Spanish publicly-subsidised private schools and equality of school choice

Mancebón-Torrubia, María Jesús and Ximénez-de-Embún, Domingo Pérez

Universidad de Zaragoza

November 2009

Spanish publicly-subsidised private schools and equality of school choice

María Jesús Mancebón-Torrubia[a] and Domingo Pérez Ximénez-de-Embún[b*]

[a]*Department of Applied Economics, Universidad de Zaragoza, Spain;* [b]*Department of Economic Analysis. Universidad de Zaragoza, Spain*

This study analyses the system of Spanish publicly-subsidised private schools from the perspective of its contribution to the equalisation of opportunities in school choice. The theoretical framework is based on the contributions of researchers into school choice policies, while the empirical application uses a 2005 questionnaire answered by the final-year secondary school students of the Spanish region of Aragon. We conclude that the system of Spanish publicly-subsidised private schools has not entirely facilitated the integration of students from different socioeconomic strata. A probit model is estimated in the last section in order to discover which factors determine the choice of a publicly-subsidised private school. It is found that the higher the socioeconomic status, the higher the probability of choosing such schools, suggesting that the segregation found in this paper may be caused partly by the choice patterns of Spanish families.

Keywords: school choice; publicly-subsidised private schools; cream skimming

1. Introduction

One of the principal traits defining the pre-university level Spanish education system is its mixed or dual character i.e. a network that is mainly public with a substantial private sector. Within the latter, an important position is occupied by publicly-subsidised private schools, owned by physical or legal persons but funded by taxpayers, via the Regional Educational Authorities, through a system of agreements regulated by the 1985 Right to Education Act (LODE, in its Spanish initials)[1].

The Spanish publicly-subsidised private schools system is based on an administrative model which establishes the reciprocal rights and obligations of the owner of the private establishment and the Local Education Authority with regard to the economic system, duration, extension and termination of the agreement and other conditions for the provision of education[2].

Formally, Spanish publicly-subsidised private schools may be viewed as an instrument which extends freedom of school choice to all social strata. It is true that the existence of such schools theoretically broadens the freedom of choice of less well-off families, offering them a far wider choice than would have been available to them in the absence of this form of public intervention. In this sense, Spanish publicly-subsidised private schools can be seen as a mechanism which equalises opportunities in school-choice which, in theory, may potentially contribute to the homogenisation of the social composition of pupils in schools as a whole and, thereby, reduce the educational segregation associated with systems in which the private sector is not financed by the public authorities.

These potential benefits of the system of educational agreements are, nevertheless, not automatic because the legal right to choice does not in itself guarantee the exercise of this right in practice. The process of choosing a school involves significant economic and information barriers which particularly affect families of lower socioeconomic status. The costs of obtaining adequate information about the schools available must be emphasised, and it should be remembered that free enrolment does not mean that all the expenses derived from attending a publicly-subsidised private school are covered.

This paper is devoted to answer the following questions. Does school segregation exist in the Spanish Educational System? In other words, does the school choice educational policy in Spain favour a mixture of pupils from different socioeconomic and academic levels? How do the public and the publicly-subsidised private Spanish education sectors compare with regard to the segregation occurring among the different schools within each sector? Which factors explain the choice of

educational centre and, therefore, the distribution of pupil types between public and publicly-subsidised private schools?

The article is organised as follows. In the next section, we review the principal theoretical and empirical contributions on the foreseeable effects of school choice policies in the field of efficiency and equity. Section 3 compares the academic and socioeconomic profiles of students in public and publicly-subsidised private secondary schools in the Spanish region of Aragon. Section 4 compares the social stratification which exists in public and publicly-subsidised private schools by calculating various indices of socioeconomic segregation. Section 5 proposes a model of school choice which permits the identification of the factors which condition the choice of educational centre and, consequently, the distribution of pupils between public and publicly-subsidised private schools. The final section presents the principal conclusions of the study.

2. School choice: effects upon the efficiency and equity of the school system

The debate over school choice stems from the proposal of Milton Friedman to establish a voucher system which would allow all families, regardless of their income level, to freely choose their children's educational centre, whether public or private (Friedman 1955). Since then, many studies have analysed the effects of school choice policies. The debate has principally been focused on conceptual arguments rather than on empirical research. A comprehensive book edited by Hoxby (2003), investigating the ways in which school choice affects a wide range of issues, tries to fill this gap.

Those who defend the various instruments which permit advances in freedom of school choice (vouchers, open enrolment, charter schools, publicly-subsidised private schools, bussing) usually base their arguments on the concepts of efficiency and equity.

From the perspective of efficiency, the potentialities of free choice are associated with the advantages which may emerge from the creation of quasi-markets in the education sector. Some authors argue that school choice will create competition among schools for student enrolment and lead to schools being more responsive to the needs and interest of parents and an improvement in school effectiveness, productivity and service, with the end result of a higher quality of education (Friedman and Friedman 1980; Chubb and Moe 1990; Levin 2002).

From the perspective of equity, the attraction of school choice is based on its potentialities as a way of equalising the opportunities to choose schools for all individuals and on its effects upon the reduction of social inequalities in the distribution of pupils among different schools. Moreover, supporters of these policies claim that their principal beneficiaries are precisely the most economically and socially disadvantaged groups, who, in the absence of measures of this type would lack the necessary resources to exercise freedom of choice.

In opposition to this argumentation in favour of freedom of choice, various authors have, over the last decade, demonstrated the difficulties of giving practical effect to the above-mentioned advantages and the strong probability that the consequences of these measures are counterproductive, especially as regards equity (Glennerster, 1991; Echols and Willms, 1995; Levin, 1998; Lankford and Wycokff, 2001; among others). This is due to the fact that the realisation of the potential advantages cited by the supporters of school choice requires the existence of certain conditions which are highly unlikely to occur in the education market. The alleged improvement in quality through increased competition, for example, requires that users have adequate information about the various options open to them. In order to enjoy the benefits of freedom of choice, all families must be able to exercise their

right to choose under identical conditions. The complex nature of educational institutions and the production process undertaken within them raises doubts as to whether these requirements are fulfilled.

In fact, despite almost forty years of research on the subject, our understanding of the factors which determine what makes a "quality" school is still limited (Hanushek, 1986 and 2003). Schools continue to be a mystery, even for the researchers examining them and, particularly, for their users, thereby making the definition of the concept of school quality extremely complicated. In a context of this nature, the best way to assess how well a school functions is by establishing direct contact with it. However, "trying out the product" in the educational sphere involves serious personal costs, given the problems of adaptation which changing schools usually involves. This is what Glennerster (1991) terms the "sunk costs" associated with the choice of a school.

The situation described above has two principal consequences. Firstly, individuals who must choose between different schooling alternatives necessarily do so on the basis of high visibility variables, such as the religious leanings of the school, its facilities and extra-curricular activities, the type of pupils attending it, proximity to the home, etc. All of these factors are non-academic and their relationship to the quality of the actual education provided is not clearly demonstrated. Various empirical studies of the factors taken into account by families when selecting a school (Echols, McPherson, and Willms 1990; Willms and Echols 1992; Lankford and Wyckoff 1992, Denessen 2005) confirm this hypothesis and, furthermore, demonstrate that one of the elements most highly rated by families is the overall socioeconomic profile of the centre's pupils. In a context such as that described above,

competition to attract pupils does not necessarily lead to greater academic quality of schools, since this is not a variable easily perceived by clients[3].

Secondly, it must be remembered that the high costs of obtaining information about schools particularly affects families with relatively low socioeconomic and/or educational levels and, thus, it is very likely that these are excluded from the choosing process[4]. A number of empirical studies support this statement (Archbald 1988; Moore and Davenport 1990; Willms and Echols 1992; Ambler 1994; Echols and Willms 1995; Ball, Bowe, and Gewirtz 1996; Martínez, Godwin, and Keremer 1996; Witte and Thorn 1996; Vandenberghe 1996; Lankford and Wyckoff 2001; Bosetti 2004, among others). All of these have demonstrated that in educational systems which have implemented measures to increase freedom of choice, the "choosers" have been economically better-off families, while the relatively disadvantaged have tended to keep their children in the educational centre allocated to them.

Thus, the foreseeable effect of freedom of choice policies upon the behaviour of the users of the educational system may be the following: "good" pupils will transfer to the centres with the best reputation and the most select pupils, while "bad" pupils will remain grouped together in their allocated centres, producing "cream skimming" in the education market, as various empirical studies show (Walford 1992; Whitty 1997; Cobb and Glass 1999; Figlio and Stone 2001; Dee and Fu 2004; among others). This tendency is reinforced by the non-neutrality of schools with regard to the characteristics of their pupils and they have significant incentives to select students from good family backgrounds (see Nechyba 1996)[5].

In conclusion, there exist strong arguments, supported by the limited empirical evidence available, which seriously question the capacity of policies aimed at

increasing freedom of choice to improve the efficiency and equity of educational systems. Our study is conceived as a further contribution to this ongoing debate.

3. The socioeconomic and academic distribution of pupils between public and publicly-subsidised private secondary schools in the Spanish Autonomous Community of Aragon

This section analyses the results of a questionnaire answered by the 5,909 students who were in the final year of secondary school in 2005 in the Spanish Autonomous Community of Aragon. 4,030 of those polled attended public schools (hereafter PS) and 1,879 attended publicly-subsidised private schools (hereafter PSPS). The questionnaire provides data for the three following fields: the academic quality of the pupils (previous marks, educational aspirations, time spent on homework, self-confidence); pupils' perceptions of family academic expectations (parents' academic aspirations and their confidence in good academic results in the future); and, finally, family socioeconomic background (educational level, parents' occupation and family income)[6]. The qualitative nature of the data suggests using crosstabs and Pearson's chi-square test (Hair *et al.* 1998)[7].

Firstly, we shall analyse the differences in the variables which represent the academic potential of pupils. Table 1 presents the relevant results.

[INSERT TABLE 1 ABOUT HERE]

The contents of the table and the value of the chi-square test permit us to deduce that the academic record of PS and PSPS secondary schools is significantly different, in favour of the latter. In the total sample, the percentage of pupils who are repeating the year is far higher in PS (11.6%) than in PSPS (5.6%). Similarly, the latter have far more pupils who passed all subjects in the previous academic year and who obtained good marks.

Similar results are obtained for the variables ASPIRATIONS (intention to go to university) and SELF-CONFIDENCE (perception of his/her own ability to obtain a university degree)[8]. While approximately 54% of pupils in PSPS want to go to university, only 40% of public school students do. Publicly-subsidised private school students are also more self-confident; 38% of all the interviewees in this sector see themselves as capable of obtaining a good degree at university, compared to 30% of public school students.

Students at PSPS also have a better perception of family academic support. As the results in Table 1 show, over 80% of the pupils surveyed in these centres consider that their parents wish them to attend university, compared to 75% in the case of public school students.

Moreover, the perception which pupils have regarding the degree of confidence of their parents that they will obtain a good university degree (another aspect of family academic support) is better in PSPS. Forty-two percent of the students interviewed in these centres reply that their parents are certain that they will achieve good marks at university, while this percentage falls to 34.4% in the case of public school students.

Having observed the distribution of pupils' academic qualities, we shall now examine the situation with regard to the family socioeconomic profile of students at each type of centre. To this end, we analyse the survey questions regarding parents' educational level, family income level and parents' occupation. Table 2 presents the results of the comparison.

[INSERT TABLE 2 ABOUT HERE]

With regard to parents' educational level, it should be noted that while, in PSPS, the distribution of the educational level of the father is fairly homogeneous (compulsory

schooling, post-compulsory schooling and university each representing approximately 33%), in PS, the distribution is biased towards compulsory schooling (48%, compared to 19.2% who completed higher education). The educational level of the mother also varies greatly according to the type of centre: the percentage of mothers with post-compulsory schooling or higher education is higher in PSPS, while the percentage of mothers with only compulsory schooling is higher in PS.

With regard to the variables most closely related to the economic aspects of the family environment, the income level and the profession of the parents, PSPS have a higher percentage of students (47.2%) whose monthly family income exceeds €1,800 than PS (35.2%). In the average income range, the percentages are more similar and, in the case of monthly family incomes under €1,200, the percentage of students is higher in PS (16.8%) than in PSPS (9.8%).

Turning to parents' profession, the analysis of Table 2 leads to similar conclusions. Far more students in PSPS have fathers with skilled jobs (62.6%, compared to 37.4% of unskilled workers), while the opposite is the case in PS (56.8% of fathers are unskilled and 43.2% skilled). In the case of the mother's employment, and as was to be expected, because of the more limited access of women to the labour market, unskilled work is the most common in both types of centre. Nevertheless, there remain significant differences in favour of PSPS.

In conclusion, the analysis performed demonstrates the existence of processes of academic and socioeconomic segregation in the Spanish educational system which favour PSPS. Pupils of PSPS have a better prior academic record, greater academic aspirations (both individual and family), higher self-confidence and a stronger perception of the degree of confidence that their parents have about their future academic success. Moreover, these schools have a higher proportion of students

whose parents are qualified workers, have completed higher education and have a monthly income exceeding 1,800 euros. Similarly, when comparing the values of Tables 1 and 2, it can be observed that the differences between the students in public and publicly-subsidised centres are even greater for the variables related to family characteristics than for the academic profile of the student. These results are similar to those obtained by other research (Jimenez, Lockheed, and Paqueo 1991; Williams and Carpenter 1991; Witte 1992; Figlio and Stone 1997; Levin 1998; Cobb and Glass 1999; Lankford and Wyckoff 2001; Dee and Fu 2004; among others). The low p-value obtained in all the cases analysed indicates, furthermore, that the variables analysed and the type of centre have some interdependence.

4. An approximation to the degree of segregation within the public and publicly-subsidised education sectors

The analysis performed in the previous section permits us to affirm that processes of academic and socioeconomic segregation exist in the Spanish educational system and that these favour publicly-subsidised private schools. However, a complete diagnosis of the stratification in the school system requires an analysis of how the public and publicly-subsidised private education sectors compare with regard to the segregation occurring among the different schools within each sector. This question is important, as the social and educational repercussions derived from widespread segregation within a sector are the same, independently of the proportion of disadvantaged pupils in that sector (Coleman, Hoffer, and Kilgore 1982). In other words, the fact that students in the public sector have a worse socioeconomic background than their publicly-subsidised private sector counterparts does not guarantee that the former produces greater integration than the latter.

10

Before describing the tools employed in the analysis and the results obtained, we would like to clarify that, when speaking of internal segregation, we are referring to the variation in the distribution of different types of students among schools within the same education sector, whether public or publicly-subsidised private. This concept of segregation does not concern the relative proportions of pupil types within the sector but, instead, concentrates on the relative distributions of pupil types among the schools in that sector (Taeuber and James 1982). On this basis, the quantification of the degree of intra-sector segregation has usually been performed using diverse indices. In the educational context, the most common of these have been those termed the dissimilarity index and the segregation index (Zoloth 1976). The first of these is based on the analysis of the deviations which exist between the composition of the student body in each school and that of the sector taken as a whole. It can be interpreted as the fraction of the minority group that would need to be relocated in different schools in order to obtain the same social composition across all schools.

Its mathematical expression is as follows:

$$D = \frac{\sum_{k} T_{ki} \mid p_{ki} - p \mid}{2Tp(1-p)}$$

where T_{ki} and p_{ki} are, respectively, the total number and the proportion of students from group i in school k, p is the percentage of students from that group in the sector and T is the total number of pupils from that group in the sector. Their values range from 0 (absence of segregation) to 1 (maximum segregation).

The segregation index, in turn, is based on a measurement of the contact which exists within each school between students from the various groups i.e. the average proportion of a student's schoolmates who are from another group (Coleman, Hoffer, and Kilgore 1982). Mathematically, this contact index is defined by the following expression:

$$c_{ij} = \frac{\sum\limits_{k} n_{ki} p_{kj}}{\sum\limits_{k} n_{ki}}$$

where n_{ki} represents the number of pupils from group i in school k and p_{kj} the percentage of pupils from group j in school k.

The segregation index is constructed by standardising the measure of contact by the proportion of students of the other group in the sector. Thus, it reflects only the distribution of pupils among the schools in the sector, given their overall numbers. The values of this internal segregation index range from 0 (absence of segregation) to 1 (maximum segregation), and its mathematical expression is the following[9]:

$$S = \frac{p_j - c_{ij}}{p_j}$$

where p_j is the proportion of pupils from group j in the sector.

The results of the application of these indices to the sample of schools belonging to the Spanish region of Aragon are presented in Table 3. As can be observed, the level of segregation among pupils of different socioeconomic levels, although generally low, is slightly greater in publicly-subsidised private schools, in all the dimensions of the analysis performed.

[INSERT TABLE 3 ABOUT HERE]

This result shows that the distribution of pupils from different socioeconomic backgrounds is more homogeneous in the public than in the publicly-subsidised private sector. In the latter, as we saw in the previous section, there is a greater concentration of the pupils with better socioeconomic backgrounds, compared to the public sector, but their distribution among schools is more heterogeneous. Thus, socioeconomic stratification is greater in the publicly-subsidised private sector. One possible explanation of this behaviour may be that families from the various socioeconomic strata have different propensities to choose. The more highly-qualified

12

and economically better-off clients of the private sector are more active participants in the school marketplace than their public school counterparts (Goldring and Phillips 2008)[10]. Another explanation may be an undisclosed policy of risk selection on the part of some PSPS (Glennerster 1991). This means that some subsidised private schools may be using various mechanisms to prevent certain students (mainly immigrants and potentially low achievers) from enrolling, like charging for uniforms, extracurricular activities, catering and parents associations.

5. Analysis of the determinants of school choice

The analysis undertaken in Section 3 has enabled us to detect the existence of a relationship of dependence between the type of pupil and the type of educational centre. From the starting point of this result, this section attempts to empirically test this relationship and to analyse it in greater depth. The specific objective of this section is to study which factors may explain enrolment in each type of school.

5.1. Specification of the model

The qualitative and discrete nature of the dependent variable (type of school) explains why we employ a regression model for a discrete dependent variable. From among the alternatives available, we chose to apply a probit model[11].

These models are intended to estimate the probability that a student i attends a PSPS (P_i=1), against the alternative of a PS (P_i=0). In our case, this probability will be analysed on the basis of a set of socioeconomic variables (S_i), of the reasons for school choice given by students (R_i) and of other characteristics of the pupils in the centres analysed (O_i)[12].

Given the nature of the problem we intend to resolve here, we have excluded from the analysis those students who attend schools located in municipalities in which

there is no educational alternative to the type of school (PS or PSPS) in which they are enrolled (since, in this case, there is no possibility of choice). The sample size is thereby reduced to slightly under 4,000 cases, from the 5,900 individuals in the initial sample.

In order to proxy the socioeconomic level of the student's family (S_i), we have information regarding the family economy (FAMILY INCOME), educational level (FATHER'S EDUCATION and MOTHER'S EDUCATION) and parents' employment category (FATHER'S JOB and MOTHER'S JOB). Employing this set of variables could introduce problems of multicollinearity since some correlation exists between many of them. To overcome this problem, we chose to synthesise the information by utilising a statistical technique of data reduction. However, the model including separate variables has also been estimated to provide greater insight into the specific mechanisms of selection.

To summarise the information regarding family socioeconomic status, we used the Homogeneity Analysis by Means of Alternating Least Squares (HOMALS) procedure, which estimates category quantifications, object scores, and other associated statistics that separate categories (levels) of nominal variables as far as possible and divides cases into homogeneous subgroups (Gifi 1990). All items of the variables were inverted for scaling so that positive scores indicate higher levels of socioeconomic status. The application of this methodology to the variables contained in Table 2 produced a single dimension, which we term socioeconomic indicator (SES) and which explains 52.73% of the information about family socioeconomic background. The SES index ranges from a minimum of -1.59 to a maximum of 2.41 with a mean of 0.13. This indicator constitutes the variable to be incorporated into the probit model as an approximation of the socioeconomic variables (S_i). Table 4

presents the measurements of discrimination which permit us to determine to what extent each variable is explained by the indicator.

[INSERT TABLE 4 ABOUT HERE]

Finally, we include in the model other variables which we consider may be relevant in the choice of school and which have usually been included in other empirical studies. Specifically, these are the variables GENDER and CHOICE REASON (see Appendix)[13].

5.2. Results

Two probit models have been estimated. Model I employs the SES indicator as explanatory variable whereas model II considers the separate variables that formed that index. In terms of overall percent correctly predicted and pseudo R-squared, the models do equally well and indicate a considerable goodness of fit. Before interpreting the coefficients of the models, we can briefly look at the predicted probabilities for some values of the socioeconomic variables. In model I, the predicted probability of attending a PSPS is 0.39 if the SES index is -1.58 (its minimum) and increases to 0.57 if the SES indicator reaches its maximum of 2.41. Families with low income in model II have a probability of attending a PSPS of 0.39, while families with medium or high income have a probability of 0.48.

Estimated coefficients from probit models are not directly interpretable because they are parameters of the latent model. They do not quantify the influence of explanatory variables on the probability that the dependent variable takes the value of one. It is necessary to estimate the marginal effects, defined as the effect of a one-unit change of an explanatory variable on the probability of the dependent, all other variables being constant. The marginal effect depends on the value of the explanatory variable. Therefore, there is an individual marginal effect for each person of the

15

sample. Two different methods of estimating marginal effects exist. One method is the computation of the average of discrete or partial changes over all observations, yielding average marginal effects. The other method is the computation of marginal effects at fixed values of the independent variables. The most often used values are sample means. This method yields marginal effects at the mean. In the literature, there is not much discussion about which of these two methods should be used, and the discussion does not seem to be conclusive. Table 5 displays both types of marginal effects. Results are quite similar but average marginal effects are slightly lower than marginal effects evaluated at the mean. This table also exhibits the minimum and maximum individual marginal effects, in which some variables show considerable variation in their individual marginal effects.

[INSERT TABLE 5 ABOUT HERE]

All variables in model I are highly significant and the signs are the expected ones. Results of model II confirm the previous ones obtained with the SES index. Most of the variables in model II are also significant, except father and mother with compulsory schooling and family with high income. The variable mother with university degree is the only one that presents the opposite sign to that expected.

For the interpretation of the models, we use the marginal effects estimated at the mean. As can be observed in Table 5, an infinitesimal increase in the socioeconomic status (SES) produces an increase of 4.7% in the probability of attending a publicly-subsidised private school, everything else being constant. Similarly, in model II, the probability of a student being enrolled in a PSPS is about 4.5% higher if he/she has a father/mother with a qualified job than if not. Belonging to a family with low income decreases the probability of attending a publicly-subsidised private school by 9%. As has been previously mentioned, there is no linear relation in

a probit model, so the marginal effects are not constant. Given the argument of the paper and the fact that equality involves what is happening at the extremes of the SES variable rather than at the means, it is important to analyse the marginal effects at these extreme values. Therefore, we have estimated the marginal effects of the socioeconomic status (SES) at its extreme values (minimum and maximum). If the SES of the student with the lowest socioeconomic background goes up by an infinitesimal amount, the probability of attending a PSPS rises by 4.4%. On the other hand, the same increase for the student with the highest socioeconomic background raises the likelihood of enrolling in a PSPS by 3.3%. These results suggest that there is no equalisation of opportunities to access publicly-subsidised private schools or that these opportunities are considerably reduced for poorer families. This confirms the results obtained in previous studies of the subject (Lankford and Wyckoff 1992; Kingdon 1996; Figlio and Stone 2001).

It is also observable that, in both models, the probability of a pupil being enrolled in a PSPS (instead of a PS) is positively related to his/her family choosing such a centre for reasons of prestige or family tradition, but negatively related to choice based on geographical proximity. Lastly, and following the pattern of other studies, the variable of gender was introduced. The results show that male pupils are more likely to attend a PSPS, as other research has also demonstrated.

6. Conclusions and final considerations

The analysis performed in the previous sections casts grave doubts on the capacity of Spanish PSPS to equalise the opportunities of school choice for all families. The distribution of pupils between the public and publicly-subsidised sectors continues to follow a clear socioeconomic pattern which favours privately-owned schools, the majority of whose pupils' families belong to the upper-income strata and are

employed in professions which require more advanced qualifications and a higher level of education. Accordingly, these pupils show better attitudes towards learning (greater academic ambition and more self-confidence) and appreciate greater academic support from their families. By contrast, public schools have a greater proportion of pupils from families with worse socioeconomic backgrounds. These results confirm, therefore, the existence of processes of cream skimming in the Spanish education market, a phenomenon which has also been detected by various studies which have analysed the British and American education systems. Our study offers an additional result, namely, that cream skimming processes are more recurrent within the publicly-subsidised sector, which is shown to be far more selective than the public sector in its distribution of pupils.

The explanation for this "failure" of Spanish publicly-subsidised private schools to equalise opportunities for school choice is rooted, in our judgement, in the lack of instruments that the Spanish education system has to give practical effect to the free choice of schools which the Spanish PSPS are intended to guarantee. In fact, apart from the formal regulations contained in the 1985 Right to Education Act (LODE) and statutes which govern the admission criteria of educational centres which receive public funding, there are absolutely no measures aimed at facilitating the choice of a school located outside the residential area of the pupil. Moreover, the very regulations stemming from the LODE hinder rather than help mobility between schools. Proximity continues to be the most important criterion for the selection of pupils in publicly-financed educational centres, which limits the possibilities of choosing a school a long way from the family home and helps to maintain the patterns of social stratification associated with residential zone.

Furthermore, the capacity of the Spanish educational system to provide freedom of school choice is severely restricted by the lack of data about the quality of the centres. In this respect, the generalised absence of information about the academic results obtained in each school is particularly important. In addition, the education legislation currently in force permits Spanish PSPS to charge fees for out-of-school activities and for educational material, which reduces the possibility to choosing for less well-off users, for whom the uniforms that pupils are required to wear by Spanish PSPS represents an additional economic barrier.

In conclusion, the significant information and economic inequalities faced by families of different income levels when putting their right to school choice into practice requires the regulations protecting that right to be accompanied by positive discrimination measures in favour of the least well-off families. By these, we mean measures such as the diffusion of information among the most disadvantaged groups about the right to choose, the provision of information about the teaching practices and academic results of the centres available in each municipality, the financing of the costs derived from attendance at a school a long way from the family home for pupils from low-income households, and the reduction of the importance of area of residence in the allocation of school places. It is only by measures of this type that it will be possible to limit the extension of the processes of cream skimming in the education markets and the consequences that these processes have in the field of equity.

Notes

[1] According to data provided by the Spanish Ministry of Education, the distribution of students enrolled in secondary education in 2005 was: 66.33% in public schools, 30.48% in publicly-subsidised private schools and a residual 3.19% in purely private schools. For a detailed description of the Spanish non-university educational system, and of its historical evolution, see Bernal (2005).

[2] The obligations of schools include the following: to provide free teaching at the educational level agreed, to request authorisation for the charging of any fees for complementary activities, to maintain a specific pupil/teacher ratio and to apply the same admission criteria as public schools. In turn, the Administration undertakes to finance the activity of the school through a system of economic modules per educational establishment, as established in the General State Budget.

[3] The results of the empirical studies in this field are varied. While Bast and Walberg (2004) summarize various studies which demonstrate beneficial effects of school choice policies upon academic results, others, such as that of Bettinger (2005), do not reveal any significant effect upon academic success.

[4] As Levin (1991) explains, both the access to information and its efficient use require a certain experience in the making of choices, in addition to a certain educational level which permits rational decisions to be made.

[5] The empirical evidence is not, however, conclusive with regard to the selection procedures of schools. Some studies, such as that of Bryk, Lee, and Holland (1993), demonstrate that private Catholic schools are not selective about admissions, while others, like that by Vandenberghe (1996), show that the opposite is true.

[6] The Appendix summarises the variables defined on the basis of the items in the questionnaire.

[7] There exist other statistics that measure the "degree of association" between two nominal variables such as Phi, Cramer's V and the contingency coefficient. These measures confirm that there is a significant association between the variables studied. Results are available upon request.

[8] The self-confidence measure is actually a mixture of self-confidence and a self-assessment of personal preparedness. For simplicity we refer to it only as self-confidence.

[9] Standardisation is carried out because of the sensitivity of the contact index c_{ij} to the total proportion of students from group j in the sector.

[10] In Bernal (2005), three types of electors are identified in the educational market of the city of Zaragoza (Spain): non-electors, moderate electors and demanding electors. Most of the first group belong to the working class and do not choose schools, but send their children to the nearest public school. Most of the moderate electors belong to the middle class and enrol their in children to subsidised private schools. Demanding electors send their children to both private and subsidised schools and belong to the upper and middle classes.

[11] The estimations we performed using logit models produced very similar results, which are available to any reader requiring them.

[12] The selection of the variables to be incorporated into the model is based on several earlier studies of the subject (Kingdon 1996; Bedi and Garg 2000; Figlio and Stone 2001; Lankford and Wyckoff 2001; Epple, Figlio, and Romano 2004)

[13] The variables measuring academic achievement reflect the experiences of students in public or private schools as well as factors that may have contributed to the initial choices of school type by their parents. Thus, we do not consider previous academic achievement as an explanatory variable in the probit model because mixed effects are difficult to separate.

Appendix: Definition of variables

Variable name	Description	Values
GENDER	Gender	Male / Female
AGE	Age	17-18 years old / Over 18 years old
PREVIOUS YEAR PERFORMANCE	Marks in previous year	I passed all subjects / I must retake subjects / I am repeating the year
PREVIOUS YEAR MARK	Mark 1st year A-level	A-B / C-D-E / I am retaking subjects
ASPIRATIONS	Do you wish to obtain a university qualification?	Yes, degree / Yes, foundation degree / No
SELF-CONFIDENCE	Do you think you are capable of obtaining a good university degree/qualification?	Yes / It will be difficult but I will make a greater effort / Only able to pass / No
PARENTS' ASPIRATIONS	Do your parents wish you to obtain a university degree/qualification?	Yes / No / Don't know
PARENTS' CONFIDENCE	How confident do you think your parents are that you will obtain a good university degree/qualification?	Completely sure / Difficult but possible / If I pass they would be satisfied
TEACHERS' CONFIDENCE	What do you think your teachers expect of you?	A brilliant future / A future in accordance with the average of the other pupils / A difficult future because I don't try hard enough
ATTENDANCE	Class attendance	When I can / Usually / Always
HOMEWORK TIME	Weekly study time	Less than 5 hours / Between 5 and 10 hours / Between 10 and 15 hours / More than 15 hours
FATHER'S EDUCATION	Father's education	Compulsory schooling / Post compulsory schooling / University
MOTHER'S EDUCATION	Mother's education	Compulsory schooling / Post compulsory schooling / University
FAMILY INCOME	Family income	< €1200 /month / €1200 - 1800 / > 1800 €
FATHER'S JOB	Father's profession	White collar / Blue collar
MOTHER'S JOB	Mother's profession	White collar / Blue collar
STAY LENGTH	How long have you attended this school?	1 year / Between 2 and 5 years / More than 5 years
SATISFACTION	Would you recommend this school to others?	Yes / No
CHOICE REASON	Why do you attend this school?	Only school in my municipality or locality / Closest school to my house / Family tradition / The school is prestigious / Other reasons

References

Ambler, J.S. 1994. Who benefits from educational choice? Some evidence from Europe. *Journal of Policy Analysis and Management* 13, no. 3: 454-76.

Archbald, D.A. 1988. Magnet schools, voluntary desegregation and public choice theory: limits and possibilities in a big city school system. PhD diss., University of Wisconsin-Madison.

Ball, S.J., R. Bowe, and S. Gewirtz. 1996. School choice, social class and distinction: the realization of social advantage in education. *Journal of Education Policy* 11, no. 1: 89-112.

Bast, J. L., and H.J. Walberg. 2004. Can parents choose the best schools for their children? *Economics of Education Review* 23: 431-40.

Bedi, A.S., and A. Garg. 2000. The effectiveness of private versus public schools: the case of Indonesia. *Journal of Development Economics* 61: 463-94.

Bernal, J.L. 2005. Parental choice, social class and market forces: the consequences of privatization of public services in education. *Journal of Education Policy* 20, no. 6: 779-92.

Bettinger, E.P. 2005. The effect of charter schools on charter students and public schools. *Economics of Education Review* 24: 133-47.

Bosseti, L. 2004. Determinants of school choice: understanding how parents choose elementary schools in Alberta. *Journal of Education Policy* 19, no. 4: 387-405.

Bryk, A., V. Lee, and P. Holland. 1993. *Catholic schools and the common good.* Cambridge: Harvard University Press.

Chubb, J.E., and T.M. Moe. 1990. *Politics, markets and America's schools.* Washington, DC: Brookings Institution.

Cobb, C.D., and G. Glass. 1999. Ethnic segregation in Arizona Charter Schools. *Education Policy Analysis Archives* 7, no. 1, http://epaa.asu.edu/epaa/v7n1.

Coleman, J.S., T. Hoffer, and S. Kilgore. 1982. *High school achievement. Public, catholic and private schools compared.* New York: Basic Books Inc. Publishers.

Dee, T.S., and H. Fu. 2004. Do charter schools skim students or drain resources? *Economics of Education Review* 23, no. 2: 59-271.

Denessen, E., G. Driessena, and P. Sleegers. 2005. Segregation by choice? A study of group-specific reasons for school choice. *Journal of Education Policy* 20, no. 3: 347-68.

Echols, F. H., A.F. McPherson, and J.D. Willms. 1990. Parental choice in Scotland. *Journal of Educational Policy* 5: 207-22.

Echols, F. H., and J.D. Willms, J.D. 1995. Reasons for school choice in Scotland. *Journal of Education Policy* 10, no. 2: 143-56.

Epple, D., D.N. Figlio, and R. Romano. 2004. Competition between private and public schools: testing stratification and pricing predictions. *Journal of Public Economics* 88, no. 7-8: 1215-45.

Figlio, D.N. and J.A. Stone. 1997. School choice and student performance. Are private schools really better? Discussion Paper 1141-97, Institute for Research on Poverty, University of Wisconsin-Madison.

———. 2001. Can public policy affect private school cream skimming? *Journal of Urban Economics* 49: 240-66.

Friedman, M. 1955. The role of government in education. In *Economics and the Public Interest*, ed. R.A. Solo. New Brunswick, NJ: Rutgers University Press.

Friedman, M. and R.D. Friedman. 1980. *Free to choose*. New York: Avon.

Gifi, A. 1990. *Nonlinear multivariate analysis.* Chichester: Wiley.

Glennerster, H. 1991. Quasi-markets for education? *The Economic Journal* 101: 1268-76.

Goldring, E.B. and K.J. Phillips. 2008. Parents preferences and parent choices: the public-private decision about school choice. *Journal of Education Policy* 23, no. 3: 209-30.

Hair, J.F., R.E. Anderson, R.L. Tatham, and W.C. Black. 1998. Multivariate data analysis. London: Prentice Hall.

Hanushek, E.A. 1986. The economics of schooling: production and efficiency in public schools. *Journal of Economic Literature* 24: 1141-77.

———. 2003. The failure of input-based schooling policies. *The Economic Journal* 113: 64-98.

Hoxby, C.M. 2003. *The economics of school choice.* Chicago: University of Chicago Press.

Kingdon, G. 1996. The quality and efficiency of private and public education: a case-study of urban India. *Oxford Bulletin of Economics and Statistics* 58, no. 1: 57-82.

Jimenez, E., M.E. Lockheed, and V. Paqueo. 1991. The relative efficiency of private and public schools in developing countries. *The World Bank Research Observer* 6, no. 2: 205-18.

Lankford, H., and J. Wyckoff. 1992. Primary and secondary school choice among public and religious alternatives. *Economics of Education Review* 11: 317-37.

———. 2001. Who would be left behind by enhanced private school choice? *Journal of Urban Economics* 50: 288-312.

Levin, H.M. 1991. The economics of educational choice. *Economics of Education Review* 10, no. 2: 137-58.

———. 1998. Educational vouchers: effectiveness, choice and costs. *Journal of Policy Analysis and Management* 17, no. 3: 373-92.

———. 2002. A comprehensive framework for evaluating educational vouchers. *Educational Evaluation and Policy Analysis* 24, no. 3: 159-174.

Martínez, V., K. Godwin, and F.R. Keremer. 1996. Public school choice in San Antonio: who chooses and with what effects? In *Who chooses, who loses? Culture, institutions, and the unequal effects of school choice*, ed. B.F. Fuller and R. Elmore. New York: Teachers College Press, Columbia University.

Moore, D., and S. Davenport. 1990. School choice: the new school sorting machine. In *Choice in education: potential and problems*, ed. W. Boyd and H.J. Walberg. Berkeley, CA: McCutcheon Publishing.

Nechyba, T. 1996. Public school finance in a general equilibrium Tiebout world: equalization programs, peer effects and private school vouchers. Discussion Paper, Department of Economics, Stanford University.

Taeuber, K.E., and D. James. 1982. Racial segregation among public and private schools. *Sociology of Education* 55: 133-43.

Vandenberghe, V. 1996. Functioning and regulation of quasi-markets. Discussion Paper 283, Faculty of Economics, Catholic University of Lovaine.

Walford, G. 1992. Educational choice and equity in Great Britain. *Educational Policy* 6, no. 2: 123-38.

Whitty, G. 1997. Creating quasi-markets in education: A review of recent research on parental choice and school autonomy in three countries. *Review of Research in Education* 22: 3-47.

Williams, T., and P. Carpenter. 1991. Private schooling and public achievement in Australia. *International Journal of Educational Research* 5: 411-31.

Willms, J. D., and F.H. Echols. 1992. Alert and inert clients: the Scottish experience of parental choice of schools. *Economics of Education Review* 11: 339-50.

Witte, J.F. 1992. Private school versus public school achievement: are there findings that should affect the educational choice debate? *Economics of Education Review* 11, no. 4: 371-94.

Witte, J.F., and C.A. Thorn. 1996. Who chooses? Vouchers and interdistrict choice programs in Milwaukee. *American Journal of Education* 104: 186-217.

Zoloth, B. 1976. Alternative measures of school segregation. *Land Economics* 52, no. 3: 278-98.

Table 1. Crosstab of academic and personal variables

Survey variable	Survey question	Reply options	Public schools	Publicly-subsidised schools	Total
PREVIOUS YEAR PERFORMANCE[a]	Previous year's academic performance	I passed all subjects	61.3%	73.4%	65.2%
		I must retake some subjects	27.0%	20.9%	25.1%
		I am repeating the year	11.6%	5.6%	9.7%
PREVIOUS YEAR MARK[b]	Mark 1st year A-level	A-B	34.2%	38.1%	35.4%
		C-D-E	41.7%	43.7%	42.3%
		I am retaking subjects	24.1%	18.3%	22.2%
ASPIRATIONS[c]	Do you wish to obtain a university qualification?	Yes, a degree	40.5%	54.0%	44.8%
		Yes, a foundation degree	36.0%	28.5%	33.6%
		No	23.5%	17.5%	21.6%
SELF-CONFIDENCE[d]	Do you think you are capable of obtaining a good university degree?	Yes	30.9%	37.8%	33.1%
		It will be difficult but I will make a greater effort	41.5%	41.3%	41.4%
		Only able to pass	18.1%	13.6%	16.6%
		No	9.6%	7.3%	8.8%
PARENTS' ASPIRATIONS[e]	Do your parents wish you to obtain a university degree?	Yes	75.3%	81.3%	72.2%
		No	2.4%	1.7%	2.1%
		Don't know	22.3%	17.1%	20.6%
PARENTS' CONFIDENCE[f]	How confident do you think your parents are that you will obtain a good university degree?	Completely sure	34.4%	42.8%	37.1%
		Difficult but possible	26.1%	25.3%	25.9%
		If I pass they would be satisfied	39.5%	31.8%	37.1%

[a]Chi-square test= 93.827 (p-value = 0.000)
[b]Chi-square test= 25.817 (p-value = 0.000)
[c]Chi-square test= 173.99 (p-value = 0.000)
[d]Chi-square test= 41.699 (p-value = 0.000)
[e]Chi-square test= 26.042 (p-value = 0.000)
[f]Chi-square test= 44.782 (p-value = 0.000)

Table 2: Crosstab socioeconomic variables

Survey question	Reply options	Public schools	Publicly-subsidised schools	Total
FATHER'S EDUCATION[a]	Compulsory schooling	48.0%	33.5%	43.4%
	Post-compulsory schooling	32.8%	33.5%	33.0%
	University	19.2%	33.0%	23.5%
MOTHER'S EDUCATION[b]	Compulsory schooling	55.7%	43.2%	51.7%
	Post-compulsory schooling	27.3%	31.8%	28.7%
	University	17.0%	25.1%	19.6%
FAMILY INCOME[c]	Under 1,200 euros	16.8%	9.8%	14.5%
	Between 1,200 and 1,800 euros	48.0%	43.0%	46.4%
	Over 1,800 euros	35.2%	47.2%	39.1%
FATHER'S JOB[d]	Blue collar	56.8%	37.4%	50.6%
	White collar	43.2%	62.6%	49.4%
MOTHER'S JOB[e]	Blue collar	77.8%	66.8%	74.3%
	White collar	22.2%	33.2%	25.7%

[a]Chi-square test= 163.464 (p-value = 0.000)
[b]Chi-square test= 89.450 (p-value = 0.000)
[c]Chi-square test= 93.916 (p-value = 0.000)
[d]Chi-square test= 189.606 (p-value = 0.000)
[e]Chi-square test= 79.381 (p-value = 0.000)

Table 3: Social class segregation indices

Category	Segregation Indices	Public schools	Publicly-subsidised schools
FAMILY INCOME[a]	Dissimilarity index (D)	0.18	0.25
	Segregation index (S)	0.05	0.18
FATHER'S JOB[b]	Dissimilarity index (D)	0.24	0.32
	Segregation index (S)	0.08	0.12
MOTHER'S JOB[b]	Dissimilarity index (D)	0.24	0.27
	Segregation index (S)	0.06	0.10
FATHER'S EDUCATION[c]	Dissimilarity index (D)	0.22	0.28
	Segregation index (S)	0.15	0.19
MOTHER'S EDUCATION[c]	Dissimilarity index (D)	0.22	0.28
	Segregation index (S)	0.13	0.18

[a]The disadvantaged group is considered to comprise those pupils whose monthly family income is below €1,200, while the most advantaged group is comprised of pupils whose monthly family income exceeds €1,800.
[b]The disadvantaged group is considered to comprise those students whose parents are in unskilled employment.
[c]The disadvantaged group is considered to comprise those students whose parents completed compulsory schooling, while the most advantaged group is comprised of pupils whose parents completed higher education.

Table 4: HOMALS discrimination measures

	SES
FATHER'S JOB	0.525
MOTHER'S JOB	0.531
FATHER'S EDUCATION	0.588
MOTHER'S EDUCATION	0.615
FAMILY INCOME	0.378

Table 5: Probit models.

Variable	Model I					Model II				
	Coef.	Marg. effects at means	Avg. Marg. effects			Coef.	Marg. effects at means	Avg. Marg. effects		
			Mean	Min.	Max.			Mean	Min.	Max.
Qualified father's job						0.115** (0.055)	0.046	0.040	0.023	0.046
Qualified mother's job						0.112* (0.062)	0.045	0.039	0.023	0.045
Compulsory schooling father						-0.001 (0.055)	-0.001	0.000	-0.001	0.000
University degree father						0.110* (0.063)	0.044	0.038	0.022	0.044
Compulsory schooling mother						-0.081 (0.054)	-0.032	-0.028	-0.032	-0.016
University degree mother						-0.145** (0.073)	-0.058	-0.050	-0.058	-0.030
Low family income						-0.229*** (0.070)	-0.091	-0.077	-0.091	-0.057
High family income						0.009 (0.051)	0.004	0.003	0.002	0.004
SES (Socioeconomic Index)	0.119*** (0.021)	0.047	0.041	0.025	0.048					
School choice (Prestige)	0.714*** (0.059)	0.284	0.267	0.238	0.279	0.698*** (0.062)	0.278	0.258	0.223	0.273
School choice (Tradition)	0.902*** (0.086)	0.358	0.322	0.283	0.346	0.911*** (0.090)	0.362	0.321	0.269	0.351
School choice (Proximity)	-0.536*** (0.049)	-0.213	-0.193	-0.211	-0.176	-0.541** (0.051)	-0.215	-0.196	-0.213	-0.154
Gender (Male)	0.140*** (0.042)	0.056	0.048	0.032	0.056	0.131*** (0.044)	0.052	0.045	0.027	0.052
Constant	-0.191*** (0.038)					-0.174** (0.069)				
Number of observations	3974					3665				
Percent correctly predicted	67.51%					67,83%				
Log-likelihood value	-2398.71					-2204.73				
Pseudo R-squared	0.126					0.130				

Note: *, ** and *** indicate significance at the 10%, 5% and 1% level, respectively. The standard errors in parentheses are robust to heteroskedasticity.