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# School Performance and Choice

## The Chilean Experience

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**Alejandra Mizala**  
**Pilar Romaguera**

### ABSTRACT

*How to achieve quality in education is a topic of increasing concern throughout the world. Many countries have made a wide variety of reforms and spent an increasing amount of resources to improve the quality of education, but often the results have not lived up to expectations. Chile has made innovative reforms to its educational system. One of the most interesting has been the introduction of a voucher-type subsidy system and the entry of private agents in the market to provide free educational services. This paper examines the Chilean experience by analyzing educational performance in different types of school.*

### I. Introduction

In recent years there has been much debate on how to improve the quality of education, and a large part of this discussion has focused on how educational outcomes are affected by the characteristics of the system itself.

In part, this discussion has stemmed from frustration at seeing society plow more and more resources into the education system without always achieving better results. Thus, from both the theoretical and policy viewpoints there has been increasing interest in analyzing the factors that affect educational outcomes, and how different forms of school administration might influence the educational results.

In recent years, one of the most important debates has revolved around the need for a private market in education supply: an issue that is captured in the concept of

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school choice.<sup>1</sup> Proponents of school-choice argue that the competition so generated would put pressure on schools to improve the education they provide. Moreover, families (like consumers) would “vote with their feet,” and bad schools would see their enrollments fall and would eventually disappear from the market.<sup>2</sup>

Chile’s education system was decentralized in 1980, and a voucher-type subsidy was introduced to encourage private providers to enter the market. This represents a real experience of school choice, which is specially interesting to analyze as it has been in operation for more than a decade. School choice in Chile has gone hand in hand with a standardized performance test, known as the SIMCE test, the existence of which is essential to the reform process, as parents need objective indicators of results to assess educational outcomes. Moreover, the mere existence of this test and the fact that school results are made public introduces an element of competitive pressure into the system.

As regards educational outcomes, although there is consensus in the literature that standardized performance tests are only a partial measure of the education process, it is also acknowledged that they are the best available proxy enabling objective and transparent comparisons to be made. There are also studies that report a high correlation between test results and individuals’ subsequent performance in the labor market.

It should be kept in mind that educational outcomes are not determined by teaching alone, but also by factors exogenous to the school. Econometric studies have shown that three factors affect results: the characteristics of students and their families, the inputs into the educational process and the structure of the system itself. Educational production-function studies, stemming from the pioneering work of Coleman et al. (1966), have usually stressed the importance of socioeconomic background in a student’s academic performance.

In Chile the performance of the different school types is an extremely important issue, as the main educational problem is not one of coverage but rather of quality, and how this relates to an individual’s chances of gaining access to higher education. This, in turn, has consequences for income distribution. As discussed below, there are significant quality differences between schools, redounding in differential access to university education. In Chile, only 15 percent of university students come from the poorest 40 percent of families, a situation not only caused by financial restraints, but basically because of a selective university entrance process in which 40 percent of students taking college entrance exams end up being admitted. Only 25 percent

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1. Among the first to suggest a choice framework was Friedman (1962), who called for school vouchers. Subsequently, Chubb and Moe (1990), put forward the idea that the way to deal with the crisis in education was through a radical reform of the system to allow parents to choose schools and introduce competition into the educational market. In recent years an extensive literature has developed on this issue, both from those in favor, and from those who are against school choice policies and subsidy-based financing. See for example, Lieberman (1990), Levin (1991), Witte (1992), Ehrenberg (1994), Hening (1994), Goldhaber (1996), West (1997) and Rouse (1998).

2. The idea that consumers will “vote with their feet” for the package of services and taxes that best satisfies their preferences, is an application to the educational field of a line of literature stemming from Tiebout (1956). See Blair and Staley (1995).

of these students are accepted in traditional universities, and just 5 percent enter the country's two most prestigious universities.<sup>3</sup>

The quality of primary and secondary education, along with access to university, are important determinants of the income distribution. There are significant differences in the returns to education between the different levels of schooling, and these have been growing since the 1970s. In 1970 the average rate of return to primary and secondary education was 12 percent and that of higher education 18 percent. By 1997, however, the primary and secondary rates of return remained unchanged at 12 percent while the return to higher education had risen to 25 percent (Contreras et al., 1998).

The paper is organized in the following way. Section II provides information on Chile's educational reforms: the implementation of the voucher system and what this has meant for school choice. In the third section, we analyze two of the central points in the school-choice debate: first we use econometric analysis to compare test results between private and public schools; then we analyze the degree of homogeneity/heterogeneity in school enrollments, as an indirect approach to the issue of student selection. The final section summarizes the conclusions of this study.

## II. Educational Reform and Educational Outcomes

Prior to 1980, the administration of the Chilean school system was fully centralized in the Educational Ministry. The Ministry laid down the curricula for the whole educational system and directly administered public schools, which accounted for over 80 percent of all schools in the country. The Ministry also appointed public school teachers and heads, as well as approving and paying expenses and salaries.

The decentralization process initiated in the early 1980s transferred the administration of public-sector schools to the municipalities. As well as this, the reform opened the way for the private sector to participate as a provider of publicly financed education, by establishing a voucher-type per-student subsidy.<sup>4</sup>

Three types of school were established. Municipal schools, financed by the per-student subsidy granted by the state and run by municipalities. Private subsidized schools, financed by the per-student subsidy and run by the private sector. Private fee-paying schools, financed by fees paid by parents and run by the private sector. The system is summarized in Table 1.<sup>5</sup>

The privately-provided sector (subsidized and fee-paying) includes both non-denominational and religious schools, the latter being supported by the Catholic Church or some other religious group (Adventist, Evangelical, etc.). Fee-paying pri-

3. Namely, the University of Chile and the Catholic University of Chile. Admission figures were obtained from the Council of University Rectors, Ministry of Education.

4. It should be mentioned that a state subsidy to private education had been established in the 1950s, equal to 50 percent of the cost for free schools.

5. These types of schools exist in each of the three levels into which the Chilean school system is divided: preschool, elementary or primary school, and secondary or high school.

**Table 1**  
*Types of School*

Education Provided	Education Financed	
	Publicly (by subsidy)	Privately (by tuition fees)
Publicly	Municipal schools	—
Privately	Subsidized private schools	Fee-paying private schools

vate schools are generally for profit,<sup>6</sup> whereas subsidized private schools may or may not be. Nonprofit private schools include church schools and those dependent on foundations or private corporations, some of which are linked to sectors of industry. For-profit schools mostly operate like firms, generating returns for their owners.

The voucher system gives families complete freedom to choose schools for their children: on the one hand, they can choose a free subsidized school, either municipal or private, with their choice being independent of where they live.<sup>7</sup> Alternatively, they can choose a fee-paying private school if they can afford the tuition fees.

In a traditional subsidy or voucher system the government makes payments directly to families to enable them to choose which public or private schools to put their children into. The system implemented in Chile is known in the literature as a “funds-follow-the-child” voucher system, where the government subsidizes the schools chosen by parents in direct proportion to the size of the enrollment (West, 1997). Specifically, the Chilean government pays each school one School Subsidy Unit (SSU) for every child effectively attending classes there.<sup>8</sup> This means that the size of the subsidy paid per student is the same for both municipal and subsidized private schools. The state does not pay any subsidy to fee-paying private schools, and these are financed entirely out of fees paid by parents.<sup>9</sup>

The most important differences between subsidized private schools and municipal ones relate to: (i) the student admission process, in which subsidized private schools can select their students and (ii) teachers’ job contracts. The first one is a fundamental difference: all private schools (both subsidized and fee-paying) have complete freedom to accept or reject students and establish their own selection processes, whereas municipal schools are compelled to accept any student who wishes to enroll, unless it can be shown that there are no vacancies in the school.

As regards job contracts, teachers in municipal schools are governed by special

6. Church schools also generate surpluses that are used for other purposes in the congregations to which they belong.

7. The Chilean system differs from the U.S. one in this sense: a child is not forced to attend the school in his or her neighborhood.

8. The SSU is paid according to the average class attendance, calculated quarterly. In the case of subsidized private schools, the subsidy is paid directly to the schools, whereas municipal schools receive it through the municipality.

9. Although there are no official statistics on average fees in the fee-paying sector, our estimations based on a sample of schools in the Santiago Metropolitan Area suggest monthly tuition fees five times higher than the SSU.



legislation (the Teacher Statute), involving a centralized collective-bargaining process, wages based on uniform pay-scales with special bonuses for training, experience and working under difficult conditions, and restrictions on dismissal. Private schools (both subsidized and fee-paying) operate as firms, and their workers (teachers) come under the Labor Code like all other private-sector workers in the country.<sup>10</sup>

Other functions of the educational system were kept under central control in the reforms of the early 1980s. The Ministry of Education (MINEDUC) retained responsibility for curricular design, and set school hours and dates. It also continued to establish the criteria for student assessment and promotion. Pedagogic or curricular guidelines scarcely changed in the reforms, and education specialists, teachers and sectoral officials hardly participated in the process. The decentralization process of the 1980s was therefore basically a far-reaching reform of the economic operation and mode of administration of the educational system. The voucher system, together with the private provision of user-free education, made it possible to promote competition between schools to attract and retain students; it created an “education market,” which, through competition, sought to encourage efficiency and quality in the education provided.

After 1990 further reforms were made, without changing the existing school types and management paradigms in a fundamental way. Additional funds were made available through the Educational Quality Improvement Program (MECE), a subsidy for lengthening the school day was introduced, and the special rural subsidy was increased. In 1993 co-financing was approved (with funds contributed by parents)—a form of financing that is more relevant to subsidized private schools. In 1996 a subsidy for educational reinforcement was established, as well as a National System of Performance Assessment (SNED) for the subsidized sector which includes a bonus for excellent performance at the school level, estimated to be equivalent to approximately 6 percent of the annual wage.

Following the reform that introduced the voucher system, the subsidized private sector rapidly expanded to cover 33 percent of total school enrollment by 1989. As a counterpart to this, the municipal sector saw its share shrink to 60 percent in the same year. During the 1990s, the system has tended to stabilize with 56 percent of enrollments in the municipal sector and 34 percent in subsidized private schools.

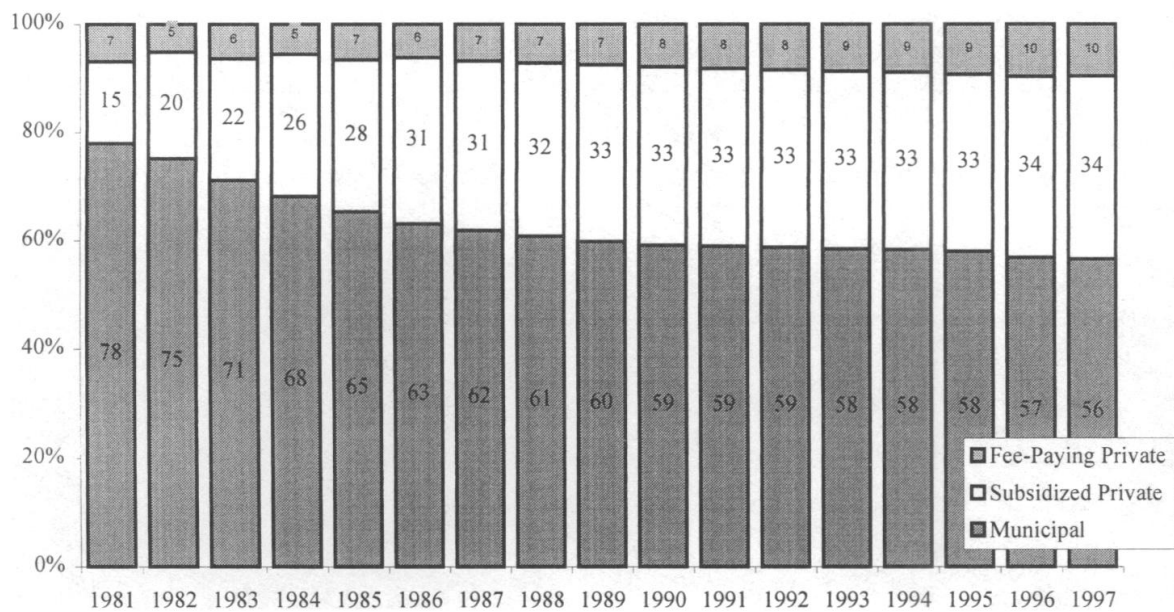
The fee-paying private sector has expanded slightly during the 1990s, to account for 10 percent of total enrollment in 1997. This increase is associated with the higher rate of growth enjoyed by the country in recent years, and seems to indicate that families choose fee-paying private schools when their income goes above a certain level. Figure 1 shows how the three sectors have evolved since the early 1980s.<sup>11</sup>

A factor which ought to affect the development of subsidized schools is the size of the government subsidy.<sup>12</sup> Following a sharp initial rise between 1980 and 1982, the value of the subsidy declined due to the fiscal constraints of the 1980s, recovering from 1991 onward (see Appendix Table A1). The value of the subsidy in 1998 was

10. There are certain minimal (labor) contractual rules from the Teacher Statute that are applied to the private sector, such as minimum wages, length of the working day, holidays and severance payments.

11. These figures do not include Private Corporations which represent a minimal fraction of the total number of schools.

12. The School Subsidy is financed out of general Treasury funds and accounted for 60 percent of total Ministry of Education expenditure in 1997.



**Figure 1**  
*Enrollment by School Type*

50.7 percent higher than its peak in the 1980s; however, it is still lower than the monthly fee paid by parents in fee-paying schools.<sup>13</sup>

Overall, the school enrollment rate is high: both primary and secondary education have mass coverage—96 percent and 82 percent respectively, according to MINEDUC (1996). The enrollment rate is greater among higher income families, especially at the secondary and preschool levels.

In view of this, it is difficult to envisage an expansion of the system based on increases in school coverage, except among low-income sectors. In this context, growth in the private sector would only be feasible at the expense of a greater reduction in the municipal sector; that is, it would only be feasible through changes in the composition of school enrollment.

There are significant differences in the geographical distribution of the three school-types: although the subsidized private system has a presence in every region of the country, there are clear differences in coverage from region to region (see Table 2). The subsidized system is particularly important in the Santiago Metropolitan Area, absorbing 45 percent of total school enrollment there, whereas there are other regions where 70 percent of enrollment is in municipal schools.<sup>14</sup> The variation is even more pronounced at the borough level.

As regards the characteristics of families attending each type of school, it is clear

13. See Footnote 9.

14. The figures in Table 2 relate to the total number of primary and secondary school students in each region. If the primary and secondary levels are distinguished, Municipal schools are slightly more important at the primary level (58.2 percent of primary school enrollment versus 56.4 percent overall), while Fee-Paying Private schools have slightly more of the enrollment at the secondary level (10.6 percent versus 8.8 percent).

**Table 2***Regional Distribution of Enrollment, by School Type, 1997 (percentages)*

Regions	Municipal	Subsidized Private	Fee-Paying Private	Corporation Private	Total
I	63.6	26.3	9.6	0.5	100.0
II	71.2	21.8	7.0	0.0	100.0
III	72.6	19.3	8.1	0.0	100.0
IV	70.5	25.2	4.1	0.2	100.0
V	53.9	34.1	10.4	1.6	100.0
VI	69.3	21.0	7.1	2.5	100.0
VII	74.3	20.0	4.3	1.3	100.0
VIII	69.7	21.9	5.9	2.6	100.0
IX	56.5	39.0	3.1	1.3	100.0
X	73.5	22.1	4.4	0.1	100.0
XI	70.1	27.8	1.1	1.0	100.0
XII	69.7	16.1	14.2	0.0	100.0
Metropolitan	39.3	45.2	12.7	2.3	100.0
Total	56.4	33.1	8.8	1.7	100.0

Source: MINEDUC

that low-income families are concentrated in municipal schools: more than 50 percent of all children from decile 1 to decile 6 attend municipal schools. The subsidized private sector has a presence at all income levels, but it is more important among middle-class families, rising steadily from 22.8 percent in the bottom decile to 47.1 percent in the seventh, before dropping back to 24 percent due to the bigger share of the fee-paying sector. The latter is really important among the wealthiest 10 percent of the population (see Table 3). This situation is consistent with the income distribution in Chile, where the big income differences occur between the ninth and tenth decile.<sup>15</sup>

In relation to the future growth of the system, there are two factors which may limit the expansion of the subsidized private sector towards low-income groups: (i) the reduced possibility of cofinancing in lower-income sectors, and (ii) lower school achievement among children coming from poorer families. Either factor could make this income group less attractive to private education providers.

### *Standardized Performance Tests*

Standardized performance tests were implemented at a national level as an integral part of the educational reforms of the 1980s. In 1988, MINEDUC introduced the

15. The income distribution in Chile is worse than the Latin American average. However, if the Gini coefficient is recalculated excluding the wealthiest 10 percent of the population, Chile has the region's best distribution of income (IDB, 1998).



**Table 3**  
*Socioeconomic Breakdown of School Enrollment, 1996 (percentages)*

Income Decile	Municipal	Subsidized Private	Fee-Paying Private	Total
1	76.42	22.81	0.77	100.0
2	72.68	26.73	0.59	100.0
3	68.43	29.92	1.65	100.0
4	62.33	34.59	3.08	100.0
5	60.12	37.31	2.57	100.0
6	54.47	40.29	5.24	100.0
7	46.51	47.08	6.42	100.0
8	38.91	44.78	16.31	100.0
9	27.76	41.26	30.98	100.0
10	12.10	23.96	63.94	100.0
Total	57.64	33.48	8.88	100.0

Source: Authors' calculations, based on socioeconomic household survey (CASEN) 1996.

**Table 4**  
*SIMCE Test Results*

	4th Grade					8th Grade				
	1988	1990	1992	1994	1996	1989	1991	1993	1995	1997
Municipal	49.25	56.70	63.85	64.43	68.00	52.27	50.14	54.00	55.07	60.50
Subsidized private	56.35	58.80	70.15	70.66	73.65	57.52	54.73	59.37	60.53	66.50
Fee-paying private	76.15	80.05	86.05	85.07	85.85	76.38	72.36	75.77	76.07	80.00

Source: MINEDUC.

Note: Figures calculated as average point scores for all students in each category.

SIMCE Educational Quality Measurement System, which carries out census-type tests on all schools and students in the country, testing Mathematics and Spanish at fourth and eighth grade in alternate years.

Table 4 gives the SIMCE test results for the period 1988–97, where the figures correspond to the percentage of correct answers obtained. In general it can be seen that test results have tended to improve over time, especially at 4th grade, but there are significant differences between the three school types.

Improved test results could be due to various factors, including better understanding of the mechanics of the test, the success of the decentralization process and greater competition in the educational market, as well as other specific MINEDUC

policies such as targeted support for the poorest schools, and the general increase in resources put into the school system.<sup>16</sup>

However, it is important to analyze the significant points gap between the different school types: first because it provides evidence of the differences in educational quality that exist in society, and which detract from education effectively becoming a vehicle for social mobility. Second, in a school system based on choice, it is important to have alternatives that offer education of at least the same quality as in the public system. In most countries the measurement of educational quality is carried out via standardized performance tests. Measuring the relative performance of private schools as against public schools has suffered from heavy ideological bias,<sup>17</sup> however, as measurements fail to consider the limitations in correctly comparing results from different schools, nor do they value the welfare benefit conferred by the possibility of choice in itself.

To summarize, as from the 1980s when a school-choice system was introduced with voucher financing, the subsidized private education system has developed and expanded by taking in children from the municipal sector. The subsidized schools do not compete seriously with fee-paying schools due to the fee difference between the two sectors. The cost to parents of sending their child to a subsidized school (either private or municipal) is zero, yet high-income parents mostly continue to prefer the fee-paying alternative.

In the next section we examine school performance in greater detail, carrying out econometric estimations of performance differences between school types. We measure the output of the educational process through the results obtained by students on standardized tests. Although this is the most common form of measurement in the literature, it is not the only way of measuring educational output. Other possibilities would be to use labor market performance, or educational attainment, but unfortunately the data needed for such measurements are not available in Chile.

### III. Relative Performance of Private and Public Schools

There have been numerous studies for the United States that examine the relative performance of private and public schools, starting with that by Coleman, Hoffer and Kilgore (1982). In general, the early studies used cross-section information only (Coleman et al, 1982, Cain and Goldberger, 1983 and Noell, 1982), and they were criticized for failing to include an initial achievement indicator among the explanatory variables in the production function.<sup>18</sup> A second group of U.S. studies, which have tried to control better for these omitted variables, report mixed evidence on the relative performance of each type of school. For example, Hoffer, Greely and Coleman (1985) and Chubb and Moe (1990) found evidence in favor of

16. According to the professional team that prepares the SIMCE tests, anchor questions have been included since 1992 to make results comparable.

17. For example, supporters of the private-sector alternative always argue that the results in these schools are superior, despite the fact that it is widely recognized that test results are heavily influenced by family socioeconomic characteristics.

18. See Hanushek (1979), Goldhaber (1996) and Meyer (1997).

private schools, whereas Willms (1985) and Alexander and Pallas (1985) found no differences between school types.<sup>19</sup>

Studies that have addressed this issue in Chile include Rodríguez (1988), Aedo and Larrañaga (1994), Aedo (1997) and Carnoy and McEwan (1997).<sup>20</sup> In general these studies conclude that the socioeconomic level of the family is a statistically significant variable in explaining student performance. However, their conclusions vary when comparing results between subsidized private and municipal schools. Rodríguez (1988), Aedo and Larrañaga (1994), Aedo (1997) conclude that subsidized private schools do better than municipal ones, whereas Carnoy and McEwan (1997) find that municipal schools have better results than private subsidized schools. The studies differ mainly in the control variables and in the samples used. Rodríguez (1988), Aedo and Larrañaga (1994), Aedo (1997) are based on small samples (less than 1000 schools), which does not allow their results to be generalized. Carnoy and McEwan (1997), while initially using the entire universe of schools doing the SIMCE test, later reduce the sample and exclude fee-paying private schools while incorporating other control variables.

As mentioned above, the SIMCE test average is higher among fee-paying schools, with subsidized private schools in second place and municipal schools third. Apart from revealing the enormous dispersion of SIMCE points across schools, Figure 2 shows that not only do SIMCE averages vary according to school type, but the shape of the distribution is also different. The question is how much of these differences can be attributed to differences in teaching in the schools, and how much to differences in student characteristics. To analyze the differences in the SIMCE results between the three school types, we estimate the following equation.<sup>21,22</sup>

$$(1) \quad L_{it} = f(F_{it}, S_{it}, A_{it})$$

where,

$L_{it}$  = average student achievement in school  $i$  in period  $t$

$F_{it}$  = characteristics of the average family in school  $i$  in period  $t$

$S_{it}$  = characteristics of the students in school  $i$  in period  $t$

$A_{it}$  = characteristics of the teachers in school  $i$  in period  $t$

One of the problems with these estimations is that they are based on cross-section analysis, that is, gross values, where the dependent variable is the points level achieved on the test in a given period. As has been discussed in the literature, a better estimation would be based on the value added by the school, using lagged test scores for the same group of students from a previous period as an independent variable. Such a specification would allow for differential achievement growth based on the initial score.<sup>23</sup>

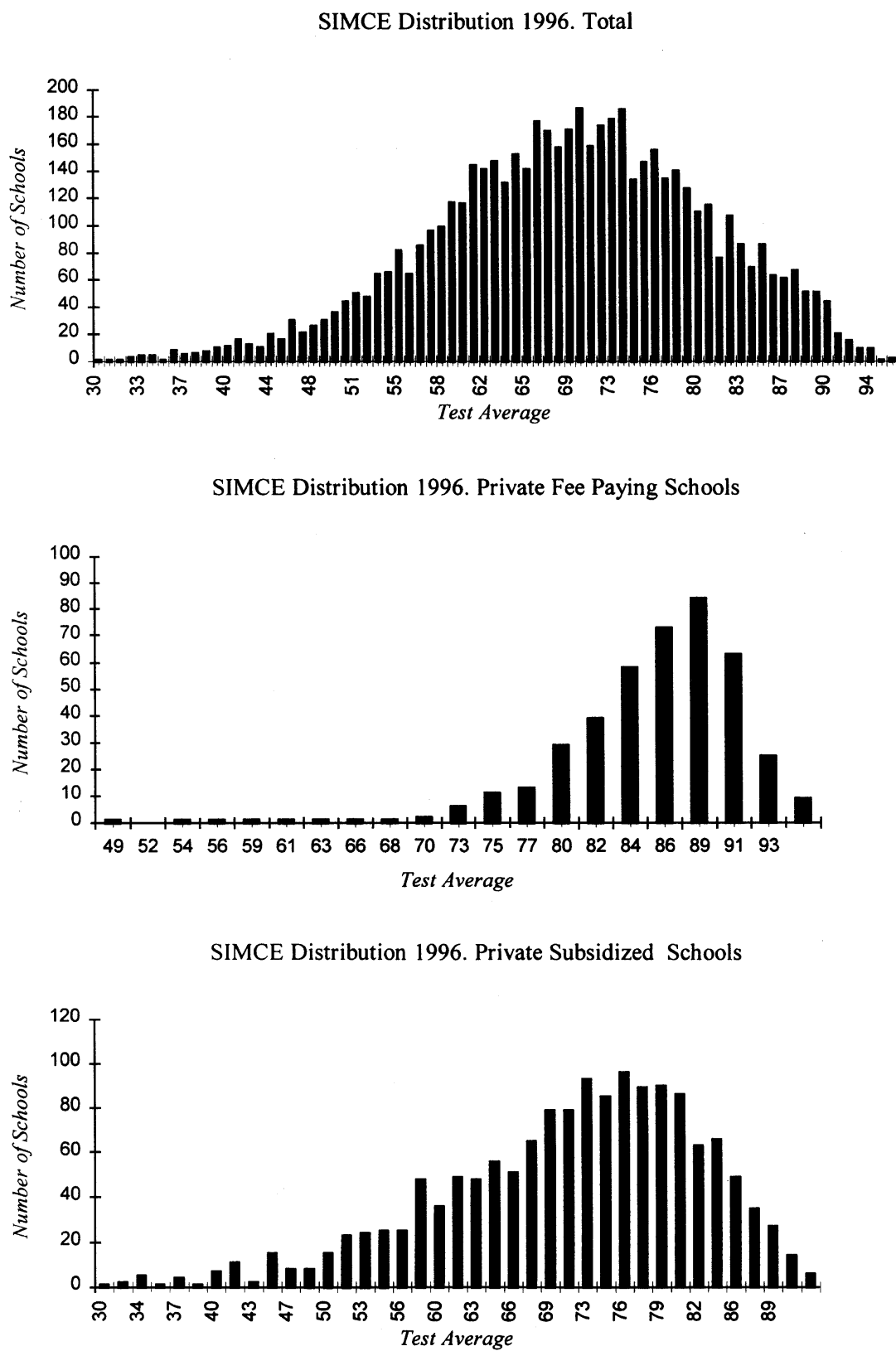
19. See also Sander (1996) and Neal (1997) on the effect of Catholic school education.

20. In addition Winkler and Rounds (1996) also analyze Chile's educational reforms, and Rounds (1996) examines selection policies, interviewing a random sample of 50 school heads in Santiago.

21. In this equation the regression coefficients can be interpreted as percentage points of achievement.

22. Although SIMCE test results exist at the individual student level, socioeconomic data is not available for each family. The information that exists corresponds to the average of all families in a given school. This is not ideal, but it should be remembered that the topic of this paper relates to school level achievement.

23. Harbison and Hanushek (1992).



**Figure 2**  
*Distribution of Results, 4th Grade 1996*

SIMCE Distribution 1996. Municipal Schools

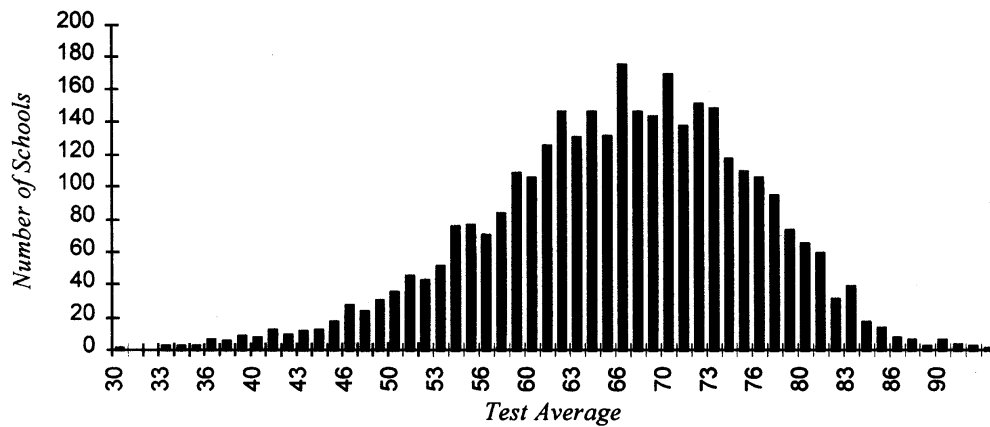


Figure 2 (continued)

The reality of the SIMCE test calendar means that results are only available once for each generation, however, so we have to use a proxy to estimate value-added. To do this we included the average result for the school the last time 4th grade took the test (that is, results achieved by a different set of students). In doing this, we are implicitly assuming that the unobservable characteristics in the same grade do not vary from year to year within a given school.<sup>24</sup>

In this case, the equation to be estimated is:

$$(2) \quad L_{it} = f(F_{it}, S_{it}, A_{it}, L_{it-1})$$

where,  $L_{it-1}$  is average student achievement in school  $i$  the last time the same grade took the SIMCE test.

The empirical analysis is carried out at the national level based on information from the SIMCE itself, as well as from the Ministry of Education, and the National School Assistance and Scholarship Board.<sup>25</sup> Table 5 presents the results; the data correspond to the SIMCE test applied to fourth grade students in 1996.

As can be seen in Column 1, the raw test results (without control variables) reveal that fee-paying private schools on average score 19 more points than municipal schools in the SIMCE test, whereas subsidized private schools score 4.5 more. These differences shrink to 5 and 0 SIMCE points respectively when the appropriate controls are included, that is, socioeconomic variables (family socioeconomic level and vulnerability index), school characteristics (such as geographical location, number of teachers and their experience, and whether the school offers preschool education), and student characteristics (gender).

Thus, there are significant differences in results between fee-paying schools and subsidized ones (both types), but no statistically significant differences between the two types of subsidized schools.

24. This method does not solve the selection problem. In fact, test results may be affected if schools have gone through an increasing process of student selection between the two years considered.

25. Table A2 of the Appendix presents a description of the variables used in the regressions.



**Table 5**

*Regressions of the Effect of School Type (Dependent Variable: SIMCE Test Average, 4th Grade, 1996)*

Variables	Level		"Value Added"	
	(1)	(2)	(3)	(4)
Constant	65.521* (378.53)	69.821* (73.21)	28.43* (39.24)	38.378* (30.38)
Dummy fee-paying	18.964* (36.33)	5.036* (7.12)	4.943* (10.84)	2.103* (3.47)
Private school				
Dummy subsidized	4.549* (14.46)	0.350 (.98)	1.149* (4.74)	0.614 (1.90)
Private school				
SIMCE Test 1994			0.615* (54.07)	0.497* (37.08)
Socioeconomic level A		9.011* (10.26)		2.450* (3.05)
Socioeconomic level B		6.154* (10.21)		1.565* (2.61)
Socioeconomic level C		1.397* (3.05)		-0.297 (-.59)
Vulnerability index		-0.123* (-16.49)		-0.071* (-10.20)
Geographical index A		-1.818* (-4.42)		-1.261* (-3.86)
Geographical index B		-0.375 (-.74)		-0.336 (-.84)
Geographical index D		2.900* (5.79)		2.399* (5.80)
Geographical index E		0.031 (.05)		1.272 (1.69)
Male schools		3.466* (3.28)		1.746* (2.13)
Female schools		4.822* (6.57)		1.943* (3.41)
Teacher experience		0.043* (2.11)		0.031 (1.63)
Pupil/teacher ratio		-0.081* (-4.25)		-0.058* (-3.43)
Preschool level		0.803* (2.12)		0.604 (1.82)
Number of teachers		0.070* (7.36)		0.035* (4.65)
$R^2$ adj.	0.213	0.423	0.565	0.593
F	715.81	236.51	1,761.02	349.59
N	5,133	5,133	4,074	4,074

Notes: Excluded dummies are: Municipal school, socioeconomic level D, geographical index C, coeducational school, school without pre-school education; *t*-statistics in parenthesis.

\* Statistically significant at the 0.01 level.

Regressions 3 and 4 estimate Equation 2, allowing better control for unobserved characteristics. The results confirm that the points gap between municipal and subsidized private schools disappears when control variables are added, while it remains true that fee-paying schools obtain better results than the other types of school.

The most important control variable is family socioeconomic characteristics. It is enough to add this variable into the regression for the test scores between subsidized private schools and their municipal counterparts to become equal. This is shown in Table A4 of the Appendix, which gives the results of a stepwise estimation of the equation including school results from an earlier year for the same class as an explanatory variable.<sup>26</sup>

These results confirm, for the Chilean case, a situation that has been widely analyzed in the international literature. However, it remains the case that despite socioeconomic characteristics being a fundamental variable, a high performance variance persists among schools with similar indices of vulnerability, as can be seen in Figure A1 in the Appendix.

Another factor which significantly affects performance is school size, measured by the number of teachers; in the Appendix we provide graphs showing the dispersion of SIMCE point scores by size of school corrected for the teacher-pupil ratio in each school. (Figure A2). Despite a significant correlation between school size and points score, again there is high dispersion; the significant points differences that exist among small schools (small number of teachers) may be an indication of the importance of teaching quality in students' results.

### ***A. Urban/Rural Results***

We should point out that the results are highly sensitive to the sample of schools being compared. Table 5 was based on data from all schools taking the SIMCE test in 1996. However, given the high points variance between schools according to geographical location, school type, size and other variables, any study based on a sample of schools could obtain biased results. In our opinion, this explains the different results obtained in earlier studies that have analyzed educational achievement by school-type in Chile.<sup>27</sup>

In particular, our analysis suggests that there are significant performance differences between subsidized private and municipal schools in urban and rural areas. This is shown in Table 6, which repeats the estimations of the previous models, but allowing for differences between urban and rural schools, for which we add a rural dummy and all the interactions with the previous explanatory variables.

The results of Table 6 show that performance differences do exist between urban and rural schools: fee-paying private schools perform better than other schools in urban areas. In rural areas there are very few fee-paying school, so the results are not statistically significant. Subsidized private schools, for their part, do better than municipal schools in urban areas, regardless of whether we estimate in terms of test

26. Table A4 of the Appendix gives the coefficient on the school-type dummies (fee-paying and subsidized private) as control variables are added in. An appendix with all the regressions can be made available on request.

27. See the discussion of the results of previous studies on Chile in Section III.

**Table 6**

*Regressions of the Effect of School Type, Urban and Rural Schools (Dependent Variable: SIMCE Average, 4th Grade, 1996)*

Variables	Level		“Value Added”	
	Coefficients	t-test	Coefficients	t-test
Constant	69.55	42.65*	49.66	35.79*
Fee-paying private school	5.41	7.06*	3.14	6.14*
Subsidized private school	1.62	3.66*	1.03	3.64*
SIMCE test 1994			0.35	30.84*
Socioeconomic level A	8.11	5.70*	2.44	2.29*
Socioeconomic level B	5.85	4.60*	1.29	1.33
Socioeconomic level C	2.28	1.88	-0.77	-0.82
Vulnerability index	-0.19	-17.28*	-0.13	-17.59*
Geographical index A	-2.27	-5.30*	-1.71	-6.24*
Geographical index B	-0.33	-0.62	-0.24	-0.72
Geographical index D	2.35	3.07*	1.92	3.87*
Geographical index E	4.29	1.59	6.58	3.31*
Boys only schools	2.57	2.43*	1.60	2.40*
Girls only schools	4.34	5.95*	2.51	5.47*
Teacher experience	0.008	2.99*	0.006	3.27*
Pupil/teacher ratio	-0.006	-2.73*	-0.005	-3.41*
Preschool level	0.61	1.20	0.24	0.71
Number of teachers	0.008	8.61*	0.005	8.29*
Rural	1.36	0.57	-60.77	-25.91*
Interactions rural with				
Fee-paying private school	-8.11	-0.63	-5.00	-0.61
Subsidized private school	-4.68	-6.02*	-0.050	-0.76
SIMCE test 1994			0.86	46.78*
Socioeconomic level A	7.74	0.64	-6.74	-0.88
Socioeconomic level B	-2.81	-1.25	-2.75	-1.61
Socioeconomic level C	-0.59	-0.44	0.21	0.20
Vulnerability index	0.11	7.15*	0.15	12.18*
Geographical index A	0.009	0.06	1.72	1.61
Geographical index B	-5.05	-2.55*	-1.47	-1.09
Geographical index D	-4.00	-3.00*	-2.37	-2.54*
Geographical index E	-8.41	-2.86*	-5.14	-2.33*
Boys only schools	9.60	1.57	-1.40	-0.36
Girls only schools	-2.03	-0.23	-2.36	-0.43
Teacher experience	0.001	0.27	-0.009	-2.50*
Pupil/teacher ratio	-0.006	-1.56	0.002	0.52
Preschool level	1.93	2.47*	-0.007	-0.13
Number of teachers	-0.009	-1.93	-0.006	-1.88
R <sup>2</sup> adj.	0.43		0.74	
F	124.44		332.96	
N	5,133		4,074	

Notes: Excluded dummies are: Municipal school, socioeconomic level D, geographical index C, coeducational school, school without preschool education.

\* Statistically significant at the 0.01 level.

score levels or “value-added” (including the SIMCE results from a previous year). On the other hand, in rural areas, other things equal, subsidized private schools achieve lower points scores than municipal schools (a negative coefficient in the estimation using test score levels), but there are no statistically significant differences between the two in achievement growth based on an initial score (“value-added”).

Factors that could be responsible for these results include, (i) less competition for students among subsidized rural schools, compared to urban ones, due to lower population densities in rural areas;<sup>28</sup> (ii) the fact that rural municipal schools may have obtained more resources (although programs in support of rural areas ought not to discriminate by school type); (iii) the lesser relative advantages of subsidized private schools in rural as compared to urban areas, such as greater difficulty in obtaining funds from parents (co-financing), and fewer opportunities for selecting students and teachers.<sup>29</sup>

These results suggest that there are limits on the mass development of private schools and, hence, for the private school-choice movement in rural areas.<sup>30</sup>

The results obtained for the school-size and vulnerability variables in rural areas are interesting, as they mean that small rural schools catering for poor families (high vulnerability index) get good SIMCE results. Case studies made of schools with high points scores and low socioeconomic levels show that their performance is explained by the effort and motivation of a teacher, or a small group of teachers, identified with a particular community.<sup>31</sup>

### ***B. Student Heterogeneity in Different Types of Schools***

The comparison of SIMCE results across different school types may be affected by selection factors: complementary studies will be needed, as well as new data sources, to analyze the issue of selection in the Chilean educational system in greater depth. As a way of approaching this issue, we examine the points dispersion among schools at 8th grade level, where selection is more important, in order to analyze the homogeneity of the school population (Table 7).

In the first place, we do indeed see that there are schools that have a highly homogeneous student composition; for example, there is one fee-paying private school with a standard deviation of 3.6 (corresponding to a SIMCE points average of 93.7 percent). However, we also found private schools, both subsidized and fee-paying with a highly heterogeneous student body. In general, looking at average and minimum values, we are inclined to conclude that the most homogeneous schools are fee-paying private, followed by subsidized private and then municipal schools.

Given that there may be homogeneous schools with low SIMCE scores, in the last three rows of the table we reproduce calculations for schools with SIMCE scores

28. In fact, rural schools tend to be monopolies in their geographical area, not only because of the lower population density but also because the government pays a higher subsidy to schools in places where there is no other school within five kilometers.

29. As Carnoy and McEwan (1997) argue, subsidized schools seem to benefit from a supply of part-time teachers provided by the municipal sector.

30. Sander (1997) argues that the private school choice movement in the USA seems to be less relevant to rural areas as compared to urban areas.

31. See, for example, Arancibia et al. (1998).

**Table 7**

*Standard Deviation of School Performance (SIMCE Test 8th Grade, 1995, Metropolitan Region)*

	Minimum Value	Maximum Value	Average
All schools			
Municipal	5.85	25.17	14.75
Subsidized private	5.32	20.92	14.74
Fee-paying private	3.55	24.01	13.92
High scoring schools (SIMCE > 70)			
Municipal	5.85	18.35	12.44
Subsidized private	8.83	17.62	12.99
Fee-paying private	3.55	18.12	12.29

Source: Authors' calculation based on SIMCE test results.

above 70 points. Interestingly, we see that the order between municipal schools and subsidized private schools is inverted. This is explained as follows: (i) high-scoring subsidized private schools (>70 points) are less homogeneous than other schools; (ii) there are some municipal schools with a highly homogeneous population which obtain high points; these are schools of long tradition in Chile and, due to an excess demand for places, they can select their students.<sup>32</sup> In the end, these results are a sign of a student selection phenomenon, which cuts across different school types.

Another piece of information pointing in the same direction comes from a survey of Provincial Education Directors, who were asked whether subsidized private schools used discriminatory practices against students, such as the cancellation of registration in the case of students repeating grade, or girls who become pregnant, or the expulsion of students for other reasons during the school year. The result of the survey was that 37.6 percent of municipal schools and 55.6 percent of subsidized private schools made use of such practices.

#### IV. Final Comments

Since the beginning of the eighties Chile has implemented an original educational reform, out of which three different types of school have developed: municipal, subsidized private and fee-paying private schools, with parents able to choose freely among the three types. An assessment of the Chilean experience is therefore relevant for countries facing similar policy options.

This paper has described the educational reforms implemented in Chile and com-

32. These are also very large schools: for example, one of them has 719 students in the year group concerned.



compares the educational outcomes achieved by schools under different forms of management.

A comparative analysis of SIMCE test results shows that, in reality, the points gap between subsidized private and municipal schools is small or nonexistent, and substantially less than what is suggested by a simple comparison of raw test results.

Subsidized private schools, which are the new school type to emerge from the 1980s reforms, at present show performance more akin to municipal than to fee-paying schools, when this is measured in terms of student achievement on standardized tests.

The significant gap that exists in scores obtained on standardized tests between fee-paying schools and publicly financed ones (both municipal and subsidized private schools) can be explained by the amount of resources available to fee-paying schools, which are financed by parents.

Although the results gap between subsidized and fee-paying schools is significant, it has tended to narrow over time. This may be due to (i) the extra competition generated by an educational market in which most of the population participates; and (ii) policies to improve educational quality that have been implemented in Chile since 1990, targeted on the worst performing subsidized schools.

When the performance of rural and urban schools is compared, it can be seen that subsidized private schools do better than their municipal counterparts in urban areas, but this is not the case in rural zones. This is probably due to the natural limits on large-scale development of subsidized private schools in rural areas.

Another issue relates to the heterogeneity/homogeneity of the student makeup in terms of academic performance. While it is true that in the public sector as a whole there are schools with a wider points dispersion in the SIMCE tests, on average these differences are not relevant in the schools we analyzed. Meanwhile, if we focus on the schools with the highest test scores, municipal schools show greater homogeneity than subsidized private schools, which may be an indicator of student selection by a segment of public schools. This does not necessarily have a negative connotation, given that the schools concerned are of long tradition, and have an excess demand for places, which allows them to select their students.

Therefore, while there are indicators suggesting the existence of student selection in the Chilean educational system, this is a problem that cuts across different school types, and one that may be inherent in a school choice system.

## Appendix

**Table A1***Monthly School Subsidy Unit (SSU)*

Year	SSU (US\$1997)
1980	21.9
1981	30.0
1982	27.6
1983	23.7
1984	22.3
1985	20.9
1986	23.4
1987	22.0
1988	22.2
1989	22.3
1990	21.2
1991	21.8
1992	23.9
1993	26.0
1994	29.0
1995	34.2
1996	38.0
1997	41.1
1998	45.2

Source: González (1998) and Ministry of Education. Figures correspond to the average monthly subsidy paid per-student, in constant 1997 dollars.

**Table A2**  
*Variable Definitions*

Variable	Definition
Socioeconomic level A	Schools in which most parents have completed secondary education, or have done some higher education (finished or unfinished); and whose monthly educational expenses are greater than \$25,052.
Socioeconomic level B	Schools in which most parents have higher, secondary or primary education finished or unfinished, and whose monthly educational expenses are between \$13,210 and \$25,051.
Socioeconomic level C	Schools where parents have secondary education unfinished, or primary education completed, or less, and whose educational expenses are between \$5,284 and \$13,209.
Socioeconomic level D	Schools where parents have primary education unfinished, or less, and whose educational expenses are less than \$5,283.
Vulnerability index	Index calculated by JUNAEB for every school, which includes anthropometric measures such as weight, height and medical needs, as well as measures of education levels among mothers.
Geographical index A	Large cities with good accessibility.
Geographical index B	Medium and small cities with good accessibility.
Geographical index C	Medium and small cities with poor or regular accessibility, and marginal urban areas with poor, regular or good accessibility.
Geographical index D	Semirural areas with poor, regular or good accessibility, and rural areas with regular or good accessibility.
Geographical index E	Rural areas with minimal accessibility and areas with minimal or poor accessibility.

Note: 1996 exchange rate: Ch \$430/US\$.

**Table A3***Variables: Descriptive Statistics*

Variables	Total		Urban		Rural	
	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
SIMCE 4th grade 1996	68.29	11.19	71.62	9.87	62.80	11.09
SIMCE 4th grade 1994	66.15	11.10	68.43	10.48	59.42	10.09
Fee-Paying private school	0.08	0.27	0.13	0.33	0.00	0.05
Subsidized private school	0.28	0.45	0.38	0.48	0.12	0.32
Municipal school	0.64	0.48	0.50	0.50	0.88	0.32
Socioeconomic level A	0.06	0.25	0.10	0.30	0.00	0.05
Socioeconomic level B	0.19	0.39	0.30	0.46	0.01	0.11
Socioeconomic level C	0.53	0.50	0.58	0.49	0.45	0.50
Socioeconomic level D	0.21	0.41	0.02	0.13	0.54	0.50
Vulnerability index	46.27	33.69	25.13	19.93	81.23	19.86
Geographical index A	0.40	0.49	0.62	0.49	0.03	0.18
Geographical index B	0.11	0.31	0.16	0.37	0.01	0.12
Geographical index C	0.12	0.30	0.17	0.37	0.03	0.18
Geographical index D	0.29	0.45	0.05	0.22	0.67	0.47
Geographical index E	0.10	0.29	0.00	0.06	0.25	0.43
Boys only school	0.01	0.11	0.02	0.14	0.00	0.03
Girls only school	0.03	0.17	0.05	0.21	0.00	0.03
Coeducational school	0.96	0.23	0.93	0.25	1.00	0.05
Teacher experience	16.29	6.71	16.10	7.01	16.61	6.17
Pupil/teacher ratio	21.90	7.31	23.09	7.73	19.92	6.06
Preschool level	0.71	0.45	0.90	0.30	0.40	0.49
Number of teachers	20.30	17.49	28.29	17.20	7.09	6.52
N (number of schools)	5,133	5,133	3,199	3,199	1,934	1,934

**Table A4**

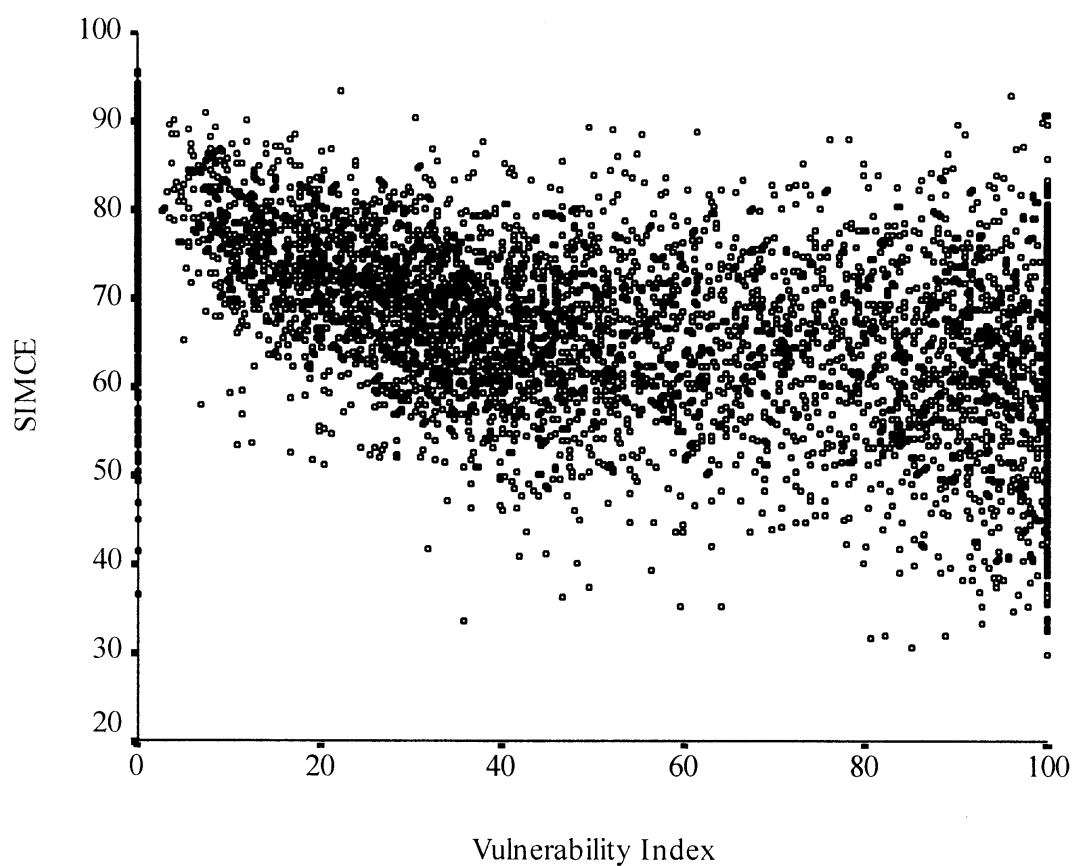
*Regressions of the Effect of School Type. Points Differences Compared to Municipal Schools (Dependent Variable: SIMCE Test Average 4th Grade, 1996)*

Controls	Fee-Paying Private	Subsidized Private
Without controls	4.943*	1.115*
+Socioeconomic level (SL)	2.659*	0.378
+SL + Vulnerability index (VI)	2.004*	-0.221
+SL + VI + Geographical index (GI)	1.924*	-0.122
+SL + VI + GI + Male/female dummy (M/F)	2.037*	-0.161
+SL + VI + GI + M/F + teachers' experience (EXP)	2.382*	0.110
+SL + VI + GI + M/F + EXP + teacher-pupil ratio (TP)	1.974*	0.208
+SL + VI + GI + M/F + EXP + TP + preschool (PS)	2.016*	0.288
+SL + VI + GI + M/F + EXP + TP + PS + num- ber of teachers	2.103*	0.614
N (number of schools)	4,074	4,074

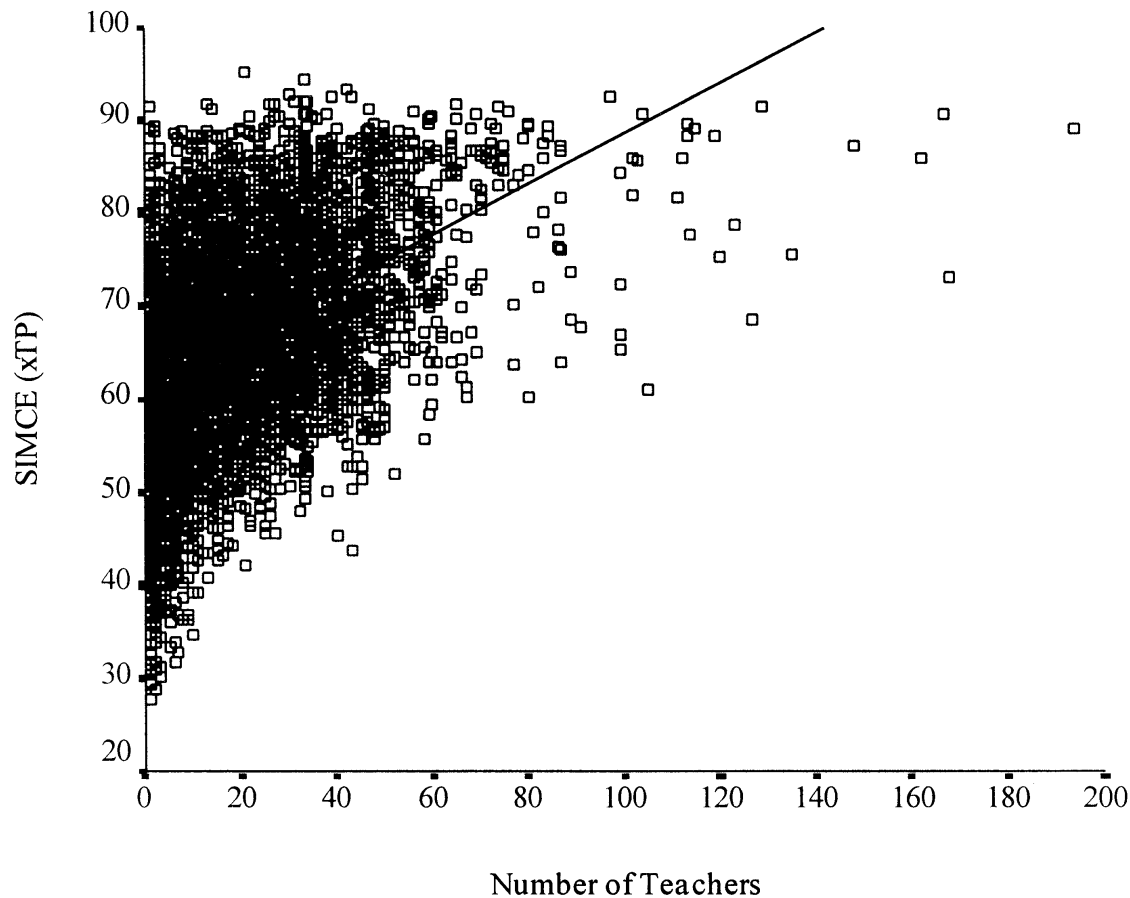
Note: The table shows coefficients obtained for dummy variables representing fee-paying private and subsidized private (the omitted dummy represents municipal school) in regressions that include the control variables indicated in the table. All the regressions include the SIMCE test results from a previous year (1994).

\* Statistically significant at the 0.01 level.





**Figure A1**  
*SIMCE Results and Vulnerability Index. 4th Grade, 1996*



**Figure A2**  
*SIMCE Results and School Size, 4th Grade 1996*

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