2. Chile's school voucher program: a brief overview

In 1981, as part of the Pinochet government's sweeping market-oriented reforms, Chile introduced a nationwide school voucher program. The easiest way to explain this reform is to discuss how it modified the manner in which schools were governed and funded. Before the reforms, there were three types of schools in Chile:

1) *Fiscal schools*. These public schools were controlled by the national Ministry of Education, which was responsible for all aspects of their operation. It hired and paid teachers, maintained facilities, and designed the curriculum. In 1981, 80% of all students were in such institutions.
2) *Unsubsidized private schools*. These private institutions did not receive public funding. They charged relatively high tuition and catered primarily to upper income households. Prior to the reforms, they accounted for about 6–7% of enrollment.
3) *Subsidized private schools*. These institutions did *not* charge tuition, received public subsidies, and were generally religious.[4] The size of the subsidy they received depended on the government's fiscal condition, but averaged 50% of nominal per-student spending in the fiscal schools. This aid was supposed to be disbursed at the end of the school year, but was typically delayed by several months, and was therefore eroded by inflation.[5] Prior to the reform, these schools accounted for 15% of enrollment.

[3] In addition to Chile, twelve other countries participated in the TIMSS in 1970 and 1999. As we document below, after controlling for variables such as per capita GDP growth, changes in enrollment rates, and educational spending per student, the performance of the median Chilean student appears to have worsened slightly between 1970 and 1999.

[4] Espínola (1993) states that in 1970, 53% of private schools were Catholic and the remaining were Protestant or run by private foundations.

The 1981 reforms sought to create a nationwide voucher program with financial incentives for both public and private institutions.[6] This initiative had three main components:

1) *Decentralization of public schools*. Fiscal schools were transferred from the Ministry of Education to roughly 300 municipalities or "communes", such that they became known as municipal schools. The contract between the Ministry and the national teachers' union was abrogated, and public school teachers had to either transfer to municipal schools as common public employees, or resign and reapply for teaching jobs as regular private sector workers. To encourage the latter, the Ministry offered substantial severance payments.
2) *Public school funding*. Municipal schools continued to be funded centrally, but municipalities started to receive a *per-student* payment for every child attending their schools. As a result, enrollment losses came to have a direct effect on their education budgets.
3) *Public funding for private schools*. Most importantly, (non-tuition charging) subsidized private schools began to receive exactly the same per-student payment as the municipal schools.[7] These payments were distributed on a monthly basis, and their initial level was set 30% higher than the pre-1981 average spending per student in the public sector. To distinguish these institutions from the subsidized private schools that existed before the reforms, we will call them *voucher* private schools.[8] These retained wide latitude regarding student selection policies (public schools can only legally turn away students when oversubscribed), and were allowed to receive outside donations. They were not permitted, however, to charge tuition.[9]

Tuition-charging private schools mostly continued to operate without public funding. While they could have stopped charging tuition and started to accept vouchers, these elite institutions in general chose not to do so.

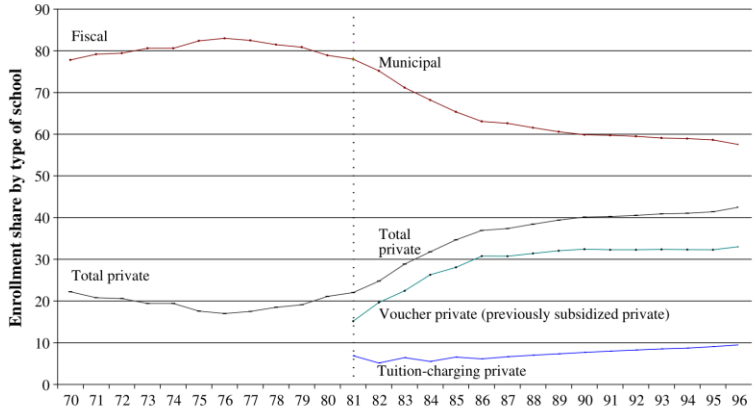

Fig. 1. National enrollment shares by sector, 1970–1996. Data assembled from several issues of the Ministry of Education's *Compendio Estadístico*.

A notable fact is that despite extensive private entry and sustained declines in public enrollments, the aggregate number of municipal schools has barely fallen. Municipal officials

If indeed incentives were completely blunted for this sector, the gains from school choice would be entirely due to the reallocation of students to the (presumably) more productive private sector.

Finally, we note two interesting differences between the subsidized schools which existed prior to 1982 (which we label incumbent voucher schools) and those that entered thereafter (which we label voucher entrants). First, while the incumbent voucher schools are almost entirely religious institutions, the entrants are largely for-profit. For example, 84% of the entrants

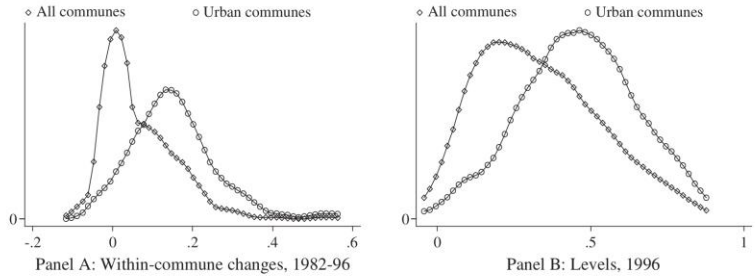

Fig. 2. Private enrollment among communes. Panel A is based on administrative information, data sources (8) and (10) in Table A.1. It covers all communes in Chile. Panel B refers to communes with positive private enrollment.

Table 3
OLS regressions for achievement, 1982–1988 and 1982–1996

	Dependent variable—change in average											
	Language score[a]			Math score[a]			Repetition rate[b]			Years of schooling[c]		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Panel A—1982–1988												
Change in priv. enrollment[b]	−5.5	−6.7	−3.4	−7.2	−9.4	−9.2	0.10***	0.09**	0.07*	−0.84	−0.72	−0.84
	(7.5)	(7.7)	(8.7)	(7.6)	(7.5)	(8.9)	(0.03)	(0.03)	(0.04)	(0.70)	(0.67)	(0.68)
	[−0.08]	[−0.10]	[−0.05]	[−0.10]	[−0.13]	[−0.12]	[0.24]	[0.21]	[0.17]	[−0.11]	[−0.10]	[−0.11]
Controls: previous trends[d]	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Controls: concurrent trends[e]	No	No	Yes	No	No	Yes	No	No	Yes	No	No	Yes
N	84	84	84	84	84	84	145	145	145	85	85	85
R^2	0.006	0.073	0.105	0.010	0.087	0.156	0.057	0.078	0.095	0.013	0.203	0.239
Panel B—1982–1996												
Change in priv. enrollment[b]	−13.8*	−12.3	−8.9	−15.8**	−15.0**	−12.8				−2.2***	−2.1***	−2.1***
	(7.9)	(7.7)	(9.9)	(6.5)	(6.7)	(8.0)				(0.4)	(0.4)	(0.4)
	[−0.24]	[−0.21]	[−0.15]	[−0.27]	[−0.25]	[−0.22]				[−0.42]	[−0.40]	[−0.40]
Controls: previous trends[d]	No	Yes	Yes	No	Yes	Yes				No	Yes	Yes
Controls: concurrent trends[e]	No	No	Yes	No	No	Yes				No	No	Yes
N	84	84	84	84	84	84				145	145	145
R^2	0.056	0.106	0.145	0.072	0.117	0.171				0.179	0.229	0.250

Notes: *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively. Huber–White standard errors are in parenthesis. Brackets contain the prop. of a standard deviation change in the dependent variable brought about by a one standard deviation increase in private enrollment.

[a] Calculated using test system information, data sources (1), (2), and (4), as described in Table A.1.

[b] Variable comes from administrative information, data sources (8) and (9), and (10). Repetition is available only up to 1988.

[c] Based on micro census data for 1982 (data source 16), and household survey data for 1990 and 1996 (sources 11 and 13).

[d] Controls for previous trends are: the 1970–1982 change in average years of schooling (from census micro data, sources 15 and 16), the 1980–1982 change in private enrollment (sources 7 and 8), and the 1978–1982 change in the proportion of schools private (sources 19 and 8).

[e] Controls for concurrent trends are the 1982–1992 change in population (from data sources 17 and 18), and the 1982–1996 change in mean years of schooling and imputed labor income among adults (from census and household survey information, sources 13 and 16).

Table 5
Sorting among communes, 1990's cross-section and 1982–1988 changes

	Dependent variable—within commune observations of average characteristic in public schools/average characteristic in all schools									
	SES index[a]		Income[b]		Language[a]		Mathematics[a]		Repetition[c]	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Panel A—1990's cross sections[d]										
Private enrollment[e]	−0.20***	−0.16***	−0.37***	−0.33***	−0.08***	−0.08***	−0.09***	−0.09***	0.42***	0.28***
	(0.02)	(0.03)	(0.07)	(0.09)	(0.02)	(0.02)	(0.02)	(0.03)	(0.07)	(0.07)
	[−0.58]	[−0.46]	[−0.43]	[−0.38]	[−0.39]	[−0.39]	[−0.42]	[−0.42]	[0.44]	[0.29]
Commune controls[e]	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Thirteen regional dummies	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
N	296	296	184	184	296	296	296	296	299	299
R^2	0.313	0.493	0.171	0.285	0.188	0.396	0.215	0.346	0.193	0.447
Panel B—1982–1988 changes										
Change in private enrollment[e]					−0.21**	−0.22**	−0.14*	−0.19**	0.51**	0.38*
					(0.10)	(0.10)	(0.08)	(0.08)	(0.24)	(0.24)
					[−0.24]	[−0.26]	[−0.17]	[−0.23]	[0.24]	[0.18]
Controls: concurrent trends[f]					No	Yes	No	Yes	No	Yes
N					84	84	84	84	163	163
R^2					0.060	0.065	0.027	0.097	0.054	0.100

Notes: *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively. Huber–White standard errors are in parenthesis.

[a] Calculated using test system information, data sources (1) and (2), as described in Table A.1.

[b] Based on household survey information, pooled from data sources (11) and (12).

[c] Based on administrative information, data sources (8), (9), and (10). Repetition data is available only up to 1988.

[d] In the cross-section, the data for test scores and the SES index are for 1996, for income they are for 1990/1992 (pooled data) and for repetition they are for 1988. For each variable, these are the latest cross-sections available in our data.

[e] Cross-sectional controls include: literacy rate, mean years of schooling, poverty rate, average household income (all from household survey information, data source 14), population and population squared (from census summary information, data source 18).

[f] Controls for concurrent trends are the 1982–1992 change in population (from data sources 17 and 18), and the 1982–1996 change in mean years of schooling and imputed labor income among adults (from census and household survey information, sources 13 and 16).

standard over-identification test, with the usual caveat about the assumptions behind and power of such tests.

In short, we have looked at three measures of educational achievement so far: repetition rates, years of schooling, and test scores. For the first two (particularly repetition), taken at face value, the point estimates and standard errors we estimate (both under OLS and IV) would rule out that choice had net beneficial effects. In the case of test scores, the majority

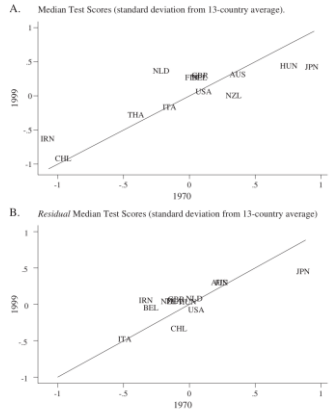

Fig. 4. Chile's performance in international tests, 1970 and 1999. (Note: The scores for each country subtract the mean score for the 13 countries and are divided by the standard deviation of U.S. scores in the given year. Residual test scores are residuals from regression of median test score on GDP/worker, enrollment rate, and ratio of spending per student to GDP per capita).

of our point estimates are indicative of a negative effect on outcomes, but a 95% confidence interval around many of them would still include substantial positive effects. Partially in light

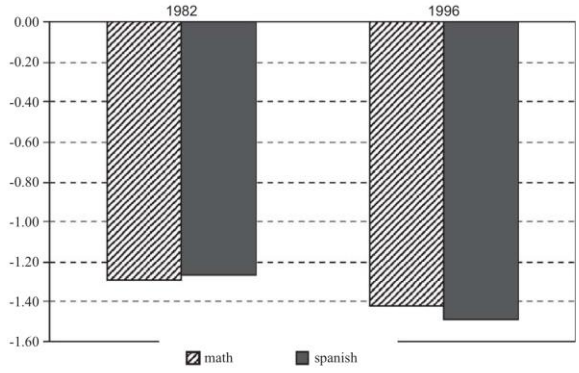

Fig. 5. Average test score among municipal and voucher schools, relative to tuition-charging private schools, 1982 and 1996 (Standard deviations below tuition charging).

change relative to that of the median student in the other 12 countries that also participated in both years.[31] This is all the more surprising since Chile's economy has performed quite well over the last two decades.[32] In fact, when one introduces controls for per capita income growth, and changes in enrollment rates and school spending, the performance of the median Chilean student appears to have slightly worsened over the last 30 years (panel B).[33]