

The Effectiveness of Franchises and Independent Private Schools In Chile's National Voucher Program

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Abstract

There is persistent debate over the role of scale of operations in schools. Some argue that school franchises offer educational services more effectively than small independent schools. Skeptics counter that large centralized operations create hard to manage bureaucracies and foster diseconomies of scale and that small schools are more effective at promoting higher quality education. We can gain insight into this debate by examining school systems where vouchers have been implemented on a large scale and where private school supply (franchises and independent schools) has increased. In 1981, Chile began financing public and most private schools with vouchers. This paper uses 2002 data on over 220,000 fourth-graders to compare Spanish and mathematics achievement in private school franchises, private independent schools, and public schools. Our findings suggest that franchises have a large advantage over public schools, once student and peer attributes and selectivity are controlled for. It appears that there is no statistically significant difference in achievement between public and private independent voucher schools. We also find that further disaggregating private voucher school franchises reduces small franchise advantages and widens the larger franchise advantages. We conclude that, while more research is needed on the factors that may influence an owner to establish a franchise, policies oriented to create incentives for private school owners to join or start up a private school franchise may have the potential for improving educational outcomes.

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1 Introduction

The optimal scale of operations of schools is one of the most hotly debated issues in current educational policy reform discussions. One view is that larger schooling operations offer educational services more effectively than small independent schools. Proponents argue that increasing the size of schooling operations would lower per-pupil costs and free up resources for use at the school and classroom level (Chubb, 2001). Advocates also argue that larger schooling operations will have more opportunities to access private investments and loans to expand than smaller schools (Whittle, 2000).

Researchers also claim that private school franchises promote the creation of sound institutional environments in member schools. McMeekin (2003) argues that being part of a schooling organization provides a sharing experience within the network and facilitates the flow of information (such as research on best practices) to network members. An additional component of the institutional climate is the degree of trust, cooperativeness or “social capital” that obtains in the school community of a network school (Rowan and Miskal, 1999). The basic hypothesis of this theory is that, all else equal, the more a school’s institutional climate facilitates transactions between members of a school’s community, the better the school’s performance (McMeekin, 2003).¹

Proponents also maintain that school franchises provide political benefits and credibility and legitimacy in the eyes of the community. Wohlstetter and Smith (2006) argue, based on their research on charter school partnerships, that well-established school networks can enhance a newly formed school’s reputation in a community through name recognition. For instance, school networks can build credibility for fundraising. Advocates argue that a well-established nonprofit or for-profit school

¹ In economic terms, a good set of institutions reduces principal-agent problems and the costs of transacting, thus making it possible for positive transacting to take place (North, 1990).

network can more easily access loans and grants than small independent schools (Wohlstetter et al., 2004).

These assertions have sparked two distinct trends in school management: consolidating public school districts and increasing public funding for private school franchises. Both gained legitimacy from research suggesting that there were inefficiencies present in the traditional public school systems (Hoxby, 1994) and in the belief that there are economies of scale in education (Chubb, 2001). Underlying the public school district consolidation movement is a belief that consolidation is a way for school districts to cut costs (Duncombe et al., 2005) and improve how educational services are delivered (Smith and Wohlstetter, 2001). Underlying the privatization movement are the beliefs that by infusing competition and a business approach to education, schools will succeed (or fail) like businesses (Whittle, 2000) and that private school franchises will produce educational outcomes more effectively and efficiently than public schools and small independent private schools (Chubb, 2001).

Critics fear that these reforms could have potential negative unintended consequences. They argue that large centralized operations will create hard to manage bureaucracies and foster diseconomies of scale due to associated problems of managing complex organizations, maintaining order, and creating a sense of community among students and staff (Brown et al., 2004; Steifel et al., 2000). Opponents of school consolidation also claim that large schooling operations would empower administrators and other professionals far removed from the classroom (Hill et al., 1997). Others are concerned that consolidation reforms would encourage more standardization and less innovation. For instance, Belfield and Levin (2005) maintain that school franchises must establish a brand to be successful, which necessitates relative uniform operations

and services from site to site. They argue that such a branded approach to education would stifle innovation.

Critics have argued that reducing the size of schooling operations is a more effective way to improve educational outcomes. They claim that small autonomous schools can improve the quality of education by creating intimate learning communities where students are encouraged by educators who know them (Wasley et al.,2000). Small school advocates also argue that small schools reduce the anonymity and isolation that many students experience in larger schooling operations and they increase students' sense of belonging (Barker and Gump, 1964). Proponents also argue that smaller schools have higher levels of cooperation between teachers, better relations with school administrators and higher trust in the school community (Lee and Loeb, 2000). In addition, they maintain that small schools will encourage parental involvement, which benefits students and the entire community (e.g. Schneider et al.,2000)

Following these insights, many current proposals for reform share a vision of small, autonomous schools, with a lean administrative structure, encouraged to bring parents, students, teachers, and administrators into supportive relationships (Raywid, 1998). In this vision of small schools, teachers and parents are viewed as essential to school governance and to the creation of effective schools (Bryk & Schneider, 2002). Working together, stakeholders promote higher quality education, making the relationship between parents, students, and teachers more cooperative (Henig 1994).

Although evidence on the optimal scale of operations is limited, there is little doubt that these movements have been increasing. School consolidation may represent one of the most significant reforms in education government and management in the United States in the 20th century (Tyack, 1974). Despite a growing population, over 100,000 school districts have been eliminated since 1938, a decline of nearly 90 percent

(NCES, 2003). There are also a growing number of private school franchises and charter school partnerships in the United States (Lips, 2000). The small schools movement has also made significant progress in recent years. For example, the Bill and Melinda Gates Foundation has already invested over US\$ 1 billion to divide large urban high schools in the United States.

Much of the existing empirical evidence has focused on the consequences of public school district consolidation and the division of large public school districts (Duncombe et al., 2006) and only a small number of studies have examined the benefits of private school franchises (Gill et al., 2006) and small independent schools (AIR & SRI, 2005). The empirical evidence on district consolidation is often clouded by methodological limitations. In their extensive review of the literature, Andrews and his colleagues (2002) conclude: “both the claims of supporters of consolidation and detractors that claim small is beautiful have not adequately been tested using good evaluation methods.”

The research that examines the benefits of private school franchises versus small independent schools suffers from thin data because it derives from the evaluation of small-scale programs. Moreover, the evidence on the impact of these small-scale programs is mixed. For instance, in its evaluation of Edison Schools, the United States’ largest for-profit manager of public schools, researchers find that the performance of these schools varies (Gill et al., 2007). Similarly, the evaluations of the small high schools funded by the Gates’ Foundation also suggest that there is wide variation in the quality of these schools (AIR & SRI, 2005). The empirical evidence on private school franchises is limited because there are so few educational systems that provide public funding to private schools (OECD, 2003) and nonprofit status is usually required for private educational institutions (James, 1993).

We can gain insight into the distinct strands of arguments on the optimal size of schooling operations by examining school systems where vouchers have been implemented on a large scale and where private school supply has increased. In 1981, Chile began financing public and most private schools with vouchers. The reform sparked a massive redistribution across private and public schools, as well as the creation of many new private schools. While many private voucher schools are run by religious organizations, the majority are operated by private entrepreneurs (Elacqua, 2006). Private voucher schools currently account for over 40 percent of total enrolment and about one-third of these schools belong to private voucher school franchises. This paper compares the achievement of fourth-graders in private voucher school franchises, private voucher independent schools, and public schools.²

This is not the first paper to compare private and public school achievement in Chile. Earlier work used aggregated school level data (e.g., Bravo et al. 1999; Mizala and Romaguera 2000). More recently, researchers used student-level data and attempted to control for selection bias induced by non-random allocation of students across school types (e.g. Anand et al., 2006; Sapelli and Vial, 2002; McEwan, 2001; Contreras, 2002; Gallego, 2006). Most of these studies show a private school advantage, although the differences are usually small.

This paper differs from earlier work by examining achievement across private voucher schools according to their network size. We consider private voucher school franchises and private voucher independent schools that do not belong to a franchise; prior analysts have used a single category to describe all private schools, with the exception of McEwan (2001) and Elacqua (2006) who considered different categories of private schools, including Catholic, Protestant and for-profit schools. Initial findings

² We do not include the private non-voucher schools in this analysis. This set of schools charge high tuition, do not receive per-pupil subsidies, and are mainly focused on high income students. They also only represent 7 percent of enrollments.

suggest that private voucher school franchises have an advantage over public schools, once student and peer attributes and selection bias are controlled for. Further separating private voucher schools by franchise size reduces small franchise advantages and widens the larger franchise advantages. We also find that there is no statistically significant difference in achievement between public and private independent voucher schools. The results presented in this study demonstrate the importance of going beyond aggregate private voucher school categories and provide suggestive evidence that, all else equal, private school franchises are more effective than small independent private schools and public schools.

The remainder of the paper is organized as follows. The second section reviews some background on Chile's voucher program and describes the private school categories that we will use in the empirical analysis. The third section presents the empirical strategy that will be used to compare student achievement across school categories, and describes the data that will be used to implement it. Section four presents and interprets the results. The final section concludes and discusses policy implications.

2 Background on Chile

During the 1980s, the school system in Chile experienced a sweeping reform program enacted by the military government (1973 to 1990). First, the government decentralized the administration of schools, transferring responsibility for public school management from the Ministry of Education to municipalities. Second, the government altered the financing of public and most private schools. Public schools continued to be funded centrally, but municipalities started to receive a per-student voucher for every child attending their schools. As a result, enrollment losses came to have a direct effect on

their education budgets. Most importantly, private schools that did not charge tuition began receiving the same per-student voucher as the public schools. Tuition-charging private schools mostly continued to operate without public funding.

The reform sparked a massive redistribution of students across private and public schools, as well as the creation of many new private schools. In 1980, 14 percent of Chilean K–12 students attended private schools that received some public subsidy, and another 6 percent attended more elite, unsubsidized private schools. By 1990, 34 percent of students attended private voucher schools. By 2003, enrollment in such schools had reached almost 40 percent of total enrollment. Most of these gains were at the expense of public school enrollments. Adding in the 9 percent of students in elite private non-voucher schools³ leaves a slight majority of Chilean students in public schools (see Figure 1).

Finally, it is worth noting that the essential features of this system (per pupil vouchers) have remained in place for almost a quarter-century. The center-left coalition in power since 1990 has chosen to focus on improving the quality of poor schools through direct resource investments, while maintaining the organizational and funding components introduced in the eighties (OECD, 2004).⁴

[Figure 1 Here]

Most researchers generally use a single category to describe all private voucher schools in Chile. However, as we will demonstrate below, there is variation in the size of private voucher school operations. The data presented Table 1 suggests that the private voucher school sector is essentially a cottage industry. Almost 68 percent of private voucher schools are independent schools that do not belong to a private school

³ We do not include the private non-voucher schools in this analysis. This set of schools charge high tuition, do not receive per-pupil subsidies, and are mainly focused on high income students.

⁴ The only significant modification was in 1994, when the Ministry instituted a shared financing scheme that allowed all private voucher schools—both elementary and secondary—and public secondary schools to charge limited tuition (Montt et al., 2006).

franchise. Private voucher school franchises⁵ account for a little over one-third of private voucher schools and enrollments. Most of the franchises are fairly small in scale, and only about 20 percent of primary private voucher students attend schools that belong to franchises that have more than 3 schools.

[Table 1 Here]

3 Empirical strategy and data

In this section, we describe an empirical strategy for comparing public and private independent schools and private network school student achievement that will correct for selection bias. Our empirical model builds on previous work by McEwan (2001).

We hypothesize that student achievement, measured as student performance on standardized tests, can be modeled as a function of student socioeconomic characteristics (family background, home resources, and peer groups⁶). Formally, we posit that linear models of the following form can explain student achievement:

$$A_{ij} = X_{ij}\beta_j + \varepsilon_{ij} \quad (1)$$

where (A_{ij}) is the test score of the i th student in the j th school type is a function of independent variables that describe the socioeconomic background of the student and the student's peer group (X_{ij}) and an error term (ε_{ij}) . In this paper, we have one public school category and 7 categories of private voucher schools. The sample is divided among school categories, as we estimate separate regression coefficients for each sub-sample.

Using the estimates $\hat{\beta}_j$, one can predict the achievement of a “typical” student in each school category. Following McEwan (2001), we use the mean characteristics of

⁵ We define franchises as schools that belong to a chain of schools that are operated by the same legal private voucher school “owner” (*sostenedor*).

⁶ We include peer group controls because a body of literature has documented the positive spillover effects of having high-ability peers and the negative effects of being surrounded by disadvantaged students (e.g. Zimmer and Toma, 2000).

public school students (denoted as \bar{X}). Thus, the predicted achievement of the average public school student in the j th school category is:

$$\hat{A}_j = \bar{X}\hat{\beta}_j \quad (2)$$

To measure the difference in achievement between two school categories, we subtract one prediction from another. The corresponding standard error can also be calculated. For example, we may estimate the corrected difference between private independent voucher schools ($j=2$) and public schools ($j=1$). This provides an approximation of the expected increase (or decrease) in test scores for the average public school student if she were to attend a private independent voucher school.

If the independent variables perfectly account for student and peer demographics, then the above strategy yields unbiased results. More likely is that some variables are imperfectly measured or omitted from the regressions. For instance, private schools may be able to select more qualified students, on average, than their public school counterparts (“school choice bias”). Similarly, the average student attending a private school may be more likely to have other attributes (such as having parents who place a higher value on education) than the average student attending public school (“parental choice bias”).

For these reasons, a simple comparison of student outcomes in private and public schools is unlikely to give unbiased estimates of the impact of private schools on student achievement. Towards diminishing “parental choice” selection bias,⁷ prior research has often applied variants of two-stage procedures developed by Heckman (1979). This analysis usually consists of a single equation model in which the dependent variable is the probability of choosing a school (e.g. public or private) and the independent variables are factors that are believed to influence the choice. These

⁷ In order to be able to control for “school choice bias”, information on school selection practices would be required.

methods presume that a choice is made between only two schooling alternatives: private voucher or public.

In the Chilean context, there are seven school categories available to students. Lee (1983) has developed a two-stage selection bias procedure for cases where choice is among several alternatives.

Consider the following model:

$$I_{ij}^* = Z_{ij}\gamma_j + v_{ij} \quad (j=1,2,3,4,5,6,7) \quad (3)$$

Where I is a latent variable and Z is a vector of variables determining school choice for student i in school type j . Let I be a polychotomous variable that can take values 1 to 7 ($I=j$ if the j th school type is chosen). A student attends the j th school type ($I=j$)

$$I_j^* > \text{Max} I_s^* \quad (s=1,2,3,4,5,6,7 \quad s \neq j) \quad (4)$$

Given assumptions about the error term v_{ij} , equation (3) can be estimated as a multinomial logit. Lee (1983) demonstrates how estimates from the multinomial logit can be used to construct a selectivity term for each observation (λ_{ij}), which then becomes an independent variable in achievement regressions:

$$A_{ij} = X_{ij}\beta_j + \lambda_{ij}\theta_j + \varepsilon_{ij} \quad (5)$$

where θ_j is an additional parameter to be estimated. The variable λ_{ij} is analogous to the inverse Mills ratio in the common two-step correction proposed by Heckman (1979). It is defined as:

$$\lambda = \frac{\phi\left(\Phi^{-1}\left(P_{ij}\right)\right)}{P_{ij}} \quad (6)$$

Where $\phi(\dots)$ is the standard normal density, $\Phi(\dots)$ is the normal distribution function, and P_{ij} is the estimated probability (derived from the multinomial logit) that the i th student chooses the j th school type.

In general, the independent variables that influence student achievement (X_{ij}) in equation (1) are quite similar to those which influence school choice (Z_{ij}) in equation (3). Demographic measures, among others, belong in both equations. In the subsequent empirical analysis, however, it is necessary that one or more variables be included in Z_{ij} that are excluded from X_{ij} , in order to identify the model (McEwan, 2001). The key empirical problem in implementing a two-stage model is in distinguishing the private school effect (or in our case the private franchise effect) from the effect of other variables that are not observed. A variable (or variables) is needed that affects the probability of attending a private voucher school that belongs to a network and that is not correlated with the error term in the outcomes equation.

In related studies in the United States researchers have assumed that family religious affiliation or the supply of Catholic schools is a determinant of Catholic school choice, but is not correlated with student achievement (e.g. Neal, 1994). Others have used variables that relate to the density of private schools for identification. Following McEwan (2001), we hypothesize that an individual's probability of choosing a given school type is affected by the number of schools per square kilometer of each type in her municipality. All else equal, students are more likely to choose schooling alternatives that are more densely concentrated in their municipalities.⁸ It is assumed, however, that school densities are not correlated with student achievement.⁹

⁸ Over 80 percent of primary school students go to school in their home municipality. Thus, the density measure provides a good proxy for local neighborhood schooling options.

⁹ The regression results (available upon request) corroborate this assumption.

We acknowledge that much of the debate around differences between public and private schools has revolved around statistical techniques that purport to control for student background characteristics and for potential selection on unobserved variables (e.g. Vandenberghe & Robin, 2004). In this article, rather than developing a different empirical strategy to control for selection bias, our empirical model builds on previous published work by McEwan (2001) that uses the same student level data in Chile. This will allow us to compare outcomes across private school types.

4 Data

The previous models are estimated with student data from Chile's national standardized test, *Sistema de Medición de la Calidad de la Educación* (the System of Measurement of the Quality of Education—SIMCE), which assesses students in grades 4, 8, and 10 in language, mathematics, history and geography, and natural sciences in odd years.¹⁰ In 2002, SIMCE evaluated 274,863 fourth graders. Students test scores are complemented with parents and teachers questionnaires, which include socioeconomic and environmental information regarding the students, their families, their peers, and their schools. Table 2 provides definitions of the dependent and independent variables used in the analysis. The dependent variables SPANISH and MATH were standardized to a mean of 0 and a standard deviation of 1.

Several independent variables characterize student demographics. These include the student's gender (FEMALE), years of parental schooling (MTHSCH and FTHSCH), self-reported household income (INCOME), the number of non-school related books in the student's home (BOOKS1-BOOKS8, expressed as a series of dummy variables). We imputed missing parent education information using student peer characteristics. A

¹⁰ For additional information on the SIMCE test, see www.simce.cl

set of dummy variables (MTHMISS and FTHMISS) is included to identify those observations with imputed data.

We calculated student peer information by averaging individual student information over all the students in a given classroom. AVMTHSCH and AVFTHSCH provide measures of the average parental schooling, while AVINCOME is the average household income in each classroom.

We also introduce a measure of average monthly tuition charged (SCHOOLFEE),¹¹ and a variable to indicate the relative isolation of the school (RURAL). Although not reported in the subsequent analysis, we also included regional dummy variables – relative to the Metropolitan Region – in the regressions to account for differences across regions. To approximate the number of neighborhood schooling options a family confronts, we include a measure of the number of schools in each category per square kilometer of each municipality (SCHOOLSKM2).

[Table 2 Here]

Table 3 provides descriptive statistics for the 222,393 students that comprise the sample, divided by school category. The distribution across school categories in the sample is similar to the universe of primary enrollments (see Table 1). About 66 percent attend public schools. According to this table 54 percent of total enrollment is in public schools, 40 percent of students attend private voucher schools, and 7 percent attend private nonvoucher schools. The data presented Table 3 also shows that most (73

¹¹ In 1994, the Ministry instituted a shared financing scheme that allowed all private voucher schools—both elementary and secondary—and public secondary schools to charge limited tuition (Montt et al., 2006). The “shared financing” law in Chile allows private voucher schools and public high schools to charge fees that can be up to 1.6 times the basic voucher payment. Discounts to vouchers are applied progressively. If monthly tuition is less than half the level of the Unidad de Subvención Escolar (USE), no discount is applied. Tuition fees between one half and one USE incur a 10% deduction. Fees between one and two USE incur a 20% deduction. Fee charging schools must also devote up to 10% of their additional income to finance scholarships. The USE is the monetary index, valued at \$12.100 Chilean pesos (US\$ 16.28) in 2003.

percent) of the private voucher school students attend independent schools that do not belong to a franchise.

[Table 3 Here]

5 Empirical results

A brief summary of the results for private independent and network school coefficients is provided in Table 4. Table 4 presents the results when a broad set of control variables and corrections for selection bias are made. The table is divided into two panels. The top panel summarizes the results for Spanish, while the bottom presents the results for mathematics. The first row presents the unadjusted difference in test scores between private voucher and public schools. The subsequent rows present the differences after accounting for individual and peer attributes and selection bias. The first column presents the private independent voucher-public school test score gap. The second column displays the private voucher franchise-public school achievement gap.

The simple unadjusted difference between schools indicates what has already been reported in the literature. The uncorrected estimates of equation (1) show that the Spanish and mathematics achievement of students that attend all private voucher school categories (independent and franchise) is higher, on average, than that of public school students. However, the first row also indicates that voucher schools present a larger gap when the school belongs to a franchise.

After controlling for student and peer attributes and selection bias, we also find a significant positive private franchise voucher school Spanish and mathematics achievement effect. However, the corrected test score estimates indicate that there is no significant difference in Spanish and mathematics achievement between public and private independent voucher schools that do not belong to a franchise.

[Table 4 Here]

These results provide some evidence of the effectiveness of private school franchises. However, a more precise analysis is needed to understand the optimal size of a franchise. Here we examine whether larger franchises are more effective than smaller franchises. Table 5 summarizes the results separating private voucher schools by franchise size. As in the prior analysis, unadjusted estimates suggest that students in private voucher schools have higher Spanish achievement than public school students. For example, the uncorrected advantage of private independent voucher schools and private voucher schools that belong to a network of two schools is over 0.3 standard deviations. Private students that attend schools that belong to networks of 3 or more schools score, on average, more than a 0.5 standard deviation higher than public school students. Raw differences on the mathematics test are similar, but the gaps are slightly narrower.

Now consider the effects of each school category on Spanish and mathematics achievement, correcting for student and peer variables and selection bias. Five categories of schools have positive and significant effects on Spanish achievement: private voucher franchises with three schools (0.5), four schools (0.21), five schools (0.83), and five or more schools (0.26). The effects on mathematics achievement are quite similar, except that the differences are larger for students that attend private voucher franchises with three schools (.67), and more than five schools (0.38), smaller for students in schools that belong to franchises with five schools (0.75) and not statistically significant for four schools. The corrected test score estimates also indicate that there is no significant difference in Spanish achievement between public and private independent voucher schools private voucher schools that belong to a franchise with only two schools.

Are the magnitudes of these effects substantial? We used student level test score data and the same empirical strategy as McEwan (2001) to correct for student and peer attributes and selection bias. Thus it may be useful to compare our findings. First, McEwan (2001) finds that there is no important difference in achievement between public and non-religious private voucher schools. We find a lack of any consistent difference between student achievement in public and private independent voucher schools. McEwan (2001) also demonstrates that Catholic voucher schools have an advantage over most public and private voucher schools, once student and peer attributes and selection bias are accounted for. He estimates that Catholic schools in Chile have an effect size of around .09 standard deviations. We find that schools that belong to a franchise have even more substantial effect sizes, on average nearly one-half of a standard deviation.

[Table 5 Here]

To probe these findings further, we compared test scores in franchise and independent private voucher schools after controlling for whether or not the private voucher school owners were Catholic. It is essential to control for the Catholic school effect because previous research in Chile (and in the United States, e.g. Bryk et al.,1993) has demonstrated that Catholic schools, all else equal, outperform public schools and other private schools (McEwan, 2001). By doing so, we avoid confounding the effect of attending a private franchise school with the effect of a Catholic school. The results, which are not reported here and are available upon request, do not change the substantial findings of our previous analysis.

6 Conclusions and policy implications

This paper compares the academic achievement of fourth-graders in private voucher school franchises, private independent voucher schools, and public schools. Controlling for individual and peer characteristics, the initial results suggest that a representative public school student would achieve highest in private voucher franchise schools, relative to public schools. Achievement is around one-third of a standard deviation higher. Private independent voucher schools – by far the largest category of private voucher schools – have slightly higher test scores than public school students.

Further attempts were made to control for selection bias. For public schools, controlling for selection bias significantly reduced the advantage of independent private voucher schools and increased the advantage of private franchise schools.

We also considered the size of the private voucher school franchises. We found that, after controlling for individual and peer characteristics and selection bias, larger private school franchise students outperform their public school peers. Achievement is around one-half of a standard deviation higher on the Spanish and mathematics tests. In contrast, the corrected test score estimates indicate that there is no significant difference in Spanish and mathematics achievement between public and private independent voucher schools and private voucher schools that belong to a franchise with only two schools.

Some of the reasons that may explain the positive private school franchise effect include the substantial benefits of scale of educational professionals and administrators (Chubb, 2001), the bulk purchases of supplies and equipment, and the costs of implementation of innovations in curriculum (Duncombe et al., 2005). Private school franchises may also be more likely to benefit from access to credit and private

investment than smaller independent private schools in Chile.¹² In addition, some argue that being embedded within a larger communal organization reduces agency problems and facilitates transactions between parents, teachers, administrator, and students (McMeekin, 2003) and influences the development of professional school communities (Smith and Wohlstetter, 2001; Bulkley & Hicks, 2003).

Before holding these results up as proof that private school franchises are more effective than private independent schools, we need additional information on the factors that may influence a school owner to establish a franchise that may determine educational outcomes. For instance, high achieving schools may be more likely to establish franchises (or to join a franchise) than low quality schools. In a competitive schooling environment, low quality schools may be unable to attract students and additional resources needed to expand operations. Private school franchises may also require superior technical skills to manage than small independent schools. An instrumental variable, which may allow us to identify such causal effects, is a topic for future research.¹³

From a policy perspective, the results of this study also suggest that more information is needed on the factors that influence schools' incentives to establish franchises. For instance, how profitable are private school franchises? The data presented in Table 1 reveals that almost two-thirds of private voucher schools do not belong to a franchise. Small private independent schools may not have incentives to establish a franchise if they are able to attract enough students and resources to cover the opportunity costs of operating a school. Anecdotal evidence in Chile suggests that

¹² See Landarreche (2007) for an analysis of these issues for small businesses in Chile. Anecdotal evidence suggests that for-profit private voucher school franchises are often controlled by a group of off-site owners, in some cases with private shareholders, and often have ties to other industries. An official at the National Private Voucher School Association (CONACEP) provided us with this information. The religious voucher schools, which are often subsidized by the Church or local businesses, often have access to donated facilities and have teachers willing to work for below-market salaries (Elacqua, 2006).

¹³ Another topic for future research, which is beyond the scope of this paper, is to compare the effectiveness of smaller and larger public school districts (*municipalidades*).

many of the independent private voucher school owners are former public school teachers.¹⁴ Therefore, the opportunity cost of running a private voucher school, in many cases, may only be a public school teacher's salary after covering operational costs. Data on the characteristics of school owners would improve our understanding of the complex decisions involved in establishing a private school franchise.

Perhaps the most interesting finding of this research is the lack of any significant differences in achievement between private independent voucher schools that do not belong to a franchise and public schools. These findings suggest that policies oriented to create incentives for private voucher schools to establish franchises, or to attract school owners with the capacity to operate franchises, may have the potential for increasing educational outcomes.

¹⁴ An official at the National Private Voucher School Association (CONACEP) provided us with this information.

References

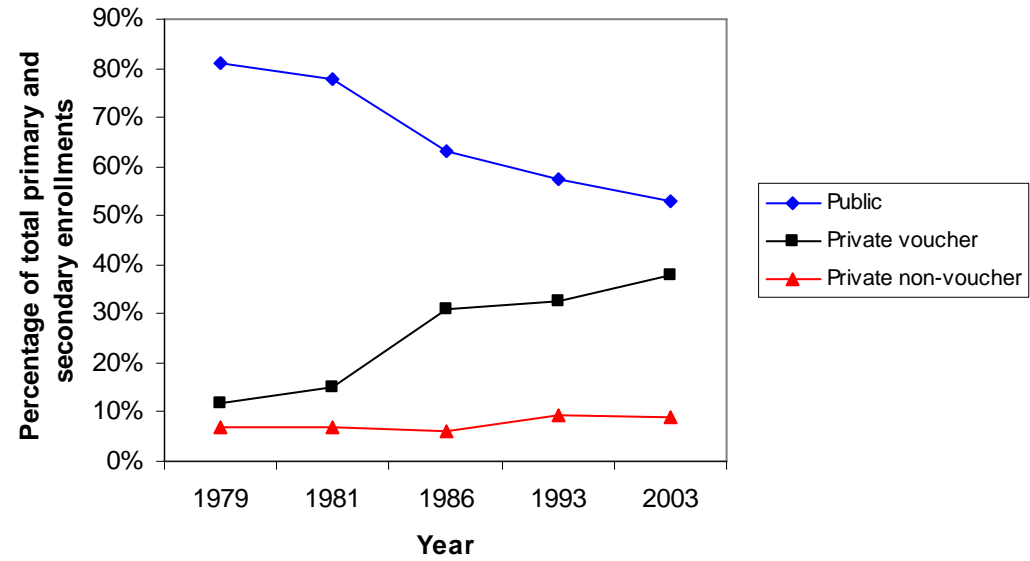
- American Institutes for Research (AIR) and SRI International (2005). *National Evaluation of the Early College High School Initiative* (Bill & Melinda Gates Foundation)
- Andrews, M., Duncombe, W., & Yinger, J. (2002). Revisiting economies of size in American education: Are we any closer to a consensus? *Economics of Education Review*, 21(3), pp. 245-262.
- Anand, P. A. Mizala & A. Repetto (2006) Using School Scholarships to Estimate the Effect of Government Subsidized Private Education on Academic Achievement in Chile. National Center for the Study of Privatization in Education Occasional Paper 120. Teachers College. Columbia University.
- Barker, R. G., and P. V. Gump (1964) *Big school, small school: High school size and student behavior*. Stanford, Calif.: Stanford University Press.
- Belfield, C. & H. M. Levin (2005) *Privatizing educational choice: Consequences for parents, schools, and public policy*. Boulder London: Paradigm publishers.
- Bravo, D., Contreras, D. and Sanhueza, C. (1999). Educational Achievement, Inequalities y Private/Public Gap: Chile 1982-1997 mimeo Departamento de Economía, Universidad de Chile, Santiago.
- Belfield, C. and H. Levin (2005). Vouchers and Public Policy: When Ideology Trumps Evidence, *American Journal of Education*, volume 111 (2005), pages 548–567.
- Brown, Heath, Henig, Jeffrey, Lacireno-Paquet, Natalie & Holyoke, Thomas T. (2004) Scale of Operations and Locus of Control in Market- Versus Mission-Oriented Charter Schools. *Social Science Quarterly* 85 (5), 1035-1051.
- Bryk, A. & B. Schneider (2002) *Trust in Schools: A Core Resource for Improvement*, co- Russell Sage Foundation.
- Bulkley, K. & J. Hicks (2003) Educational Management Organizations and the Development of professional community in Charter Schools. National Center for the Study of Privatization in Education, Occasional Paper 69.
- Contreras, D. (2002) “Vouchers, school choice and the access to higher education”. *Economic Growth Center*. Yale University. Center Discussion Paper N°845.
- Chubb, J. E. (2001). “The profit motive. The private can be public.” Spring. *Education Next*.

- Duncombe, W. and J. Yinger (2005) Does School District Consolidation cut costs?
Center for Policy Research at Syracuse University, Syracuse, NY.
- Elacqua, G. (2006). Enrollment practices in response to vouchers: Evidence from Chile.
Occasional Paper No. 125. National Center for the Study of Privatization in
Education, Teachers College, Columbia University.
- Gallego, F. (2006). Voucher school competition, incentives, and outcomes: Evidence
from Chile. Unpublished PhD dissertation. Massachusetts Institute of
Technology (MIT).
- Gill, B, R. Zimmer, J. Christman, S. Blanc (2007) State Takeover, school restructuring,
private management, and student achievement in Philadelphia. Rand
Corporation. Washington D.C.
- Heckman, J. (1979) Sample selection bias as a specification error, *Econometrica*, 47,
pp. 153-161
- Henig, J. (1994). *Rethinking school choice: Limits of the market metaphor*. Princeton,
NJ: Princeton University Press.
- Hill, P., L. Pierce & J. Guthrie (1997). Reinventing public education: how contracting
can transform America's Schools (RAND Research Study). Chicago: University
of Chicago Press.
- Hoxby, Caroline Minter , "Do Private Schools Provide Competition for Public
Schools?" (December 1994). NBER Working Paper No. W4978. Available at
SSRN: <http://ssrn.com/abstract=226577>
- James, E. 1993. "Why do different countries choose a different public-private mix of
educational services?" *The Journal of Human Resources*. 28(3), 571-592.
- Landarreche, O. (2007) Heterogeneous Entrepreneurs, Creation and Destruction:
A Simple Model and some Evidence from an Emerging Market. Documento de
Trabajo. Universidad de Chile
- Lee, L.-F. (1983) Generalized econometric models with selectivity, *Econometrica*, 51,
pp. 507-512
- Lee, V. E., and S. Loeb (2000) School size in Chicago elementary schools: Effects on
teachers' attitudes and students' achievement. *American Educational Research
Journal* 37 (1): 3

- Lips, C. (2000) "Edupreneurs": A Survey of For-Profit Education. *Cato Policy Analysis* No. 386. Washington D.C.
- McEwan, P. (2001) The effectiveness of Public, Catholic, and Non-Religious Private Schools in Chile's Voucher System, *Education Economics*, Vol. 9, No2, pp. 103-128.
- McMeekin, R. (2003). Networks of schools. *Education Policy Analysis Archives*, 11(16).
- Mizala, A., & P. Romaguera. Winter, 2000. "School performance and choice: The Chilean experience." *Journal of Human Resources*.
- Montt, P., G. Elacqua, P. Gonzalez, & D. Razyinski (2006) *Hacia un sistema escolar descentralizado, sólido y fuerte: El diseño y las capacidades hacen la diferencia*. Ministerio de Educación, Santiago, Chile
- National Center for Education Statistics (2003). *Digest of Education Statistics, 2002*. U.S. Department of Education, Washington D.C.
- Neal, D. (2002) How Vouchers Could Change the Market for Education. *Journal of Economic Perspectives*. Fall 16:4, pp. 25-44.
- North, D. C. (1990). *Institutions, institutional change and economic performance*. Cambridge, UK: Cambridge University Press.
- OECD (2003). *Education at a glance*. Paris: Organization for Economic Co-operation and Development.
- OECD (2004). *Revisión de políticas nacionales de educación: Chile*. Paris: OECD.
- Palomer C.G. & R. Paredes (2006) Reducing the Educational Gap in Chile: Good Results in Vulnerable Groups. Working Paper. PUC, Chile
- Raywid, M.A. (1998) "Small schools: A reform that works." *Educational Leadership*. v55 n4 p34-39 Dec-Jan 1997-1998
- Rowan, B. & Miskel, C. B. (1999). Institutional theory and the study of educational organizations. In J. Murphy and K. S. Louis (eds.) *Handbook of research on educational administration* (pp. 359-383). San Francisco: Jossey-Bass.
- Sapelli, C., & B. Vial December, (2002). The performance of private and public schools in the Chilean voucher system. *Cuadernos de Economía*, 118, 423-54.

- Schneider, M., P. Teske, and M. Marschall. 2000. *Choosing schools*. Princeton, N.J.: Princeton University Press.
- Smith, A. & P. Wohlstetter (2001) Reform through school networks: A new kind of authority and accountability. *Educational Policy*, Vol. 15 No. 4, September 499-519
- Steifel. L., R. Berne, P. Iatarola, and N. Fruchter (2000) High school size: effects on budgets and performance in New York City. *Educational Evaluation and Policy Analysis* 22 (1): 22–39.
- Vandenberghe & Robin (2004) Evaluating the effectiveness of private education across countries: a comparison of methods. *Labour economics* 11 Pp 487-506.
- Wasley, P. M., M. Fine, N.E. Gladden, S. P Holland, E. King, E. Mosak, and L. C. Powell. (2000). Small schools: Great Strides. A study of new small schools in Chicago. Retrieved 03/17/07 from http://www.essentialschools.org/cs/resources/view/ces_res/19
- Wohlstetter, P. & J. Smith (2006) Improving schools through partnerships: Learning from charter schools *Phi Delta Kappa*, February, 464-467
- Wohlstetter, C. Malloy, G. Hentschke, & J. Smith (2004) Improving service delivery in education through collaboration: An Exploratory study of the role of cross-sectoral alliances in the development and support of charter schools *Social Science Quarterly* 85 (5), 1078–1096.
- Zimmer, R. W., & Toma, E. F. (2000). Peer effects in private and public schools across countries. *Journal of Policy Analysis and Management*, 19(1), 75–92.

Figure 1: Enrollment share in public and private schools, 1979-2003



Source: Ministry of Education

Table 1 Distribution of primary schools and students across private voucher school categories, (2003)

	Percent of schools	Percent of enrollment
Voucher 1 school	67.7	59.8
Voucher franchise 2 schools	12.1	13.1
Voucher franchise 3 schools	3.9	6.6
Voucher franchise 4 schools	1.9	3.1
Voucher franchise 5 schools	2.4	3.7
Voucher franchise >5 schools	12.0	13.7
Total	100	100
Number of schools or students	2,872	914,439

Source: Ministry of Education and authors' calculations

Table 2 Variable definitions

Variable	Description
SPANISH	Student score on the fourth-grade Spanish test (standardized to a mean of 0 and a standard deviation of 1)
MATH	Student score on the fourth-grade mathematics test (standardized to a mean of 0 and a standard deviation of 1)
FEMALE	Dummy variable indicating whether student is female
MTHSCH	Years of schooling of student's mother
MTHMISS	Dummy variable indicating whether MTHSCH is missing
FTHSCH	Years of schooling of student's father
FTHMISS	Dummy variable indicating whether FTHSCH is missing
INCOME	Monthly family income, divided by 100,000
BOOKS1-BOOKS8	Eight dummy variables indicating the number of books in the family home, ranging from 1 (5 or less) to 8 (more than 200). BOOKS2 is omitted in regressions.
AVMTHSCH	Average schooling of student mothers in classroom
AVFTHSCH	Average schooling of student fathers in classroom
AVINCOME	Average monthly household income of students in classroom
TUITION	Average monthly tuition (in Chilean pesos) for students in school.
SCHOOLSIZE	Total enrollment in school
SECPROPORTION	Proportion of secondary students over total enrollment
RURAL	Dummy variable indicating whether school is rural

Table 3 – Sample descriptive statistics

	Sample	Voucher network size						
		Public	1 school	2 schools	3 schools	4 schools	5 schools	>5 schools
SPANISH	0.000 (1.000)	-0.163 (0.978)	0.158 (0.996)	0.192 (0.983)	0.375 (0.921)	0.452 (0.984)	0.333 (0.928)	0.368 (0.960)
MATH	0.000 (1.000)	-0.151 (0.985)	0.145 (0.985)	0.201 (0.981)	0.305 (0.932)	0.430 (1.005)	0.316 (0.959)	0.333 (0.975)
Public	0.584							
Voucher 1 school	0.241							
Voucher 2 schools	0.060							
Voucher 3 schools	0.027							
Voucher 4 schools	0.012							
Voucher 5 schools	0.012							
Voucher >5 schools	0.064							
FEMALE	0.488	0.482	0.476	0.504	0.541	0.464	0.473	0.552
mthsch	10.676 (3.698)	10.676 (3.698)	10.676 (3.698)	10.676 (3.698)	10.676 (3.698)	10.676 (3.698)	10.676 (3.698)	10.676 (3.698)
mthmiss	0.105	0.110	0.103	0.101	0.098	0.091	0.093	0.090
fthsch	10.705 (3.646)	9.941 (3.611)	11.725 (3.460)	11.628 (3.387)	12.195 (3.136)	12.085 (3.378)	11.883 (3.287)	11.852 (3.423)
fthmiss	0.142	0.151	0.133	0.130	0.123	0.115	0.122	0.120
income	2.453 (2.163)	2.023 (1.725)	3.052 (2.582)	2.966 (2.446)	3.165 (2.416)	3.418 (3.076)	2.977 (2.246)	3.001 (2.417)
books1	0.170	0.221	0.102	0.106	0.067	0.077	0.091	0.097
books2	0.213	0.247	0.167	0.172	0.143	0.150	0.163	0.161
books3	0.215	0.217	0.213	0.217	0.217	0.194	0.208	0.206
books4	0.202	0.172	0.241	0.239	0.257	0.253	0.264	0.248
books5	0.109	0.080	0.147	0.143	0.169	0.154	0.139	0.155
books6	0.037	0.026	0.053	0.048	0.063	0.065	0.062	0.052
books7	0.020	0.013	0.028	0.027	0.032	0.041	0.028	0.028
books8	0.035	0.024	0.050	0.048	0.052	0.066	0.047	0.052
Rural	0.129	0.183	0.050	0.061	0.019	0.017	0.092	0.072
MTHSCH (peer)	10.698 (1.835)	9.937 (1.461)	11.699 (1.829)	11.565 (1.788)	12.130 (1.341)	12.137 (1.985)	11.948 (1.437)	11.909 (1.689)
FTHSCH (peer)	10.729 (1.886)	9.970 (1.530)	11.741 (1.884)	11.636 (1.809)	12.218 (1.336)	12.080 (2.062)	11.906 (1.481)	11.865 (1.761)
HH Income (peer)	2.442 (1.185)	2.017 (0.693)	3.040 (1.514)	2.959 (1.362)	3.162 (1.126)	3.411 (2.008)	2.974 (1.102)	2.989 (1.284)
SCHOOLSIZE	794.804 (689.23)	718.067 (468.06)	780.511 (671.76)	1069.144 (1204.17)	1679.618 (1909.85)	965.290 (457.24)	900.962 (432.05)	862.443 (525.00)
SECPROPORTION	0.076 (0.146)	0.039 (0.116)	0.127 (0.167)	0.107 (0.158)	0.166 (0.164)	0.133 (0.153)	0.143 (0.150)	0.131 (0.174)
Lambda	0.554 (0.651)	0.214 (0.187)	0.729 (0.548)	1.397 (0.751)	1.553 (0.894)	1.774 (0.877)	1.756 (1.001)	1.313 (0.757)
N (students)	252,202	147,197	60,686	15,044	6,876	3,082	3,107	16,210
N (schools)	5,574	3,439	1,391	260	98	40	49	297
N (franchises)	1713	n/a	1391	166	39	12	12	22

Source: Ministry of Education and authors' calculations

Table 4 Differences between private voucher independent and private voucher franchises with average characteristics of public school students

	Voucher 1	Voucher >1 <i>franchise</i>
SPANISH		
Unadjusted difference	0.321 [0.005]	0.476 [0.006]
Difference adjusted for:		
Individual SES	0.110 [0.028]	0.286 [0.041]
Individual SES/peer SES	0.051 [0.025]	0.200 [0.039]
Individual SES/peer SES/selectivity	0.057 [0.033]	0.284 [0.064]
Number of observations	47,754	34,685
	Voucher 1	Voucher >1 <i>franchise</i>
MATH		
Unadjusted difference	0.296 [0.005]	0.440 [0.006]
Difference adjusted for:		
Individual SES	0.063 [0.027]	0.296 [0.043]
Individual SES/peer SES	0.008 [0.025]	0.220 [0.041]
Individual SES/peer SES/selectivity	0.041 [0.033]	0.315 [0.069]
Number of observations	47,610	34,722

Source: Ministry of Education and authors' calculations

Note: Standard errors are in parentheses

Table 5 Differences between private independent, private voucher franchise categories, with average characteristics of public school students

	Voucher 1	Voucher 2 <i>franchise</i>	Voucher 3 <i>franchise</i>	Voucher 4 <i>franchise</i>	Voucher 5 <i>franchise</i>	Voucher >5 <i>franchise</i>
SPANISH						
Unadjusted difference	0.321 [0.005]	0.355 [0.009]	0.538 [0.013]	0.615 [0.019]	0.496 [0.019]	0.531 [0.009]
Difference adjusted for:						
Individual SES	0.110 [0.028]	0.216 [0.067]	0.246 [0.071]	0.368 [0.086]	0.420 [0.125]	0.287 [0.059]
Individual SES/peer SES	0.051 [0.025]	0.165 [0.062]	0.149 [0.065]	0.235 [0.067]	0.189 [0.138]	0.204 [0.059]
Individual SES/peer SES/selectivity	0.050 [0.032]	0.186 [0.140]	0.501 [0.130]	0.206 [0.104]	0.831 [0.167]	0.257 [0.104]
Number of observations	47,556	11,981	5,548	2,517	2,341	12,298
MATH						
Unadjusted difference	0.296 [0.005]	0.351 [0.009]	0.456 [0.013]	0.581 [0.019]	0.466 [0.019]	0.483 [0.009]
Difference adjusted for:						
Individual SES	0.063 [0.027]	0.222 [0.068]	0.214 [0.078]	0.372 [0.108]	0.432 [0.140]	0.312 [0.065]
Individual SES/peer SES	0.008 [0.025]	0.176 [0.061]	0.138 [0.089]	0.250 [0.081]	0.157 [0.164]	0.234 [0.067]
Individual SES/peer SES/selectivity	0.036 [0.032]	0.225 [0.117]	0.671 [0.180]	0.232 [0.152]	0.751 [0.225]	0.378 [0.127]
Number of observations	47,612	11,994	5,550	2,521	2,346	12,311

Source: Ministry of Education and authors' calculations

Note: Standard errors are in parentheses