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MUNICIPAL AND PRIVATE SECTOR RESPONSE TO DECENTRALIZATION AND SCHOOL CHOICE

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Municipal and Private Sector Response to Decentralization and School Choice: The Case of Chile, 1981-1990

by
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and
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Abstract

A large number of developing nations are in the process of decentralizing basic education, with the aim of diversifying revenue sources and introduction greater accountability and efficiency. This is especially true in Latin America, where Chile introduced the first significant reform in 1981. This reform kept most of the responsibility for educational finance with the Ministry of Education but transferred the responsibility for delivering services to municipalities and non-profit, private schools. In response to this reform, municipalities increased their finance of public schools, and the supply of subsidized-private education increased dramatically. By 1990, enrollment in subsidized-private schools represented about one-third of total primary-secondary school enrollments.

This paper examines the effects of the reform. Municipal finance, which is closely tied to municipal fiscal capacity, has created inequities in school expenditures even though it represents only ten percent of total revenues. Variations in the private school market share across municipalities are principally explained by the ease of market entry, family socioeconomic status, and the relative performance of public and private schools; this model does not offer a satisfactory explanation of the growth in private school enrollments in Chile over time. The effect of the reform on cost-effectiveness is ambiguous. Ministry of Education non-teacher employment declined by over half, cognitive test also declined. There is some evidence that the growth in private school enrollments may have improved overall efficiency since private schools are found to be slightly more cost-effective than public schools.
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INTRODUCTION

Countries in Latin America are increasingly experimenting with educational reform which decentralizes the responsibility for providing primary and secondary education and introduces elements of school choice and competition. At present, school choice experiments are still in the planning stage, while decentralization is being implemented rapidly and chaotically. Among the features of decentralization in the region are: (1) the division of responsibilities among levels of government is poorly defined; (2) revenue transfers to subnational governments are ad hoc in nature and frequently politically negotiated; (3) subnational governments are ill-prepared to assume their new functions; and (4) little attention is paid to the design of mechanisms to promote accountability and consumer voice.

Given the current popularity of decentralization and school choice policies, it is useful to evaluate the experience of one developing country--Chile--which undertook such reforms over a decade ago. As with any case study, unique features of the Chile reform bring into question its applicability to other countries. In particular, the fact the reform took place in a nondemocratic political context means the design and implementation of the reform might not be practical where political opposition, especially among teachers, would be freely expressed. Despite the various caveats one can make about the Chilean reforms, the unique nature of the policy change and the availability of data to measure its effects are sufficient reason to attempt a systematic assessment.

EDUCATION REFORM IN CHILE

As is true in many countries today, education reforms in Chile were part of a larger decentralization policy, which included assigning municipalities new revenue sources and new expenditure responsibilities. In terms of expenditures, the largest responsibilities given to municipalities were primary and secondary education and primary health care. The 1980 Decentralization Act transferred all school property from the Education Ministry to the municipalities. Teachers were terminated as central government employees, given severance pay, and transferred to municipal payrolls.

One of the more unique features of the education reform was the introduction of central government school attendance grants (or vouchers) to finance primary-secondary education. Municipalities receive grants based on the number of students attending class each month, with the base grant level adjusted for differences in costs. In addition, the Education Ministry directly provides textbooks to schools and directly contracts for the provision of school lunches

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1 The Municipal Revenue Act of 1980 created new sources of municipal revenue, including a large block grant called the Municipal Common Fund, which attempted to equalize fiscal disparities. However, municipalities were given only very limited powers to change their revenues by altering tax rates.

2 The 1980 Law of Subventions, which remains relatively unchanged today, provides a per student payment adjusted for education level and other school characteristics, including location, with rural schools and boarding schools receiving more.
to poor children, while municipalities can also receive grants for school construction and rehabilitation from the central government's Regional Development Fund. Also, in the early stages of decentralization, the Ministry provided municipalities with a 3-5% overhead grant on salaries to cover administrative expenses. As stated in early policy papers of the Education Ministry, municipalities were expected to supplement the school attendance grants they received.

Another unique feature of the reform was the treatment of private schools. Chile has a long tradition of public subsidies to private schools offering free education; historically, most such schools had a religious affiliation. A 1951 law provided a per student subsidy equal to fifty percent of the cost of public education. Subsequent reductions in the real value of this subsidy forced the closure of a large number of private schools in the late 1960s and early 1970s; the military government attempted to reverse this pattern by increasing the subsidy level in the late 1970s. The 1980 reform further increased the subsidy to one hundred percent of the recurrent cost of public education, with the value of the attendance grant determined by the same formula used to determine municipal school grants. In effect, the reform introduced education vouchers which could be used in any school, public or private, which did not charge tuition.

Perhaps the most important behavioral effect of Chile's educational reform was to directly tie school revenues to school enrollments, thus providing an incentive to schools to compete for students. Municipal schools, which often have excess physical and teaching capacity, find that enrolling an additional student generates revenues (the voucher) in excess of marginal cost, thus permitting reductions in municipal finance. Subsidized, private schools, which have lower recurrent costs than the public schools, can also maximize profits (in the form of director/owner salaries) by enrolling students up to the school's physical capacity.

MUNICIPAL AND PRIVATE SECTOR RESPONSE

Revenues. The school attendance grant or voucher represents a minimum expenditure level which municipalities may choose to augment through transfers from their other, non-earmarked revenues. When the reform was initiated in 1980, the grant was set equal to the per student expenditures of the Education Ministry, but by 1990 the real value of the grant had decreased by almost forty percent. The result has been a rapid growth in municipal finance of municipal schools. By 1991 municipal finance represented 10.5 percent of total municipal

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3 Private schools are eligible to receive government-financed textbooks and school lunches for poor children, but they are not eligible for capital investment grants.

4 In principle, even schools which charge tuition are eligible to receive the voucher, but a 40 percent tax rate on tuition revenue (as reflected in reduced voucher levels) means that very few schools choose to openly charge tuition. Some schools do receive significant amounts of donated revenues or revenues in kind, especially for capital investment, which avoid the tax.

5 The rapid growth in the number of subsidized, private schools since 1981 suggests that vouchers, though declining in real value over the decade, are adequate to generate "profits".
school revenues.

Although municipal and private schools receive attendance grants of equal value, municipal schools receive three additional types of financial assistance: (1) in-kind transfers of school buildings from the Education Ministry to the municipalities; (2) cash transfers from the Regional Development Fund for municipal school construction and rehabilitation; and (3) cash transfers from municipal general funds. The result is that municipal school revenues per student exceed subsidized-private expenditures.

Changing Market Share. As shown in Figure 1, the percentage of all primary-secondary school students in municipal schools has continuously declined since the introduction of the reform, and the share of all students in subsidized-private schools has continuously grown and currently represents about one-third of total enrollments. Meanwhile, the share of students in paid-private schools initially decreased and subsequently increased. Upon the introduction of the full-cost voucher all paid-private schools which were spending less than the voucher amount had a clear incentive to accept the voucher and become subsidized-private schools. As a result, between 1979 and 1982, paid-private enrollments decreased by about 27 percent while subsidized-private enrollments increased 35 percent. However, as the real value of the voucher declined throughout the 1980s, paid-private school enrollments grew. By 1989, paid-private enrollments were larger than they were prior to the reform and were 50 percent higher than they were in 1982. Interviews with subsidized-private school directors suggest the trend of conversions from subsidized-private to paid-private status will continue, largely due to the decrease in the real value of the voucher.

Despite the voucher scheme, not all students in Chile can choose the school they attend. Of the total of 325 municipalities, 234 have subsidized-private schools, and only 72 have paid-private schools. Both types of schools are concentrated in urban areas, where private school enrollments are as high as public school enrollments. In 91 predominantly rural municipalities, students have no choice but to attend public schools.

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Some subsidized private schools also receive other financial assistance in the form of donated school buildings and financial or in-kind contributions from school parent-teacher associations.

We estimate the difference is between 13.8 percent (the reported difference in expenditures per pupil in municipal compared to subsidized-private schools) and 36.8 percent (which includes, in addition, an estimate of the implicit rental subsidy received by municipal schools). The implicit rental subsidy is estimated assuming that municipal and subsidized-private schools spend an equal percentage of their budget on materials and supplies. A recent study for the Education Ministry finds municipal schools spend 90 percent of their budget on salaries, compared to 67 percent for subsidized-private schools, which in most cases must also pay rent on their premises.

The Education Ministry budget increased 49 percent in real terms the year (1981) of the reform, but not all of this can be attributed to subventions to formerly private-paid schools.

A municipality is defined as a geographic area; while it typically includes an urbanized area, it may be predominantly rural.
Figure 1: Market Shares in Primary-Secondary School Enrollment

![Bar chart showing market shares in primary-secondary school enrollment from 1979 to 1989. The bars represent Public, Subsidized Private, and Paid Private sectors.]

**Demand for Private Education.** The demand for private education has been hypothesized to be directly caused by (1) excess demand resulting from less than complete coverage by the public school system and (2) heterogeneity in tastes not fully satisfied by public schools oriented to the tastes of the median voter, in addition to the usual variables of tuition price and ability to pay. While excess demand, as measured by comparing the size of the age cohort to the supply capacity of the public sector, is likely to explain demand in many developing countries, it is unlikely to be an important factor in Chile, where 80 percent of the primary-secondary school age cohort are enrolled in school and where public supply is most deficient in rural municipalities. The relatively homogeneous cultural and religious composition of the population also suggests these taste factors are likely to play a relatively unimportant role in explaining demand for private schooling. On the other hand, heterogeneity in tastes associated with socioeconomic status or educational levels of households, a household's ability to pay, and school quality are all likely to positively affect demand. Of these variables, the most difficult

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10 See James (1985, 1991) for further elaboration of these arguments.
Table 1

STUDENT CHARACTERISTICS BY TYPE OF SCHOOL

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Public School Students</th>
<th>Subsidized Private School Students</th>
<th>Paid Private School Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Years of Education of Head of Household*</td>
<td>7.8</td>
<td>9.3</td>
<td>NA</td>
</tr>
<tr>
<td>Monetary Income* (Thousands of Pesos per Month)</td>
<td>110.6</td>
<td>153.3</td>
<td>NA</td>
</tr>
<tr>
<td>Household Size*</td>
<td>5.1</td>
<td>5.1</td>
<td>NA</td>
</tr>
<tr>
<td>Percent of Households not Receiving any School Meals*</td>
<td>58.3%</td>
<td>76.7%</td>
<td>NA</td>
</tr>
<tr>
<td>Average Education Level of Parents (1 low, 5 high)**</td>
<td>2.18</td>
<td>2.41</td>
<td>3.63</td>
</tr>
<tr>
<td>Average Socioeconomic Level of Parents (1 low, 4 high)**</td>
<td>0.94</td>
<td>1.27</td>
<td>2.16</td>
</tr>
<tr>
<td>Average Repetition Rate**</td>
<td>9.7</td>
<td>7.8</td>
<td>2.2</td>
</tr>
<tr>
<td>Average Fourth Grade Math Score (1990)**</td>
<td>49.86</td>
<td>60.26</td>
<td>77.06</td>
</tr>
<tr>
<td>Average Fourth Grade Spanish Score (1990)**</td>
<td>55.46</td>
<td>61.47</td>
<td>77.41</td>
</tr>
</tbody>
</table>

* For 72 municipalities in the CASEN 3 (1990) sample.
** For 325 municipalities from the 1990 SIMCE test and teacher questionnaire.

to measure is school quality. Among the perceived indicators of quality in Chile are the school name, the presence of school uniforms, and the background of school peers.11

Table 1 shows a number of household and school characteristics for children in public, subsidized-private, and paid-private schools in Chile. These data show: (1) public and subsidized-private schools appear to be more similar than do subsidized-private and paid-private
schools; (2) household income, education, and socioeconomic status are all higher in private than
public schools; and (3) school peers in private schools are of higher socioeconomic status and
higher educational achievement levels than peers in public schools.¹²

**Supply of Private Education.** Private education in Chile is characterized by the nature
of ownership and the price of the service. The traditional private school has an affiliation with
some non-profit (religious or civic) organization; it often has an elite clientele and charges high
tuition levels. The new, non-traditional private school is sectarian, frequently owned by former
teachers in the public system, and typically receives most its revenues from the government
voucher.¹³

The traditional private school is similar to private education in other countries in its
affiliation with non-profit organizations and its access to donated capital and volunteer labor,
which reduce its costs. The supply of education by traditional schools is likely to be relatively
inelastic with respect to input prices and voucher levels, although the voucher is likely to
influence its decision to accept tuition or not. The new private school, while required to be non-
profit, may be de facto profit seeking with surplus revenues captured by the owner/director of
the school. Hence, the supply of education by new schools is likely to be more elastic with
respect to input prices and the voucher level. Since public schools already exist in all
municipalities, private supply is also affected by the opportunity for market entry, which is likely
to be easier in larger metropolitan areas which could support both public and private schools.

**Model of Private School Market Share.** This paper attempts to estimate a reduced-form
model of private school market share for the 234 urban municipalities that have both public and
private schools.¹⁴ Since there are no data on paid-private school enrollments at the municipal
level, market share is defined as the percent of publicly-financed students that enroll in
subsidized private schools. The model hypothesizes the demand for subsidized-private schooling
is determined, among other things, by the relative educational outcomes of public and private
schools. Earlier empirical studies of variations in private market share across countries have not
tested this hypothesis but have instead demonstrated that public school spending levels adversely
affect private school demand.¹⁵ In the case of Chile, educational outcomes would appear to
be a better indicator to parents of the quality of schooling than would public school spending,
which does not always reflect the quantity of school resources received by public school

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¹² Educational achievement, as measured by the grade four SIMCE test administered in about 5000 of Chile's
schools, is both a schooling outcome and an input to learning.

¹³ These differences are reflected in the test scores of students enrolled in the two types of schools. In 1990,
subsidized private schools more than ten years old had an average Spanish test score of 63.8, compared to 60.5 for
subsidized private schools less than ten years old.

¹⁴ The model is a reduced form equation of the supply of and demand for private education.

¹⁵ See James (1993). One difficulty with the spending variable is that it is likely to reflect variations in input
prices as well as the quantity of educational inputs received by children.
children.\textsuperscript{16}

This model also assumes the subsidized-private school market share is determined by relative test scores but not vice versa, since government regulations prevent subsidized-private schools from using entrance examinations to select students. Of course, schools may use proxies for cognitive achievement in selecting students, but at least one study finds no evidence of such simultaneity.\textsuperscript{17}

Earlier cross-sectional empirical work has shown the private school market share to be larger where public school provision is small, where there is high cultural heterogeneity, and where governments subsidize private schools.\textsuperscript{18} These findings are not easily confirmed for the cross-section of Chilean municipalities as public school provision is consistently high, the culture is fairly homogeneous, and subsidy levels, adjusted for differences in costs, are uniform. The estimated model, reported in Table 2, finds a strong relationship between the private school market share and population density, which can be interpreted as a proxy for ease of market entry.\textsuperscript{19} Neither the subsidization or voucher level per student nor the teacher salary level are significantly related to private supply. This is not surprising given the lack of variation in voucher levels, controlling for costs, and the lack of a measure of teacher salaries in private schools.

\textsuperscript{16} Instead, it sometimes reflects constraints on municipalities in their ability to either release redundant teachers or to replace older, highly paid teachers.

\textsuperscript{17} In estimating simultaneous models of private school market share and public school spending, a possible proxy for relative educational quality, James (1993) found no evidence that private market share determines public spending.

\textsuperscript{18} See James (1986 and 1987).

\textsuperscript{19} A linear probability model is adopted over a logit model, as its coefficients are more easily interpreted, and, in this case, does not yield predicted values of percent private that lie outside the zero to one boundary.
Table 2
PRIVATE SCHOOL MARKET SHARE
(Standard Errors in Parentheses)

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>Private Enrollments as Percent of Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>15.551 (9.715)</td>
</tr>
<tr>
<td>Subsidization per Student (in thousands)</td>
<td>-0.255 (.369)</td>
</tr>
<tr>
<td>Teacher Salary in Public Schools (in thousands)</td>
<td>1.359 (1.641)</td>
</tr>
<tr>
<td>Density (in thousands)</td>
<td>1.785 (.344)</td>
</tr>
<tr>
<td>Socioeconomic Status of Families with Children in School</td>
<td>8.573 (3.615)</td>
</tr>
<tr>
<td>School Age Population</td>
<td>0.141 (.102)</td>
</tr>
<tr>
<td>Poverty Rate</td>
<td>0.382 (.170)</td>
</tr>
<tr>
<td>Ratio of Public to Private Test Score-Math</td>
<td>-11.392 (6.061)</td>
</tr>
<tr>
<td>Ratio of Public to Private Test Score-Spaniah</td>
<td></td>
</tr>
<tr>
<td>$R^2$</td>
<td>0.240</td>
</tr>
<tr>
<td>S.E.</td>
<td>14.583</td>
</tr>
</tbody>
</table>

* Significant at 0.10 level.

** Significant at 0.05 level.
Three demand variables are found to be strongly related to the private school market share. Higher average household socioeconomic status, a proxy for household tastes, positively affects private school demand, a finding consistent with our expectations. However, the school-age population of the municipality, a proxy for heterogeneity of tastes, is not statistically significant. A high poverty rate is also found to increase private school demand; since most poor students are found in the public schools, higher poverty rates may drive higher income students out of public and into private schools. Finally, there is weak evidence that student test scores affect school choice. A higher ratio of public to private school test scores in mathematics (but not Spanish) adversely affects private school demand. Since most parents do not have access to school-level test score data, these variables are a proxy for parental perceptions of student peer groups.

These results help confirm some propositions but fail to shed light on others. They confirm the proposition that the supply of private education is larger in densely populated areas where there is likely to be greater ease of market entry; that households of high socioeconomic status are more likely to prefer private schooling; and that peer group characteristics, be they measures of achievement or economic status, affect school choice. But the model fails to explain the large increase in private market share between 1982 and 1989 at a time when the real voucher level was decreasing. Two untested hypotheses suggest themselves: (1) the demand for private education shifted sufficiently rapidly to offset the reduction in supply resulting from reduced real vouchers; and (2) input prices, especially teacher salaries, decreased even more rapidly than voucher levels, resulting in continued supply increases.

THE EQUITY AND EFFICIENCY CONSEQUENCES OF THE REFORM

The major criticisms of both decentralization and privatization of education through voucher schemes is that both policies may lead to greater inequality of educational opportunity among children. Data constraints do not permit us to fully examine the equity consequences of Chile's educational reform, but the data do permit some partial answers.

Equality in Spending. Equity can be assessed in terms of either school inputs or school outputs. The voucher financed by the central government provides a high base level of minimum spending that either municipal or subsidized-private schools can increase from other revenue sources. As noted earlier, the voucher varies among jurisdictions to compensate for differences in costs between levels of education and student and community characteristics, including needs of the physically challenged. However, the formula that determines the voucher level does not adjust for the compensatory requirements of poor or low-achieving children. In fact, the only extra resources those children receive is in the form of free school lunches.

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20 Given the zero or near-zero price of private education, household ability to pay should not be strongly related to demand.
Despite the apparent equity of the basic voucher, the relatively small average amount of extra monies budgeted by the municipalities results in significant expenditure disparities. Figure 2 compares the finance and expenditures per pupil for the bottom and top decile of municipalities ranked by poverty rates, fiscal capacity, and education test scores. As shown in the figure, the voucher alone provides more cash per pupil in high poverty than low poverty municipalities and in low achieving than high achieving municipalities. But disparities in municipal finance reverse the pattern in terms of total spending, resulting in higher per pupil spending in low than high poverty municipalities and in high than low achieving municipalities. Regarding fiscal capacity (as measured by per capita general revenues), the voucher is larger for high than low fiscal capacity municipalities (reflecting cost variations), but adding the municipal finance results in expenditures in high fiscal capacity municipalities more than double those in low fiscal capacity
municipalities.\textsuperscript{21}

\textit{Equality in Outcomes.} As shown in Table 1, educational outcomes as measured by repetition rates and mathematics and Spanish test scores differ greatly between public, subsidized-private, and paid-private schools, with public schools having the worst and paid-private schools the best outcomes. Table 3 disaggregates achievement scores by four levels of household socioeconomic status. These results show the same ranking of performance by school type controlling for average socioeconomic status in the schools. The differences between municipal and subsidized-private schools, however, is small compared to the differences in test scores between socioeconomic levels.\textsuperscript{22} There is no convincing evidence that changes in test scores since the reform have favored one type of school over another. However, at least one study concludes that within public schools higher socioeconomic level students' performance improved and lower socioeconomic level students' performance worsened between 1982 and 1988.\textsuperscript{23}

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\textsuperscript{21} In addition to generating spending inequities between municipalities, municipal finance creates spending differences between public and subsidized-private schools. As of 1989, per pupil primary education and secondary education expenditures in municipal schools were 8.7 percent and 22.3 percent, respectively, above those in subsidized-private schools. This comparison, however, is not complete as it does not include the implicit rental value of public school buildings or services and goods donated in-kind to private schools, nor does it take account of the different teacher's wages paid by public and private schools. A 1990 Education Ministry survey showed that subsidized private school salaries are 24.1 percent lower than public school salaries at the primary level and 17.5 percent lower at the secondary level.

\textsuperscript{22} The data reported are for mathematics achievement in large cities. Morales Frias (1990) reports several other disaggregations of test results by subject matter, size of jurisdiction, and socioeconomic status. The results are in general consistent with those reported in Table 3 although there are cases where municipal schools have higher test scores than subsidized-private schools.

Table 3

MATHEMATICS ACHIEVEMENT (GRADE 4) IN 1988 FOR METROPOLITAN AREAS

<table>
<thead>
<tr>
<th>Socioeconomic Level</th>
<th>School Type</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Municipal</td>
</tr>
<tr>
<td>4 (highest)</td>
<td>NA</td>
</tr>
<tr>
<td>3</td>
<td>56.7</td>
</tr>
<tr>
<td>2</td>
<td>48.4</td>
</tr>
<tr>
<td>1 (lowest)</td>
<td>47.2</td>
</tr>
</tbody>
</table>

Source: Morales Frias (1990)

**Effects on Costs.** The overall cost of primary-secondary education in Chile has decreased considerably since the reform; real expenditures of all publicly-financed schools decreased 25 percent between 1981 and 1989 (see Figure 3). In addition, the overhead administrative costs of the Education Ministry decreased, with employment decreasing from 18,522 to 8,305 employees between 1981 and 1989 (see Figure 4). While much of the decrease in education expenditures has been the result of reduced teacher salaries, outlays on textbooks and school lunches have declined as well.

**Cost-Effectiveness.** While the unit costs of primary-secondary education have decreased since the reform, the evidence on educational outcomes is mixed with some evidence of declines in test scores for all types of schools between 1984 and 1988. The ambiguity of the

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24 This average hides the fact that per pupil expenditures actually increased in primary education, while they decreased in secondary education. See Espinola H. (1991).

25 The Education Ministry overhead is, of course, for all education levels.

26 The number of textbooks distributed annually decreased by 43.7 percent between 1980 and 1990; in 1980 the average student received 1.5 texts, while in 1990 this number declined to 0.9. The number of school breakfasts and lunches served also declined in the same time period.

27 However, differences in test construction over this time period result in the tests not being strictly comparable over time.
achievement data also make it difficult to determine changes in efficiency in the use of resources. Nothing can be concluded from the fact that education expenditures have declined more rapidly than test scores over the past decade, for while there has been some reduction in real school inputs, the principal consequence of reduced expenditures has been reduced teacher pay. Similarly, the observation that test scores are higher and per pupil expenditures are lower in subsidized-private compared to municipal public schools says nothing about the efficiency of these school types in producing new cognitive knowledge, for students in subsidized private schools also have home environments that are more conducive to learning and have a higher level of knowledge upon starting school than do students in municipal public schools.

The education reform introduced competition between schools for students. As opposed to the usual monopoly model of public education, competition should increase efficiency in producing those educational outcomes which influence school choice. In the particular case of Chile, it could be argued that the incentives for maximizing performance are more transparent

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21 See Levin (1991) for an elaboration of this thesis, including discussion of the possible social costs of private choice in education.
and direct for private than public schools. The owner/directors of private schools can directly
benefit from the increased enrollments which result from better performance, while the principal
benefit to public schools from increased enrollments is reduced municipal finance; public school
managers may in fact find that increased enrollments makes for extra work.\footnote{Municipal finance may be reduced to the extent the revenue from the voucher exceeds the marginal costs of an additional enrolled student; this is likely to be true for many municipalities where increased private school enrollments have resulted in excess capacity in the public schools.} If this argument
is true, one would expect to find private schools performing better than public schools.

In what follows, we specify a crude model of student learning and attempt to estimate
the relative effectiveness of public and private schools in Chile. The performance of public and
private schools has by now been examined in several important empirical studies, beginning with
Coleman, Hoffer, and Kilgore (1982). However, lack of adequate data have limited the number
of such studies for developing countries.\footnote{See Psacharopoulos (1987), Cox and Jimenez (1987), and Jimenez, Lockheed and Wattanawaha (1988).} The data for Chile have several flaws that constrain
the validity of the empirical analysis. First, our observations are at the municipal and not the individual student level. Second, the sample consists only of the seventy largest municipalities in the country. Third, the measures of current (grade 8) and lagged educational achievement (grade 4) are for different students within the same municipality, and we have school input data for only one year (1989). Thus, we make the strong assumption that student cohorts do not differ and school inputs are perfectly correlated over time. Finally, our measures of home and school environments are not very rich.

We assume the usual model in which achievement is determined by prior or lagged achievement, the home environment, and the school environment. Since the sample size is small, consisting of 70 municipal-level observations of public schools and 70 municipal-level observations of subsidized-private schools, the estimated parameters are constrained to be identical for public and private schools, excepting school expenditures, where including a separate variable for private school expenditures permits a test of the hypothesis that private and public schools are no different in their productivity.

The estimated parameters of the model are given in Table 4. Models 1 and 2 show that the effects of the home environment are captured by a measure of lagged achievement. Model 3 shows that, controlling for fourth grade achievement, school expenditures significantly affect eighth grade achievement; in addition, the magnitude of the effect is about 30 percent larger for private than public schools. Overall, however, the magnitude of the expenditure effect is small. To bring about a five percent improvement in eighth grade achievement would require a 32 percent increase in public school spending or a 27 percent increase in private school spending.

While aggregate data, a small sample, and weak measures of the student’s home environment suggest caution in drawing strong conclusions from these findings for Chile, these results are consistent with other empirical work comparing public and private schools, which typically finds private schools to have a small edge in cost-effectiveness. The principle

31 The data come from the 1990 household survey (CASEN 3), and the sample size is adequate to compute separate subsidized-private and public school means only for the largest municipalities.

32 The Chile achievement test (SIMCE) is administered at grade four in even-numbered years (e.g., 1988) and grade eight in odd-numbered years (e.g., 1989).

33 The model is estimated using OLS. As noted earlier, subsidized-private schools are not permitted to select students on the basis of test performance, but they might use proxies for test performance in selecting students. Hence, we used instrumental techniques to estimate an alternative model specification, which includes the percent of students in subsidized-private schools as an endogenous, independent variable. The coefficient on Percent Private was statistically insignificant, and other estimated coefficients were not materially affected in terms of either size or statistical significance.

34 Since the estimated results are very similar for grade eight mathematics and Spanish achievement, only the mathematics results are reported here.
<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
<th>Model 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Grade 8 Mathematics Achievement</td>
<td>Grade 8 Mathematics Achievement</td>
<td>Grade 8 Mathematics Achievement</td>
<td>Grade 8 Spanish Achievement</td>
</tr>
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<td>Years of Education of Household Head</td>
<td>1.282** (.281)</td>
<td>-0.011 (.271)</td>
<td>-0.111 (.269)</td>
<td>0.098 (.289)</td>
</tr>
<tr>
<td>Household Size</td>
<td>-3.141** (.281)</td>
<td>-0.691 (1.200)</td>
<td>-1.087 (1.118)</td>
<td>-0.095 (1.229)</td>
</tr>
<tr>
<td>Grade 4 Spanish Achievement</td>
<td>0.582** (.075)</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Grade 4 Mathematics Achievement</td>
<td></td>
<td>0.703** (.082)</td>
<td>0.637** (.085)</td>
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<tr>
<td>Expenditure Per Student (in thousands)</td>
<td>0.204** (.033)</td>
<td>0.118** (.028)</td>
<td>0.103** (.028)</td>
<td>0.098** (.029)</td>
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<tr>
<td>Expenditure Per Student in Private Schools (in thousands)</td>
<td></td>
<td></td>
<td></td>
<td>0.031** (.013)</td>
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<tr>
<td>R²</td>
<td>0.403</td>
<td>0.618</td>
<td>0.633</td>
<td>0.661</td>
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<tr>
<td>Standard Error</td>
<td>4.658</td>
<td>3.724</td>
<td>3.651</td>
<td>3.808</td>
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* Significant at 0.10 level.

** Significant at 0.05 level.
difference is one of context—despite the fact that both public and private schools in Chile compete for students, private schools are still slightly more cost-effective.

CONCLUSIONS

Education reform in Chile had two principal characteristics which are popular among reformers in other countries today: decentralization of the provision of educational services and introduction of choice and competition. The reform had several results:

(1) Municipalities provide a small share of total public school financing, but inter-municipal variations in fiscal capacity generate inequities in per pupil school expenditures.

(2) The relatively large size of the central government school attendance grant (almost 90 percent of total financing) ensures all pupils receive a relatively high minimum level of school services.

(3) In the short-run, introduction of the voucher program led to large numbers of schools changing status from paid-private to subsidized-private, resulting in significantly higher government-financed education spending.

(4) In the long-run, reductions in the real value of the voucher led to paid-private schools regaining their earlier market share.

(5) The subsidized-private market share has consistently grown, despite reductions in the real value of the voucher and despite approximate parity with municipal schools in terms of test scores (controlling for socioeconomic status). The model estimated here suggests parents select private schools based on the characteristics of their students; since the demand for private schooling increases with socioeconomic status, private schools have a continuing advantage in terms of student background characteristics.

(6) Subsidized-private schools appear to be more cost-effective than municipal schools. While test scores, controlling for socioeconomic status, are approximately equal in municipal and subsidized-private schools, unit costs are lower in private schools. Also, the model estimated here provides evidence that additional monies spent in subsidized-private schools yield slightly higher returns than those spent in public schools.

Since the design and implementation of the Chile reform occurred in a setting that did not permit political opposition, they are unlikely to be easily replicated in other countries. In addition, Chile has had several institutional advantages in implementing the reform. By the standards of other developing countries, management capacity at both the central and municipal
level is relatively high, and the degree of public corruption is perceived to be low. As a result, it was possible to implement a financing mechanism which requires accurate counts of numbers of students in the classroom and which effectively penalizes schools for inaccurate reporting. Also, over the past two decades the Chilean public sector has become sophisticated in the use of contracting to purchase specialized expertise that would not otherwise be available (e.g., municipalities contracting consultants to develop the detailed plans required to obtain central government financing of capital investment.)

Sound financial management has also been important in implementing the decentralization component of the reform. All levels of government in Chile use the same standardized government accounts for budgeting and expenditure reporting, with municipal expenditure reports submitted on a monthly basis to the Finance Ministry. This financial information system provides the basis for periodic audits of municipal accounts by the country’s Controller General, and helps ensure that central government grants are used as intended.36

Finally, Chile is the only country in Latin America to have a national system of student testing. In principle, this can provide both municipalities and parents with information on their schools’ performance. In practice, the results are not widely disseminated, and parents seldom know either their school or their child’s performance.37

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35 The point being made here is not that the Education Ministry and Chilean municipalities have adequate management and planning capacity; there are many deficiencies, especially among smaller municipalities and in the supervision capacity of the Education Ministry’s provincial administrative units.

36 The penalties associated with misappropriation of government funds are severe, including personal liability.

37 The reasons for lack of dissemination are not clear. The testing system was first introduced as part of a plan to measure teacher performance and to tie salaries to performance. Several difficulties, including teacher opposition, led to this plan never being fully implemented.
REFERENCES


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