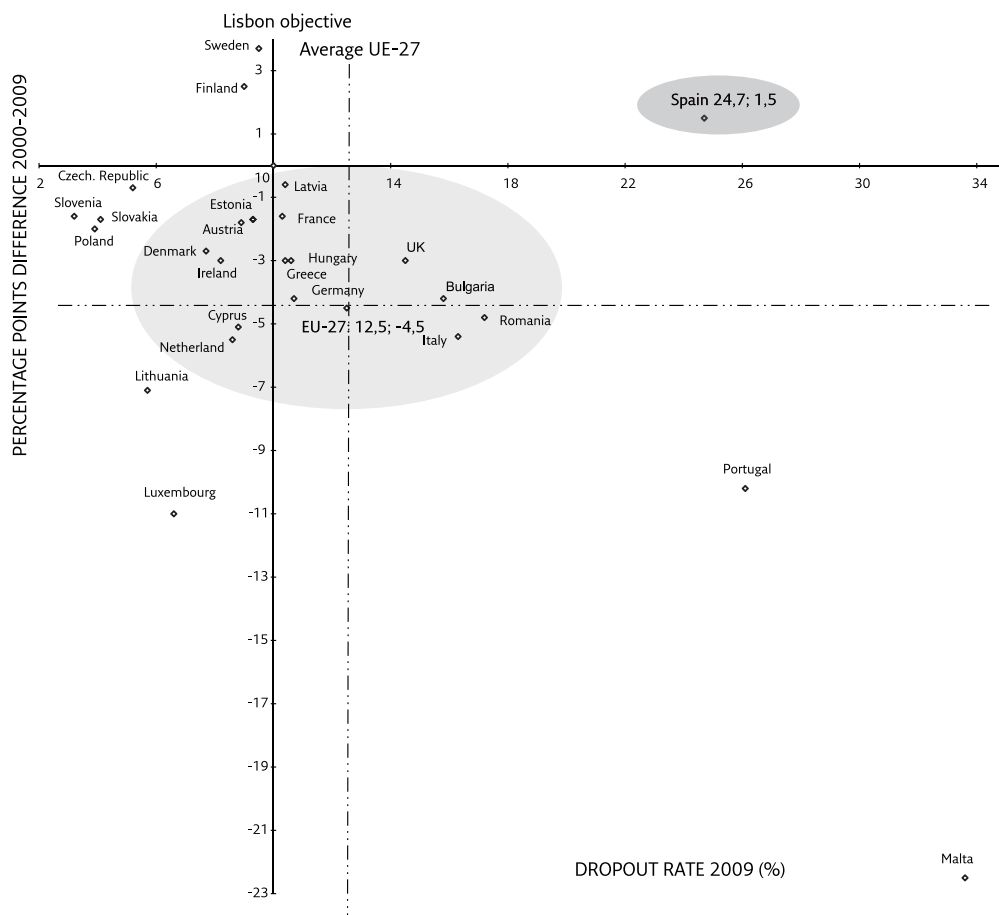
Figure 3: School dropout in EU-27. Males

Source: Eurostat (2009)

Figures 3 and 4 present the evolution of school dropout rates for males and females in the EU-27, through showing the difference in percentage points between the dropout rate in the period 2000-2009 (vertical axis)⁸ and the school dropout rate in 2009 (horizontal axis).

For the EU-27, average male dropout rate is 16.3% (Figure 3), and for 2009 only six countries (the Czech Republic, Luxembourg, Austria, Poland, Slovenia and Slovakia) display school dropout rates below 10%, the established short-term Lis-

⁸ For years before 2000, Eurostat information is incomplete. The two axes intersect in the Lisbon Objective (a school dropout rate of 10%).

Figure 4: School dropout in EU-27. Females

bon Objective. At the opposite extreme is Spain, where the male school dropout rate, 37.4%, is only exceeded by Malta, 39.7%. The recent evolution of this rate is also notable, with Spain as the country furthest from achieving the Lisbon Objective, with the exception of Sweden.

Figure 4 illustrates female school dropout rates in the EU-27. It shows that female school dropout rates are concentrated in the third quadrant, and thus the already low rates are in a declining trend. An average rate of 12.5% in 2009, lower

than the average male dropout rate by almost four percentage points, means that in most EU-27 countries, females, but not males, have already achieved the above-mentioned Lisbon Objective. The United Kingdom, Bulgaria, Romania, Italy, Portugal, Malta and Spain (with a 24.7% female school dropout rate) are the only countries still far from achieving this goal.

While female dropout rates exceeded male dropout rates in Germany, Luxembourg and Austria in 1996, this was only true for Austria by 2009. This data show that the situation is now reversed from the traditional model of educational demand, in which females suffered higher dropout rates. In short, the problem has been “masculinised”, confirming the information provided by other education indicators⁹.

MATERIALS AND METHODS

Both general opinion and the specialist literature are unanimous that decreasing school dropout rates is a multidimensional problem, because its causes, e.g., the individual decision to abandon education, are diverse and frequently interlinked. Analysing these causes jointly is a highly complex task that requires the availability of considerable statistical data.

The principal factors influencing the decision to dropout of school are the personal and family characteristics of individuals and their socioeconomic environment. Within the latter, the presence of employment opportunities is especially important among young people who can access their first job. Independent of other factors, the factors listed in this paragraph, which are related essentially to educational context¹⁰ or academic achievements, strongly affect the decision about whether or not to remain in education. The literature demonstrates that academic results strongly influence the student’s decision of whether or not to remain in the education system, especially in secondary education¹¹.

9 In Spain, the enrolment ratio for females aged 16-18 is almost 10 percentage points higher than for males. Female school life expectancy, the average number of years a student is expected to remain in the education system, slightly exceeds that of males and is in line with the European average.

10 The educational context refers to data describing the educational institution, such as the type of centre, whether it is publicly or privately owned, or the duration of courses, which is a decisive factor in educational demand. In short, the institutional context consists of aspects of educational supply that obviously condition demand decisions.

11 The OECD Programme for International Student Assessment (PISA) as it measures student’s skills in selected domains and draw conclusions on the factors influencing the performance of various education systems. The report results can be interpreted as “advance” indicators of dropout.

Table 1: School dropout rates by gender and age group in Spain (%)

AGE	1996			2009		
	MALES	FEMALES	TOTAL	MALES	FEMALES	TOTAL
18-20	32.46	24.09	28.72	36.29	23.75	29.15
21-24	39.71	28.83	34.15	38.15	25.01	32.52
TOTAL	36.78	26.12	31.45	37.42	24.71	31.05

Source: Eurostat (2009). National Statistics Institute (1996). National Statistics Institute (2009).

The foregoing descriptive analysis has shown that the extremely high rate of school dropout in Spain is affected by the high male dropout rate, which is much higher than the female dropout rate. The following logistic regression analysis and estimation of the qualitative response models establish the influence of certain individual characteristics on the decision to drop out from school early¹².

Data and variables

The data used to estimate the logit models comes from LFS microdata for 1996 and 2009 from Spain provided by the National Statistics Institute (National Statistics Institute, 1996; National Statistics Institute, 2009)¹³. To avoid undesirable seasonal effects, the analysis is of the second quarter data. Table I shows the evolution of school dropout rates in Spain using individual data from the LFS, distributed by gender, for 1996 and 2009, for the two age intervals in the sample data.

The information in Table I presents shows that women are more permanent members of the Spanish educational system, and the gender gap in terms of dropout rates is persistent over this period. Between 1996 and 2009 this gender gap in dropout rates has persisted due to both a slight increase in the male dropout rate and a significant reduction in the school dropout rate among women. In turn, the

12 Manski and Wise, 1983, tackled a broad application of discrete choice models to the various educational decisions undertaken by individuals.

13 Although there are alternative data sources, the indicator of early dropouts used in this research is designed to economically active population surveys, hence the LFS is suitable. In addition, its structure allows in opposite to panel data (for example, panel data of households in the European Union -PHOGUE-) direct comparisons intertemporal as we are carrying out here.

table shows a direct relationship between age and dropout rates. Thus regardless of gender, dropout rates are always higher among older cohorts, although this correlation fades over time¹⁴.

Bearing in mind the limitations of the LFS data, the independent variables included in the logistic regression analysis reflect the personal and family characteristics of individuals and their socioeconomic environment. The latter are directly related to their employment.

To assess the influence of specific factors on demand decisions, this analysis considers single parent (*no father/mother figure*) as reflecting the particular socioeconomic conditions of family and academic performance. Unfortunately, these are only available for the academic year 2009. Low academic performance is represented by a dummy variable (*academic performance*) indicating that schooling was completed later than scheduled¹⁵. Conversely, high academic performance is indicated by completion ahead of schedule.

This analysis includes the following family variables: the parents' educational level, their occupation, their employment situation and the number of siblings. For 2009, the family variables also include the father's nationality, to observe the effect of immigration on the education decisions of the individuals in the study. The educational level of the parents reflects not only the family's socioeconomic status but also its education preferences and is expected to have a positive and strongly significant effect on children remaining in education. Two dummy variables distinguish parents with secondary and higher education from those with only primary or no education. The parents' occupation is also represented by dummy variables distinguishing skilled workers (for instance, clerks and sales personnel) and unskilled workers (such as agricultural and service workers) from managers, technicians and professionals. Individuals are distinguished as unemployed or employed and as inactive or active. For each case, the situation occupied is omitted. All the above variables are reliable indicators of household economic capacity and family income, a determining factor in children's education decisions. The LFS does not provide these data.

The number of siblings is used to indicate family size. However, if the individual in the survey has siblings who are students or who have completed their ed-

14 Spain has maintained the same definition of school dropout, a similar demographic structure and education policy over the period of this survey. However, the definition of dropout, demographic structure or education policy may have changed in other countries in the survey and any comparison over time should be made with caution.

15 With the LFS 2009, the number of years taken to complete studies has been estimated and used as a proxy for academic performance.

ucation, then this reveals a clear household preference for education, which is expected to have a negative effect on the individual decision to drop out. Household preference for education is indicated by two variables to represent the number of siblings over 16 who persist in education or are school dropouts, and a third for the number of siblings under 15.

Six dummy variables represent the region of residence¹⁶. The region of residence is defined by the geographical regions into which the European Community Household Panel groups the Spanish Autonomous Communities, which include the following: *Northwest*: Galicia, Asturias and Cantabria; *Northeast*: the País Vasco, Navarra, La Rioja, and Aragón; *Madrid*; *Center*: Castilla-León, Castilla-La Mancha and Extremadura; *East*: Cataluña, Valencia and the Islas Baleares; *Canary Islands* and *South*: Andalucía, Murcia, Ceuta and Melilla. *South* is the omitted variable or reference.

In addition, transition from school to high school or college is critical because of its interconnection with the possible transition to the labour market. The opportunity cost of remaining in education is reflected by dummy variables representing both the unemployment rate and the under-25 unemployment rate in the province of residence, compared to the national unemployment rate¹⁷.

Estimation procedure

To cover all the possibilities of individual choice, analysis of the decision-making process requires the construction of a multinomial model. In the present case, general methodology has been simplified, but remains discrete, to reduce the model to a single choice between two alternatives: to continue education or to abandon the education system.

The empirical model formulated follows that of Willis and Rosen (1979), who applied it to the decision of whether or not to remain in university education. The specification adopted here is based on a simple discrete choice model. This model considers that the individual is faced with his or her first educational choice upon completion of basic or compulsory education: not to continue with any type of education (*T*) or to pursue any type of education (*E*). In this decision, he or she takes

16 This variable is important because there considerable differences in dropout rates among the Autonomous Communities.

17 Because a correlation exists between the unemployment rate and the under-25 unemployment rate, proper statistical models call for a variable to describe their joint effect. However, as the results thus obtained did not vary significantly from those presented, this effect has been omitted.

into account the current value of the flow of potential income associated with each option. This value summarises both the costs and benefits of each alternative and is given by the following expressions: $VP_T^* = \alpha_T' Z_T + \zeta_T$ and $VP_E^* = \alpha_E' Z_E + \zeta_E$ where VP_T^* and VP_E^* represent the values of the income expected if the individual chooses to dropout or to continue in the school, respectively. Z_T and Z_E are two vectors of observable variables that determine these expected values and include, among other factors, income and employment expectations and indicators of the family and socioeconomic environment of the young person. α_T and ζ_E are non-observable random variables, such as tastes, preferences, and ability, which also influence the expected present value of each alternative. According to the fundamental assumption of human capital theory (Becker, 1964), individuals choose the “best” alternative from among their educational options. If this choice were early school drop-out, it would signify that: $VP_T^* > VP_E^*$. In other words, the current value of the income flow expected from dropping out exceeds the corresponding flow associated to choosing any type of education. Thus, the individual will choose to abandon education if: $\alpha_T' Z_T + \zeta_T > \alpha_E' Z_E + \zeta_E$

However, in reality the expected income flows VP_T^* and VP_E^* are unobserved, and consequently only the final decisions of individuals, made after applying their education decision rules, are observed. Thus, if Y is defined as a random variable that takes the value of 1 in the case that the individual drops out and 0 in the case that the individual continues his or her education (independent variable), then the individual education decision can be expressed in probabilistic terms as:

$$\text{Prob}(Y=1) = \text{Prob}(\alpha_T' Z_T - \alpha_E' Z_E \geq \zeta_E - \zeta_T) = \text{Prob}(\varepsilon \leq \beta' X) = F(\beta' X)$$

where $\beta' = \alpha_T' - \alpha_E'$; $X = Z_T - Z_E$, and $\varepsilon = \zeta_E - \zeta_T$

If it is assumed, furthermore, that the random disturbance term, ε , follows a logistic distribution, the educational choice model to be estimated will be the logit model:

$$\text{Prob}(Y=1) = \frac{e^{\beta X}}{1 + e^{\beta X}} \quad \text{where the vector } X \text{ displays a set of observable characteristics of the youth and the environment determining his or her decision. } \beta' \text{ is the vector of parameters to be estimated (predictors) with a given sample, to quantify the influence of these characteristics on the individual educational choice.}$$

18 It should be remembered that much of the demand education and school dropout literature in Spain addresses the college level.

Table 2: Estimation of dropping out by gender

1996

	MALES		FEMALES	
	COEF.	ODDS RATIOS	COEF.	ODDS RATIOS
Constant	-0.814***		-1.426***	
Low academic performance				
<i>Family characteristics</i>				
No father figure	0.883***	2.416	0.853***	2.346
No mother figure	0.457***	1.574	1.181	3.256
Father of foreign nationality				
Father with secondary education	-0.751***	0.472	-0.851***	0.427
Father with higher education	-1.704***	0.182	-1.456***	0.235
Mother with secondary education	-0.545***	0.574	-0.759***	0.468
Mother with higher education	-1.469***	0.244	-1.356***	0.258
Brothers ≤ 15 years	0.167***	1.157	0.232***	1.265
Brothers ≥ 16 years studying	-0.531***	0.607	-0.625	0.534
Brothers ≥ 16 years who do not study	0.549***	1.751	0.464***	1.595
Father unemployed	1.242***	3.426	1.077***	2.936
Father inactive	1.034***	2.919	0.968***	2.636
Mother unemployed	0.144	1.169	0.722*	2.056
Mother inactive	0.171	1.192	0.598*	1.818
Father administrative, commercial	0.136*	1.146	0.224***	1.255
Unskilled working father	0.835***	2.351	0.641**	1.899
Mother administrative, commercial	-0.145	0.864	0.195	1.214
Unskilled working mother	0.417	1.557	0.741	2.095
<i>Socio-economic environment</i>				
Youth unemployment rate > than the average	-0.127***	0.885	-0.313***	0.736
Unemployment rate prov. > than the average	0.087*	1.091	0.252*	1.286
Reside in the Northwest area	-0.108***	0.897	-0.433***	0.649
Reside in the Northeast area	-0.343***	0.679	-0.684***	0.505
Reside in Madrid	-0.274***	0.762	-0.598***	0.551
Reside in the Central area	0.024**	1.027	-0.632***	0.532
Reside in the Eastern area	0.178	1.187	-0.140***	0.869
Reside in the Canary Islands	0.073	1.072	-0.202*	0.817
<i>Number of observations</i>		10,425		8,791
<i>Correct responses (%)</i> :		81.1		74.9
<i>Likelihood ratio (degree of freedom)</i>	12314.781	(25)	10113.809	(25)

* Significant at 10% , ** significant at 5% ,*** significant at 1 %

Omitted categories (references): for 1996 and 2009 (first specification) without siblings, whose parents have primary education or less, are employed as technicians and professionals, reside in a area of the south and provincial youth unemployment which is lower

2009 (First specification)				2009 (Second specification)			
MALES		FEMALES		MALES		FEMALES	
COEF.	ODDS RATIOS	COEF.	ODDS RATIOS	COEF.	ODDS RATIOS	COEF.	ODDS RATIOS
0.365***		-0.428***		0.356***		-0.469***	
				0.060**	1.061	0.254**	1.283
0.067***	1.066	0.410***	1.516	0.056	1.053	0.398***	1.487
0.073***	1.078	0.015	1.013	0.065***	1.067	0.011	1.015
				0.306**	1.358	0.711**	2.038
-0.786***	0.458	-0.619***	0.539	-0.784***	0.457	-0.624***	0.535
-1.224***	0.294	-1.640***	0.194	-1.224***	0.294	-1.636***	0.193
-0.766***	0.462	-0.915***	0.401	-0.776***	0.460	-0.929***	0.396
-1.559***	0.211	-1.801***	0.165	-1.563***	0.209	-1.811***	0.164
0.228***	1.252	0.194***	1.214	0.218***	1.244	0.185***	1.206
-2.145***	0.117	-1.388	0.249	-2.145***	0.117	-1.383	0.262
0.512***	1.669	0.499***	1.647	0.510***	1.665	0.491***	1.635
0.213***	1.237	0.721***	2.056	0.208**	1.232	0.691**	1.993
0.078***	1.081	0.421***	1.524	0.079**	1.083	0.409**	1.505
-0.112	0.894	-0.128*	0.880	-0.117	0.889	-0.127*	0.884
-0.164	0.848	-0.150*	0.861	-0.164	0.849	-0.148*	0.862
-0.722*	0.486	-0.708***	0.493	-0.719*	0.487	-0.684***	0.504
0.297***	1.345	-0.189**	0.828	0.296***	1.345	-0.183**	0.837
-0.048	0.956	-0.266	0.767	-0.043	0.958	-0.247	0.781
0.524	1.689	0.416	1.516	0.524	1.689	0.421	1.523
-0.297***	0.743	-0.278***	0.757	-0.302**	0.739	-0.293**	0.746
-0.071*	0.932	-0.042*	0.959	-0.069*	0.933	-0.035*	0.96
-0.516***	0.597	-0.422***	0.656	-0.520**	0.595	-0.430**	0.651
-0.710***	0.492	-0.699***	0.497	-0.714**	0.490	-0.723**	0.485
-0.827***	0.437	-0.576***	0.562	-0.837**	0.433	-0.609**	0.544
-0.170***	0.843	-0.651***	0.522	-0.172**	0.842	-0.542*	0.581
-0.272	0.762	-0.327***	0.721	-0.280	0.756	-0.343*	0.710
-0.053	0.949	-0.275*	0.760	-0.061	0.940	-0.302*	0.739
	7,156		6,783		7,158		6,784
	77.0		79.8		84.0		79.6
7511.379	(25)	6242.941	(25)	7618.519	(27)	6123.924	(27)

than the national average. For the 2009 (second specification) high academic performance and father' Spanish nationality are added. Source: National Statistics Institute, 1996 and 2009. Second quarter.

EMPIRICAL RESULTS

The statistical significance of the gender influence is widely accepted in the literature review of early school drop in Spain. Thus, women have a lower odds ratio than men to dropout (Albert y Toharia, 2000)¹⁸. At the same time, early school dropout in post-secondary is much higher in Spain than EU-15 and higher between male than women, though gender differences far exceed the European average. In this context, with a gender-differentiated approach, we analyze separately both groups to know their specific determinants (Valiente, 2003).

Table 2 presents the estimations of the parameters of the logit model, which explains the probability that individuals aged 18-24 will abandon education, for 1996 and 2009 and by gender. This table offers the estimated coefficients and the corresponding odds ratios¹⁹. Generally, the results are consistent with human capital model to explain dropout behaviour. In line with much of the literature our estimates show that the variables that are powerful determinants of the likelihood of dropout are related to family characteristics, specifically the characteristics of the father.

A majority of the studies found that academic achievement had a statistically significant effect on the likelihood of dropping out or graduating from high school (such as, Reyes, 1993; Montmarquette, Viennot-Briot and Dagenais, 2007; Elias, 2008, among others). Analysing the variables by gender shows that academic performance has the same directional impact on the educational demand of men and women. Coinciding with Marcenaro y Navarro (2001) this analysis shows that better educational performance implies lower dropout rates, although this variable is demonstrated to have a greater impact on women. Low academic performance appears to be correlated with high repetition rates or with failure at school (such as, Felman, 2005; González, Álvarez, Cabrera and Bethencourt, 2007) although the explanatory variable is slightly significant²⁰. In relation to academic performance, it should be emphasised that various analyses have consistently shown that females perform better academically than males (Latiesa, 1992)²¹.

19 In overall terms, the estimated parameters display a strong capacity to explain the post-compulsory education demand of Spanish youth. In all cases, the likelihood ratio tests permit the rejection of the null hypothesis of the absence of joint significance of the explanatory variables considered.

20 Although it is well known that the correlation between poor results, failure and school dropout is not simple, each influence may have a different response, depending on gender.

21 Thus, in the OECD as a whole, female students achieve an average reading comprehension score 39 percentage points above that of males. In Spain, this difference in favour of women is a recurrent question in national and international research.

Family structure has a significant influence on early school dropout (see, for example, Mora, 1997; Lassibille and Navarro, 2008, among others). Among family characteristics, an absent father has high explanatory power for males and an absent mother has explanatory power females, although the latter factor has a low level of significance (Rumberger, 1995; Albert, 1997). Additionally, the daughter of an immigrant father is twice as likely to abandon her studies prematurely as the daughter of a Spanish father²². In the case of sons of immigrant fathers, the probability of abandoning school is *only* 1.3 times as high (such as, Muñoz de Bustillo, Antón, Braña and Fernández 2009)

For both males and females, the parents' education has a consistent effect (see, for example, González and Dávila, 1998). However, in 1996 the variable which most strongly affected the probability that a student would dropout was the father's attainment of higher education, while in 2009 the mother's attainment of higher education was the more influential variable. Our estimates show that over the years the education level of the mother has become a more important factor influencing in their children's educational decisions. This variable has a stronger explanatory power for daughters.

For the effect of household size, a high number of household members participating in the education system lowers the probability that both males and females will choose to drop out of school (Cañadas, 1999), although for females, the coefficients are less significant.

With regard to the labour market participation of the parents, unemployment and, to a lesser extent, inactivity, strongly affects children's education decisions (see, for example, Modrego, 1988; Ahn and Ugidos, 1996, among others). The importance of this factor; however, has declined over the years analysed. Although the mother's labour force participation has a significant impact, during the period analysed it is irregular. Spanish youth whose fathers have low vocational qualifications (i.e, father is unqualified as compared to technicians and professionals), have a reduced likelihood of continuing to study, with a higher level of explanatory power for men than for women. As with the previous explanatory variables, this impact becomes less relevant over time and is not significant in the case of mothers' occupation.

Unlike the results of similar studies (see, for example, Calero, 2006) this study establishes that the socioeconomic characteristics (unemployment rate and region of residence) show a lower level of impact on the odds of school dropout in Spain.

To measure the opportunity cost of remaining in education, the estimations incorporate the provincial unemployment rates and the provincial youth unemploy-

22 Strictly speaking, a father of foreign or dual nationality.

ment rates in the Autonomous Community in question. The results show that the effects of provincial youth unemployment on school dropout are similar in the different estimates. Thus, for both males and females, a provincial youth unemployment rate above the national average discourages students from continuing to study (Micklewright, Pearson and Smith 1990; Petrongolo and San Segundo, 2002). This is due to the lower opportunity cost represented by unemployment. This positive effect of unemployment upon education demand is particularly stable. In 1996, high provincial youth unemployment rates reduced the probability of males dropping out only slightly more than that of females, and raises doubts as to whether cyclical employment effects influence school abandonment more decisively for males than for females. As expected, the male dropout rate is much more closely linked to the labour market (see, for instance, Peraita and Pastor, 2000).

As the majority of the literature predicts, incorporating the provincial unemployment rate into the estimations produces contradictory results, (unlike, San Segundo y Petrongolo, 2000) in 1996 the unemployment rate appears to discourage students from remaining in the education system, especially women, although the significance level is low. For 2009 this factor is not significant, which may indicate that the prevailing provincial labour market is declining somewhat as an indicator of expected future benefits, and thus as a determinant of the decision to abandon or continue in the education system.

To determine the effect of the specific characteristics of the region of residence, itself a proxy of internal effects related to education supply and even income per capita, a variable is included in the estimations by gender. The results show that the Autonomous Community of residence is, in general terms, an explanatory variable of individuals' education decisions, thereby confirming that regional differences persist in Spain (Lacasa, 2009; Mora, Escardibul and Espasa 2010). For males in 1996, all regions display a negative sign except the East region and the Canary Islands, although these are not significant. In the case of women in both 1996 and 2009, the Centre region joins those Autonomous Communities that have the highest increase in the probability of their residents remaining in the education system. The Northeast region, followed by Madrid, is still (for males) the region in which the probability of educational abandonment saw the largest increase, taking the South region as reference.

CONCLUSIONS AND DISCUSSIONS

In this paper, a regression analysis has been applied to explain the high school dropout rate in Spain, emphasising the causes linked to gender of the students.

When describing the data, we found that the incidence of dropping out is particularly high in Spain. At the time of the survey (2009), around 31% of students abandoned the educational system without completing upper secondary studies.

The statistical analysis presented in this paper offers interesting results on the determinants of early school dropouts in Spain: dropout level in Spain is not only higher compared to the average of the EU but unlike other EU member states it doesn't tend to diminish, and the gap (male-female) is persistent. This fact strengthens the increased presence of women in Spanish universities and, in the medium-term, the difference in the educational specialization by gender.

The empirical results, consistent with the descriptive analysis, show that a gender effect is observed with respect to the dropout rate. In general, personal and family characteristics, instead of other socio-economic variables (unemployment rate and region of residence), provide the strongest explanatory power in the decision to persist in education among Spanish youth. When the study is analysed by gender, the probability models show significant disparities in the likelihood of dropout. Thus, while academic performance, mother's educational levels and the foreign nationality offers. This result raises questions about the idea that educational demand is more dependent on the business cycle among men than women. And questions the idea that better rates of male labour market have a direct impact on *masculinization* of dropout in Spain.

Finally, it should be emphasised that the causes of high dropout rates in the Spanish education system are not only internal functioning of families and the socioeconomic status. While these are important, examination must also be made of parallel and external causes that are grounded in the context of profound social transformation in Spain. This social transformation may be reflected in an education system subjected to excessive legislative changes, which already incorporates the majority of females. These factors, together with those analysed in detail here, should inform education policies aimed at reducing school dropout rates in Spain. Analyzed the determinants, such policies should be directed to reduce the low academic performance, to stimulate demand for vocational training and, in general, to promote chances of a second opportunity in the school. In this sense, the idea of lifelong learning takes on special prominence among students during the transition from school to work. Thus, the learning experience should not be understood as an exclusive and linear process.

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