Journal of School Choice, 3:31–54, 2009

ISSN: 1558-2159 print/1558-2167 online
DOI: 10.1080/15582150902805016

Routledge
Taylor & Francis Group

ARTICLES

Comparing Public, Private, and Market Schools: The International Evidence

ANDREW J. COULSON
Cato Institute Center for Educational Freedom, Poulsbo, Washington, USA

Would large-scale, free-market reforms improve educational outcomes for American children? This question cannot be reliably answered by looking exclusively at domestic evidence, much less by looking exclusively at existing "school choice" programs. Though many such programs have been implemented around the United States, none has created a truly free and competitive education marketplace, being too small, too restriction laden, or both. To understand how genuine market forces affect school performance, we must cast a wider net, surveying education systems from all over the globe. The present paper undertakes such a review, assessing the results of decades of international research comparing market and government provision of education and explaining why these international experiences are relevant to the United States. In more than 150 statistical comparisons covering eight different educational outcomes, the private sector outperforms the public sector in the overwhelming majority of cases. Moreover, this margin of superiority is greatest when the freest and most market-like private schools are compared to the least open and least competitive government systems (i.e., those resembling typical U.S. public school systems). Given the breadth, consistency, relevance, and decisiveness of this body of evidence, the implications for U.S. education policy are significant.

KEYWORDS school choice, education markets, competition, parental choice, private schools, public schools, efficiency, cost effectiveness

Address correspondence to Andrew J. Coulson, Director, CEF, Cato Institute, 19689 7th Ave. NE, #354, Poulsbo, WA 98370. E-mail: ACoulson@cato.org

INTRODUCTION

Would families and communities be better served by a competitive marketplace of minimally regulated independent schools than they are by existing state school systems that enjoy exclusive access to large amounts of government funding (something Quentin Quade [1996] called state schools' public finance monopoly)? This question lies at the heart of the U.S. school choice debate, but the evidence presented to address it has typically been inadequate or even irrelevant (Merrifield, 2008b). School systems that differ from free and competitive markets in crucial ways have been used routinely to make claims about markets, while evidence of actual education markets operating in other nations has been ignored.

Economist John Merrifield has documented numerous cases in which scholars have incorrectly tried to draw conclusions about free education markets by observing nonmarket and pseudomarket "school choice" programs. He notes that the "most intensely studied [school choice] programs lack most or all of the key elements of market systems, including profit, price change, market entry, and product differentiation—factors that are normally central to any discussion of market effects" (Merrifield, 2008a). "In essence," Merrifield concluded, "researchers have drawn conclusions about apples by studying lemons." He argues that it is dubious to assume that studies of limited consumer choice within U.S. public school monopolies offer reliable guidance on the outcomes that might be expected under true market conditions.

I have previously presented evidence and arguments to the same effect (Coulson, 1999). After surveying alternative school governance and funding systems in more than a dozen times and places from classical Greece to contemporary Japan, Canada, the United Kingdom, and the United States, I found that school choice and direct payment of fees by parents, autonomy for educators, minimal regulation, vigorous competition among schools, and the profit motive for at least some portion of schools were associated with the most effective and responsive education systems. The lack of even one or two of these characteristics was associated with inferior outcomes.

The purpose of this article is thus to draw conclusions about education-market apples by studying the apples themselves, reviewing the relevant research conducted all over the world in the past several decades. A free education market is defined here as a set of competing, minimally regulated, parent-chosen private schools whose tuition prices are not strictly controlled by the state and that are funded (at least in part) directly by parents. As a result, this article does not concern itself with the extensive literature on the effects of varying degrees of consumer choice and competition *within* state-run education finance monopolies or among charter public

schools, nor does it investigate the effects of private sector competition on public sector outcomes. Its exclusive focus is on educational outcome comparisons between the public sector and the private sector, particularly between free market and state monopoly school systems.

The next section of the paper explains the relevance of the international evidence to domestic policy. The methodology used to find and categorize the studies included in this analysis is then described, the findings presented and discussed, and conclusions drawn.

THE RELEVANCE OF THE INTERNATIONAL EVIDENCE

The U.S. education policy debate is parochial. Evidence from abroad is seldom mentioned in policy discussions, and when it is, its relevance is usually dismissed. The key objection to the consideration of foreign experiences is that nations differ substantially in factors related to educational outcomes (e.g., wealth, culture, demographics). It is therefore dubious, critics claim, to assume that the performance of students in any particular foreign nation is due to that nation's school system alone.

The critics have a point. Whenever a prominent set of international test results is released, it is common for attention to be lavished on whichever nation has scored highest in the given school grade and subject tested. Many in the media and education policy circles then call for the emulation of that top-scoring nation. As skeptics rightly observe, however, it is not possible to conclude that a particular nation's success on a single test is attributable entirely or even chiefly to its education system (let alone that its performance is equally high across grades and subjects). Fortunately, there are ways of using the international evidence that not only overcome the hurdle posed by cultural and economic differences between countries but actually turn those differences into an asset. The most obvious way of eliminating the obfuscating effect of differences between nations is to compare different sorts of school systems within nations. A study that compares public and private schools within Sweden, or within India, for example, eliminates international differences as a factor.

Still, the results of such studies, taken individually, can tell us only that one sector outperforms the other *in that particular nation*. But what if we repeat this sort of comparison scores of times in a dozen or more very different countries and we find the same result occurring over and over again? If a particular approach to organizing and funding schools consistently outperforms other approaches across widely varying circumstances, we can be fairly confident that the observed pattern is the result of the system itself and not simply an accident of circumstance, because, although the circumstances will have varied from place to place, the results will have remained

the same. In fact, the greater the cultural and economic differences among the nations studied, the more striking any consistent pattern of results becomes.

The approach to the international data described previously is a form of natural experimentation, a method used to great effect in fields as diverse as epidemiology and cosmology.[1] By applying it to the international research on private-versus-government provision of education, we can discover answers to questions that are difficult to explore empirically in any other way.

METHODOLOGY

This literature review is organized into two distinct stages. In the first stage, a wide net is cast to collect as many public sector versus private sector educational outcome comparisons as possible. Those comparisons are then tabulated. But this wide net, despite its advantage of scooping up the largest possible number of studies, is insufficient to understand the relative performance of market and monopoly approaches to schooling. Much of the "public school versus private school" research deals with private schools that lack crucial market features (Merrifield, 2008b), and some of it deals with public schools that face real competition owing to the presence of large (though heavily regulated) school choice programs. In order to compare genuine education markets to public school monopolies such as exist in the United States, it is necessary to narrow the criteria for the studies to be considered. To that end, a second tabulation of the research is presented that specifically compares the performance of market and monopoly school systems.

This two-part presentation of the results is a useful test of the contention that genuine competitive education markets are substantively different in their performance from pseudomarkets. If this contention is correct, then the performance disparity between market and monopoly schools should be greater than that between the public and private sectors more generally (as the public versus private sector comparisons include numerous studies of private schools that lack one or more features of free markets). Conversely, if the contention is incorrect, then there should be little difference between the two tabulations.

The studies reviewed in this paper were collected over several years by a combination of Internet searches (chiefly via Google), multidatabase computer searches of academic journals, and examination of the sources cited in previously identified studies. The search strings used were extensive and varied, consisting of combinations of numerous synonyms for and varieties of "private schools," "public schools," and "outcomes."

Once identified, studies were included in this review if they used generally accepted quantitative methods to compare public versus private school performance in one or more of these areas:

- Academic achievement (as measured by student test scores)
- Efficiency (measured as academic achievement per dollar spent per pupil)
- Parental satisfaction
- Orderliness of classrooms
- Condition in which facilities were maintained
- Subsequent earnings of graduates (of K–12 academic programs)
- Attainment (graduation rates of high schools, or highest average grade completed)
- Effects on measured intelligence

Sixty-five studies covering more than 20 nations were found to meet these criteria. Though every effort was made to be comprehensive, it is entirely possible that some studies were missed. Readers aware of any studies matching the stipulated criteria but not included in the Appendix are encouraged to contact the author with the citation information and propose a "comment" article for a subsequent edition of this journal.

Some of these studies reported more than one statistical comparison of private and government schools, either because the research was conducted in several distinct locations, because several different types of private schools were examined, because results were only reported separately by student race,[2] or because multiple distinct outcomes were measured. In these cases, each comparison, or "finding," is counted separately in the tabulations of results that follow. Each row in Table 1 records all of the findings for a given geographical area and for the type of schools reported in the specified study. Table 1 reports 156 separate findings.

The convention in the social sciences when reviewing a large body of quantitative studies is to perform a meta-analysis. A meta-analysis takes the effect sizes and confidence intervals of the collected studies and subjects them to a further ("meta") regression analysis to arrive at the most precise possible conclusion on the direction, significance, and magnitude of the treatment effect in question (in this case, consumption of private or market schooling relative to consumption of public or monopoly schooling).

A meta-analysis of the studies collected here is certainly desirable (additional precision is always desirable), but the present study eschews meta-analysis for a simple "vote count" approach. Each statistically significant finding in favor of private (or market) schooling is counted as +1, each insignificant finding is counted as 0, and each significant finding in favor of public (or monopoly) schools is counted as –1. This vote count approach

TABLE 1 Private School Versus Government School Outcomes: The International Research Findings

Educational outcomes								School details			Study details	
Ach	Eff	Sat	Ord	Fac	Ear	Att	Int	PrF	Aut	Mon	Location	Author(s) & date
					1			1	1	1	United States	Aftab (2006)
1								0	0	0	Sweden	Ahlin (2004)
1	1							1	1	1	Pakistan	Alderman, Orazem & Paterno (2001)
0						1		1	1	1	United States	Altonji, Elder, Taber (1999
1								0	0	0	Chile	Anand, Mizala, Repetto (2006)
1	1	1						1	1	1	Pakistan	Andrabi et al. (2008)
1								1	1	1	Colombia	Angrist et al. (2002)
1						1		0	1	1	Colombia	Barrera-Osori (2006)
0	−1							1	0	1	India	Bashir (1997)
1	1							0	0	1	India	Bashir (1997)
					1					1	Indonesia	Bedi & Garg (2000)
−1								0	1	1	Cleveland	Belfield (2006)
0								1	1	1	United States	Braun, Jenkins & Grigg (2006)
1								1	1	1	United States	Bryk, Lee & Holland (1993)
1								1	1	0	Chile	Contreras (2002)
1								0	0	0	Chile	Contreras (2002)
1								1	1	0	Chile, non voucher	Contreras, Elacqua & Salazar (2006)
1								0	0	0	Chile, voucher chain	Contreras, Elacqua & Salazar (2006)
0								0	0	0	Chile, indep. voucher	Contreras, Elacqua & Salazar (2006)
				1				0	0	0	Chile	Cusato & Palafox (2002)
		1	1	1				1	1	1	India	De et al. (1999)
1								0			International	Dronkers & Robert (2008)
−1								1			International	Dronkers & Robert (2008)
0							1	1	0	1	Germany	Dronkers, Baumert & Schwippert (2002)
						1		1	1	1	United States	Evans & Scwab (1995)
1								1	1	1	United States, secular	Figlio & Stone (1999)
−1								1	1	1	United States, religious	Figlio & Stone (1999)
					1			1	1	1	Vietnam	Glewwe & Patrinos (1999)
0								1	1	1	United States	Goldhaber (1996)
1										1	India	Govinda & Varghese (1993)
						1		0	1	1	Milwaukee	Greene (2004)

(*Continued*)

TABLE 1 (*Continued*)

Educational outcomes								School details			Study details	
Ach	Eff	Sat	Ord	Fac	Ear	Att	Int	PrF	Aut	Mon	Location	Author(s) & date
		1						0	1	1	United States	Greene & Forster (2003)
		1						0	1	1	Milwaukee	Greene et al. (1996)
1						1		1	1	1	Urban United States, minority	Grogger & Neal (2000)
1						1		1	1	1	Urban United States, white	Grogger & Neal (2000)
0						1*		1	1	1	Sub'n United States, minority	Grogger & Neal (2000)
1						0		1	1	1	Sub'n United States, white	Grogger & Neal (2000)
1								1	1	1	United States	Hoffer, Greely, & Coleman (1985)
		1						1	1	1	United States, CSF program	Howell & Peterson (2002)
0	1	1	1					1	1	1	New York City	Howell & Peterson (2002)
0	1	1	1					1	1	1	Dayton	Howell & Peterson (2002)
0	1	1	1					0	1	1	Washington, DC	Howell & Peterson (2002)
0								0	0	0	Chile	Hsieh & Urquiola (2003)
	1							1	1	1	Indonesia	James et al. (1996)
1	1							0	0	0	Netherlands	Levin (2002)
1								1	1	1	Colombia	Jimenez & Lockheed (1995)
1	1							1	0	1	Dominican Rep.	Jimenez & Lockheed (1995)
1	−1							1	0	1	Dominican Rep.	Jimenez & Lockheed (1995)
1	1							1	1	1	Philippines	Jimenez & Lockheed (1995)
1	1							1	1	1	Tanzania	Jimenez & Lockheed (1995)
1	1		1					0	1	1	Thailand	Jimenez & Lockheed (1995)
1	1							1	1	1	India	Kingdon (1996b)
−1	1							0	0	1	India	Kingdon (1996b)
	1							1	1	1	India	Kingdon & Teal (2007)
0								0	1	1	New York City	Krueger & Zhu (2004)
−1	1							1	1	1	Tanzania	Lassibille et al. (1999)
−1								1	1	1	United States	Lubienski & Lubienski (2006)
0								1	1	0	Chile	McEwan (2002)
1								0	0	0	Chile	McEwan (2002)
0								0	0	0	Chile	McEwan (2002)

(*Continued*)

TABLE 1 (*Continued*)

Educational outcomes								School details			Study details	
Ach	Eff	Sat	Ord	Fac	Ear	Att	Int	PrF	Aut	Mon	Location	Author(s) & date
1	–1							1	1	0	Chile	McEwan & Carnoy (2000)
1	0							0	0	0	Chile (religious)	McEwan & Carnoy (2000)
–1	1							0	0	0	Chile (secular)	McEwan & Carnoy (2000)
1		1						0	1	1	Cleveland	Metcalf (1999)
0								0	1	1	Cleveland	Metcalf (2003)
1								1	1	1	Rural India	Muralidharan & Kremer (2006)
					1	1		1	1	1	Urban United States, minority	Neal (1997)
					0	1		1	1	1	Urban United States, white	Neal (1997)
					0	0		1	1	1	Sub'n United States, minority	Neal (1997)
					0	0		1	1	1	Sub'n United States, white	Neal (1997)
–1								1	1	1	Indonesia	Newhouse & Beegle (2005)
1								1	1	1	United States	Peterson & Llaudet (2006)
1	1							1	1	1	Colombia	Psacharopolous (1987)
1	1							1	1	1	Tanzania	Psacharopolous (1987)
1								0	1	1	Milwaukee	Rouse (1998)
						1		1	1	1	United States	Sander Krautmann (1995)
1								0	0	0	Chile	Sapelli & Vial (2001)
1								1	1	0	Chile	Sapelli & Vial (2001)
0	1							0	0	0	Chile	Sapelli & Vial (2002)
1	1							0	0	0	Chile	Sapelli & Vial (2005)
0											Argentina	Somers et al. (2004)
0											Bolivia	Somers et al. (2004)
0											Brazil	Somers et al. (2004)
1											Chile	Somers et al. (2004)
0											Colombia	Somers et al. (2004)
0											Dominican Republic	Somers et al. (2004)
0											Mexico	Somers et al. (2004)
0											Paraguay	Somers et al. (2004)
0											Peru	Somers et al. (2004)
0											Venezuela	Somers et al. (2004)

(*Continued*)

TABLE 1 (*Continued*)

Educational outcomes								School details			Study details	
Ach	Eff	Sat	Ord	Fac	Ear	Att	Int	PrF	Aut	Mon	Location	Author(s) & date
	1							1	1	1	Brazil	Sprietsma & Waltenberg (2005)
1								0	0	0	Chile (non poor)	Tokman (2001)
–1								0	0	0	Chile (poor)	Tokman (2001)
1	1							1	1	1	Hyderabad, India	Tooley & Dixon (2006)
1	1							1	1	1	Ga, Ghana	Tooley & Dixon (2006)
1	1							1	1	1	Lagos, Nigeria	Tooley & Dixon (2006)
0											International	Vandenberghe & Robin (2003)
1								1	1	0	Chile	Vegas (2002)
1								0	0	0	Chile	Vegas (2002)
0								0	0	0	Chile	Vegas (2002)
						1		0	1	1	Milwaukee	Warren (2008)
0		1						0	1	1	Milwaukee	Witte (1998)
0		1						0	1	1	Washington, DC	Wolf et al. (2008)
					0						Philippines	Yamauchi and Abrenica (2002)
					1						Philippines	Yamauchi et al. (2002)
					0					1	Thailand	Yamauchi et al. (2002)

*In Grogger and Neal (2000), the educational attainment benefit reported for suburban minority students is for college attendance rate. There is no additional benefit for these students in terms of high school graduation rate.

was chosen so that the methodology of this study could be easily understood by a lay audience, ensuring its transparency. The resultant loss in precision, while regrettable, is not of paramount concern given the data at hand. As the reader will soon see, the results in the literature are so one-sided on the questions addressed by this review, particularly the question of market versus monopoly educational outcomes, that no plausible distribution of effect sizes could affect the ultimate balance of the results. That said, a meta-analysis of this literature would be useful for and more appealing to a technical audience of social scientists, and would be an excellent opportunity for any interested researcher to contribute to the field.

In computing the vote count, academic achievement results for different grades or subjects are not counted as separate findings if they are from the same geographical area and for the same types of schools. Instead, academic achievement comparisons for different grades or subjects are

combined into a single overall "academic achievement" finding for the given geographical location and school type.

The results of alternative model specifications within a single study are not reported as separate findings. Instead, only the model preferred by the study's authors is reported. This is to avoid including findings from models that are deemed misspecified by their own authors, and also to avoid overweighting studies that report results for numerous slightly different model specifications applied to a single data set.

One of the most challenging issues for any literature review is the decision of whether or not to reject studies from consideration on methodological grounds, and if so, what criteria to use. In principle, studies whose models are biased in the same direction as their results should be discounted, because the results may simply be artifacts of the erroneous model (e.g., a model biased in favor of private schools may show a private sector advantage when none in fact exists).

Difficulties arise, however, in the assessment of what constitutes a sufficient degree of model misspecification to warrant a study's exclusion. For example, it has been empirically shown (Peterson & Llaudet, 2006)[3] that the Braun, Jenkins, and Grigg (2006) study of U.S. public and private schools suffered severe model misspecification, although many scholars accepted it without question (Pecheone & Vasudeva, 2006). If broad agreement on model bias could not be reached in that single seemingly straightforward case, then agreement across 65 different studies is unlikely indeed. It is a virtual certainty that whatever criteria were adopted here for the exclusion of studies on the grounds of model bias, many readers would object. For that reason, the present literature review opts not to exclude any studies due to perceived methodological flaws, allowing readers to come to their own judgments regarding which studies, if any, should be dropped from consideration. The emphasis here is on inclusiveness and transparency. Researchers who favor a particular set of criteria for the exclusion of problematic studies are invited to use the literature collected here as a starting point for their own analyses.

The inclusive approach adopted in the present review should not significantly skew its results so long as there is no major, consistent, uncontrolled source of bias that would disproportionately favor one sector over the other. Some would argue that there *is* a possible source of asymmetrical bias: so called "selection bias." Selection bias occurs when families choose public or private schools because of personal characteristics related to educational outcomes, and researchers fail to control for those characteristics. Parents who choose to pay for private schooling could have greater interest in and expectations for their children's educational success, which could lead to higher achievement for their children no matter which type of school the children ultimately attend. If these presumably more motivated

parents disproportionately choose private schools, then the private sector will enjoy an academic advantage that must be controlled for in order to make a fair comparison between the sectors.

There are two reasons why selection bias is unlikely to dramatically skew the results of this literature review: first, many of the studies reviewed here expressly control for selection bias, and second, the effect of controlling for selection bias is not uniform and in many cases private school advantages persist or even grow after the application of such controls. Examples of studies controlling for selection bias and finding that private sector advantages remain or even grow after doing so include the following: Kingdon (1996b) (India), Bedi and Garg (2000) (Indonesia), Jimenez and Lockwood (1995) (Colombia, Dominican Republic, the Philippines, Thailand, Tanzania), Contreras (2002) (Chile), and Tooley and colleagues (2009) (India and Nigeria). Controlling for selection bias tends to favor the private sector in countries like Tanzania and Indonesia that ration access to public secondary schooling on the basis of student achievement. This means that parents of low-scoring students who want their children to continue their education beyond elementary school must pay for that privilege in the private sector, creating a selection bias against private school achievement. A discussion of how selection bias was dealt with in many of the studies collected here, and the effect that controlling for it had on the results of those studies, can be found in an earlier literature review (Coulson, 2004). All of the studies reviewed here also include control variables to deal with differences in student background between the sectors, to isolate sectoral effects from student effects.

It is also worth noting that this paper analyses studies published in formally peer reviewed academic journals, studies published or distributed elsewhere, and as-yet-unpublished studies, and that it weights all of these equally. Why? First, many of the papers not published in peer-reviewed journals were nevertheless peer reviewed. This is true of the graduate theses that had to pass muster with dissertation committees, most academic book chapters, and papers published by think tanks (which, like individuals, have their reputations to think of).[4] Even as-yet-unpublished papers are not generally made publicly available until they have been vetted by colleagues. The unpublished paper by Altonji, Elder, and Taber (1999), for instance, was formally peer reviewed by anonymous referees and also commented on by 10 named reviewers including Nobel laureate economist James Heckman. It would seem strange to exclude or underweight such a paper simply because it had not yet been published. And second, it is not unusual in this field for respected scholars to include unpublished nonjournal papers in their literature reviews and to treat them in much the same way as published journal papers. The recent review of domestic "school choice" studies by Barrow and Rouse (2008), for example, includes unpublished studies.

FINDINGS: PRIVATE VERSUS GOVERNMENT SCHOOLING

Table 1 distills the international research findings comparing private and government provision of education across eight different measures:

Ach Student academic achievement
Eff Efficiency (achievement per dollar spent per pupil)
Sat Parental satisfaction
Ord Orderliness of classrooms
Fac Physical condition in which facilities are maintained
Ear Subsequent earnings of graduates (of K–12 academic programs)
Att Attainment (graduation rates of high schools, or highest average grade completed)
Int Effects on measured intelligence

For each of those measures, a value of 1 indicates a statistically significant advantage for private schools, a value of –1 indicates a statistically significant advantage for public schools and a value of 0 indicates a statistically insignificant finding. Table 1 also categorizes each finding according to three contextual details:

PrF Parents directly pay, on average, one-third or more of the cost of the private schools under consideration[5]
Aut The private schools under consideration have considerable or complete managerial autonomy (e.g., over pedagogy, staffing, etc.)
Mon The government schools under consideration are considered monopolies if they receive at least 30% more government funding per pupil than do most private schools (private schools usually receive either no government funding or comparable government funding to public schools, so the exact placement of this cutoff has only a modest impact on the classification of government systems as monopolies)

Findings for each of these three details is coded as 1 if true or 0 if false, and findings for which these details are unknown are coded as blank cells in the table. Each finding is also identified by the geographical location from which the data were collected and an abbreviated author/year citation.

Note that the results in Table 1 likely understate the private sector's efficiency advantage. In several cases (e.g., Peterson and Llaudet [2006] and the Dronkers and Roberts [2008] studies), private schools are found to have comparable or better academic achievement than government schools, but these studies do not report efficiency comparisons. Given that spending per pupil is generally higher in government than in private schools, the achievement findings in these studies strongly suggest an additional efficiency advantage for the private sector that is not reflected in the Table 1 results

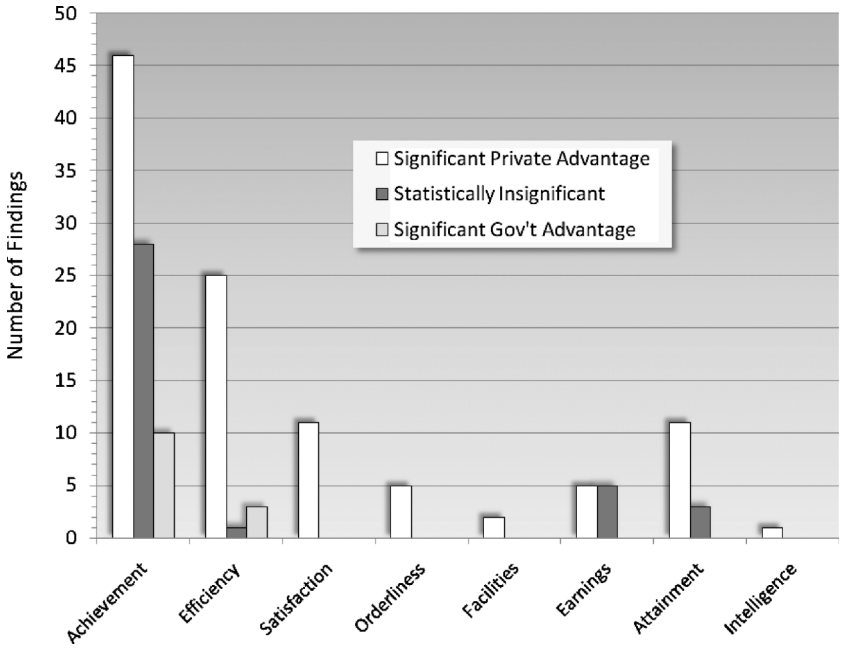

FIGURE 1 Private school versus government school outcomes, number of significant and insignificant findings, worldwide

TABLE 2 Summary of Findings Comparing Private and Government Schooling, by Result and Outcome Category

	Total	Ach	Eff	Sat	Ord	Fac	Ear	Att	Int
Sig. Private Advantage	106	46	25	11	5	2	5	11	1
Statistically Insignificant	37	28	1	0	0	0	5	3	0
Sig. Gov't Advantage	13	10	3	0	0	0	0	0	0

(equal or higher achievement at a lower per-pupil cost is the definition of efficiency) (Coulson, 2006).[6]

Figure 1 and Table 2 summarize the Table 1 results, showing the distribution of those favoring the private sector, those favoring the public sector, and those that are statistically insignificant.

FINDINGS: MARKET VERSUS MONOPOLY SCHOOLING

While the results reported in the previous section have the advantage of comprehensiveness (including all of the studies identified by this review), they are not as meaningful as we would like. The terms "private school"

and "government school" encompass many different types of institutions. Private schools in the United States are usually quite lightly regulated and are funded almost exclusively through fees paid by parents. Private schools in the Netherlands, by contrast, receive virtually all of their funding from the state and must follow state rules regarding curriculum, testing, teacher qualifications, and teachers' salaries, and they may not be operated for profit. These are clearly different types of institutions. There are also great dissimilarities among the world's government schools. In the United States, these enjoy, with only a few minor and isolated exceptions, a monopoly on government K–12 education funding, to the tune of more than $11,000 per pupil.[7] In Chile, the Netherlands, Australia, parts of Canada, Sweden, and other nations, various levels of public funding are made available to private as well as to government schools, though this funding usually comes with extensive regulatory strings, putting the government sector under some degree of competitive pressure, to the point that it could not reasonably be described as a monopoly. So, in order to understand what the international evidence has to say about the relative merits of a genuinely competitive education market as opposed to the sort of state-school monopolies that exist in the United States, we must winnow down the range of studies under consideration to only those that contrast marketlike private education systems with monopolistic government systems.

As noted in the Introduction, this paper defines market education systems as those that are funded at least in part by parents paying tuition fees, do not suffer strict price controls, and are free of intrusive regulation of their curricula, methods, and personnel decisions.[8] Note that this review is concerned with the level of private school regulation *actually enforced* rather than with the theoretical regulatory burden expressed in law. That is because many developing countries have extensive regulatory codes for private schools but do not enforce those codes in practice. This distinction, where it is significant, is usually discussed in the studies themselves.

Note, too, that this is not the strictest definition of a free education marketplace (e.g., it disregards government-created barriers to entry into the private education sector), but it serves to identify relatively marketlike education systems while not overly narrowing the scope of the empirical findings under consideration (see Merrifield, 2008a). It is, in other words, an operational definition that is both meaningful and useful. Readers wishing to see which studies report findings for "market" schools as defined here may refer to those rows in Table 1 for which both the "PrF" (parent funding) and "Aut" (autonomy) columns have the value "1."

Monopoly state systems are herein defined as those that do not face substantial competitive pressures from the private sector because they enjoy a nonnegligible[9] government funding advantage (per pupil) over most private schools. In practice, this usually means that the jurisdictions in question do not have large-scale school choice programs that provide significant

funding to private schools. To clarify with a few examples, the United States has no large scale school choice programs that substantially diminish public schools' government funding advantage, and so U.S. public school systems can be described for our purposes as monopolies. The Chilean and Dutch governments provide a great deal of funding to most private schools, forcing public schools into more direct competition with them, and hence the Chilean and Dutch public school systems do not constitute monopolies for our purposes.

When the findings in Table 1 are winnowed down to only those comparing market to monopoly school systems using the operational definitions just provided (i.e., those findings for which the "PrF," "Aut," and "Mon" cells have the value "1"), the breakdown of results is as shown in Figure 2 and Table 3. For the reader's convenience, the relevant three cells in Table 1 are shaded when they all have the value "1" so that the "market" versus "monopoly" findings can easily be distinguished from those that do not meet the above operational definitions.

It is perhaps worth noting that the only rich Western nation included in the second tabulation is the United States. This is due primarily to the fact that virtually all rich Western nations provide considerable funding to private schools, thus causing their public school systems not to qualify under the operational definition of monopoly used in this paper.

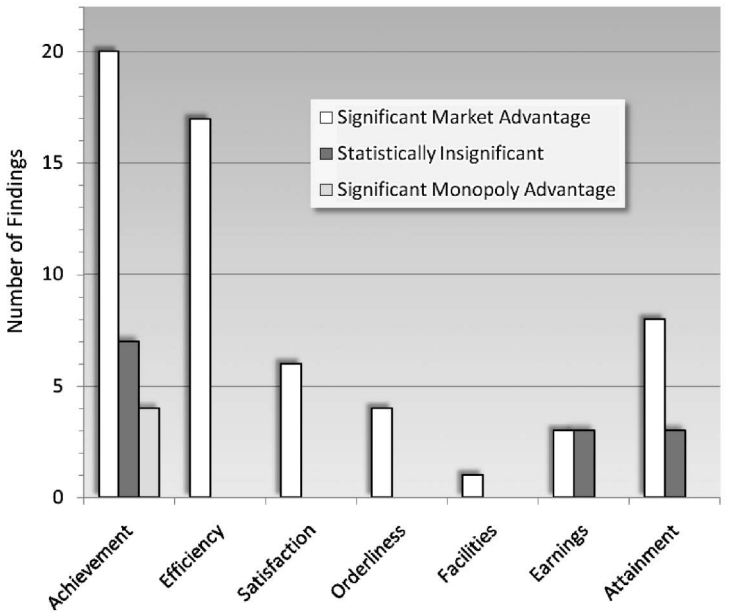

FIGURE 2 Market school versus monopoly school outcomes, number of significant and insignificant findings, worldwide.

TABLE 3 Summary of Findings Comparing Market and Monopoly Schooling, by Result and Outcome Category

	Total	Ach	Eff	Sat	Ord	Fac	Ear	Att
Sig. Market Advantage	59	20	17	6	4	1	3	8
Statistically Insignificant	13	7	0	0	0	0	3	3
Sig. Gov't Advantage	4	4	0	0	0	0	0	0

DISCUSSION

The contrast between Tables 2 and 3 tells a new and compelling story. While private schools clearly outperform state-run schools all over the world across a host of outcome measures, this difference pales in comparison to that between relatively free education markets and state monopolies. While findings of a private-schooling advantage outnumber those of a public schooling advantage by a ratio of roughly 8 to 1, findings of a free-market advantage outnumber those of a school-monopoly advantage by a ratio of nearly than 15 to 1. And while there are 37 insignificant public-versus-private findings, there are only 13 insignificant market-versus-monopoly finding.

These findings, moreover, span some of the most diverse cultural and economic settings on earth: from the United States to Colombia, from the urban slums of Hyderabad to the rural fishing villages of Ghana. The parents whose children benefit from market school systems range from some of the most privileged on the planet to some of the least literate and most destitute.

Contrary to the expectations of many conservative and liberal education commentators in the United States, there is little evidence that government regulation improves the operation of the marketplace. It is actually the freest, most marketlike education systems that demonstrate the greatest margin of superiority over state schooling.

These findings present an opportunity and a challenge for U.S. education policymakers. The opportunity is obvious: it is clearly possible to structure the provision of schooling in ways that will improve a host of valued educational outcomes. The challenge is to find ways of doing so that will ensure that all families have ready access to the marketplace without compromising key features of markets that are responsible for their superior performance: professional autonomy for educators, unfettered choice for parents, and some direct payment of tuition by parents.

Despite the controls for selection bias in many of the studies analyzed here, and despite the controls for differences in student and family characteristics between the sectors, some readers may still find it hard to shake the notion that private school families are fundamentally different from public

school families because they chose to directly shoulder the schooling costs themselves. These readers may continue to harbor the belief that there is a small, elite pool of committed parents who will choose private schools and that it is their commitment and not a private sector effect, that is responsible for the striking results documented in this paper.

If that belief were correct, we would expect the education market's advantage over monopoly schooling to decline as private sector enrollment share rises, and eventually to be eliminated or even reversed in cases where private sector enrollment share exceeded public sector enrollment share (because, once the private sector began to serve the majority of families, the impact of a small elite of committed parents on its overall performance would be greatly attenuated and perhaps erased). This expectation is subject to empirical investigation, and, as it turns out, is not consistent with the evidence. Significant advantages for market provision over monopoly provision persist even in areas where private schools *already* enroll the majority of students.

Consider, for instance, the work of Oxford University's Geeta Gandhi Kingdon (1996b). Kingdon has shown that parent-funded, minimally regulated private schools in Lucknow, India—most of them neither recognized by, nor registered with, the state—produce significantly higher student achievement per dollar spent than local "free" government schools. Kingdon separately (but contemporaneously) showed that the private sector in Lucknow enrolled 80% of all students (Kingdon, 1996a). More recently, Tooley and Dixon (2006) and Tooley and colleagues (2009) have found that the parent-funded private school sector enrolls the majority of students in a variety of African and Indian villages, while also significantly outperforming government schools in those areas.

The superiority of market over monopoly provision of schooling revealed by the econometric literature thus does not, in practice, depend on the share of students enrolled in the private sector, as would be expected if that superiority depended on the consumption of private schooling only by a small, especially committed elite. When the majority, sometimes the vast majority, of schoolchildren enroll in the private sector, and when market schools still significantly outperform their public sector counterparts, it is no longer reasonable to ascribe the market's advantage to some special indefinable quality of a parental elite.

Readers interested in learning more about these entrepreneurial schools serving the third world poor are encouraged to see James Tooley's fascinating forthcoming book *The Beautiful Tree: A Personal Journey into How the World's Poorest People are Educating Themselves* (Tooley, 2009).

CONCLUSION

Across time, countries, and outcome measures, private provision of education outshines public provision according to the overwhelming majority of

econometric studies. Findings of a statistically significant advantage for private schooling outnumber findings of a significant advantage for public schooling by a ratio of roughly 8 to 1, and the statistically significant advantage for private schools outnumbers by a ratio of more than 3 to 1 the statistically insignificant findings.

However, since the funding and regulatory structures of "public" and "private" schools vary widely, this breakdown of the research is insufficiently detailed to be of real use to policymakers. If we want to ascertain the merits of real market reform in education, we must compare genuinely marketlike private school systems (which are minimally regulated and are funded, at least in part, directly by parents) with state school monopolies protected from significant market competition (such as the typical U.S. public school system). When we assess the evidence using these more specific criteria, the results are more stark: there are 59 statistically significant findings of marketlike education systems outperforming government monopoly schooling, and only four findings of the reverse, for a ratio of nearly 15 to 1 in favor of free education markets. There are only 13 statistically insignificant findings among market versus monopoly comparisons, and *every* finding comparing the efficiency of market and monopoly schooling is both statistically significant and favors markets.

These results call into question the notion, prevalent in both conservative and liberal circles, that the content of schooling must be overseen by the state in order for schools to achieve optimum performance. It is in fact the least regulated market school systems that show the greatest margin of superiority over state schooling.

Based on the patterns that emerge from the global evidence, policymakers should seriously consider providing universal access to minimally regulated education markets in which parents, whenever possible, directly pay at least some of the cost of their children's education. Programs intended to accomplish that objective (such as education tax credits) have already been proposed, and partial, scaled-down versions of such programs are already operating in several U.S. states (Schaeffer, 2007).

NOTES

1. Natural experimentation is far from a new concept. The pioneering work with this method was John Snow's discovery of the source of London's cholera epidemics of the mid-19th century. See Snow 1855.

2. For studies reporting both collected findings for students of all races and breakdowns by race, only the collected findings are reported. The racial breakdowns are tabulated here only when no aggregated findings are reported.

3. Peterson and Llaudet (2006) empirically assessed the impact of many of the methodological flaws in the Braun, Jenkins, and Grigg (2006) study. They found that the flaws in that study did indeed bias its results.

4. As an editor of education publications for the Cato Institute, among other duties, I regularly seek peer reviews for our prospective publications, and other think tanks I have worked with do the same.

5. Note that the precise choice of this cutoff share for parent funding has only a modest impact on the categorization of studies since direct parent funding of private schools generally comprises either a very high or a very low share of the total, with few schools falling in between.

6. For international evidence on this point, see the studies reporting efficiency results in the Appendix. For a detailed investigation of spending in private and government schools in the U.S. state of Arizona, see Coulson (2006).

7. The U.S. Census Bureau reports that total per pupil spending in government schools was $11,098 in 2005–2006, and with inflation and the historically rising trend in spending, the figure is likely close to $12,000 per pupil today.

8. Private schools were included in the market sector if approximately one-third or more of their funding was derived directly from parents through tuition fees. This cutoff point is admittedly arbitrary, but since most of the private schools that qualify as "market" schools under this paper's definition actually derive all or virtually all of their funding from parents, the results of this study are robust to alternative cutoff values.

9. For the purposes of this analysis, "nonnegligible" is defined as greater than or equal to 30%. That is, "monopoly" public schools receive at least 30% more government funding than do private schools. While this is an admittedly subjective cutoff point, very few of the studies collected here deal with private schools that receive any government funding whatsoever, while the public schools they study are fully government funded—a clear monopoly scenario. Hence, the conclusions of this study would be robust to a much higher cutoff on the government funding level that qualifies public schools as monopolies.

REFERENCES

Altonji, J.G., Elder, T., & Taber, C. (1999). Selection on observed and unobserved variables: Assessing the effectiveness of catholic schools. Yale University research paper. Retrieved from http://www.econ.yale.edu/~jga22/website/research_papers/altonji_elder_taber_catholic_schools_jpe_final_te21.pdf.

Barrow, L. & Rouse, C. E. (2008, August). School vouchers and student achievement: Recent evidence, remaining questions. FRB of Chicago Working Paper No. 2008-08, http://ssrn.com/abstract=1267346.

Bedi, A. S., & Garg, A. (2000). The effectiveness of private versus public schools: The case of Indonesia. *Journal of Development Economics*, *61*(2), 463–494.

Braun, H., Jenkins, F., & Grigg, W. (2006). *Comparing private schools and public schools using hierarchical linear modeling*. NCES Publication 2006-461, National Center for Education Statistics, Institute of Education Sciences, U.S. Department of Education. Washington, DC: Government Printing Office.

Contreras, D. (2002). Vouchers, school choice, and the access to higher education. Discussion Paper no. 845, Economic Growth Center, Department of Economics, Yale University, New Haven, Connecticut.

Coulson, A. J. (1999). *Market education: The unknown history*. New Brunswick, NJ: Transaction Books.

Coulson, A. J. (2004). How markets affect quality: Testing a theory of market education against the international evidence. In D. Salisbury & C. Lartigue Jr. (Eds.), *Educational Freedom in Urban America* (pp. 265–324). Washington, DC: Cato Institute.

Coulson, A. J. (2006). Arizona public and private schools: A statistical analysis. Goldwater Institute Policy Report no. 213, http://www.goldwaterinstitute.org/AboutUs/ArticleView.aspx?id=1149.

Dronkers, J, & Roberts, P. (2008). Differences in scholastic achievement of public, private government-dependent, and private independent schools: A cross-national analysis, *Educational Policy*, *22*(4), 541–577.

Jimenez, E., & Lockwood, M. E. (1995). Public and private secondary education in developing countries: A comparative study. World Bank Discussion Papers No. 309. Washington, DC: World Bank.

Kingdon, G. G. (1996a, December). Private schooling in India: Size, nature, and equity-effects. *Economic and Political Weekly*, *31*(51), 3306–3314.

Kingdon, G. G. (1996b). The quality and efficiency of public and private schools: A case study of urban India. *Oxford Bulletin of Economics and Statistics*, *58*(1), 57–82.

Merrifield, J. (2008a, April 16). Dismal science: The shortcomings of U.S. school choice research and how to address them. *Cato Institute Policy Analysis*, *616*, 1.

Merrifield, J. (2008b). School choice evidence and its significance. *Journal of School Choice*, *2*(3), 223–259.

Pecheone, R. & Vasudeva, A. (2006, October 25). Review of "Giving kids the chaff: How to find and keep the teachers we need." Tempe, AZ: Education Policy Studies Laboratory, Arizona State University, http://epicpolicy.org/files/EPSL-0610-217-EPRU2.pdf.

Peterson, P. E., & Llaudet, E. (2006). On the public-private school achievement debate. Publication no. PEPG 06-02. Cambridge, MA: Program on Education Policy and Governance, Harvard University.

Quade, Q. (1996). *Financing education*. New Brunswick, NJ: Transaction Books.

Schaeffer, A. B. (2007, December). The public education tax credit. *Cato Institute Policy Analysis*, *605*.

Snow, J. (1855). *On the mode of communication of cholera,* 2nd ed. London: John Churchill, http://www.deltaomega.org/snowfin.pdf.

Tooley, J. (2009). *The beautiful tree: A personal journey into how the world's poorest people are educating themselves*. Washington, DC: Cato Institute.

Tooley, J., Bao, Y., Dixon, P., & Merrifield, J. (2009). School choice and academic performance: Evidence from developing countries. Manuscript under review by *Economics of Education Review*.

Tooley, J., & Dixon, P. (2006). "De facto" privatisation of education and the poor: Implications of a study from Sub-Saharan Africa and India. *Compare*, *36*(4), 443–462.

APPENDIX: SOURCE STUDIES

Aftab, Z. (2006). The effects of private schooling on adult economic outcomes. Master's thesis, Graduate School of Arts and Sciences, Georgetown University, Washington, DC.

Ahlin, Å. (2004). Compulsory schooling in a decentralized setting: Studies of the Swedish case. Doctoral dissertation, Uppsala University, Uppsala, Sweden.

Alderman, H., Orazem, P. F., & Paterno, E. M. (2001). School quality, school cost, and the public/private school choices of low-income households in Pakistan. *Journal of Human Resources, 36*(2), 304–326.

Anand, P., Mizala, A., & Repetto, A. (2006). Using school scholarships to estimate the effect of government subsidized private education on academic achievement in Chile. Working paper 220, Centro de Economia Aplicada, Universidad de Chile. Retrieved from http://ideas.repec.org/p/edj/ceauch/220.html.

Andrabi, T., Das, J., Khwaja, A. I., Vishwanath, T., & Zajonc, T. (2008). *Pakistan: Learning and educational achievements in Punjab schools*. Washington, DC: World Bank.

Angrist, Joshua D., et al. (2002). Vouchers for private schooling in Colombia: Evidence from a randomized natural experiment. National Bureau of Economic Research Working Paper No. 8343. Retrieved from http://www.nber.org/papers/w8343.

Barrera-Osorio, F. (2006). The impact of private provision of public education: Empirical evidence from Bogota's concession Schools. World Bank Policy Research Working Paper No. 4121. Retrieved from http://www-wds.worldbank.org/external/default/WDSContentServer/IW3P/IB/2007/01/26/000016406_20070126111542/Rendered/INDEX/wps4121.txt.

Bashir, S. (1997). The cost effectiveness of public and private schools: Knowledge gaps, new research methodologies, and an application in India. In C. Colclough (Ed.), *Marketizing education and health in developing countries: Miracle or mirage* (pp. 124–164). Oxford: IDS Development/Clarendon Press.

Belfield, C. (2006). The evidence on education vouchers: An application to the Cleveland scholarship and tutoring program, Working Paper, National Center for the Study of Privatization in Education, Teachers College, Columbia University, January 2006. Retrieved from http://www.ncspe.org/publications_files/OP112.pdf

Braun, H., Jenkins, F., & Grigg, W. (2006). Comparing private schools and public schools using hierarchical linear modeling. NCES Publication 2006-461, National Center for Education Statistics, Institute of Education Sciences, U.S. Department of Education. Washington, DC: Government Printing Office.

Bryk, A., Lee, V., & Holland, P. B. (1993). Catholic schools and the common good. Cambridge, MA: Harvard University Press.

Contreras, D., Elacqua, G., & Salazar, F. (2006). *School choice in Chile*. Paper presented at the September 2006 Encuentro de la Sociedad de Economia de Chile, La Serena, Chile. Revised draft. Retrieved from http://sechi.facea.uchile.cl/sechi/contributed_1/Contreras_dant.pdf.

Cusato, S., & Palafox, J. C. (2002). Qualitative study of schools with outstanding results in seven Latin American countries. Research report, Latin American Laboratory for the Assessment of Education. Santiago, Chile: UNESCO, Regional Bureau of Education for Latin America and the Caribbean. Retrieved from http://unesdoc.unesco.org/images/0013/001310/131037e.pdf.

De Anuradha, et al. (1999). *Public report on basic education in India* (The PROBE report). New Delhi: Oxford University Press.

Dronkers, J., Baumert, J., & Schwippert, K. (2002). Are German non-public secondary schools more effective at teaching mathematics and natural sciences? Paper

presented at the XV World Congress of Sociology in Brisbane, Australia. Retrieved from http://www.eui.eu/ Personal/Dronkers/English/germanschoolssciences.pdf.

Evans, W. N., & Schwab, R. M. (1995). Finishing high school and starting college: Do catholic schools make a difference? *The Quarterly Journal of Economics, 110*(4), 941–974.

Figlio, D. N., & Stone, J. A. (1999). School choice and student performance: Are private schools really better? *Research in Labor Economics*, *18*, 115–140.

Glewwe, P., & Patrinos, H. A. (1999). The role of the private sector in education in Vietnam: Evidence from the Vietnam living standards survey. Working Paper No. 132, Living Standards Measurement Study. Washington, DC: World Bank.

Goldhaber, D. D. (1996). Public and private high schools: Is school choice an answer to the productivity problem. *Economics of Education Review*, *15*(2), 93–109.

Govinda, R., & Varghese, N. V.. (1993). Quality of primary schooling in India: A case study of Madhya Pradesh. Paris: International Institute for Educational Planning; New Delhi: National Institute of Educational Planning and Administration.

Greene, J. P. (2004). Graduation rates for choice and public school students in Milwaukee. Milwaukee: School Choice Wisconsin. Retrieved from http:// www.schoolchoiceinfo.org/ data/hot_topics/grad_rate.pdf.

Greene, J. P., & Forster, G. (2003). Vouchers for special education students: An evaluation of Florida's McKay scholarship program. Civic Report no. 38. New York: Manahattan Institute.

Greene, J. P., et al. (1996). The effectiveness of school choice in Milwaukee: A secondary analysis of data from the program's evaluation. Occasional Paper 96-3. Cambridge, MA: Program in Education Policy and Governance, Harvard University.

Grogger, J., & Neal, D. (2000). Further evidence on the effects of Catholic schooling. *Brookings-Wharton Papers in Urban Economics, 1*, 151–193.

Hoffer, T., Greeley, A. M., & Coleman, J. S. (1985, April). Achievement growth in public and Catholic schools. *Sociology of Education*, *58*, 74–97.

Howell, W. G., and Peterson, P. E. (2002). *The education gap: Vouchers and urban public schools*. Washington, DC: Brookings Institution.

Hsieh, C-T., & Urguiola, M. (2003). When schools compete, how do they compete? An assessment of Chile's nationwide school voucher program. National Bureau of Economic Research Working Paper No. 10008. Retrieved from http:// www.nber.org/papers/w10008.

James, E., King, E. M., & Suryadi, A. (1996). Finance, management, and costs of public and private schools in Indonesia. *Economics of Education Review, 15*(4), 387–398.

Kingdon, G. G., & Teal, F. (2007). Does performance related pay for teachers improve student performance? Some evidence from India. *Economics of Education Review, 26*(4), 473–486.

Krueger, A. & Zhu, P. (2004). Another look at the New York City school voucher experiment. *American Behavioral Scientist*, *47*(5), 658–698.

Lassibille, G., Tan, J-P, & Sumra, S. (1999). Expansion of private secondary education: Experience and prospects in Tanzania. Working Paper Series on Impact

Evaluation of Education Reforms, No. 12, revised draft. Washington, DC: World Bank, Development Economics Research Group. Retrieved from http://siteresources.worldbank.org/EDUCATION/Resources/278200-1099079877269/547664-1099079934475/547667-1135281552767/Expansion_Secondary_Ed_Tanzania.pdf.

Levin, J. (2002). Do Dutch Catholic primary schools really perform better? Working paper, Faculteiten Economie en Bedrijfskunde, University of Groningen. http://www.eco.rug.nl/~espe2002/Levin.pdf.

Lubienski, C., & Lubienski, S. T. (2006, January). Charter, Private, Public Schools and academic achievement: New evidence from naep mathematics data. Working Paper, National Center for the Study of Privatization in Education, Teachers College, Columbia University.

McEwan, P. J. (2002). Public subsidies for private schooling: A comparative analysis of Argentina and Chile. *Journal of Comparative Policy Analysis: Research and Practice, 4*(2), 189–216.

McEwan, P. J., & Carnoy, M. (2000). The effectiveness and efficiency of private schools in Chile's voucher system. *Educational Evaluation and Policy Analysis, 22*(3), 213–239.

Metcalf, K. (1999). Evaluation of the Cleveland Scholarship and Tutoring Grant Program: 1996–1999. Technical report, Indiana Center for Evaluation. Bloomington, IN: School of Education, Indiana University. Retrieved from http://ceep.indiana.edu/projects/PDF/199909b_clev_3_report.pdf.

Metcalf, K. (2003). Evaluation of the Cleveland Scholarship and Tutoring Grant Program: Summary report 1998–2002. Indiana Center for Evaluation. Bloomington, IN: School of Education, Indiana University. Retrieved from http://ceep.indiana.edu/projects/PDF/200312b_clev_6_sum_rep.pdf.

Muralidharan, K., & Kremer, M. (2006). Public and private schools in rural India. Working paper, Cambridge, MA: Graduate School of Education, Harvard University. Retrieved from http://www.people.fas.harvard.edu/~muralidh/Public_and_Private_Schools_in_Rural_India_032206.pdf.

Neal, D. (1997). The effects of Catholic secondary schooling on educational achievement. *Journal of Labor Economics*, *15*(1), 98–123.

Newhouse, D., & Beegle, K. (2005). The effect of school type on academic achievement: Evidence from Indonesia. World Bank Policy Research Working Paper, WPS3604.

Psacharopoulos, G. (1987). Public versus private schools in developing countries: Evidence from Colombia and Tanzania. *International Journal of Educational Development, 7*(1), 59–67.

Rouse, C. E. (1998). Private school vouchers and student achievement: An evaluation of the Milwaukee parental choice program. *Quarterly Journal of Economics, 113*(2), 553–602.

Sander, W., & Krautmann, A. C. (1995). Catholic schools, dropout rates and educational attainment. *Economic Inquiry*, *33*(2), 217–233.

Sapelli, C., & Vial, B. (2001). Evaluating the Chilean education voucher system. Working paper, second draft, Instituto de Economía. Santiago: Pontificia Universidad Católica de Chile.

Sapelli, C., & Vial, B. (2002). The performance of private and public schools in the Chilean voucher system. *Cuadernos de Economia, 39*(118), 423–454. http://www.cuadernosdeeconomia.cl/Pdf/117sapeA.pdf (Spanish language).

Sapelli, C., & Vial, B. (2005). Private vs. public voucher schools in Chile: New evidence on efficiency and peer effects. Working paper No. 289, Instituto de Economía. Santiago: Pontifica Universidad Católica de Chile. Retrieved from http://www.economia.puc.cl/index/detalle_publica.asp?id_publicacion=834&id_subsecciones=123&id_seccion=3.

Somers, M-A., McEwan, P. J., & Willms, J. D. (2004). How effective are private schools in Latin America? *Comparative Education Review*, *48*, 48–69.

Sprietsma, M., & Waltenberg, F. D. (2005). The impact of teachers' wages on students' performance in the presence of heterogeneity and endogeneity: Evidence from Brazil. Discussion Paper no. 2005-8, Institut de recherches économiques et socials, Département des Sciences Économiques de l'Université Catholique de Louvain. Retrieved from http://www.ires.ucl.ac.be/DP/IRES_DP/2005-8.pdf.

Tokman, A. P. (2001). Is private education better? Evidence from Chile. White paper, Gerencia de Investigación Económica, Banco Central de Chile.

Vandenberghe, V., & Robin, S. (2003). Private, private government-dependent and public schools: An international efficiency analysis using propensity score matching. Working paper, Institut de recherches économiques et socials, Département des Sciences Économiques de l'Université Catholique de Louvain.

Vegas, E. (2002). School choice, student performance, and teacher and school characteristics: The Chilean case. Policy Research Working Paper No. 2833, Development Research Group, World Bank. Retrieved from http://www-wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/2002/05/20/000094946_02050804162265/Rendered/PDF/multi0page.pdf.

Warren, J. R. (2008). *Graduation rates for choice and public school students in Milwaukee*. Milwaukee: School Choice Wisconsin.

Witte, J. F. (1998). The Milwaukee voucher experiment. *Educational Evaluation and Policy Analysis*, *20*(4), 229–251.

Wolf, P., Gutmann, B., Puma, M. Kisida, B., Rizzo, L., & Eissa, N. (2008). *Evaluation of the DC Opportunity Scholarship Program impacts after two years* (NCEE 2000-4023). Washington, DC: National Center for Education Evaluation and Regional Assistance, Institute of Education Sciences, U.S. Department of Education. Retrieved from http://ies.ed.gov/ncee/pdf/20084023.pdf.

Yamauchi, F., & Abrenica, J. (2002). Is private school premium spurious? The role of private schools in the Philippines. Conference paper, Institute of Economic Research, Kyoto University. Retrieved from http://www.kier.kyoto-u.ac.jp/~ariga/download/ADBI2002/education2.pdf.

Yamauchi, F., et al. (2002). Why do schooling returns differ so much? Observations and puzzles from Thailand and the Philippines. Conference paper, Institute of Economic Research, Kyoto University. Retrieved from http://www.kier.kyoto-u.ac.jp/~ariga/download/ADBI2002/education3.pdf.