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The effect of school choice on student satisfaction

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Abstract

This paper estimates the determinants of satisfaction regarding education for a representative sample of high school students in three Spanish regions. In particular, our goal is to examine the causal effect of studying in a public school (PS) or in a publicly subsidized private school (PSPS) on student's satisfaction. We do this using POLS, ordered probit and generalized threshold models, exploiting availability of a private school in the area in an IV framework. Our results suggest that once the school characteristics and unobserved heterogeneity is taken into account, students enrolled in public schools are more satisfied with the education received. We analyze not only overall satisfaction but other satisfaction domains regarding education such as satisfaction with learning, whether students learn and enjoy in the center, they are proud of studying in their center or they think it is nice to study in it.

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I. INTRODUCTION

The debate over privately and publicly funded secondary schools has generated a outstanding literature on school choice and schooling quality (Coleman *et al.*, 1982; Hoxby, 2003; Witte, 1992). For instance, Evans and Schwab (1995) and Neal (1997) take into account the selection into Catholic schools using whether the student is from a Catholic family and access to Catholic secondary schooling, respectively, as an instrument. Both studies find that Catholic high school raises the probability of high school graduation or college attendance. Altonji, Elder and Taber (2002) criticize the previous methodology for its potential correlation with unobservable variables associated with student's outcomes.

School choice appears to be crucial since school quality has subsequent effects on wages. Card and Krueger (1992) use the presence of private schools as a source of unobserved variation in school quality on their study of the returns to education in the US. Kim (2011) finds that catholic schooling is significantly associated with higher wages over the careers, using whether the religion of the family is catholic and the proportion of catholic population in the country of residence as an IV.

Moreover, education quality affects social mobility (Schneider, 2010; Manski, 1992) as well as income growth and mortality decline (Jamison et al., 2007).

We are interested in studying the effect of school choice on schooling quality from another perspective, focusing on the (short-run) direct effect on student's well-being. In order to do this, we use satisfaction variables that have been shown to be valid measures of individual well-being in the happiness literature (Frey and Stutzer, 2002a; 2002b; Layard, 2005; Van Praag and Ferrer-i-Carbonell, 2008). In particular, we use the specific satisfaction domain "Children's school satisfaction".

Although there is evidence that indicates that child wellbeing affects their education and labor market outcomes in adulthood, the literature on children's wellbeing is scarce. Gibbons and Silva (2011) is the first study that analyses the determinants of children's wellbeing in school, using data from the Longitudinal Survey of Young People in England (LSYPE). In particular, they investigate to what extent parents' and children's views of their school are linked to test-score based performance, and to what extent parents' judgments of school quality are linked to their child's happiness. Another study

is that of Levy-Garboua, Lohac and Fayolle (2006) where school dissatisfaction is found a determinant of adolescents engaging into risky activities.

One of the defining characteristics of the non-university levels of the Spanish educational system is its mixed or dual nature, that is, a predominant public network alongside a substantial private sector. Within the latter, an important position is occupied by publicly subsidized private schools (PSPS). PSPS are owned and run privately but fully financed by local education authorities and the central government. According to the data provided by the Spanish Ministry of Education, the distribution of students enrolled in secondary education among different school types in Spain in 2002 was as follows: PS 67%, PSPS 26 % and private-independent schools 7%. PSPS have to provide free teaching and to apply the same admission criteria as PS, among other obligations. For a detailed description and historical evolution of the Spanish non-university educational system see Bernal (2005).

The contribution of this paper is to estimate the determinants of students' satisfaction, focusing in the causal effect of school ownership (public or private) when both types of schools are fully publicly financed. We use a representative sample of high school students in three Spanish regions. We do this using POLS, ordered probit and generalized threshold models, exploiting availability of a private school in the area in an IV framework.

Our results suggest that once the center characteristics and unobserved heterogeneity is taken into account, students enrolled in public schools are more satisfied with the education received than their private counterparts. Moreover, it analyses not only overall satisfaction regarding education but other satisfaction sub-domains such as satisfaction with learning, whether students learn and enjoy in the center, they are proud of studying in their center or they think it is nice to study in it.

The remainder of the paper is organized as follows. The next section outlines the data and descriptive figures used. In section 3, we briefly describe the POLS, ordered probit and generalized threshold models. Section 4 presents the results on school choice and other determinants on student's satisfaction, and the final section presents our conclusions.

II. DATA

Our empirical analysis employs survey data from a representative sample of final year of secondary school students in the Spanish regions of Aragon, Asturias and Extremadura in 2002. The questionnaire was answered by 17297 students (79% of the students enrolled). 13288 of them attended PS and 4009 attended PSPS. The questionnaire provides data for the following fields: the academic potential of the pupils (previous year performance and 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); family socioeconomic background (educational level, parents' occupation and family income); quality perception of school and student's satisfaction regarding education received.

The variable we study is student's satisfaction regarding education received. Students rank their perceptions on overall school satisfaction taking values from 1, 'not satisfied at all' to 5, 'completely satisfied'. Moreover, we consider the following sub-domains: (2) I am very satisfied with the learning I receive in this center, (3) I really learn and enjoy in this center, (4) It is nice to study here and (5) I feel proud of my study center. The following equation shows the estimated weights of each sub-domain on overall satisfaction.

$$OVERALLSAT_i = 0.33 SAT(2)_i + 0.16 SAT(3)_i + 0.09 SAT(4)_i + 0.20 SAT(5)_i + \varepsilon_i$$

(44.21) (19.91) (11.50) (26.52)

Figure 1 shows the histograms with the distribution of the satisfaction levels across the different domains.

Table 1 displays the descriptive of the variables collected through the questionnaire and employed in this study. Concretely, the percentage of each item for the total sample (second column) and for the percentages broken down by the level of overall satisfaction (rest of the columns)

We use a range of control variables such as socio-economic family background (parents' job and education, family income); academic profile (marks, grants, aspirations, study time, class attendance, and confidence); personal characteristics (gender, age, siblings, and region); variables regarding school (choice reason, recommendation to others, any serious problem); and quality perceptions.

Figure 1. Histograms of Satisfaction regarding education



If we compare the PS and PSPS students' satisfaction with the education received, the results from both parametric techniques (t-test) and non-parametric ones (Mann-Whitney), lead us to conclude that PSPS students are more satisfied with their schools/education received. To what extend this conclusion is truth?

III. METHODOLOGY

We observe $EDUCSAT_i^j$ that is the answer of the student to their perceived satisfaction regarding education. Where the former has been generated by $EDUCSAT_i^{j*}$, that is the latent variable that reflects the real satisfaction regarding education that is discrete and ordinal, and takes values that go from 1 to 5, 1 meaning that the student is totally unsatisfied and 5 completely satisfied, respectively.¹

$$EDUCSAT_i^{j*} = X_i' \beta + \varepsilon_i \quad i = 1, \dots, n \quad (I)$$

¹ $j =$ (1) overall satisfaction regarding education received in this center (2) I am very satisfied with the learning I receive in this center (3) I really learn and enjoy in this center (4) It is nice to study here (5) I feel proud of my study center.

The latent variable $EDUCSAT_i^{j*}$ and the observed outcome $EDUCSAT_i^j$ are related as follows:

$$EDUCSAT_i^j = s \text{ if and only if } \kappa_{s-1} \leq EDUCSAT_i^{j*} = X_i'\beta + \varepsilon_i < \kappa_s$$

where s denotes the total number of distinct categories of the answer to the question of satisfaction regarding education (5 in our case).

The probability of the student i reporting a satisfaction level regarding education of s is given by:

$$P[EDUCSAT_i^j = s | X_i'\beta] = \Phi(\kappa_s - X_i'\beta) - \Phi(\kappa_{s-1} - X_i'\beta) \quad i = 1, \dots, n \quad s = 1, \dots, 5$$

Assuming that the error term ε_i is normally (independently and identically) distributed, (I) corresponds to an ordered probit model and $\Phi(\varepsilon_i)$ to the cumulative distribution function of the standard normal.

Where $\kappa_0, \dots, \kappa_5$ are threshold constant parameters, $-\infty = \kappa_0 < \kappa_1 < \dots < \kappa_5 = +\infty$ that divide the real line represented by $EDUCSAT_i^{S*}$ into 5 categories.

In Table 3 (Panel A) we observe the marginal probability effects of an ordered probit calculated as:

$$MPE_{s(l)}(X_i) = \frac{\partial P[EDUCSAT_i^j = s | X_i'\beta]}{\partial X_{i(l)}} = [\phi(\kappa_{s-1} - X_i'\beta) - \phi(\kappa_s - X_i'\beta)]\beta_{(l)}$$

Whereas in Table 3 (Panel B) we observe the marginal probability effects of a generalized threshold model, proposed by Maddala (1983) and Terza (1985). It has been employed in Boes and Winkelmann (2004) for an analysis of happiness and Garcia and Garcia (2006) for job satisfaction.

When relaxing the single index assumption (Boes and Winkelmann, 2006), the threshold parameters depend on covariates: $\kappa_s = \tilde{\kappa}_s + X_i'\gamma_s$ and under the restriction $\beta_1 = \dots = \beta_{s-1}$ the generalized model is going to nest the standard one.

The probability of the student i reporting a satisfaction regarding education of s is given by:

$$\begin{aligned}
P[EDUCSAT_i^j = s | X_i' \beta] &= P(\kappa_{s-1} \leq EDUCSAT_i^{j*} = X_i' \beta + \varepsilon_i < \kappa_s) = \\
&= \Phi(\tilde{\kappa}_s + X_i' \gamma_s - X_i' \beta) - \Phi(\tilde{\kappa}_{s-1} + X_i' \gamma_s - X_i' \beta) = \Phi(\tilde{\kappa}_s - X_i' \beta_s) - \Phi(\tilde{\kappa}_{s-1} - X_i' \beta_{s-1}) = \\
&= \Phi(\tilde{\kappa}_s - X_i' \beta) - \Phi(\tilde{\kappa}_{s-1} - X_i' \beta)
\end{aligned}$$

where $\beta_s = \beta - \gamma_s$, $\kappa_0 = -\infty$, $\kappa_5 = +\infty$, and thus $\Phi(\tilde{\kappa}_0 - X_i' \beta_0) = 0$ and $\Phi(\tilde{\kappa}_5 - X_i' \beta_5) = 1$.

The new model contains $s-1$ parameter vectors $\beta_1, \dots, \beta_{s-1}$ plus $s-1$ constants $\tilde{\kappa}_1, \dots, \tilde{\kappa}_{s-1}$ that can be estimated jointly by maximum likelihood.

$$MPE_{s(l)}(X_i) = \frac{\partial P[EDUCSAT_i^j = s | X_i' \beta]}{\partial X_{i(l)}} = \phi(\tilde{\kappa}_{s-1} - X_i' \beta_{s-1}) \beta_{s-1(l)} - \phi(\tilde{\kappa}_s - X_i' \beta_s) \beta_{s(l)}$$

$$EDUCSAT_i^j = \beta_1 TypeCenter_i + \beta_2 Marks_i + \beta_3 X_i + \beta_4 Z_i + \beta_5 W_i + \beta_6 P_i + \alpha_i + \varepsilon_i$$

Student's satisfaction is explained by $TypeCenter_i$, $Marks_i$ and X_i that is a vector of socio-demographic variables (gender, age, siblings in the family), Z_i that is a vector of parental background characteristics (father's and mother's job and education levels, monthly income intervals), W_i that is a vector of both school and education characteristics and P_i that is a vector of variables that try to proxy unobserved heterogeneity (ability perceived of finishing with success a university degree as well as expectations and reliance of teachers and parents in achieving this goal).

The type of school can be endogenous leading to biased and inconsistent estimates of the causal effect of the type of school on children's satisfaction. We can have endogeneity problems if an individual unobserved factor is correlated with both school choice and education satisfaction declared. When we add P_i' we are trying to proxy individual unobserved heterogeneity with variables that can be indicative of ability, expectations and effort, and thus the coefficient of school type falls from X to X in Panel A).

One solution to the potential endogeneity problem is to instrument for type of center. A suitable instrumental variable must be relevant and exogenous. The relevance condition consists on correlation of the instrument that is availability of a private school in the area with the type of center. The exogeneity condition requires that the instruments

affect children satisfaction regarding education only through type of school in the first equation, and therefore the instrument is uncorrelated with the error term in the student's school satisfaction equation (Wooldridge, 2002).

$$EDUCSAT_i^j = \beta_1 TypeCenter_i + \beta_2 Marks_i + \beta_3 X_i + \beta_4 Z_i + \beta_5 W_i + \beta_6 P_i + \alpha_i + \varepsilon_i \quad (1)$$

$$TypeCenter_i = \gamma Availability_i + v_i \quad (2)$$

We are going to implement a two stage procedure. In the first stage we estimate (Equation 2). The predicted values from the former estimation $\hat{TypeCenter}_i$, are used in place of $TypeCenter_i$ in the second-stage estimation of Equation 1.

The instrument (availability) is valid if it is orthogonal to the error term in the student's education satisfaction equation $E[Availability_i, \varepsilon_i] = 0$ (Equation 1). The availability variable is excluded from the students' satisfaction regarding education equation in order to be able to identify it.

IV. RESULTS

In Tables 2-4 we observe the effect of school choice on each school satisfaction domain. In Table 2, we assume implicit cardinalizations of the dependent variables, which are discrete and ordinal. This procedure (Probit Ordinary Least Squares-POLS) has been shown to generate very similar results to those of ordinal analysis.²

Specification 1 in Table 2 shows that students in a public school are significantly less satisfied regarding education. This holds for children's overall satisfaction and its different domains. When we take the school characteristics into account in Specification 2, students that are enrolled in a public school are 6.4% more satisfied regarding the education received than those attending a PSPS. Specifications (1) and (2) differ as we try to proxy individual unobserved heterogeneity in order to deal with omitted variable bias in the performance coefficients. As being more able, having to implement less effort or having higher expectations would affect both education performance and satisfaction declared, we take this into account by means of the self-perceived capacity of successfully finish a university degree, parental reliance in their children achieving

² Ferrer-i-Carbonell and Frijters (2004) and Clark and Senik (2010) also find that assuming cardinality or ordinality does not change the results.

that goal with good marks and expectations of teachers regarding the student performance in the future.

When we include the rest of characteristics in specification 3 the coefficient for school type rises to 11.1%. After taking into account unobserved characteristics instrumenting school choice by availability of a private school in the area, we observe that students attending a public center are 14.5% more satisfied than their private counterparts.

In Table 3 we report the marginal effects of specification (3) for the ordered probit model (panel A) and the threshold model (panel B), as well as the marginal effects of the same specification but allowing the thresholds of the model to vary dependent on individual characteristics. Table 4 shows the marginal effects of specification with instrumental variables.

Table 5 shows all the estimated parameters for the specifications 1 and 3 of the POLS model shown in Table 2, but only for the overall satisfaction. Results for other satisfaction domains are available from the authors upon request.

Unobserved heterogeneity: those students that report having the capacity of obtaining good marks in a university degree as well as students whose parents rely on them to successfully finish with good marks are significantly more satisfied than those that declared themselves as not being able. We observe the same with students whose teachers expect an average or a brilliant performance in the future; they are highly more satisfied than those that are worse considered.

Parental background: those born to a father with secondary or higher education are significantly less satisfied with their education than those born to a primary educated father. The same occurs with those born to a white collar mother or with those students which family income is either between 1200 and 1800 € per month or higher than 1800 €. These three results can be related to others in the satisfaction literature (Ref) that explain it due to the expectations students from these backgrounds have and lead them to lower satisfaction levels regarding education.

Students that obtained at least B-levels in first year report significantly more satisfaction regarding education.

Regarding socio-demographic characteristics, we show how males are significantly less satisfied than females (finding also found in the job satisfaction literature).

Those that attend to courses, devote hours to study, those that would recommend the center of studies as well as those that have not had any problems in the center declare themselves as being more satisfied.

Being the only center in the municipality or have chosen it because of proximity reasons lead students to be less satisfied.

V. CONCLUSIONS

This paper estimates the determinants of satisfaction regarding education for a representative sample of high school students in three Spanish regions. In particular, our goal is to examine the causal effect of studying in a public school (PS) or in a publicly subsidized private school (PSPS) on student's satisfaction. We do this using POLS, ordered probit and generalized threshold models, exploiting availability of a private school in the area in an IV framework. Our results suggest that once the school characteristics and unobserved heterogeneity is taken into account, students enrolled in public schools are more satisfied with the education received. We analyze not only overall satisfaction but other satisfaction domains regarding education such as satisfaction with learning, whether students learn and enjoy in the center, they are proud of studying in their center or they think it is nice to study in it.

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Table 1. Descriptive analysis (Panel A)

		%	1	2	3	4	5
Socio-economic family background							
Father's job	Blue collar	53.99	48.14	52.87	55.43	53.36	54.17
	White collar	46.01	51.86	47.13	44.57	46.64	45.83
Mother's job	Blue collar	75.66	69.88	74.00	77.03	75.24	75.40
	White collar	24.34	30.12	26.00	22.97	24.76	24.60
Father's education	Compulsory schooling	47.6	41.59	43.90	48.90	47.66	48.49
	Post-compulsory schooling	31.35	35.01	33.76	31.54	30.48	30.17
	University	21.05	23.40	22.35	19.57	21.86	21.33
Mother's education	Compulsory schooling	54.07	53.36	51.46	55.27	53.14	56.25
	Post-compulsory schooling	27.6	24.76	30.52	28.20	27.24	24.23
	University	18.32	21.88	18.02	16.53	19.61	19.52
Family income per month	< 1200 €	23.05	21.87	20.52	22.60	23.30	27.17
	1200-1800 €	43.6	37.18	43.07	45.76	42.86	40.49
	> 1800 €	33.35	40.95	36.41	31.64	33.85	32.35
Academic profile							
Extra-curricular	No extra-curricular activities	92.49	90.15	93.06	93.65	91.93	89.94
	Extra-curricular activities	7.51	9.85	6.94	6.35	8.07	10.06
Previous year mark	I am retaking subjects	22.01	33.27	28.32	25.95	16.83	15.91
	C-D-E	41.61	38.81	45.21	44.86	38.32	38.59
	A-B	36.38	27.92	26.47	29.19	44.84	45.50
Grant received	Yes	20.59	15.47	17.86	18.50	22.60	25.94
	No	79.41	84.53	82.14	81.50	77.40	74.06
School change	I have changed this year	3.34	7.34	3.30	3.28	2.96	4.00
	I have changed previous year	9.85	10.23	10.18	9.76	9.99	9.29
	No recent change	86.81	82.43	86.51	86.96	87.05	86.71
Personal aspirations	No university degree	21.5	30.27	27.87	25.98	15.63	17.21
	Foundation degree	32.94	31.03	32.43	34.86	32.54	27.64
	Full degree	45.57	38.70	39.69	39.17	51.83	55.15
Weekly study time	< 5 hours	33.07	42.77	40.95	34.78	28.95	30.60
	5-10 hours	34.78	30.86	34.18	35.93	34.88	31.19
	10-15 hours	21.22	14.06	17.57	20.39	23.54	21.69
	> 15 hours	10.92	12.30	7.31	8.90	12.63	16.51
Class attendance	When I can	3.28	14.09	6.55	3.19	1.95	1.80
	Usually	22.69	31.27	31.27	27.76	16.86	13.06
	Always	74.03	54.63	62.17	69.05	81.20	85.14
Self-confident	Not able to pass a univ. degree	8.67	16.51	12.21	11.10	5.33	5.86
	Only able to pass	16.75	22.07	20.93	18.97	14.08	11.53
	Able making greater effort	41.11	27.26	35.68	41.69	43.68	39.04
	Able to get a good degree	33.47	34.17	31.18	28.25	36.90	43.57
Teachers' confidence	Difficult but possible	14.57	28.13	23.80	17.21	9.84	8.11
	Average performance	63.1	53.37	59.28	66.01	63.56	56.58
	Brilliant performance	22.33	18.50	16.92	16.77	26.60	35.31
Parents' confidence	Be satisfied if pass	38.8	47.08	43.66	42.07	35.05	32.26
	Difficult but possible good marks	26.08	24.12	27.98	28.65	24.17	21.62

	Rely on good marks	35.13	28.79	28.36	29.28	40.77	46.12
Personal characteristics							
Gender	Male	42.95	59.26	50.82	43.32	40.46	37.32
	Female	57.05	40.74	49.18	56.68	59.54	62.68
Age	17-18 years old	78.69	64.60	74.26	75.88	83.51	79.90
	Older than 18	21.31	35.40	25.74	24.12	16.49	20.10
Siblings	> 3 siblings	10.17	14.56	9.89	9.34	9.99	13.27
	2 or 3 siblings	76.14	71.84	75.45	76.56	76.68	74.30
	Only child	13.69	13.60	14.66	14.10	13.33	12.44
Region	Aragón	33.75	27.00	33.26	35.10	34.41	27.39
	Asturias	30.72	39.92	37.58	32.80	26.90	26.44
	Extremadura	35.52	33.08	29.16	32.10	38.69	46.16
School variables							
School type	Public Schools	75.91	75.29	77.68	81.37	72.34	66.07
	Publicly Subsidized Private Schools	22.9	23.38	21.21	17.84	26.30	31.71
Private alternative	No	39.45	37.45	40.16	42.59	37.25	35.51
	Yes	60.55	62.55	59.84	57.41	62.75	64.49
Choice reason	Only school in my municipality	10.08	11.26	11.74	11.49	8.90	6.74
	Proximity	36.61	36.45	40.30	41.23	33.14	27.78
	Family tradition	6.7	8.40	6.13	6.39	7.20	6.10
	Prestige	14.7	7.82	8.04	9.09	18.94	30.58
	Other reasons	31.91	36.07	33.79	31.80	31.82	28.80
Recommendation to others	He/she would recommend the school	74.92	27.87	42.75	67.83	90.24	93.96
	He/she would not recommend the school	25.08	72.13	57.25	32.17	9.76	6.04
Serious problem at school	Yes	16.34	39.96	26.52	17.22	11.80	11.88
	No	83.66	60.04	73.48	82.78	88.20	88.12

Table 1. Descriptive analysis (Panel B – Quality perception)

	1	2	3	4	5
v21 Physical installations	11.65	21.97	32.7	23.85	9.83
v22 School equipment	12.85	23.6	30.63	23.68	9.24
v23 Teaching materials	6.19	13.83	33.53	32.24	14.21
v24 Central heating works	24.59	23.49	20.23	17.1	14.6
v28 Fulfill Commitments	12.31	21.5	31.41	25.63	9.15
v30 Teachers few mistakes	5.91	12.69	27.85	38.06	15.49
v32 Clear explanations	5.63	15.42	37.77	33.16	8.02
v33 Updated teaching materials	3.54	6.14	18.68	41.08	30.57
v35 Teaching mixture	32.72	24.67	21.41	13.51	7.7
v37 Human and academic formation	8.56	16.43	30.71	27.73	16.57
v39 Specific needs understood	15.1	24.25	37.04	18.28	5.33
v40 Teachers motivate students	9.82	19.23	38.02	24.63	8.3
v41 Teachers interested	6.32	15.46	31.54	32.09	14.59
v42 Professional orientation	11.75	20.43	30.76	25.69	11.36
v43 Overall quality perception	3.25	8.31	36	42.45	9.99

Table 2. Effect of school choice on student's school satisfaction (POLS)

VARIABLES	POLS (1)	POLS (2)	POLS (3)	IV
Satisfaction 1: Overall Satisfaction regarding Education received in this center				
School type	-0.224*** [0.021]	0.064*** [0.019]	0.111*** [0.023]	0.145** [0.071]
Suf or Good			0.088*** [0.020]	0.089*** [0.020]
>= Not			0.186*** [0.023]	0.187*** [0.023]
R-squared	0.007	0.336	0.357	0.356
Partial R-squared				0.0960
F-test for excl.IVs				2274.97
Prob > F				0.0000
Satisfaction 2: I am very satisfied with the learning I receive in this center				
School type	-0.269*** [0.022]	0.002 [0.020]	0.054** [0.024]	0.111 [0.075]
Suf or Good			0.060*** [0.021]	0.061*** [0.021]
>= Not			0.138*** [0.024]	0.139*** [0.024]
R-squared	0.010	0.291	0.308	0.308
Partial R-squared				0.0960
F-test for excl.IVs				2274.97
Prob > F				0.0000
Satisfaction 3: I really learn and enjoy in this center				
School type	-0.209*** [0.021]	0.034* [0.019]	0.081*** [0.023]	0.100 [0.075]
Suf or Good			0.061*** [0.022]	0.062*** [0.022]
>= Not			0.173*** [0.024]	0.174*** [0.024]
R-squared	0.006	0.266	0.287	0.287
Partial R-squared				0.0960
F-test for excl.IVs				2274.97
Prob > F				0.0000
Satisfaction 4: It is nice study here				
School type	-0.109*** [0.022]	0.151*** [0.021]	0.232*** [0.025]	0.123 [0.082]
Suf or Good			0.043* [0.023]	0.040* [0.024]
>= Not			0.098*** [0.026]	0.096*** [0.026]
R-squared	0.002	0.244	0.256	0.255
Partial R-squared				0.0960
F-test for excl.IVs				2274.97
Prob > F				0.0000
Satisfaction 5: I feel proud of my study center				
School type	-0.247*** [0.022]	0.036* [0.020]	0.139*** [0.025]	-0.043 [0.078]
Suf or Good			0.079*** [0.022]	0.074*** [0.023]
>= Not			0.094*** [0.025]	0.091*** [0.025]
R-squared	0.008	0.269	0.289	0.287
Partial R-squared				0.0960
F-test for excl.IVs				2274.97
Prob > F				0.0000
Observations	16861	15750	14223	14223

Table 5: Determinants affecting student satisfaction

VARIABLES	NO IV		IV	
	POLS (1)	POLS (3)	POLS (1)	POLS (3)
School type	-0.224*** [0.021]	0.111*** [0.023]	-0.205*** [0.046]	0.145** [0.071]
dmark12		0.088*** [0.020]		0.089*** [0.020]
dmark13		0.186*** [0.023]		0.187*** [0.023]
dincome2		-0.036* [0.020]		-0.035* [0.020]
dincome3		-0.051** [0.024]		-0.049** [0.024]
dfatherjob2		-0.028 [0.017]		-0.026 [0.018]
dmotherjob2		-0.039** [0.019]		-0.038* [0.020]
dgender1		-0.038** [0.016]		-0.036** [0.016]
dage2		-0.041** [0.021]		-0.043** [0.021]
dcaa2		-0.026 [0.018]		-0.028 [0.019]
dcaa3		0.086*** [0.020]		0.081*** [0.022]
dcapacity2		0.012 [0.032]		0.012 [0.032]
dcapacity3		0.031 [0.030]		0.031 [0.030]
dcapacity4		0.075** [0.032]		0.075** [0.032]
dproblem2		0.105*** [0.022]		0.104*** [0.022]
dyearsestudio1		0.054 [0.051]		0.049 [0.052]
dyearsestudio2		-0.036** [0.016]		-0.041** [0.020]
dwhystudy1		-0.094*** [0.027]		-0.102*** [0.032]
dwhystudy2		-0.016 [0.019]		-0.022 [0.022]
dwhystudy3		-0.038 [0.033]		-0.031 [0.035]
dwhystudy4		0.193*** [0.027]		0.200*** [0.030]
Constant	-0.238*** [0.019]	-3.521*** [0.063]	-0.252*** [0.037]	-3.550*** [0.086]
Observations	16861	14223	16861	14223
R-squared	0.007	0.357	0.007	0.356
Partial R-squared			0.1896	0.096
F-test for excl.IVs			6009.57	2274.97
Prob > F			0	0

Robust standard errors in brackets

*** p<0.01, ** p<0.05, * p<0.1

