Voice, Accountability and fiscal decentralization. The case of Chilean Municipal Education

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ABSTRACT

At the beginning of the 80s, the Chilean government handed over the administration of public schools to municipal governments and established a voucher per student type of funding. By running an empirical model that uses a panel of municipal observations between 2005 and 2011, we intend to explain the average municipal score achieved by public schools on the so called "SIMCE" test, which measures math and language skills at the 4th degree. Our empirical analysis suggests that; i) more "fiscally empowered" and "accountable" local governments perform better, ii) competition from publicly funded private schools enhances municipal schools' performance, iii) benefits from decentralization appear to diminish as the number of schools per municipal jurisdiction raises and, iv) socio economic variables are globally and individually significant.

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I. Introduction.

By the beginning of the 80s, Chile underwent a deep municipal level decentralization reform. It mainly consisted in handing over to municipal governments the administration of schools and primary health centers. Ever since, public schools came to be named as "municipal schools" (MSs). Originally, municipal governments were allowed to choose between direct school administration or delegate it on to nonprofit private organizations called "corporations", which were meant to take advantage from private like management practices. Since above reforms took place, basic school funding hinges on a centrally assigned voucher per student which is differentiated in accordance to the students being attended, this being given to municipalities upon pupil's attendance to classes (e.i. Aedo and Sapelli 2001). A parallel model of publicly funded education exists in the form of private subsidized schools (PSs). Although they are voucher eligible in a similar way as MSs do, these private "providers" are allowed to partially charge for each student in return for a reduced voucher value. A third track of providers is represented by fully paid private schools. Above described model is assumed to promote school competition, local government's accountability and better quality public schools.

While the Chilean case has been widely studied, no clear cut evidence exists that relates municipal fiscal autonomy with more residents' voice and stronger accountability of authorities to their local constituency. In dealing with above questions, two complementary approaches are explored in this present paper. One follows Barankay and Lockhood (2007) in testing the effect of a municipal level fiscal decentralization measurement, which stands for the municipally controlled share of local expenditures. The second one builds upon a proposal by Boex and Simatupang (2008) in measuring what they call "fiscal empowerment", which stands for the actual "individual's empowerment over each per-capita peso being spent". Above measurements are used both individually as well interactively to estimate en empirical model that explains municipal schools' scores in the so called SIMCE test, which is annually taken by 4th degree students.

The remaining of this paper is organized as follows. Section II presents the current academic debate on the subject matter, section III describes the empirical model and section IV summarizes the estimation and main results. Finally, section V presents the conclusions.

II.   The debate.

A variety of pro decentralization hypothesis have been developed in the literature. Most popular arguments hinge upon information advantages (Von Hayek 1945), the potential for market like competition across local governments (Tiebout 1956, Brennan and Buchanan 1980, Tirole 1994), and the likely benefit in political accountability that decentralization may bring about (e.i.Seabright 1996). Counter arguments highlight the lack of skilled personnel and genuinely democratic practices at the local level in developing countries (Prud'homme 1995), the likelihood of decentralization leading to costly public goods resulting from too small scale operations (Oates 2001), the danger of weak jurisdictions being potentially subject to "elite capture" (Bardhan y Mookherjee 2006) and the possible segregation against poorer jurisdictions (Bonet 2006, Rodríguez-Pose and Ezcurra 2009). As far as education is concerned, decentralization is assumed to strengthen service providers' responsiveness to local needs by making them more accountable to clients, which may be channeled through more school choice, increasing participation and increasing voice (World Bank 2004).

Generally, cross country studies appear to support the view that decentralization enhances education quality (Letelier 2010, 2012; Lindaman and Thurmaier 2002; Busemeyer 2008). Nevertheless, country case evidence is rather mixed. While positive effects from some kind of decentralization on schools performance has been found for Switzerland (Barankay and Lockhood 2007), Bolivia and Colombia (Faguet and Sánchez 2007), no conclusive evidence exists for Sweden (Ahlin and Mork 2008). Yet another

group of studies finds that decentralization deepens the educational gap between poor and wealthy jurisdictions, this being the case of China (Zhao 2009) and El Salvador (Cuéllar-Marchelli 2003). To the extent that decentralization promotes competition across schools and neighboring jurisdictions, this potential quality improving effect has been extensively researched in the USA case (Belfield and Levin 2002, Kaustav et. al. 2012, Juliana et. al. 2012) and Sweden (e.i.Sandstromand Bergstrom2005). While that evidence generally supports the competition hypothesis, some concern exits on the chance that increasing free school choice may lead to some kind of social or even grades segregation (Östh. al. 2013). When it comes to the more specific question as to whether decentralization does favor accountability and local governments' responsiveness to people's educational demands, existing evidence is scant and even more inconclusive. Evidence from China shows that additional fiscal autonomy given to local governments results in a lower share of total expenditure being made on education (Zheng and Zhao 2013), which may be interpreted as a sign of fiscal decentralization not having a pro accountability effect. However, a comprehensive review by Bruns et. al. (2011) shows that accountability matters but it does so in a school based decentralization context in which teachers are directly accountable to parents.

Concerning the Chilean case, some stylized facts suggest that fiscal decentralization does not enhance MSs' performance (Larrañaga1995, Parry 1997a, Parry 1997b). Nevertheless, a study by Contreras and Macías (2002) finds systematic differences on MSs' performance across the territory, which points out to some municipal specific type of explanation, as such a pattern does not appear to hold for PSs. In line with the view that real municipal autonomy is an attribute worth having, some stress the advantages of PSs managers having enough leeway to decide on their budget and teaching personnel (Sapelli 2003, Paredes and Paredes 2009). Although some evidence suggests that school providers do compete with each other (Auguste and Valenzuela, 2003), such a competition seems to be stronger in between PSs (Larrañaga, 2004), or even within MSs that face a hard budget constraint (Gallego 2005).

While parents' choice has been perfected over time, most free of charge schooling options have a low quality record (Elacqua and Martìnez 2011), tend to benefit more educated and well informed families (Fischer et. al. 2006, Gershberg et. al. 2012), and have a significant students' segregation bias (Elacqua 2012). But yet, no clear cut evidence on the Chilean case exists that relates parents' choice with educational outcomes (Hsieh and Urquiola 2005, Carrasco and San Martin 2012).

Expectedly, students' family background is an internationally recognized variable to explaining school performance (Woessmann 2003, Hanushek and Woessmann 2011). Along similar lines, direct comparison between MSs and PSs in Chile shows that albeit PSs rank higher in the national tests scores, that gap diminishes when students' social background in the two types of schools is properly accounted for (Aedo and Larrañaga, 1995;Mizala et. al., 2005).

III. Empirical model.

Equation 1 (Ec1) bellow provides the basic structure of the empirical model. This is meant to explain the score of the "SIMCE" test, which is annually taken at private and municipal schools alike. Explanatory variables are sorted out in two groups. One is assumed to capture the potential municipal fiscal capacity (*MFC*) to attend specific local expenditure demands. The second type (*CONTROL*) is a set of environmental variables that may affect test scores other than *MFC*.

$$SCORE_{it} = \alpha + \beta_1 \times MFC_{it} + \beta_2 \times CONTROL_{it} +_{it} \qquad\qquad Ec.1$$

As far as a suitable proxy for *MFC* is concerned, two approaches are followed. On the one hand, we follow Barankay y Lockhood (2007) in using a municipal specific measurement of fiscal decentralization (*FD*), this being the share of municipally controlled expenditures. In

our case, this equals $FD_i = \left[\frac{R_i - W_i}{R_i}\right]$, in which R_i stands for net of transfers municipal budget revenues and W_i is the plant contract staff's payroll. Alternatively, we build upon a proposal by Boex and Simatupang (2008) in producing a municipal specific accountability corrected "fiscal empowerment" index. In adapting Boex and Simatupang's frame to our case, we define "Municipal Fiscal Empowerment" (E_i) as the interaction between residents' voice (V_i) and municipal expenditures (MEX_i), so that the following is in order:

$$E_i = V_i \times MEX_i = V_i \times (g_i * P_i) \qquad E.2$$

Where g_i is local expenditure per head and P_i is the municipal population. As for "voice", this is defined as $V_i = \frac{1}{P_i^{1+\gamma_i}}$, where γ_i stands for the speed at which municipal government's accountability (voice) diminishes as local P_i rises. If we substitute the local population by the local constituency (j_i), the ratio between the "effective" and the "voice corrected" expenditure (E/g) can be expressed as: $\frac{E}{g_i} = \frac{1}{J_i^{\gamma_i}}$, which stands as our optional measurement of *MFC*.

As for *CONTROL* variables, municipality's socio economic characteristics are being measured by households' income (*inc*), parents' years of education (*p.educ*), and a municipal urbanization rate (*urban*). Remaining control variables include the rate of students per teacher (*stud/teach*), the number of schools being run by the municipality at stake (*n.schools*) and the average SIMCE score by PSs in that particular municipal district (*simce.sub*). We assume that a higher *simce.sub* promotes a more competitive environment among schools' providers, which leads to a better municipal school performance.

IV. Estimation and results.

A municipal based panel between 2005 and 2011 is used to estimate the empirical model defined above. All 345 municipal governments are represented. Data is taken from the Ministry of Interior Affair and Public Order's data base (SINIM), and the National Household Survey for the years 2006-2011 (CASEN). SIMCE scores are available from the Ministry of Education. An obvious challenge though, is the estimation of a proxy for γ_i. While municipal residents' utility function is not observable, it will be assumed that more preference heterogeneity is positively associated with the degree of "households' incomes dispersion", which can be measured through the local GINI coefficient. As far as the political dimension is concerned, it will be asserted that municipal government's accountability will be lower the higher the ratio of "residents per municipal council member" and the larger the "concentration of specific party member representatives at the municipal council". Highly uneven political representation at the council level is assumed to induce a monopolistic behavior toward local constituents, which lowers residents' voice. This is measured through a council level Herfindahl index which is meant to capture council members' political dispersion. We combine above three variables to produce a factor analysis based index which proxies γ_i. In order to get consistent values of γ_i , the estimated "factor" is then rescaled to fit between 0.0 and 0.5, which is in line with Boex and Simatupang (2008) simulation analysis.

Two sets of regressions are run by using the average SIMCE score, and the specific math and language scores separately (table 1). In both cases, endogenous variables and some of the exogenous ones are expressed in logs ("L"). Two sets of regressions are reported. In the first set, variables *FD* and *E/g* have been included separately. The second set includes an interaction term between them. In all cases, the fixed effect model was chosen on the basis of the Hausman test, so that random effect regressions are not reported.

The first result worth mentioning is the fact that regardless of the type of SIMCE score being looked upon and the use of *FD* and *E/g* individually - as opposed to the interaction term, both measurements of fiscal responsiveness are significant. This suggests that more

accountable and fiscally decentralised municipalities perform better. Second, socioeconomic variables are globally as well as are individually significant. Interestingly, the effect of parents' education seems to be stronger in math than in language. Albeit urban located schools appear to perform better, this effect is only significant in the language case. Concerning the competition effect from PSs, this is significant and positive as expected. Higher PSs scores are clearly associated with higher municipal schools scores. Expectedly, as students per teacher rises, SIMCE score diminishes, albeit this effect appears to be weak in math. Finally, the negative and significant coefficient of *n.schools* reveals that benefits from municipal decentralization diminish as the same municipal administration encompasses numerous education units.

Tabla 1. Regresiones para el SIMCE promedio de establecimientos municipales, 2005-2011.

	Average	*Average*	*Math*	*Math*	*Lang*	*Lang*
constant	4.268***	4.345***	4.324***	4.396***	4.216***	4.299***
	(26.16)	(27.66)	(22.95)	(24.25)	(26.13)	(27.58)
E/g	0.171***		0.093***		0.245***	
	(5.87)		(2.75)		(8.51)	
FD	0.079*		0.084*		0.075*	
	(1.79)		(1.65)		(1.72)	
$(E/g) \times FD$		0.169***		0.106***		0.228***
		(5.71)		(3.11)		(7.79)
L (inc)	0.048***	0.045***	0.043***	0.042***	0.053***	0.048***
	(6.41)	(6.16)	(4.93)	(5.01)	(7.17)	(6.58)
p.educ	0.006***	0.006***	0.009***	0.009***	0.004	0.004*
	(2.64)	(2.75)	(3.24)	(3.25)	(1.61)	(1.80)
urban	0.001	0.001	0.0003	0.0003	0.001*	0.001*
	(1.17)	(1.16)	(0.51)	(0.52)	(1.76)	(1.72)
L (stud/teach)	-0.025***	-0.029***	-0.005	-0.006	-0.043***	-0.051***
	(-3.01)	(-3.58)	(-0.57)	(-0.62)	(-5.26)	(-6.29)
L (simce.sub)	0.175***	0.182***	0.156***	0.157***	0.191***	0.206***
	(7.41)	(7.85)	(5.74)	(5.86)	(8.21)	(8.92)
L (n.schools)	-0.094***	-0.095***	-0.076***	-0.077***	-0.111***	-0.113***
	(-5.06)	(-5.12)	(-3.55)	(-3.57)	(-6.01)	(-6.10)
Observaciones	1,733	1,733	1,733	1,733	1,733	1,733
F test	50.44***	57.07***	25.64***	29.33***	73.85***	82.03***
Wald Chi2						
F test that all u_i=0:	6.82***	6.81***	6.36***	6.41***	6.12***	6.04***
Chi2`s Hausman test	58.06***	50.09***	27.05***	22.41***	99.25***	87.06***
F test: Emp. and DF vars.	18.07***	32.66***	4.78***	9.67***	75.72***	64.18***
F test: socioeco. var.	29.14***	27.99***	22.31***	22.82***	140.96***	130.58***
F test: municipal vars.	36.15***	42.64***	17.97***	19.11***	186.65***	216.87***

Significant at 10% *, 5% **, 1% ***.

T statistic in parenthesis

V. Conclusions.

An empirical municipal data based model is estimated in order to test the hypothesis that more fiscal capacity enhances the quality of municipal school administration. In so doing, we provide evidence that local fiscal decentralization as well as "voice corrected" municipal expenditure per head have a significant effect in explaining MSs performance. Complementary, a set of control variables in the regression analysis suggest that socio economic factors such as parents' education and households' income do favor schools' performance. A rather mild positive impact was detected in the case of urbanization. Finally, albeit competition from PSs appears to affect MSs scores positively, benefits from a fiscally decentralized administration of public schools seem to get lower the higher the number of schools being attended by the same municipal government.

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