

SONALDE DESAI

University of Maryland College Park

AMARESH DUBEY

*National Council of Applied Economic Research
and Jawaharlal Nehru University*

REEVE VANNEMAN

University of Maryland College Park

RUKMINI BANERJI

PRATHAM

Private Schooling in India: A New Educational Landscape*+

Introduction

Although the growth of private schooling in India is quite visible, even in rural areas, the contours of this change remain poorly understood because of data limitations. Official statistics often tend to underestimate private school enrollment (Kingdon, 2007). Moreover, there is at best limited understanding of the effectiveness of private education in India. If parents know what is best for their children and if they are voting with their feet, we might assume that private schools must be of better quality than exist-ing public schools. Two considerations suggest a need for deeper reflection, however: (a) There is a long history of school quality research in different contexts, particularly in the United States, which suggests that much of the apparent differences in schools are due to parental choices that propel children from certain backgrounds into certain types of schools (Hanushek, 1997) and

* Views presented in this paper are authors' personal views and do not reflect institutional opinions.

+ The results reported in this paper are based primarily on India Human Development Survey, 2005. This survey was jointly organized by researchers at the University of Maryland and the National Council of Applied Economic Research (NCAER). The data collection was funded by grants R01HD041455 and R01HD046166 from the National Institutes of Health to the University of Maryland. Part of the sample represents a resurvey of households initially surveyed by NCAER in 1993-94. More information about the survey is available at www.ihds.umd.edu.

(b) the panorama of Indian private schools is dotted with small, unrecognized, and unregulated schools, frequently with poorly trained teachers. Anybody who has observed some of these schools would not automatically assume that private schools are better than government schools. Hence, it is important to empirically examine the impact of private school enrollment on educational outcomes.

So far, lack of appropriate data has made it difficult to explore this issue. However, a new survey (Desai et al., 2009), the India Human Development Survey 2005 (IHDS), jointly organized by researchers from the University of Maryland and The National Council of Applied Economic Research (NCAER), makes it possible to explore some of the linkages between private school growth and school quality. Using data from IHDS, this paper will provide a description of public and private schools in India as well as some of the considerations that guide parents in selecting private schools. In addition to providing descriptive information, it will examine whether private school enrollment is associated with higher student performance and whether this relationship, if any, is concentrated in certain sections of the population.

The second section describes the findings from the literature comparing public and private schools with a focus on findings from international studies, results from Indian studies, and some of the policy considerations. The third section describes the India Human Development Survey 2005 (IHDS) on which this paper is based and the methodology is described in the fourth section. The following three sections describe the nature of school systems in India, provide some descriptive statistics on the characteristics of private and public schools and also examine the social and economic backgrounds of students who attend public and private schools. The eighth section examines the impact of private school enrollment on child outcomes and the section following it focuses on the characteristics of the children who benefit most from private school enrollment. The final section of this paper draws out the implications of our results for policy considerations.

Literature on Public and Private Schools

Throughout the 20th century, as the role of the State grew in industrial societies and as many third world countries obtained independence, it has come to be universally accepted that education is one of the core functions of any mature civil society and has resulted in massive expansion of publicly provided education (Meyer et al., 1977). However, a growing dissatisfaction

with the quality of public education has led to an increased focus on private education resulting in a spirited debate. In this section, we review the following dimensions of the public–private education debate: (a) international school effects debate; (b) research on the quality of public and private schools in India and (c) policy alternatives under consideration.

School Effects Debate in an International Context

The school effects debate in the United States began with the Coleman report of 1966. This report is most remembered for what it did *not* find, rather than what it did find (Coleman et al., 1966). It failed to find a relationship between school-level inputs such as expenditures and teacher quality and children’s performance. It concluded that children’s educational trajectories are determined by their home environments and parental education rather than school-level inputs. A cottage industry has developed in the United States that has tried to address this counterintuitive finding (Hanushek, 1997).¹ Emerging literature on developing countries is also a patchwork of results with weak to negligible relationship between school inputs and child outcomes (Banerjee et al., 2007; Hanushek, 1995). One of the most interesting contributions to this debate has concluded, however, that school effects are far more important to children in low-income countries (Heyneman and Loxley, 1983). Parental characteristics in these countries play a far less important role than school characteristics (Fuller, 1987).

A second strand of this discourse centers on the role of private schools. Coleman and his colleagues went on to explore the determinants of children’s schooling attainment and observed that enrollment in Catholic schools leads to better performance and a lower chance of dropping out for American children than enrollment in public schools (Coleman et al., 1982). In this precursor to the modern public/private school debate, the improvement in student performance was attributed to the “social capital” arising out of Catholic schools which creates a supportive environment that supersedes the influence of the family and encourages better performance on the part of all students, but particularly disadvantaged students (Hoffer et al., 1985). This line of research has given rise to another cottage industry trying to compare achievements in Catholic schools, other private schools, and

1. One influential aspect of the Coleman report was the argument that peer influences play an important role in children’s educational outcomes; consequently, black children in integrated schools do better than black children in segregated schools, with little decline in the performance of white students. This finding had far reaching impact in creating an impetus for court-ordered busing of children to create racially integrated schools.

public schools in the United States. There is considerable debate on whether higher performance of children in Catholic schools is a function of school environment or of the characteristics of parents who opt for Catholic schools (Marks, 2002).

The public/private school considerations in a developing country context rarely focus on the “social capital” inherent in private schools but instead arise out of frustration with the quality of public schooling and concentrate on efficiency issues (Glewwe and Patrinos, 1999). Some of the early studies in this area found that in many developing countries, children from private schools perform better on various measures of cognitive skills than those from public schools (Jimenez and Lockheed, 1995; Jimenez et al., 1991).

Unfortunately, the reasons for greater effectiveness of private schools are poorly understood. In particular, it is difficult to draw the conclusion that private schooling per se caused the observed improvement in educational outcomes (if any) and not the characteristics of the parents of who chose to send their children to private schools, or some other processes associated with private school enrollment (Hanushek, 1997). In particular, two dimensions of private school enrollment pose a challenge to conclusions that children in private schools learn more than those in public schools:

1. Parents who send their children to private schools tend to come from upper socioeconomic strata. While studies attempt to control for parental socioeconomic status, these factors are imperfectly measured and hence, at least part of the relationship between private schools and children’s educational outcomes may be spurious.
2. Parents who send their children to private schools may place a greater value on education and hence may encourage children to work hard at school and complete their homework. Thus, it may be parental influence rather than school quality that results in improved learning.

One way of eliminating this selection bias is to randomly assign children to public and private schools and compare their learning outcomes. However, even well-designed experiments do not always yield clear-cut estimates of school effects. Voucher experiments in Colombia and Chile provide interesting examples.

Colombia began experimenting with school vouchers in 1991 and provided vouchers to students entering Grade 6 by randomly assigned lottery. This allows for a comparison of lottery winners and losers and the comparison indicates that the winners have lower dropout rate and somewhat higher tests scores than losers (Angrist et al., 2002). However, while random

assignment controls for the endogeneity of school choice, it is difficult to use this experiment to conclude that private schooling increases educational attainment. Since students were at a risk of losing vouchers for poor performance, participation in voucher program may increase student motivation to work hard. The effect of better school inputs may be inseparable from the effect of higher student motivation (Bettinger, 2005).

Chile undertook one of the largest experiments in public funding of private schools beginning in the 1980s. Governments provided vouchers to students to attend private schools that were completely privately run and managed. Consequently, about 53 percent of the students study in municipal schools while 34 percent study in subsidized private schools with the remainder in unsubsidized private schools. A review of test scores of children in Grade 4 from ten studies shows that private school students have a slight advantage in test scores in five studies, four show little difference between the two and in one study the municipal schools students perform slightly better than the private school students (Bellei, 2008). This review goes on to note that private school admissions are selective and a poorly performing student can be easily expelled, so the slight advantage in scores for private school students could easily be due to selectivity.

Research on Public and Private Schools in India

In comparison with the extensive literature in other countries, research on public and private schools in India is still in infancy. However, studies in India have noted that government schools are more expensive than private schools with lower teacher accountability. Kingdon (2008) reports from a micro study in the Uttar Pradesh that recurrent per pupil expenditure in private schools was only 41 percent of the expenditure in public schools; most of this difference occurs because teacher salaries are much lower in private schools compared to government schools. Another study in Delhi found that on average, the full-time teachers teaching Grade 4 in government schools earned Rs 10,071 per month compared to Rs 3,627 in private recognized schools and Rs 1,360 in private unrecognized schools (Tooley and Dixon, 2005).

Another aspect of public schooling that attracts considerable attention relates to the lack of accountability and frequent teacher absences (Chaudhury et al., 2006; Muralidharan and Kremer, 2006). Studies in India have found considerable absenteeism among school teachers in rural areas (ranging from 11 to 25 percent) and found that private school teachers are 2–4 percentage points more likely to be present in school than government school teachers (Muralidharan and Kremer, 2006).

While research on student performance in government and private schools remains limited, the available information records higher performance on the part of students from private schools than from government schools. For example, a nationwide survey of rural children's reading and arithmetic skills conducted by Pratham found that 60 percent of the rural children enrolled in Grade 5 in government schools can read a simple paragraph compared to 70 percent for those in private schools (Pratham, 2005). Similar results are shown by a study in Delhi slums (Tooley and Dixon, 2005). However these studies do not fully control for the socioeconomic differences in children in government and private schools.

Private Schooling and Public Policy Debates

Increasing dissatisfaction with the quality of public schooling has given rise to calls for increasing the involvement of the private sector in education and even public–private partnership in the form of state provision of vouchers for private schools in India (Kelkar, 2006; Muralidharan, 2006; Panagariya, 2008) and elsewhere (Chakrabarti and Petersen, 2008; Tooley, 2007).

Advocacy for public–private partnership in early education depends on some crucial assumptions:

1. it assumes that private education can be more efficient and cost-effective than publicly provided education without diluting the quality of education;
2. social class inequalities in access to private education are undesirable and can be addressed through government financing of privately delivered education and
3. increased public funding of private education will not have a deleterious effect on public education.

Unfortunately, the advocacy for private education has fast outpaced the available research base in this area and none of these assumptions can be easily substantiated. Since parents who are able and willing to send their children to private schools tend to be highly educated themselves and value educational attainment, it is difficult to say that it is private school enrollment per se that causes the observed differences in skills between children in private and government schools. When the effect of government funded but privately managed charter schools in the United States are compared to government schools, results do not show substantial improvement in student performance (Fuller, 2003). Moreover, growth of private schooling may be

associated with flight of middle-class parents from public schools, the very parents who are best able to increase school and teacher accountability, and improve overall educational climate in public schools. Research on school and neighborhood effects suggests that the social and economic composition of student population in schools has an impact on school functioning (Jencks and Mayer, 1990) and accountability as well as attitudes and aspirations of peers (Goddard 2003; Pong, 1998; Roscigno, 2000). Thus, migration of middle-class parents may accelerate a downward spiral of public education.

This brief review suggests that while dissatisfaction with performance of public schools in providing education is an important driving force behind the advocacy for private schools, research in this area must carefully evaluate the evidence before engaging in policy prescriptions. While private schools have mushroomed in many parts of India, including rural India, whether they can be effectively utilized to provide a viable alternative to public education remains open to question and forms the topic of this paper. The literature reviewed here is useful in shaping the questions, but answers will depend on educational conditions on the ground in India.

India Human Development Survey 2005

The India Human Development Survey of 2005 was jointly organized by researchers from University of Maryland and NCAER. This survey was funded by a grant from the U.S. National Institute of Health and builds on a prior survey by NCAER. This is a nationally representative survey of 41,554 households located in both urban and rural areas of 33 states and union territories of India with the exception of Lakshadweep and Andaman and Nicobar. The sample extends to 384 districts out of 593 districts identified in 2001 census and covers 1503 villages and 971 urban blocks located in 276 towns and cities.

A major innovation of this survey was to conduct short assessments of reading, writing, and arithmetic skills for children aged 8–11 years. Conducting educational assessment in developing countries particularly India is difficult for a variety of reasons: children's abilities vary tremendously and an instrument must capture children at both ends of the distribution; tests must be translated into many different languages with similar difficulty levels; the instrument must be simple and intuitive so that interviewers can administer it easily and it would not frighten children who are not used to standardized tests. Luckily, we were able to work with Pratham, a non-governmental organization that has worked in the field of elementary

education for many years. They have developed simple assessment tools to measure the effectiveness of their training programs and have administered these tools to over 250,000 children in their nationwide survey reported in the *Annual Status of Education Report 2005* (Pratham, 2005). These tests were included in the IHDS and allow us to measure whether a child is not able to read at all, or is able to read letters, words, sentences, paragraphs, or stories. Simple addition, subtraction, multiplication, and division problems were also developed. The English version of the test is reproduced in the appendix 3.

Interviewers were trained extensively by Pratham volunteers using specially developed films so that they could differentiate between a child's shyness and inability to read. They were also taught how to develop rapport with children. Tests were developed in twelve Indian languages as well as English, and children were asked to take the test in whichever language they were most comfortable in.

In all the IHDS sample consists of 17, 117 children aged 8–11 years. Reading and arithmetic tests were administered to 72 percent of the children aged 8–11 years. Children may not be tested for two reasons: (a) interviewers were explicitly instructed to obtain parental consent as well as assent from children for testing and were asked not to pressurize children who were reluctant and (b) since the household survey was the main focus of this study, the administration of the reading and arithmetic skills was left to the end. We suspect that household fatigue as well as interviewer fatigue may have played a role in missing skill testing. Appendix table A-1 in appendix 2 shows the proportion of children tested by a variety of household and background factors. The results suggest that children who are currently not enrolled are the least likely to be tested. Beyond this, while there is a mild difference in test completion rate between different social and economic groups, this difference is not large. There is little difference in test completion for children in private and government schools. While instruments for test completion are difficult to find, a Heckman selectivity correction relying on probit-linear regression combination was not statistically significant nor did it change any other coefficients substantially.

The test data we have available to us are quite unique, particularly since they are combined with a wealth of household and contextual characteristics. Children are classified according to their ability to read in one of the five categories:

1. Cannot read at all.
2. Can read letters but not form words.

3. Can put letters together to read words but not read whole sentences.
4. Can read a short paragraph for 2–3 sentences but not fluent enough to read a whole page.
5. Can read a one-page short story.

In all 12,394 children aged 8–11 years were administered the reading test. Excluding cases with missing data on independent variables as well as non-enrolled students, the analytic sample for reading skills consists of 11,702 children.

Children's mathematical skills are classified in four categories:

1. Cannot read numbers above 10.
2. Can read numbers between 10 and 99 but not able to do more complex number manipulation.
3. Can subtract a two-digit number from another.
4. Can divide a number between 100 and 999 by another number between 1 and 9.

Note that we focus on 2-digit numbers to avoid calculations on fingertips and to get a better estimate of true understanding of subtraction and division. Also, given the Indian system of expecting children to memorize multiplication tables from 1 to 20, we chose to test children on division rather than multiplication skills. In all, 12,345 children aged 8–11 years were administered the arithmetic test. Excluding cases with missing data on independent variables as well as non-enrolled students, the analytic sample for reading skills consists of 11,655 children.

In addition to the household module, the survey also included a primary school module where the interviewers were asked to conduct a school facilities survey for one public and one private primary school in each village and urban block. When more than one facility was available in each block/village, interviewers were asked to select the facility that was predominantly used by the residents. The school facilities survey provides an interesting description of the schooling climate in India. However, given the differential use of private and public schooling in different parts of India, the results from this survey should be treated as being indicative of the schooling climate around different parts of India rather than providing a representative sample of primary schools.² However, this survey provides us with some

2. With appropriate weighting, these data can provide a representative sample of public and private schools. However, the descriptive results in paper are unweighted.

interesting exclusions restrictions to handle the endogeneity of choice of private schools.

Methodology

The primary goal of this paper is to examine the relationship between enrollment in private schools and academic skills for children aged 8–11 years. In view of some of the methodological considerations outlined above, we rely on a variety of techniques to obtain a sense of the magnitude of this effect. Specifically, we examine the impact of private school enrollment on children's verbal and mathematical skills using ordinary least squares regression, Heckman control function method based on exclusion restrictions (Heckman and Navarro-Lozano, 2004), and family fixed-effects models. Triangulation based on these three methods allows us to develop a range of estimates for the impact of private school enrollment on children's skills.

The Heckman control function method assumes that the underlying model is:

$$Y_i = \beta X_i + \delta Z_i + \varepsilon_i$$

Where Y_i is the child's score on reading and arithmetic tests, Z_i reflects private school enrollment, and X_i includes controls for a variety of background characteristics including state of residence, urban/rural residence, caste/tribe/religious background of the parents, child's age, sex, highest level of education obtained by parents in the household, household size, log of annual household income, and household's score on an index of possession of a variety of consumer durables. The switching regression is identified by W_i , the instruments that affect private school enrollment. These include presence of a private school in the village, whether English is taught early on, presence of a cook in government school, and household's social networks. These variables are described in greater detail in a later section.

Further, Z_i in the equation above is supposed to stem from an unobservable latent variable:

$$Z_i = \gamma W_i + \mu_i$$

The decision to send a child to private school or not is made according to the rule:

$$Z_i = \begin{cases} 1, & \text{if } Z_i > 0 \\ 0, & \text{if } Z_i \leq 0 \end{cases}$$

These equations are estimated in STATA using the TREATREG routine with full maximum likelihood. Instruments used in identifying the selection equation are discussed along with the characteristics of private and government schools in India below. Due to the reliance on probit-linear combination, the dependent variables—reading and arithmetic skills—are assumed to be continuous variables for this analysis.

Since results from this method are highly sensitive to the choice of exclusion restrictions (Stolzenberg and Relles, 1997), we supplement this analysis with a highly restrictive family fixed-effects model. Impact of private schooling on children is riddled with concerns about the fact that families which choose private schools are different from those that choose government schools and any observed relationship between private schooling and child outcomes could be due to these unobserved factors. One way of addressing this is to compare the achievements of children within the same family based on whether they go to private school or not, that is, adding a dummy variable per household. We supplement the analysis using Heckman control function method with family fixed-effects models to give us another estimate of school effect.

Growth of Private School Enrollment in India

The Indian educational panorama consists of a variety of schools. While schools run by Central, state, and local governments comprise a clear “government” sector, the private sector consists of three types of schools:

1. Schools that receive government grant-in-aid but are privately run.
2. Schools that receive little government funding but are recognized based on certain criterion outlined by the government and must follow certain regulations.
3. Schools that are unrecognized and might not meet the criteria (such as infrastructure or teacher salaries) needed for recognition. Private schools that receive grants-in-aid, normally called aided schools, resembled private schools in early decades following Independence. They received money from the government but teachers were directly hired and paid by the schools. Since the 1970s, these teachers receive their salary directly from the state and are recruited by a government appointed commission but their routine operations are governed by the private management (Kingdon, 2008). Hence in cost and teacher

qualification, they are similar to government schools but retain a private character in management and day-to-day operations. Private recognized schools must meet certain criteria regarding infrastructure, teacher qualifications, and salaries to receive recognition, however, some schools manage to slip by without fully complying with the regulations. The private recognized schools tend to be larger, often run by non-profit management, and be located in urban areas. In contrast, the unrecognized schools tend to retain a home grown flavor and are frequently run in a more ad-hoc fashion, sometimes in the back of a teacher's home.

Private school enrollment in India has been rising rapidly with 20–24 percent of the rural students being reportedly enrolled in private schools (Pratham, 2005). Primary education has been a priority for the Indian government for many decades. Successive Five Year Plans have emphasized the importance of investing in primary schooling with a plethora of government programs (Govinda, 2002). Hence, the rapid rise in private school enrollment comes somewhat as a surprise. Even now, official statistics do not fully capture the growth of private school enrollment. Official data from the Seventh All India Survey of Education show that the share of private schools in primary enrollment is about 6 percent in rural areas and about 29 percent in urban areas. However, there are good reasons to believe that this is a substantial underestimate (Kingdon, 2007)

Official statistics do not usually collect data on unrecognized schools and consequently tend to underestimate the size of the private sector (Kingdon 2007). The 1993–94 household survey by NCAER (Shariff, 1999) found that about 10 percent of the primary school students in rural India were in private school while the comparable figures from the Sixth All India Survey by National Council for Educational Research and Training (NCERT) conducted in 1993 recorded only about 3 percent in private unaided schools. The 2002 Seventh All India Educational Survey conducted by the NCERT found 5.8 percent enrollment in private (unaided) schools in rural areas and 28.8 percent in urban areas. If aided private schools are included, this number swells to 9 and 45 percent in rural and urban areas respectively. However, household based surveys—which include both recognized and unrecognized schools document a higher prevalence. Consequently, the Annual Status of Education Report (ASER) survey conducted by Pratham in 2005 (Pratham, 2005) and confined to rural areas, found that private school enrollment for rural children was nearly 20 percent.

The India Human Development Survey 2005 (IHDS) documents similar enrollments. Table 1 shows that at the all India level, about 68 percent of children are enrolled in government schools with 42 percent and 76 percent of the urban and rural students respectively in government schools. Private enrollment—combining enrollment in aided and unaided private schools, *madrasas*, and convents—forms 58 percent and 24 percent of the urban and rural enrollments respectively, among children of age 6–14 years. We combine aided and unaided schools into a single category—“private schools”—because parents may often not know the exact management of the schools their children attend, resulting in considerable measurement error. Moreover, private aided schools are similar to private recognized but not aided schools in many ways since teacher recruitment and performance are monitored by school management using locally appropriate standards and increasing numbers of teachers are paid by the management rather than by the government (Chopra and Jeffrey, 2005).

As Figure 1 indicates, private school enrollment rises in higher standards but even for primary schools, the proportion in private schools is substantial.

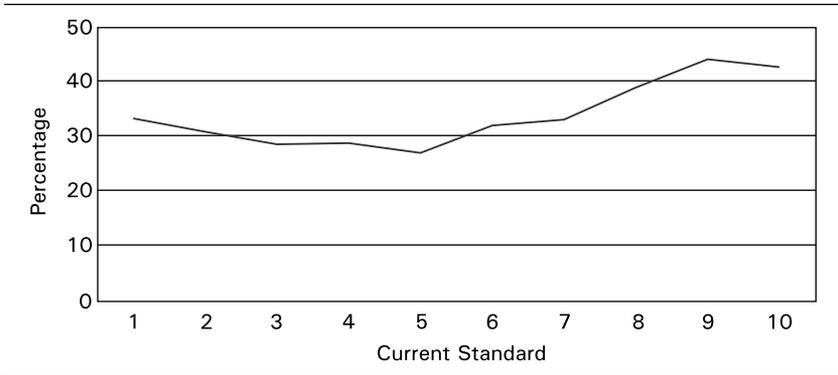
This can be costly, of course. Figure 2 shows the average educational costs for private and public schools by current standard. The average primary student in a private school pays Rs 600 in fees and another Rs 600 in expenses for book, uniforms, and transportation (compared to Rs 20 and Rs 200 for government schools). Furthermore, while only 17 percent of the children in government schools get private tutoring, nearly 27 percent in private schools do so and when they do get private tutoring, median cost for private school students is Rs 600 instead of Rs 500 for the private school students.

TABLE 1. Distribution of Type of Schools Attended for Enrolled Children 6–14

	<i>Rural</i>	<i>Urban</i>	<i>All</i>
School Type			
Government	76	42	68
Education Guarantee Scheme (EGS)	1	1	1
Government	75	41	67
Private	24	58	32
Private Aided	4	8	5
Private	17	45	24
Convent	1	3	2
Madrasa	1	1	1
Other	1	2	1
Sample Size	24949	11776	36725

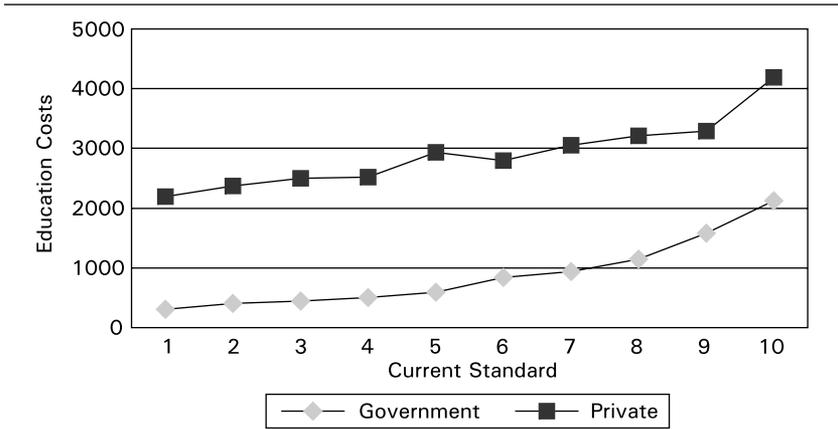
Source: Authors' calculations based on India Human Development Survey (IHDS) 2005.

FIGURE 1. Enrollment in Private School by Current Standard



Source: Authors' calculations based on India Human Development Survey (IHDS) 2005.

FIGURE 2. Total Educational Costs by Standard for Public and Private School Students (Age 6-14)



Source: Authors' calculations based on India Human Development Survey (IHDS) 2005.

Note that these costs are per student per year, borne by the family and do not include government expenditure.

Characteristics of Public and Private Schools in India

As we designed and fielded the IHDS, we had the opportunity to talk to many parents. We heard two main themes in their explanations for sending their

children to private schools: (a) government schools are not good around here; the teachers are often absent and do not work hard even when present and (b) “We want our children to learn English, and the private schools are English medium or teach English earlier than the government schools.”

The parents’ observations have good empirical support. As Table 2 indicates, the school facilities survey in the IHDS found that about 12.4 percent teachers in government schools were not present on the day of the survey. While these estimates are below the 25 percent absenteeism found in more detailed studies using multiple unannounced visits, the data nevertheless reflect some of the same public/private differences (Chaudhury, 2006; Muralidharan and Kremer, 2006). While private school teachers are only 2 percentage points less likely to be absent overall, a within-village fixed-effects model shows that private school teachers are 1.39 times as likely to be present on the day of the visit as government school teachers. The within-village results differ because private schools may be located more often in villages with low attendance rates by public school teachers. This correlation may result either from private schools prospering in areas with weak public schools, or because the rise of private schools results in deterioration of public schools by removing civic pressure on the government schools system.

TABLE 2. Characteristics of Private and Public Schools in India

	<i>Government schools</i>	<i>Private schools</i>
Percentage of teachers present in school	87.6	89.4
Percentage of teachers trained	85.9	43.8
Percentage of teachers with college degree	43.7	64.4
Percentage of students present in school	86.9	91.9
Some subjects taught in English +	26.8	51.1
English instruction begins in 1st standard	53.2	88.2
No. of classes meeting outside	0.7	0.3
No. of mixed grade classrooms	0.9	0.6
Any toilet facility	60.9	78.3
Chairs/desk for all students	29.2	63.5
Blackboard in all classrooms	95.4	98.1
Computer available for student use	5.9	29.2
School has fans	28.4	63.3
Kitchen for cooked meals	41.3	10.8
Cook employed by school	74.9	11.1
Any teaching material on the wall	77.3	78.9
Children’s work on the wall	67.6	73.9
No. of Schools Surveyed	2034	1748

Source: Authors’ calculations based on India Human Development Survey (IHDS) 2005.

Notes: + Many schools teach some subjects in English and others in vernacular languages

*IHDS selected one predominant private and one government school per village/urban block. The school sample is nationwide but not nationally representative.

Our data also show that private schools have better facilities such as desks, flush toilets, and fans. The differences in teacher characteristics between private and government schools are striking. Private school teachers are more likely to have a college degree but less likely to have received teacher training than government schools. Part of this difference may be that employment in government schools is conditional on a training certificate.

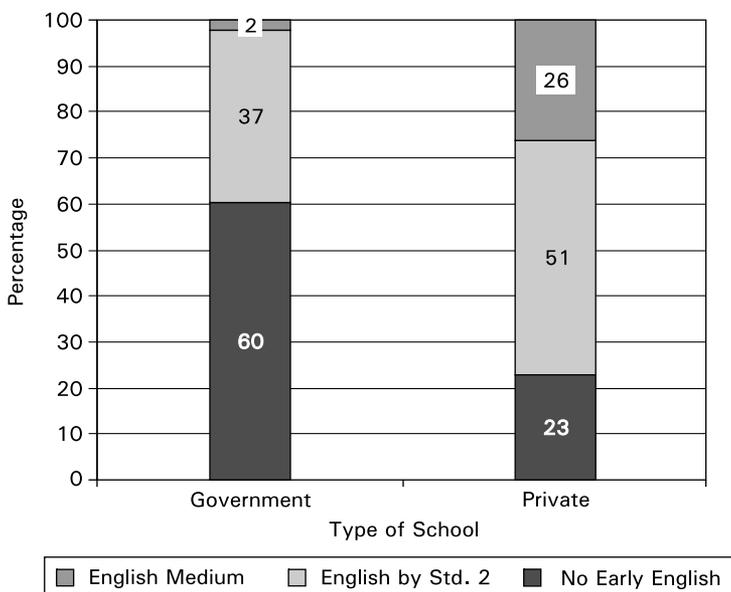
Government and private schools also differ substantially in the provision of a mid-day meal. After Tamil Nadu introduced a successful mid-day meals program in its schools, the National Program of Nutritional Support to Primary Education was launched across India in 1995. The mid-day meals program (MDM) aims to increase primary school attendance, as well as improve the nutritional status of school children. Generally, the program serves the 6–11-year age group. However, some upper-primary schools run the MDM program as well, and in recent union budgets, separate provision has been made for the upper-primary school also. Under the MDM scheme, cooked meals are to be served during the lunch time in the school, with calorie value equivalent to 100 gm of wheat or rice per student per school day. In some places, a dry ration is provided to be carried home based on a certain minimum level of school attendance.

The IHDS data report 60 percent of children up to Grade 5 receive mid-day meals or free grains. Of these, 35 percent receive the full MDM program benefits; 8 percent get only *dalia* (porridge) for the meal and 16 percent are given grains in place of the meal. These programs are mainly found in government schools. Among private schools, only 8 percent of primary students participate compared to 80 percent at government schools. It would be reasonable to expect that a fully functioning MDM program would increase the likelihood that a child attends government school and one of the indicators for a functioning MDM program is the presence of a cook in the school (Dreze and Goyal, 2003).

Similarly, IHDS data presented in Figure 3 show that private schools are more likely to teach English early.³ While only 2 percent of children in government schools are taught in English exclusively, nearly 26 percent of children in private schools are. When the initial medium of instruction is a vernacular language, English is introduced in earlier standards in private schools.

The school facilities, teacher absenteeism, and English medium results suggest that parents send their children to private schools for good reason.

3. Table 2 is based on school data and not nationally representative of the experiences of students. Figure 3 is based on student data which are nationally representative.

FIGURE 3. English Instruction by Type of School, Children Age 6–14

Source: Authors' calculations based on India Human Development Survey (IHDS) 2005.

Obviously, private school students are a selected population coming from higher socioeconomic backgrounds. It will be important to control for this selectivity insofar as possible when examining the impact of private schools on student performance.

Characteristics of Private School Students

Table 3 provides descriptive statistics for our sample, private school enrollment as well as children's ability to read a simple paragraph and do basic two digit subtractions. In recent decades, there has been a sharp increase in school enrollment, about 92 percent of the children aged 8–11 years in IHDS are in school; of these, about 31 percent of the children aged 8–11 years are enrolled in private schools. In keeping with generally preferential treatment of boys in Indian families, boys are somewhat more likely to be enrolled in private schools than girls. Private school enrollment seems clearly associated with higher income and education of the household. Interestingly, students in metro cities are about as likely to enroll in private schools as students

TABLE 3. Sample Distribution, Private Schooling, and Skill Levels by Background Characteristics

	<i>Proportion of sample</i>	<i>Prop. in private school</i>	<i>Prop. able to read a para</i>	<i>Prop. able to subtract</i>
Gender				
Male	0.53	0.33	0.57	0.51
Female	0.47	0.29	0.54	0.46
Place of residence				
Metropolitan	0.05	0.58	0.69	0.72
Other Urban	0.19	0.58	0.69	0.62
Developed Village	0.34	0.29	0.55	0.48
Less Developed Village	0.42	0.17	0.48	0.41
Household income quintile				
Poorest	0.18	0.16	0.45	0.38
Second	0.22	0.17	0.47	0.4
Third	0.22	0.26	0.51	0.45
Fourth	0.20	0.39	0.62	0.54
Affluent	0.18	0.59	0.73	0.69
Standard of living quintile				
Poorest	0.20	0.1	0.34	0.29
Second	0.22	0.16	0.47	0.37
Third	0.24	0.27	0.54	0.49
Fourth	0.20	0.44	0.69	0.6
Affluent	0.15	0.69	0.81	0.78
Socio religious group				
Forward Caste	0.19	0.43	0.71	0.64
Other Backward Classes (OBC)	0.36	0.29	0.57	0.5
Dalit (Hindu, Sikh, Buddhist)	0.24	0.21	0.45	0.39
Adivasi (Any religion)	0.06	0.15	0.48	0.38
Muslim	0.13	0.38	0.46	0.42
Minority Religions	0.02	0.74	0.8	0.79
Max. adult education in (HH)				
Illiterate	0.24	0.16	0.37	0.31
1-4 std	0.09	0.14	0.48	0.38
5-9 std	0.35	0.26	0.55	0.47
10-11 std	0.14	0.45	0.66	0.61
High secondary & some college	0.08	0.53	0.72	0.66
College graduate	0.09	0.63	0.8	0.75

Source: Authors' calculations based on India Human Development Survey (IHDS) 2005.

in smaller cities and, controlling for income and education of the adults in the household, enrollment in private schools is marginally lower in metropolitan cities than in other urban areas. This is probably due to the presence of higher quality Central Government schools in major metropolitan areas, particularly Delhi.

Caste and religion seem associated with private school enrollment. Forward castes and other minorities groups such as Christians, Sikhs, and Jains are far more likely to send their children to private schools than Dalits and Adivasis with Muslims and Other Backward Classes (OBCs) falling in the middle. Results from multivariate analyses (not reported here) indicate that even after controlling for parental income and education, Dalit children are substantially less likely to be enrolled in private school.

State differences in private schools are interesting (Table 4). Private school enrollment in one of the high education states, Himachal Pradesh, is low while it is high in Kerala, the other high education state. Uttar Pradesh has considerably higher private school enrollment than the neighboring Bihar. Some of these regional differences in private school enrollment may well be associated with socioeconomic background of its residents but may also reflect some differences in state policies. Christians are substantially more likely to be in convent schools and the Christian population is high in the North East and in Kerala. However, history also plays a substantial role.

TABLE 4. Private Schooling and Skill Levels by State

	<i>Proportion in private school</i>	<i>Proportion able to read a paragraph</i>	<i>Proportion able to subtract</i>
All India	0.31	0.55	0.49
Jammu and Kashmir	0.46	0.41	0.61
Himachal Pradesh	0.18	0.84	0.69
Uttarakhand	0.34	0.63	0.47
Punjab	0.52	0.67	0.73
Haryana	0.44	0.66	0.63
Delhi	0.31	0.77	0.72
Uttar Pradesh	0.44	0.40	0.34
Bihar	0.18	0.47	0.48
Jharkhand	0.37	0.61	0.61
Rajasthan	0.32	0.57	0.44
Chhattisgarh	0.19	0.62	0.37
Madhya Pradesh	0.29	0.47	0.33
North East	0.54	0.60	0.78
Assam	0.09	0.75	0.46
West Bengal	0.12	0.52	0.58
Orissa	0.08	0.59	0.51
Gujarat	0.20	0.65	0.43
Maharashtra/Goa	0.29	0.66	0.54
Andhra Pradesh	0.29	0.50	0.51
Karnataka	0.27	0.53	0.55
Kerala	0.61	0.82	0.60
Tamil Nadu	0.42	0.80	0.72

Source: Authors' calculations based on India Human Development Survey (IHDS) 2005.

Exclusion Restrictions for Private School Enrollment

The brief description of students in private schools as well as the literature cited earlier clearly suggest that private school enrollment is a choice variable and while we expect to control for observable family background factors such as education, income, and household size, these controls may be inadequate due to omitted variables as well as measurement error in some of the included variables. In order to estimate the Heckman control function discussed earlier, instead of relying simply on distributional assumptions, we rely on theoretically motivated exclusion variables that are expected to be associated with the decision to enroll in private school as well as private school admission but are not expected to be independently associated with educational outcomes.

Availability of Private Schools

Private school enrollment is dependent on a complex interplay of supply and demand. Social composition of an area, history, and state policies all play an important role in shaping the availability of private schools. Hence, availability of private schools is an important instrument for private school enrollment which has been used in the literature (Jimenez et al., 1991). We assume that in all urban areas private schools are available.

Desirability of Public Schools

Given the IHDS's focus on school surveys, we also included a set of variables describing the characteristics of government schools in the village/urban block as factors which may motivate parents to favor or not favor government schools. These include English medium instruction for some academic subjects, early introduction to English language, and presence of a cook in the government school as a marker for the draw of the mid-day meal program. Since school surveys for some localities were not conducted due to interviews taking place during weekends or holidays, a variable denoting missing school survey is included in the analysis.

Parental Ability in Gaining Entrance in Private Schools

Private school enrollment is not simply a function of parental preferences. In urban areas, admission into quality private schools can be a highly competitive process in which parents with broader social networks gain an edge over less connected parents. Consequently, we also control for two markers

of family social networks, whether the household members know anyone working in the medical profession and whether they know anyone working for the government. These variables are described in Table 5.⁴

While switching regressions estimated with maximum likelihood are considered both unbiased and efficient, they are highly dependent on the validity of the exclusion criteria as well as their strength as predictors of private school. Table 6 shows the first stage regression with the exclusion variables listed above as predictors. The results show that with the exception of

TABLE 5. Sample Distribution, Private Schooling, and Skill Levels by Instruments for Private Enrollment

	<i>Proportion of sample</i>	<i>Proportion in private school</i>	<i>Proportion able to read a para</i>	<i>Proportion able to subtract</i>
Know any medical personnel				
No	0.67	0.27	0.52	0.45
Yes	0.33	0.39	0.61	0.56
Know any Govt. workers				
No	0.68	0.26	0.51	0.45
Yes	0.32	0.41	0.64	0.58
Private primary school in village/ town (all towns = yes)				
No	0.50	0.15	0.51	0.43
Yes	0.50	0.47	0.6	0.55
Local govt. school has a cook				
No	0.37	0.4	0.57	0.53
Yes	0.63	0.26	0.54	0.46
Local govt. school teaches English in KG/Std 1				
No	0.58	0.34	0.52	0.46
Yes	0.42	0.26	0.6	0.53
English as a medium of instruction in local govt. school				
No	0.83	0.31	0.54	0.47
Yes	0.17	0.28	0.63	0.56
School survey missing for village/ block				
No	0.84	0.27	0.54	0.48
Yes	0.16	0.5	0.6	0.52

Source: Authors' calculations based on India Human Development Survey (IHDS) 2005.

4. This analysis has been carried out with and without the two variables measuring social networks due to our concern that the network measures may not be truly exogenous. The coefficient for private schools in the regression with smaller set of instruments was similar in magnitude but had a greater standard error. The school variables are excellent instruments for rural India; for urban areas since parents have choices beyond the local school, having other instruments makes the results more robust.

**TABLE 6. Impact of Excluded Variables on Enrollment in Private Schools
Results from the First Stage of Switching Regression Model**

	<i>Coef.</i>	<i>Z value</i>
Know anyone in medical profession	0.24**	5.6
Know anyone in government	0.27**	6.61
Private schools available in a village	0.92**	21.69
Cook in a local govt. school	-0.08*	-1.88
Early English in a local govt. school	-0.08*	-1.94
Instr. in English in local govt. school	0.07	1.56
Missing school schedule	0.34**	5.29
Constant	-1.18	-19.65
No. of cases	11667	
Chi Square (7 df)	704	

Source: Authors' calculations based on India Human Development Survey (IHDS) 2005.

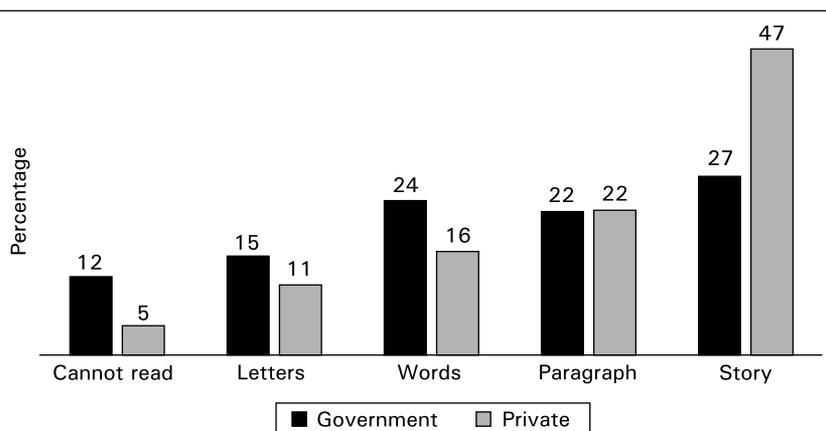
Note: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

English medium instruction, each of the other variables is associated with private school enrollment in the direction expected and these relationships are statistically significant. Overall, the model is highly significant with a Chi Square of 704 and 7 degrees of freedom.

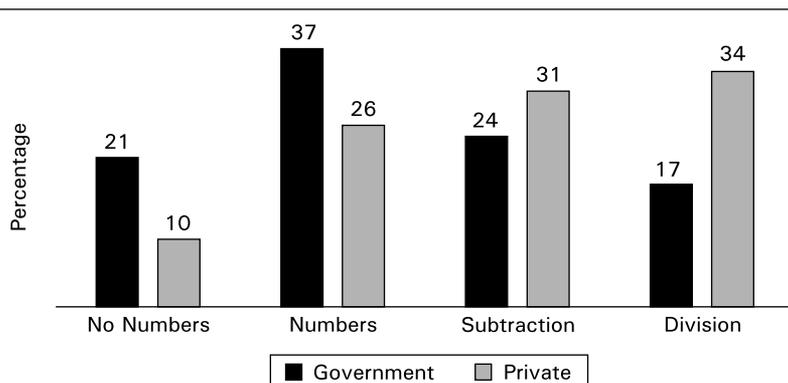
Private School Enrollment and Child Outcomes

As the brief overview of literature presented above suggests, it is important to be cautious about drawing inferences based any perceived relationship between private school enrollment and children's skill acquisition. Hence, in this section we first describe the basic relationship between private school enrollment and children's performance on reading and arithmetic tests while controlling for observable characteristics of their households. Then we address the issue of endogeneity using a switching regression model in which school choice is captured by a set of theoretically motivated exclusion restrictions. Finally, we examine the impact of private school enrollment on child outcomes within a highly restrictive framework, family fixed-effects model.

Figures 4 and 5 indicate basic differences in reading and arithmetic skills among children enrolled in government and private schools. Results indicate that private school students have higher achievement on these tests. These differences are further analyzed by adding controls for parental socioeconomic background, place of residence, and children's sex, age and current standard. In addition to private school enrollment, these regressions control for highest education level attained by any of the household adults,

FIGURE 4. Distribution of Reading Skills by School Type

Source: Authors' calculations based on India Human Development Survey (IHDS) 2005.

FIGURE 5. Distribution of Arithmetic Skills by School Type

Source: Authors' calculations based on India Human Development Survey (IHDS) 2005.

log of family income, a 30-item standard of living index consisting of ownership of various consumer durables (TV, refrigerator, telephone, car, cot, etc.) and quality of housing (toilet, piped water, etc.), household size, number of children under age 15, place of residence, state of residence, child's sex, and age. Caste, ethnicity, and religion are particularly important to control for since they are linked to private school enrollment, particularly enrollment in *madrasas* or convents, as well as having an independent impact on educational outcomes (Desai et al. Forthcoming). Controls for state of residence are also included in each regression although not presented in the tables.

TABLE 7. Impact of Private School Enrollment on Reading and Arithmetic Skills

	Reading skills			Arithmetic skills		
	1	2	3	1	2	3
	Basic OLS	Switching regression	Family fixed effect	Basic OLS	Switching regression	Family fixed effect
Residence (metro omitted)						
Other urban	0.163***	0.161***		0.112**	0.108**	
Developed village	0.179***	0.171**		0.092*	0.078	
Less developed village	0.176**	0.167**		0.101**	0.082	
Socio religious group (forward caste omitted)						
Other Backward Classes (OBC)						
Dalit	-0.051	-0.051		-0.054*	-0.055*	
Adivasi	-0.222***	-0.222***		-0.222***	-0.222***	
Muslim	-0.104*	-0.104*		-0.124***	-0.125***	
Other minority religions	-0.231***	-0.231***		-0.241***	-0.242***	
Maximum household education (none omitted)	-0.101	-0.102		-0.0602	-0.062	
1-4 std	0.147**	0.147**		0.037	0.038	
5-9 std	0.186***	0.187***		0.110***	0.111**	
10-11 std	0.338***	0.338***		0.252***	0.253***	
high sec & some coll	0.387***	0.389***		0.302***	0.305***	
College graduate	0.417***	0.419***		0.388***	0.390***	
Log of hh. annual income	0.001	0.001		0.006	0.006	
Score on Std. of Living Scale	0.034***	0.035***		0.031***	0.031***	
No. of persons in the hh	-0.0237***	-0.024***		-0.019***	-0.019***	
No. of children < 15 in the hh.	-0.00504	-0.005		0.004	0.003	

Female Child	-0.100***	-0.100***	-0.07	-0.157***	-0.156***	-0.179***
Current Standard	0.341***	0.341***	0.229***	0.247***	0.247***	0.183***
Age of the child	0.025	0.025	0.164***	0.037***	0.037***	0.123***
In private school	0.392***	0.362**	0.307***	0.280***	0.221**	0.224***
Constant	0.497**	0.513**	1.482***	0.148	0.179	0.879***
R-squared	0.337		0.286	0.355		0.287
Chi Square (42 df)		3954			4782	
Observations	11667	11667	11667	11619	11619	11619

Source: Authors' calculations based on India Human Development Survey (IHDS) 2005.

Note: ***p < 0.01, **p < 0.05, *p < 0.1. Regressions also include controls for states.

In Model 1, the basic OLS model, students' reading and arithmetic skills are regressed on a set of independent variables including enrollment in private school. As might be expected, parental education, urban residence, household income, and index measuring standards of living are all positively associated with student performance on these skill tests. However, while standard of living—a marker of long-term economic status—is consistently statistically significant, log of household income is not. This may be because income contains considerable year to year fluctuation while standard of living indicates permanent income, a variable with longer term impact on well-being (Filmer and Pritchett, 2001). While it is reasonable to see skills increase with age and current standard, the coefficient on sex is surprising. Holding age and current standard constant, girls have lower performance on both reading and arithmetic tests, possibly due to greater demands of household chores compete with time spent doing homework. In international studies, girls generally perform slightly above boys in verbal tests and slightly below boys in mathematical tests.

Enrollment in a private school is positively related with higher performance on both verbal and mathematical skills. While the coefficient for verbal skills is slightly larger, it is important to remember that the skill levels range from 0 to 4 for the verbal skill and from 0 to 3 for mathematical skills.

The second model corrects for the endogeneity of school choice by using a Heckman type correction, in which the binary choice of attending private school or not is modeled with the set of exclusions restrictions described above. The results from this endogenous switching regime are presented in Model 2. The first stage probit model (presented in table 6) suggests that our instruments are highly correlated with private school enrollment. Each is statistically significant and in the expected direction—with the exception of English medium instruction. The second stage regression includes the effect of private school enrollment on reading and arithmetic skills, correcting for the biases introduced due to endogeneity of school choice. As might be expected, the coefficients for private school are smaller in size than those from the naïve OLS regression models; however, the difference is not substantial. Nor is the λ statistically significant. The Wald test for independence of regressions is not statistically significant suggesting that the possibility that selection equation and achievement equation are unrelated cannot be ruled out. This suggests that while omission of the endogenous nature of school choice introduces some bias in the regression estimate the size of this bias is not very large. The regression coefficient for private school from the uncorrected model for reading skill is 0.39 while in the model correcting for endogeneity it is 0.36. The difference for arithmetic skills is similar in

magnitude, 0.28 vs 0.22. Since the standard deviation is 1.35 for reading skills and 1.03 for mathematical skills, the improvement associated with private schools is about one-fourth to one-third of a standard deviation.

Results from any models relying on instrumental variables are only as good as the instruments themselves. Hence, we compare these results with those from a strongly restrictive model—family-level fixed-effects model. Here we assume that all family influences such as desire for education and parental encouragement are shared by all children in the family. Children differ mainly in their personal characteristics such as gender, age, standard, and private school enrollment. These family-level fixed-effects models continue to suggest that private school enrollment is consistently related to higher performance and the magnitude of these coefficients is similar to those obtained from the switching regression.

These results suggest three things:

1. Private school enrollment is associated with higher child outcomes, even after controlling for a variety of family factors.
2. Size of this effect is statistically significant but moderate with average improvement being about one fourth of a standard deviation.
3. The coefficients from these three models are not vastly different from each other.

Some caveats in interpreting these results are in order. One of the greatest difficulties in interpreting the association between private school enrollment and children's educational outcomes is affected by biases at various levels.

Within Family Choices

Parents when faced with spending scarce resources on children's education may choose to send an academically gifted child to private school. Hence, in within-family fixed-effects models, any association between private schools and child scores may be due to children's ability rather than their school. The only way of addressing this would be via longitudinal data in which one would try to examine the differential growth in educational achievement between children in private and government schools, holding their initial talent constant. This may be particularly important because studies have also found that at times educational innovations or programs have a large initial impact, with declines in magnitude over time (Banerjee et al., 2007). Cross-sectional analyses like ours are unable to do this.

Differential Value Placed on Education between Families

Some families value education more than others and may be more likely to invest in by sending children to private school and ensuring that they do their homework. While we have tried to control for these differences using switching regression, some of the variables in the model such as having greater access to social networks may not be fully exogenous. In particular, household with greater social connections may have a greater ability to get their children into private schools (as we argue), and at the same time, may have greater returns to education in the form of better access to jobs.

Differential Demand for Education across Communities

Some of our exclusion restrictions rely on village level access to private schools and characteristics of public schools. It is possible that communities may differ in their demand for schools and certain types of education such as early instruction in English. Hence, it may be higher demand for high quality education that may lead to better outcomes rather than access to private schools. While this seems a more remote possibility—it is difficult for parents and communities to change government school curriculum and ensure early English instruction—it is not impossible.

However, we have used a variety of techniques and excluded variables with the expectation that while each may retain some sources of bias, together they provide us with a rough indication of whether private school enrollment might be associated with higher performance or not. Our results suggest remarkable similarity of effects across the three models. It is possible that some of these effects are overestimated; particularly, the within-family fixed effect may decline if children's ability is taken into account. However, if the results we present suggest an upper bound for the impact of private school education, the estimated effects are no more than one-third to one-fourth of a standard deviation. As we discuss below, in comparison to inter-state differences in educational outcomes, these are modest effects.

Which Children Benefit the Most from Private School Enrollment?

The debate on the validity of evidence about the impact of private schooling, or lack thereof, has occupied the center stage in such a way that there has been little room for studying differences in potential benefits of private schooling. In this paper we focus on the interaction between parental economic status and school type to explore the mechanism through which

private schools may influence child outcomes. Research in the United States suggests (Hoffer et al., 1985) that benefits of private schools accrue disproportionately to disadvantaged students. In order to examine this, we interact private school enrollment with household standard of living in Model 2 from table 7, that is, the Heckman switching regression. In this analysis private school enrollment is interacted with the 30-item standard of living index,⁵ while controlling for the selection into private schools using the instruments discussed above.⁶

This interaction term is highly significant and negative in sign and the coefficients are presented in appendix table A-2 in appendix 2. Results from this analysis are graphically presented in figures 6 and 7 which suggests that benefits to private school enrollment for children from lower economic strata are far greater than those for children from upper economic strata and at upper income levels, the difference between private and government school narrows considerably. The lack of difference between private and government schools at upper income levels is not surprising; parent with the means to send their children to private school would only select government school if it is high quality. A good example may be university professors whose children attend Central Government schools located on campus and run with great deal of intellectual input from the campus community. However, the benefits of private schooling to poorer children are more intriguing and deserve greater attention to the mechanisms through which these benefits accrue.

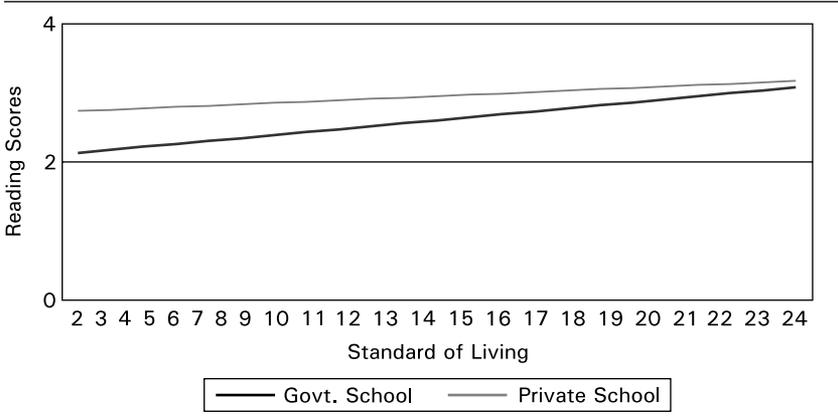
While the US research has tried to understand the mechanisms through which experiences of students in private and government schools may differ, in the developing country context, little attention has been directed to this issue. In the following analysis we attempt to provide some qualitative information on experiences of children in government and private schools. We note that this part of the analysis is suggestive rather than conclusive since it is difficult to determine the causal direction of the association. Nonetheless, this may well be the only data where even associations can be explored.

The IHDS interviewed parents about the schooling experiences of up to two children in the household. Two variables in this section are interesting:

5. While not reported here, we obtain similar results for interaction between household education and private schooling and between place of residence and private schooling with children from lower education households and those from least developed villages benefiting the most from private school enrollment.

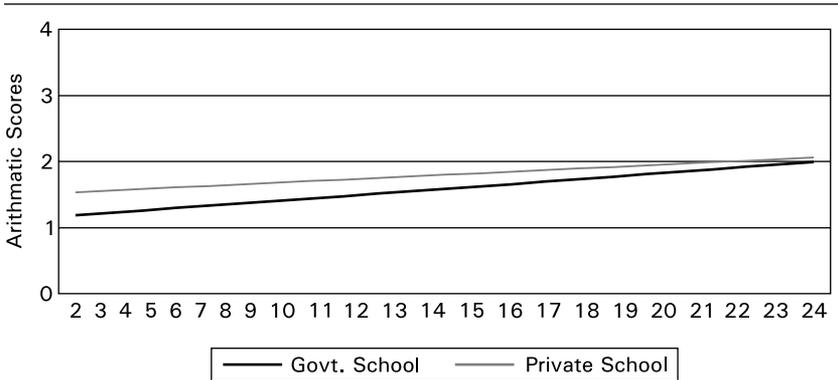
6. The same analysis was conducted with the naïve regression model without taking into account endogeneity of private school enrollment and results were similar. This is not surprising given the similarity of results from models 1 and 2 in table 7.

FIGURE 6. Predicted Reading Scores by Standard of Living for Government and Private Schools



Source: Authors' calculations based on India Human Development Survey (IHDS) 2005.

FIGURE 7. Predicted Arithmetic Scores by Standard of Living for Government and Private Schools



Source: Authors' calculations based on India Human Development Survey (IHDS) 2005.

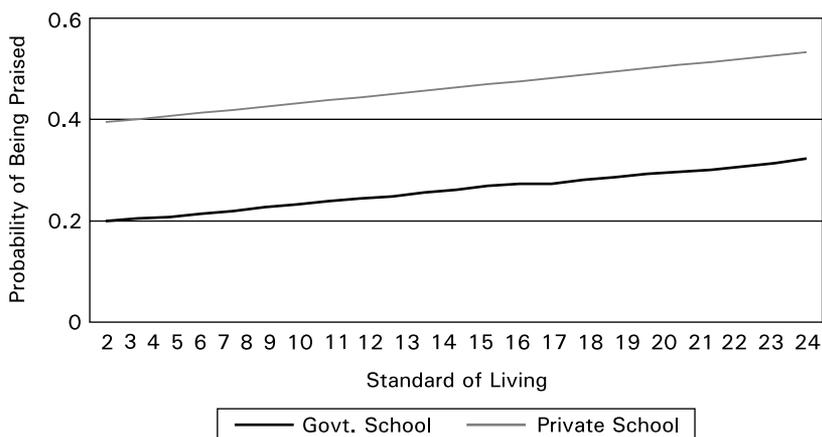
(a) whether the parent reported that the child was praised in the month preceding the survey and (b) whether the parent reported that the child was physically beaten or pinched in the month preceding the survey. On both of these variables, private school students fare better than government school students. About 25 percent of the government school students were praised compared to 42 percent in private schools and about 29 percent of the government school students were beaten compared to 25 percent in private schools.

However, it is the interaction of school type with family's standard of living that is of greatest interest.

Figure 8 shows the predicted probability of a child being praised by school type and parental economic status. This probability is calculated from a probit model which controls for the selection factors as well as the family background factors in table 7 with the coefficients presented in appendix table A-2 in appendix 2. The results indicate that children from higher economic strata are more likely to be praised and the slope of this line does not differ considerably between government and private schools. Positive reinforcement is really important in any setting but particularly in Indian classrooms where constant comparisons and attendant humiliation are fairly common.⁷ Greater positive reinforcement in private schools may be a reflection of better learning environment in these schools although social class clearly seems to play a role in both settings.

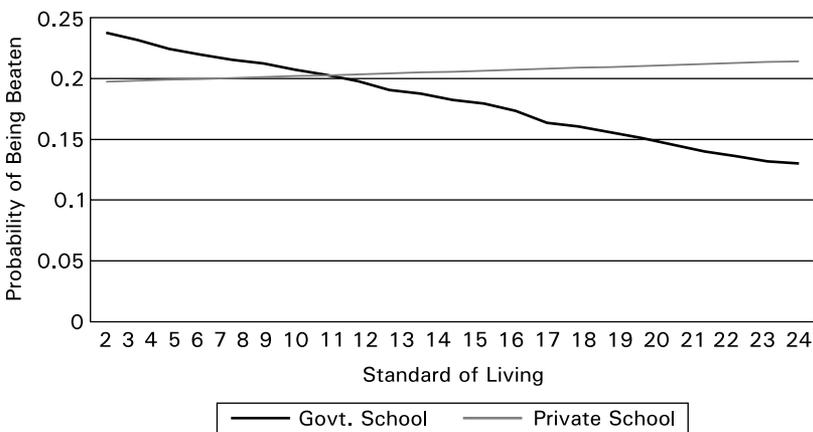
Figure 9, however, shows a very different picture when it comes to the probability that the child was beaten or pinched. There is little difference in the likelihood of physical punishment by parental economic status for children in private school; however, there is a strong negative relationship between economic status and punishment in government schools. In government

FIGURE 8. Probability of a Child Being Praised in the Last Month by Standard of Living



Source: Authors' calculations based on India Human Development Survey (IHDS) 2005.

7. Many schools rank students in a class explicitly in comparison to each other and ranking is clearly known to students and their families.

FIGURE 9. Probability of a Child Being Beaten in the Last Month by Standard of Living

Source: Authors' calculations based on India Human Development Survey (IHDS) 2005.

schools, children from poorer homes are far more likely to be punished than those from richer homes.

Many educational researchers have remarked upon the pervasiveness of physical punishment in Indian schools (The Probe Team, 1999); indeed, our estimates suggest that nearly a quarter of the children were physically punished in the prior month. We suspect that this humiliation does not create an environment conducive to learning and if children (and their families) perceive this punishment to be unfairly meted out, it may lead to even greater alienation among students from poorer households. In contrast to government schools, in private schools parents may be able to demand fair treatment, and although physical punishment remains rampant even in private schools, it does not seem to be associated with children's social class. It may be tempting to argue that the teachers who teach in private schools are more egalitarian than those in government schools, but the evidence from the likelihood of the child being praised contradicts this argument. When it comes to positive attention, richer students receive more attention in both settings although the intercept is higher for private schools. However, the link between parental social class and negative attention is nonexistent in private schools.

These results suggest a need to pay greater attention to qualitative dimensions of classroom environment. While teacher presence and accountability may be one of the avenues through which private schools outperform government schools, hidden aspects of classroom environment such as

positive reinforcement and reduced discrimination against disadvantaged children may be equally important.

Lessons for Public Policy

As we document modest but statistically significant improvements in reading and arithmetic skills of students in private schools and further note that these benefits are particularly concentrated among disadvantaged students, it may be tempting to argue that perhaps private schooling is the amrit or the elixir that will cure Indian education. If the reader were to come to this conclusion he or she would be in good company given the rising chorus of advocacy for private schools around the world (Kochar, 2001; Chakrabarti and Petersen, 2008; Glewwe and Patrinos, 1999; Dixon and Tooley, 2005). However, a number of considerations suggest caution before leaping to this conclusion. These fall in two categories: (a) empirical results based on our data and (b) theoretical issues raised in the literature.

Empirically, we find that while private school students perform somewhat better than their government school peers, these effects are modest compared to other structural effects. Table 8 provides an overview of the inter-state variation in reading skills across India based on the Model 2 from Table 7 with state of residence and private school interaction term added.⁸ Column 1 shows unadjusted differences across states; column 2 shows the predicted scores for students in private schools, holding their family characteristics constant at all India means; column 3 shows the predicted scores for students in private schools and the final column shows the difference between predicted scores in private and government schools. The states are sorted from lowest difference to highest difference.⁹

The results show substantial inter-state variation in the scores of both government and private school students. Controlling for parental characteristics, government school students in states as diverse as Kerala, Himachal Pradesh, Chhattisgarh, and West Bengal perform at a higher level than private school students in many other states. Within states, the performance of private school students is not consistently higher than government school students and in some states, government school students do better than private school students. Most importantly, private school advantage seems

8. For brevity we do not present results for arithmetic skills but they present a similar pattern.

9. Note that while all India sample is fairly large, about 11,700 children aged 8–11, the sample sizes at state level are considerably smaller and these results should be treated with caution.

TABLE 8. Predicted Reading Scores for Children in Private and Government Schools by State

	<i>Unadjusted reading score</i>	<i>Adjusted</i>		<i>Diff Private-Govt.</i>
		<i>Govt.</i>	<i>Private</i>	
North East	2.57	2.78	2.49	-0.29
Maharashtra/Goa	2.83	2.77	2.55	-0.21
Tamil Nadu	3.17	2.03	1.84	-0.20
Delhi	3.09	2.79	2.69	-0.09
Haryana	2.88	2.73	2.65	-0.08
West Bengal	2.45	2.83	2.91	0.09
Gujarat	2.79	2.62	2.76	0.14
Kerala	3.29	3.70	3.87	0.17
Chhattisgarh	2.81	2.91	3.10	0.19
Orissa	2.65	2.67	2.95	0.28
Karnataka	2.50	2.35	2.64	0.29
Himachal Pradesh	3.43	3.13	3.48	0.35
Rajasthan	2.52	2.43	2.89	0.46
Andhra Pradesh	2.40	2.21	2.68	0.47
Punjab	2.94	2.46	3.00	0.54
Jharkhand	2.58	2.73	3.27	0.55
Assam	2.84	2.97	3.52	0.56
Madhya Pardesh	2.31	2.36	2.99	0.63
Uttar Pradesh	2.02	2.03	2.72	0.69
Uttarakhand	2.74	2.53	3.24	0.72
Bihar	2.31	2.72	3.48	0.76
Jammu and Kashmir	2.37	2.03	2.85	0.82

Source: Authors' calculations based on India Human Development Survey (IHDS) 2005.

to be located in states like Bihar, Uttar Pradesh, Uttarakhand, and Madhya Pradesh—states known for poorly functioning public institutions as well as being some of the poorer states in India. These results are consistent with the findings for Uttar Pradesh from other studies that find large differences in student outcomes for children from “best” schools in poorly performing districts and “worst” schools in better performing districts (Das et al., 2006).

These results suggest that before a blanket embrace of private schooling, it may be worthwhile figuring out why some government schools function well and others do not. Blaming teacher absence may seem intuitive but the complete story may be more complex. While our school data become somewhat unreliable when we start comparing across states due to limited sample size, we find that public school teacher absence is higher in states like Kerala (17 percent) than in states like Uttarakhand and Punjab (4 percent and 9 percent respectively), however gains to private schooling are only modest in Kerala but considerably larger in Uttarakhand and Punjab.

Theoretical considerations also suggest caution before a massive embrace of school voucher program. If classroom environment is affected by the demands paying parents—most of whom are middle class—place on teachers, a voucher program that leads to an influx of poorer parents may dilute this effect. Kerala is an interesting example, 61 percent of the students in our sample in Kerala are in private schools but as table 8 indicates students in Kerala appear to have only a modest gain associated with private school enrollment although it is possible that even here poorer students may benefit more.¹⁰ Students in Haryana and Tamil Nadu, the other states with large private school enrollment, show a loss in skills for students in private schools compared to their government school peers. These observations are comparable to those from the voucher program in Chile where some studies evaluating Chile's massive voucher program record modest gains and others record a loss for students in private schools (Bellei, 2008).

These observations suggest that it may be worthwhile examining the differences in classroom environment between government and private schools and the processes through which these occur before shifting our attention to private schooling as the panacea for the ills of public education. The differential slope of parental social class on physical punishment between government and private schools provide an interesting illustration. If children from poor households in private schools benefit because their parents are able to ensure that they are not physically punished, would this benefit be diluted if parent were not paying the tuition but were relying on school vouchers? Are there other ways of ensuring that government school teachers do not resort to discriminatory behavior? To date, the discourse on benefits to private schooling in developing country context has focused on teacher absence and lack of accountability and to some extent, lower costs of private schooling. While these are important, perhaps a better understanding of how parental social class operates in government schools and shapes student learning may be a useful contribution to this research.

We sound these cautionary notes because an enthusiastic embrace of private school through large voucher program has a potential for disrupting existing structure of public education. Transfer of better educated or better motivated families into private school system may negatively affect the quality of public education—a deterioration that may be difficult to reverse. Hence, a thoughtful evaluation of private and public education coupled with experimental programs in a few geographically diverse districts may be a more reasonable strategy at this juncture in Indian development.

10. Kerala has a substantial proportion of students in government-aided schools—one version of voucher schools. These are included with private schools in this analysis.

APPENDIX

Appendix 1**TABLE A-1: Proportion of 8–11 Year Olds Tested**

All India	0.72
Place of Residence	
Metro City	0.69
Other Urban	0.76
More Developed Village	0.71
Less Developed Village	0.72
Socio Religious Group	
Forward Caste Hindu	0.78
Other Backward Classes	0.73
Dalits	0.74
Adivasis	0.66
Muslim	0.66
Christian	0.68
Maximum Adult Education in HH	
0 years	0.65
1–4 std	0.70
5–9 std	0.74
10–11 std	0.77
Higher Secondary/Some Coll	0.78
College Graduate	0.77
Household Income Quintile	
Poorest	0.71
Second	0.72
Third	0.73
Fourth	0.71
Affluent	0.75
Standard of Living Quintiles	
Poorest	0.67
Second	0.71
Third	0.75
Fourth	0.74
Affluent	0.76
Child Gender	
Male	0.73
Female	0.72
Type of School	
Not Enrolled	0.39
Government School	0.78
Private School	0.78

Source: Authors' calculations based on India Human Development Survey (IHDS) 2005.

Appendix 2

TABLE A - 1. Interaction Effect of Standard of Living and Private School Enrollment on Children’s Reading and Arithmetic Skills, Likelihood of Being Praised and Being Beaten

	<i>Reading</i>	<i>Arithmetic</i>	<i>Praised</i>	<i>Beaten</i>
Standard of living	0.043***	0.035***	0.022***	-0.013**
Private school enrollment	0.654***	0.364***	0.628***	-0.123
Private * standard of living	-0.023***	-0.012***	-0.006	0.016**

Source: Authors’ calculations based on India Human Development Survey (IHDS) 2005.

Notes: ***p < 0.01, **p < 0.05, *p < 0.1.

Regression includes all variables in Table 7, Model 2.

Appendix 3

TABLE A - 1. Learning to Read Language (Level 1)

(a) Alphabets

k	P	r
S	t	
D	h	n
M	b	

(b) Words

Cat		Ball
water	mat	boy
Put	road	my
Come		make

(c) Story

When Rita was going home it started raining. Her friend Minu saw her. Minu said to Rita, Rita it is raining hard. Come with me to my house. When it stops raining you can go home. Rita went to Minu’s house.

(d) Paragraph

Animals live in the forest. Lion is the king of the forest. But when the lion comes, they all run away.

Paragraph

Jaipur is a large city. It has a famous palace. Ajmer is another city near Jaipur. People go for vacation there.

TABLE A-2. गणित (Mathematics)

1		2		3
36	72	56	74	7) 468 (
		-38	-56	
64	48	46	75	5) 275 (
		-18	-37	
33	76	63	94	8) 496 (
		-47	-65	
45	82	84	84	3) 174 (
		-68	-46	
56	76			
पाँच पूछो (4/5) संख्या 5 में से 4 पहचान होनी चाहिए।		दो करो। (2/2) 2 में से दोनों सही होने चाहिए।		एक करो। (1) किया हुआ भाग का सवाल सही होना चाहिए।

Comments and Discussion

Kaushik Basu: As the Indian economy picked up steam in the early 1990s and, somewhat unexpectedly, the services sector became the engine of growth, the subject of education and the acquisition of human capital, always important, acquired a salience not seen before. Since, evidently, a large part of this services sector advantage is a lagged effect of the country's large investment in higher education and especially in engineering in the first few decades after the country's Independence, there is a lot of soul searching on whether India is continuing to invest in education adequately at all levels—school, college, and university. The debate is spurred on by the nagging feeling that the answer is no, India is not doing as well as it should in the spread of quality education and the acquisition of human capital suited to the needs of a vibrant 21st century economy. The debate has ranged from the need to overhaul its structure of university education to the significance of raising basic literacy and reaching minimal school education to the entire population.

The paper by Sonalde Desai, Amaresh Dubey, Reeve Vanneman, and Rukmini Banerji is a remarkably balanced contribution to the charged field of school education and, in particular, the strengths and weaknesses of government run schools in contrast to private schools. In an area where the position that so many commentators take is based on ideological priors, this paper stands out by being firmly rooted in evidence and statistics. Not surprisingly the findings that emerge are measured and even those measured findings are stated with all the caveats spelled out clearly, as good research demands. For these very reasons, the results seem persuasive and dependable.

At the risk of an overly simplistic summary, the main findings of the paper may be stated as follows. Overall, private schools provide not hugely but somewhat better quality education than state-run schools and the advantage accrues in greater measure to the economically disadvantaged children. Teachers in private schools are paid less but they are more diligent in doing their work in the sense of having a lower absenteeism rate than their counterparts in government schools. In studying the relation between school ownership and the quality of education the authors make a lot of effort in trying to isolate the direction of causality—from ownership to quality but nevertheless they caution the reader that for the final word on causality the jury must still be considered to be out.

Critique

Compounding the risk of a short colloquial summary of the main findings of the paper by Desai et al., let me begin by being equally pithy in stating my own main critique. If we are to take lessons from studies such as this to the domain of actual policy-making as the authors are clearly keen on doing, it is important to go a step or two beyond the ownership structure of the schools to matters of micro-organization in understanding the correlates of school quality and what exactly parents seek in choosing a school for their children. The paper under discussion describes some broad-brush regularities in the data well, but stops short of what is critical in crafting policy. Hence, the paper reads a bit like a preamble to a serious study. That does not take away from its merit, but at the same time it leaves the reader with the feeling that the paper delivers less than what it sets out to do, less than what it could have. The rest of my note may be viewed as an elaboration of this cryptic comment.

It is useful to begin from a somewhat different tack—by analyzing in the abstract what the respective strengths and weaknesses may be for government and private schools in delivering quality education. The literature in economics is replete with ideas on why the state sector tends to be inefficient. The main reason is that the agent delivering the product cannot, typically, earn a profit on what he or she delivers, and so, the person's incentive for doing a good job is stunted. This is probably at the core of why the state-owned sector tends to be less efficient and more bureaucratic. In addition, in a large sector like school education in India, it is likely that politicians will have an interest in getting electoral mileage out of the sector. Providing quality education may increase the popularity of a government, but the link between better organization of schools and the delivery of good quality education and widespread perception of this may have a considerable time lag. On the other hand, how teachers are treated—their salary, the propensity to look the other way when they do not deliver—would be immediately felt by the teachers and could have an important effect in propping up or dismantling governments. The evidence from India suggests that this second effect is dominant. Indian teacher absenteeism in government-run schools is embarrassingly high.

This problem is emblematic of much what is wrong with the bureaucracy. Several studies show that, when it comes to playing truant from school, Indian teachers are very good match for their students (PROBE, 1999; Rana et al., 2002). A multi-country study by Kremer et al. (2005), in which researchers made surprise visits to government-run primary schools, shows that in terms

of teacher truancy, India performs very poorly. At any time, 25 percent of teachers are found missing from government-run schools in India. Among the countries studied the only one to have a higher figure is Uganda with 27 percent. Further, Kremer et al. (2005) found that only 45 percent of the teachers in India were actually teaching at the time of the surprise visit.

As Desai et al. (2009) point out, private school teachers have a better record of attendance. Do government teachers have a lower salary to compensate for the fact that they can “take off” more easily? On the contrary, they earn considerably more than their counterparts in private schools. As Tooley and Dixon’s (2005) study of schools in Delhi show, teachers in government schools earn about three times as much as those in private recognized schools and around seven times as much as teachers in private unrecognized schools. Hence, the performance and pay of teachers in government-run schools do not seem to be driven by the forces of demand and supply. Evidently, this is a sector that enjoys political protection in keeping with the reasoning above.

Before moving on, a caveat needs to be spelled out. It is not always realized that in India, the private school–public school distinction must not be thought of solely in terms of a school’s profit earning capacity. This is because in India, private schools are set up by opening a trust or a charitable foundation and under the law the “owners” of these schools cannot earn profits. All profits must be reinvested in the school. Hence, the profit motive cannot work in the same way as in a privately-owned corporation. Instead, the incentive comes from the ability to pay oneself a higher salary and collect higher benefits when the school earns a higher profit. The legality of these practices is somewhat questionable. The main profit advantage of privateness in the education sector is whatever can come from these borderline practices.

Returning to the discussion of lack of incentives in state-run schools, I observe that not all advantages are stacked in favor of the private sector. This is because education is a “product” that is particularly prone to asymmetric information. By its very nature this is a product where the buyer is much less able to judge the quality of what he or she is buying than the seller. So the market for education is likely to suffer from the classic lemons problem which can result in a serious malfunctioning of the free market.

In addition, a person who sells education is immediately creating competition for himself or herself by the act of selling the product. If there is one literate person in the village and he teaches another person and helps that person to become literate, then he will have to contend with the fact that what was earlier a monopoly will now be a duopoly (two teachers in

the school). This will be one more reason why education may not be entirely in safe hands in the free market sector. It is not surprising that government has played a huge role in the provision of education the world over.

The fact that *a priori* reasoning demonstrates there are advantages and disadvantages on both sides makes the empirical investigation in a paper such as the one being discussed here interesting. The verdict could have gone either way; the study by Desai et al. shows that it goes in favor of the private sector. But maybe because there are disadvantages on both sides, the victory turns out to be slender.

There are important qualifiers. First, some states, especially the better managed ones are better in both private and public sector schools. And in fact government-run schools in some states are better than private schools in other states. Take reading performance of children. In Kerala, where we know that education is in general well-provided, performance in government schools is better than in government schools in any other state. But not just that. The children of government schools outperform the children of private schools in every state in India except Kerala. Another state where education in general has been a great success is Himachal Pradesh. The reading performance of children in Himachal Pradesh is beaten by the children of private schools of only five other states. In other words, for children in most states moving them from government schools to private schools would help but the help would be greater if they were to be moved to government schools in Kerala or Himachal Pradesh.

This has an important lesson. Government cannot be left off the hook for providing education on the ground that the private sector can do it better. There are states where the government does deliver, and in fact, delivers better than the private sector in many states. Therefore, while we should try to get private schools to supplement the effort of the state, the responsibility for creating an educated citizenry has to be shouldered by the state. In case teachers play truant and do not do their work seriously, pressure has to be brought on government to design teacher incentives and punishments more effectively.

The paper also mentions, echoing the celebrated Coleman Report (Coleman et al., 1966) in the US, how one reason why school structure does not have too sharp an effect on the quality of education could be because a child's performance depends more on home "atmosphere" than school. Unfortunately, this important lead is not taken any further by Desai et al. There are two different ways in which I have found corroboration for this. In an informal study that I did some time ago, I found strong evidence of the role of home atmosphere (Basu, 2008). This was based on some data that

I acquired from an NGO-run teaching institute for slum children in Kolkata called Anandan. At Anandan slum children are taught basic numeracy, logic, English; they are made to be aware of world affairs. The idea is to take the poorest children and spark their curiosity and intellectual interests. Anandan collects basic information about the children's background: their household income; whether their households have radios, bicycles, watches; the number of siblings they have; and, of course, basic information about each child such as age, sex, and mother tongue. In addition, they also have with them answers from questions directly administered to the children, about social conditions in the household, such as, if the parents beat each other, if the parents talk to each other and if so how much, if the parents talk to the children.

Furthermore, the school had given 60 children, of ages from 9 years to 16 years, take some basic IQ, arithmetic, and general knowledge questions. The questions they were asked may be found in Basu (2008). The data were not collected with special statistical care and was not meant for formal statistical enquiry. They were for the school's internal use. But the data nevertheless conveys a sense of what is important as a determinant of a child's aptitude. What turns out to be most important for a child's aptitude is not income or the possession of radios, watches, and bicycles, but whether the child lives with her own family (that is a big plus) and whether the parents talk to each other (that is again a big plus). The OLS results and the summary statistics are reported in Basu (2008).

The second lead that much of what one learns comes from beyond school comes from the idea of proximate literacy. There is now a substantial literature that suggests that how one performs in life can depend on having access to a literate person at home or, in the parlance of this literature, being a "proximate literate" (Basu and Foster, 1998; Subramanian, 2008; Gibson, 2001; Maddox, 2008). If one lives in a household with just one more literate person in the household that makes a huge difference. Gibson's study, based on Papua New Guinea, suggests that one can get three-fourths of the benefit of being literate oneself by having an access at home to a literate person. Basu, et al.'s (2002) study based on evidence from Bangladesh corroborates large benefits to proximate literacy.¹ Something similar to the Coleman observation that Desai et al. talk about in the context of the United States may

1. Some aspects of our findings are contested in an interesting paper by Iversen and Palmer-Jones (2008). For instance, household literacy may not be all good for females. This raises interesting questions about the directions of externality. The existence of externality, however, seems to be beyond question.

well apply to poorer nations even though the mechanics of learning at home may be different.

Schools as Fraternities

This still leaves an open question, which can be turned into a creative critique of the paper by Desai et al. If it is the case that (a) a lot of one's educational skills depend on the home ethos or, more accurately, on what a student learns at school, but the student's receptivity depends critically on the atmosphere at home and (b) of what depends exclusively on the atmosphere at school, the marginal advantage of going to a private school is not that large, then how come private schools are so much in demand in India and how is it the case that so many private schools, registered and unregistered, flourish?

This suggests that maybe the indicators that Desai and her co-authors study—such as the ability to read and write and do mathematics—are not what parents are after when they try to decide what kind of school to send their children to. That is, the children are, may be, sent to school to learn precisely what is suggested in the Desai et al. paper but the choice of school is guided by other considerations. Suppose that one important consideration in choosing a school is to form associations and networks that can help later in life. I am suggesting the kind of consideration that often prompts students in American campuses to join fraternities and sororities. Now suppose that some children are considered to be more coveted to associate with. It could be the children of some caste group or class or social background. This in turn can be derived from something more fundamental. We know that in getting good jobs it matters a lot what kind of network one belongs to. Hence, if the children of aristocracy or some caste group are likely to be better linked to the world of quality jobs, it may make sense to be willing to pay to get one's children into the network of this group.

Once this objective is recognized, it is easy to understand how a private school can become coveted purely by biasing admissions in favor of the category of students whose association is sought after. The school can then charge higher admission fees from all children. What the children or their parents will be paying for is partly the quality of education, but more importantly, for the quality of associates that students are likely to find in this school.

If the model I am suggesting is valid, then the somewhat lukewarm findings by Desai, Dubey, Vanneman, and Banerji on the quality advantages of private schools are easily explained. I am not suggesting that it is association

with a certain class of children that parents are after, but simply that what the parents are after could be different from what is treated as axiomatic in the paper under discussion, namely, that the choice of school is guided by the objective of bettering ones reading and arithmetic skills. In fact, one important contribution of their paper is that it leads to this important question: What is it that parents, especially in poorer regions, seek for their children in choosing schools?

Abhijit Bannerjee: Kaushik Basu and I made a deal. There are two roles that a discussant plays. One is to make nit-picky comments about the econometrics and the other is to provide wisdom. I think he is naturally chosen to do the wisdom bit. So I will take on the econometrics. But before that, a little bit of perspective.

If I think of what India Policy Forum should be doing, at some level, there should be ten papers like this one for every one paper of all the other kinds. I think the question here is entirely first order for the future of India. Twenty years later no one will care about what we did with our excess reserves today (indeed, since I spoke about this, the reserves have been substantially depleted) but everyone will know if growth stops because we did not generate enough human capital to sustain growth.

This is my prejudice: Let me express it bluntly. I think human capital is vital for us to be able to sustain the specific pattern of growth that has been ours for the last twenty years, and we know very well that our supply chain for skill is pretty broken and we do not actually understand how to fix it.

I think one of the very important contributions of Pratham's work is to tell us just how broken it is. I think it is spectacularly broken: These are some of those numbers that are frightening, any way you think about it. They concentrate on the early years of schooling. We do not actually know as much about the later years of schooling, but I would imagine that they do not look much better. So, I think this is an extremely important question.

The paper mentions both the reasons why you would want to think about it. One is to determine the government's regulatory stance on this, which is entirely absent at this point—while there is an official view of what are called recognized schools, unrecognized schools, which is where most poor children end up, seem to be delivering private education essentially with impunity right now. Whether that is how things ought to be, and if not that, how best to regulate them, are problems we need to be grapple with.

Second, and related, is the whole issue of whether or not we want to move to something like a voucher model where the government moves away from

actually providing towards funding. This is a question that often comes up in policy conversations but the evidence base, as emphasized in the paper, is remarkably thin.

What we do know from the work of many people, including Lant Pritchett and Rinku Murgai (2007) in this journal, is that public school teachers are much better paid. As a result, one might expect them to be better educated. The data from the India Human Development Survey suggests, interestingly, that this is not the case, though they may be better trained. On the other hand, there is now a fair amount of documentation of what, for want of a less polite description, is called the problem of incentives in the public sector.

We also know that even poor parents are now keen to send their children to private schools, and that private school participation is growing apace. However it does not follow that private schools are better: It is true that people are voting with their money but we do not know what they are voting for. Zhang (2008) shows that parents in China queue up to get their children into more expensive schools, but when you look at the impact effect of going to those more expensive schools, it is negative for a large part of the distribution. Everybody, except the very top students, loses out in terms of test scores by jumping the queue and getting into these schools. In contrast Andhrabi et al. (2007) conclude based on data from Pakistan that even illiterate parents can distinguish between the best and worst schools. However, they do have trouble with schools of intermediate quality.

We therefore need an independent answer to the question: Are the parents making the right choice? The reason why it has always been a challenge to answer this question is that there is an identification problem. The paper is very conscious of this: It basically comes down to the question, “Are children who get sent to private schools different from those who are not?” This is a problem at every level—within a family, within a neighborhood, within a district, and within a state. That is to say, you always worry about the fact that the district that ended up with better quality public schools might be a district where education is valued for reasons that are unobserved or unmeasured in the data. Likewise, you worry that the child who gets sent to the public school rather than the private school by a family that can afford both, might have certain characteristics that are driving the choice. As a result, there is the eternal search for an instrument. What you want is something that influences the private school participation but not performance.

This can be a frustrating effort. While I do not want to be too critical of the paper, there are obvious reasons why the presence of a private school in the village does not qualify. If you want to use the presence of a private school as an instrument, you will have to be willing to say that I as a businessman

setting up a private school will be happy to set it up at a random place. Literally. As soon as you say that, you know that that sentence is false. A mad man will set up schools in random places if his goal is to make money, and presumably, we think that schools are not run by mad men.

Likewise for Early English in government schools. The variation in this cannot come from a state-level policy decision because all regressions control for state effects. If it is a policy decision that is allowed to vary within the state, then one would imagine that the Early English schools would be special schools within the school system. Where do you choose to set up these special schools? I would not imagine that they are unresponsive to demand, for example, and demand is correlated to people's priorities. So, I cannot imagine that the school that is within the state government system and has early English is going to be randomly placed within the state. So, again there is the same challenge.

Another interesting idea they have is to make use of the fact that different people belong to different social networks and social networks provide access to a different menu of schools. But even the authors do not believe that social networks are excludable. It is not hard to imagine that if you have connections that help you get your children into school, having that connection would also affect the value you place on schooling, and hence the effort you would put into making sure that your children do well. For example, the same connection could get your child a job later.

The presence of a cook in a government school is the most interesting candidate for an instrument. In principle, the rule that the government uses to allocate cooks might have specific features that could be exploited to generate a compelling instrument. However, the authors do not have that information and therefore end up comparing villages with and without a cook, which is not very satisfactory—it could be, for example, that it is harder to find a cook in villages where job opportunities are better.

However, even if the exclusion restrictions fail, the reduced form in this case is of some independent interest. It tells us that the villages where there is a cook in the local government school systematically and substantially under-perform as compared to other villages—there is a 20 percent reduction in the set of children who can do the required level of arithmetic. In other words, if we were to assume that the cook was randomly assigned, we would conclude that the school meal program is hurting children's education because parents are basing their school choice decision on the presence of the cook. I am not sure I believe that cooks were randomly assigned, so I am not too worried about this, but it is certainly an intriguing possibility.

The paper also provides an alternative set of estimates based on family-fixed effects. I like this approach less: It seems to me that the fact that the same family sent one of its children to private school and another to government school is telling something about the children, or at least about the family's perception of the children, and something about the family's willingness to make other kinds of investment in these children. Which child is getting private tuition? Which one gets more time to do her homework? One could imagine models of the family which predict that this is also the child they are sending to private school and perhaps models where we see the opposite (because of inequality aversion, say). So, it seems like we do not exactly know what is being picked up here.

It is true that despite these potential endogeneities, the IV and family-fixed effect models generate results that are similar to the OLS. While it could all be accidental (the standard errors are sufficiently large that a formal over-identification test would not be very meaningful), it is striking nevertheless because there is no reason why the selection of schools *to not get a cook* should be similar to the selection of children within a family who get private schooling. It is true that none of this helps us with the concern that what we observe here is the effect of private schooling plus other complementary inputs that families provide to the children who they send for private schooling, but it does make these results harder to dismiss.

To get anything much more definitive, we will probably need to rely on randomized experiments. There is a paper by Angrist et al. (2002) that takes advantage of a program in Colombia that allocated school vouchers by lottery to estimate the benefits of private schooling for high school-age girls in urban settings and finds moderate-sized effects. This is useful, but given the many differences in the contexts (we are talking about co-educational primary schools in rural India, a much poorer part of the world) it is hard to imagine putting too much weight on these results. There is however an ongoing study by Kremer and Muralidharan in Andhra Pradesh that I expect make a dent in this problem.

The paper also gives us some interesting clues about the reasons why private schools work better. They start from the observation that the gains from going to private school, measured by the IV approach are bigger for children from poorer families. This is striking given that we do not control for the quality of the private schools: one might have been tempted to assume that government schools vary less in quality than private schools and therefore while everyone goes to roughly the same kind of government schools, the children of the non-poor go to much better private schools than the poor. This would have made the private school effect bigger for the rich.

The paper then makes an attempt to see why we might see these differences. While it is beyond its scope to settle the issue, it makes two very useful observations. One is that a child is much more likely (nearly twice as much) to have been praised in the previous month in a private school than in a government school. It is possible that the effect of the praise on the confidence and performance of children is much larger for children from economically more deprived backgrounds because they have less confidence to start with and moreover, are less likely to have parents who can judge the quality of their work. Second, poorer children are much more likely to have been beaten in a government school in the last month than richer children but there is no such difference in private schools. This might also encourage them to perform better.

This exercise echoes something that a number of other studies of Indian government schools have found: It is not at all uncommon for children to go through several years in a government school without having learnt to read letters or do the most basic arithmetic despite getting promoted to higher grades every year. On the other hand, when there is an attempt to actually teach the children these basic skills, they learn fast, even when the teachers teaching them have only a week's training and a high school education (Banerjee et al., 2007; Banerjee et al., 2008). If the government school teachers actually wanted to teach these children, it is hard to imagine that they could not do better.

The authors also emphasize the fact their OLS result should be seen as an upper bound on the effect of private schools since typically those people who end up in private schools tend to be the more motivated and the more socially advantaged even after we control for all observable differences. While I am sympathetic to this view, it is worth noting that this might not be the case if the primary source of variation in private school participation comes from the presence of a cook in the school—it may well be that the demand for a cook comes precisely from parents who care more about eating in schools than teaching in school. It could also be the case that private schools set up precisely in places where the government teacher never shows up, and these are typically places where the demand for quality is also low. However, the evidence in Andhrabi et al. (2007) suggests that this is not the case at least in Pakistan; if anything, the opposite: Private schools tend to be concentrated in less remote areas.

It is very important to emphasize that this entire discussion of OLS bias assumes that we are only talking about the effects of small changes in access to private schools. The full equilibrium effects of shutting down the government system and going to a voucher-based approach could be very different both

because then there would be a demand effect (there will need to be more private schools at the same level of quality) and also a supply effect (many more qualified people would be looking for jobs in private schools since the government will no longer hire them). The two effects in opposite directions and the direction of the net effect are not possible to predict. But it is at least conceivable that the full equilibrium effect could be much larger than the partial equilibrium version.

The ongoing study by Kremer and Muralidharan makes an attempt to empirically make some progress on this issue. They do a two-stage randomization. They randomly choose villages where some people will get vouchers. Within a village, they randomly choose people and give them vouchers. So, what that does is, first if you compare the villages that have vouchers with those that do not, that gives you the effect of being in the voucher treatment, and then you get a separate estimate by looking within the village. The difference between these two estimates is exactly a measure of the supply elasticity of private schools, which is what we need when we think of increasing participation on a large scale. There is still the worry that villages are small, so the supply effect may be relatively weak, and there is certainly no attempt to think about what happens if government schools stop hiring and hence there are more teachers available, but it is clearly a very important start.

With all these caveats, if we accept that the OLS estimate is an upper bound on the effect of private schools, I think we ought to be quite concerned. We know that the public school system suffers from quite serious incentive problems. Teachers do not show up to work and even when they do they do not teach. Yet the gains from moving to a system that ought to have much better incentives are no more than 1/3 of a standard deviation. To put some scale on this number, the gains from private schooling are significantly smaller than the effects of the two Pratham-run supplemental teaching programs we have evaluated (the Balsakhi program and the Read India program). Those programs were both implemented by non-professionals—mostly high school students or the equivalent, with a week of training.

A different scaling emphasized by the authors makes the same point. The government schools in Chhattisgarh are better than private schools in Gujarat. The private-school effect is dwarfed by cross-state differences. Both of these facts point to the same conclusions. Incentives are important but there is something else that is missing. It may be that the skills of the private school teachers who are willing to work at the current, abysmally low, salary levels leave much to be desired. It is possible some of these can be rectified by more targeted and better designed training programs and better pedagogy.

It is also possible that they need to be paid more. Putting pressure on the schools to deliver more by setting clearer standards and testing children may also help though testing at young ages is always a vexed issue. The general point is that we cannot rely on privatization alone to save us.

General Discussion

Esther Duflo noted that the effects private schools are shown to have on achievements in the paper are quite large. When test scores in private schools are 0.3 standard deviations higher in private schools on the average than in public schools, we are talking about large differences. Duflo also stated that contrary to the author's remark in the presentation randomized experiments do establish causality between the policy and outcome.

Surjit Bhalla said he would like to know if the authors' surveys showed that families overwhelmingly sent male children to private schools while sending female children to public schools. He also expressed the opinion that even if private schools did not offer superior education, vouchers had a role to play. They gave individuals the freedom to choose and such choice was an essential feature of a democracy.

Geeta Kingdon noted that the authors' implicit conclusion during the presentation that public-private partnerships produced no better outcome than public schools because the learning outcomes in government-aided private schools were no better than in government schools, was incorrect. For the first 15 or 20 years of Independence, the aided school system had functioned like a privately managed system. But around 1970 onwards, highly centralizing pieces of legislation turned this system *de facto* into government school system. Since then, teachers of aided schools are recruited and paid directly by the government at the same salary rate as in government schools. These schools receive block grants just as government schools do, that is, there are no performance-based incentives built into the system of public grants to private schools. Today's public-private partnership reform recommendations, or voucher school recommendations, are not of that nature. They are advocating giving the educational resource to the child or to the school in ways that are very different. They intend to give public resources in ways that incentivize private schools via, for example, per student grants (rather than block grants) directly to students (rather than to schools), thus promoting competition between schools to attract students.

Dilip Mookherjee noted that the authors' regressions did not include any controls for school inputs despite substantial differences in inputs as shown

in table 2. To what extent can the differences in outcomes be related to differences in inputs employed? Mookherjee also hypothesized that the wealth effects, not included by the authors in their analysis, could be important. The poorer the parent, the more selective he or she is likely to be with respect to the child's ability when considering sending the latter to a private school. And if there is complementarity between school resources and child's ability, you will find the poor children to be benefiting more from private schools just as the authors find.

Devesh Kapur raised the point that sometimes the identity of the school attended by children is less than well defined. They enroll in the area public school, get their mid-day meal, and promptly walk across to a private teacher who gives private tuitions for Rs 5, 10, or 15. So, here we have an altogether different kind of public-private partnership! Public schools are also happy with the arrangement since they collect revenues from the government based on enrollments.

Rukmini Banerji concurred with Kapur noting that the classification of children between private and public schools can often turn fuzzy. She had found that in schools in Bihar, 30 percent of the children were not present on even one of the four visits made. Did that mean they were enrolled but did not actually exist, or enrolled but not in attendance, or enrolled but attending a private school?

Rukmini Banerji added that a closely related phenomenon was private tuition, massively present in the ASER data in states such as West Bengal that oppose vouchers and private schools. In these states, 60-70 per cent of all children attend coaching institutes from a very young age. The ASER project did not ask who the providers of tuition were, but in all likelihood, they are the schoolteachers. Thus, education is coming from multiple sources.

Rukmini Banerji further stated that the implications of absence in private and public schools are very different. In public schools, children are promoted automatically up to 5 th grade as long as the child attends 75 percent of the classes. In turn, attendance can be manipulated. In private schools, children can fail and be held back. Student absenteeism remains a hugely understudied phenomenon.

Barry Bosworth stated that this is a nice paper but the results are predictable. We have by now seen, maybe, a thousand of these empirical studies. Most would agree that students in private schools perform better than students in public schools but the whole problem is the selection bias. Bosworth said that it was more or less agreed that addressing the selection bias required randomized experiment. When the experiments had been done in the United States with random assignments, the private school effect did not turn out

to be big. The present study is probably not going to convert many to the idea of a wholesale switch to private schools. We need to wait for the paper by Michael Kremer using random assignment, which would be far more convincing.

In response, Sonalde Desai noted that the challenges for pretty much anybody working in this area is to satisfy multiple audiences and serve multiple purposes. While randomized experiments may give you a definite answer on the role of a specific variable in a specific situation, they may not help the policy-maker a whole lot. One of the problems with experimental research is that it is going to focus on a specific question in a specific area under a specific set of conditions. But some of the most interesting issues on schooling in India relate to the differences across states and social groups. Experiences of Scheduled Tribes are very different from those of upper caste students and Scheduled Tribes in Assam have very different experiences from those in Maharashtra. So, as social scientists, if we put all our eggs in the experimental basket, we would fail to adequately inform policy. Desai added, however, that at the same time, she accepted the criticism that her analysis will never convince the skeptic.

Turning to other comments, Desai said she found the point made by Kaushik Basu interesting. She agreed that the benefits from being part of an elite group of students would have an important effect on the decision to attend private school. The opposition to vouchers may partially be coming from this fact since wide access to such schools would dilute the effect. Research along these lines may help us understand why there has been exponential growth of private schools in Uttar Pradesh but not in Madhya Pradesh and Bihar.

Regarding the pitch in favor of universal vouchers by Bhalla, Desai said this required careful thinking since institutions were very difficult to build and very easy to dismantle. Notwithstanding our complaints, Indian school system functions reasonably well when compared to many other countries. Before engineering a massive switch in the structure through vouchers, we need more compelling evidence in favor of private schools than presented here.

Abhijit Banerjee quipped that he was glad to have allocated the wisdom constituency to Kaushik because his comment on causality was characteristic of mystical Indian wisdom and entirely beyond himself (Banerjee). He also said that data on physical punishment are very difficult to interpret. Expressing disagreement with Bhalla on the issue that people should have the right to send children to the school of their choosing, Banerjee said that regulating education system is a common practice. For instance, we decide

who can provide education so as to minimize fraud. Besides, people voting with their feet is not equivalent to them being necessarily better off.

Kaushik Basu returned to the causality issue. He noted that randomized experiments about which Barry talked are extremely important. When such experiment can be done—often this is not the case—you can go to the heart of the matter. But there is a risk of overselling. And here is the example that helps sharpen the reservations. Suppose a properly done randomized experiment shows that 80 percent of the children in Delhi benefit by going to private schools. Now consider a specific parent: should he send his child to a private school or not? The answer to that question based on the randomized experiment is not so clear. The specific child is not a random draw from Delhi population: the parent knows a whole lot about his characteristics and those characteristics may pull the other way. Randomized experiment studies usually do not give us any insights into what is really the link between the cause and effect. That remains mystical.

The session concluded with Sonalde Desai adding that when randomized experiments are done, knowledge of that fact, via the Hawthorne effect, may impact the subject's behavior and produce spurious outcomes. So, even the experiments may produce unreliable outcomes.

References

- Andrabi, Tahir, Jishnu Das, Asim Khwaja, Tara Vishwanath, and Tristan Zajonc. 2007. *The Learning and Educational Achievement in Punjab Schools (LEAPS) Report*. Washington, D.C.: World Bank.
- Angrist, Joshua, Eric Bettinger, Erik Bloom, Elizabeth King, and Michael Kremer. 2002. "Vouchers for Private Schooling in Colombia: Evidence from a Randomized Natural Experiment." *The American Economic Review* 92 (5): 1535–1558.
- Banerjee, Abhijit V., Shawn Cole, Esther Duflo, and Leigh Linden. 2007. "Remedying Education: Evidence from Two Randomized Experiments in India." *Quarterly Journal of Economics* 122 (3): 1235–1264.
- Banerjee, Abhijit V., Rukmini Banerji, Esther Duflo, Rachel Glennerster, Stuti Khemani. 2008. "Pitfalls of Participatory Programs: Evidence from a Randomized Evaluation in Education in India." Paper, Massachusetts Institute of Technology.
- Basu, K. 2008. "Participatory Equity, Identity, and Productivity Policy Implications for Promoting Development," *mimeo*, Cornell University.
- Basu, K. and Foster, J. 1998. "On Measuring Literacy." *Economic Journal*, vol. 108.
- Basu, K., A. Narayan, and M. Ravallion. 2002. "Is Literacy Shared within Households: Theory and Evidence for Bangladesh." *Labour Economics*, vol. 8.
- Bellei, Cristian. 2008. "The Private-Public School Controversy: The Case of Chile." In *School Choice International: Exploiting Public-Private Partnerships*, edited by R. Chakrabarti and P. Petersen. Cambridge, Mass.: MIT Press.
- Bettinger, Eric. 2005. "Private School Vouchers in Colombia." In *Harvard University and World Bank Conference on "Mobilizing Public Sector for Private Education"*, *mimeo* Cambridge: Massachusetts.
- Chakrabarti, Rajashri, and Paul Petersen (eds). 2008. *School Choice International: Exploiting Public-Private Partnerships*. Cambridge, Mass.: MIT Press.
- Chaudhury, Nazmul, Jeffrey Hammer, Michael Kremer, Karthik Muralidharan, and F. Halsey Rogers. 2006. "Missing in Action: Teacher and Health Worker Absence in Developing Countries." *Journal of Economic Perspectives* 20 (Winter): 91–116.
- Chopra, Radhika and Patricia Jeffrey (eds). 2005. *Educational Regimes in Contemporary India*. New Delhi: Sage.
- Coleman, James S., Earnest Q Campbell, Carol J. Hobson, James McPartland, Alexander M. Mood, Frederick D Weinfeld, and Robert L. York. 1966. *Equality of Educational Opportunity*. Washington, D.C.: Department of Health, Education and Welfare.
- Coleman, James S., Thomas Hoffer, and Sally Kilgore. 1982. *High School Achievement: Public, Catholic and Private Schools Compared*. New York: Basic Books.

- Das, Jishnu, Priyanka Pandey, and Tristan Zajonc. 2006. "Learning levels and Gaps in Pakistan." *World Bank Policy Research Working Paper WPS 4067*, World Bank, Washington DC.
- Desai, Sonalde, Cecily Darden Adams, and Amaresh Dubey. Forthcoming. "Segmented Schooling: Inequalities in Primary Education." In *Blocked by Caste: Discrimination and Social Exclusion in Modern India*, edited by K. Newman and S. Thorat. New Delhi: Oxford University Press.
- Desai, Sonalde, Amaresh Dubey, B. L. Joshi, Mitali Sen, Abusaleh Shariff, and Reeve Vanneman. 2009. "India Human Development Survey: Design and Data Quality," *IHDS Technical Paper No. 1*. College Park: University of Maryland.
- Dixon, Pauline and James Tooley. 2005. "The Regulation of Private Schools Serving Low-Income Families in Andhra Pradesh, India." *The Review of Austrian Economics* 18 (1): 29–54.
- Dreze, Jean and Aparajita Goyal. 2003. "Future of Mid-Day Meals." *Economic and Political Weekly* 38 (44): 4673–4683.
- Filmer, Deon and Lant H. Pritchett. "Estimating Wealth Effects Without Expenditure Data-or Tears: An Application to Educational Enrollments in States of India." *Demography*, 2001, 38 (1): 115-32.
- Fuller, Bruce. 1987. "What School Factors Raise Achievement in the Third World?" *Review of Educational Research* 57 (3): 255–292.
- Fuller (ed.). 2003. *Inside Charter Schools: The Paradox of Radical Decentralization*. Cambridge, MA: Harvard University Press.
- Gibson, J. (2001), "Literacy and Intrahousehold Externalities." *World Development*, vol. 29.
- Glewwe, Paul and Harry Anthony Patrinos. 1999. "The Role of the Private Sector in Education in Vietnam: Evidence From the Vietnam Living Standards Survey." *World Development* 27 (5): 887–902.
- Goddard, Roger D. 2003. "Relational Networks, Social Trust, and Norms: A Social Capital Perspective on Students' Chances of Academic Success." *Educational Evaluation and Policy Analysis* 25 (1): 59–74.
- Govinda, R. 2002. *India Education Report*. New Delhi: Oxford University Press.
- Hanushek, Eric A. 1995. "Interpreting Recent Research on Schooling in Developing Countries." *World Bank Research Observer* 10 (2): 227–247.
- Hanushek. 1997. "Assessing the Effects of School Resources on Student Performance: An Update." *Educational Evaluation and Policy Analysis* 19 (2): 141–161.
- Heckman, James and Salvador Navarro-Lozano. 2004. "Using Matching, Instrumental Variables, and Control Functions to Estimate Economic Choice Models." *Review of Economics and Statistics* 86 (1): 30.
- Heyneman, Stephen P., and William A. Loxley. 1983. "The Effect of Primary-School Quality on Academic Achievement Across Twenty-nine High- and Low-Income Countries." *The American Journal of Sociology* 88 (6): 1162–1194.
- Hoffer, Thomas, Andrew M. Greeley, and James S. Coleman. 1985. "Achievement Growth in Public and Catholic Schools." *Sociology of Education* 58 (2): 74–97.

- Iversen, V. and Palmer-Jones, R. (2008), "Literacy Sharing, Assortative Mating or What? Labor Market Advantages and Proximate Illiteracy Revisited." *Journal of Development Studies*, vol. 44.
- Jencks, Christopher and Susan E. Mayer. 1990. "The Social Consequences of Growing up in a Poor Neighborhood." In *Inner City Poverty in the United States*, edited by L. E. J. Lynn and M. McGeary, pp. 111–186. Washington D.C.: National Academy Press.
- Jimenez, Emanuel and Marlaine E. Lockheed. 1995. "Public and Private Secondary Education in Developing Countries: A Comparative Study." In World Bank Discussion Paper No. 309. Washington, D.C.: The World Bank.
- Jimenez, Emanuel, Marlaine E. Lockheed, and Vicente Paqueo. 1991. "The Relative Efficiency of Private and Public Schools in Developing Countries." *The World Bank Research Observer* 6 (2): 205–218.
- Kelkar, Vijay. 2006. "Let Every Parent be a Consumer." *India Today* January 16.
- Kingdon, Geeta Gandhi. 2007. "The Progress of School Education in India." In *Global Poverty Research Group Working Paper No. 071*, pp. 111–142. London: London School of Economics.
- Kingdon. 2008. "Private and Public Schooling: The Indian Experience." In *School Choice International: Exploiting Public-Private Partnerships*, edited by R. Chakrabarti and P. Petersen. Cambridge, Mass.: MIT Press.
- Kochar, Anjani. 2001. "Emerging Challenges for Indian Education Policy." In *Center for Research on Economic Development and Policy Reform, Working paper No. 97*.
- Kremer, M., Muralidharan, K., Chaudhury, N., Hammer, J. and Halsey Rogers, F. (2005), "Teacher Absence in India: A Snapshot." *Journal of European Economic Association*, vol. 3.
- Maddox, (2007), "Worlds Apart? Ethnographic Reflections on "Effective Literacy" and Intrahousehold Externalities." *World Development*, vol. 35.
- Marks, Helen M. 2002. "School Composition and Peer Effects in Distinctive Organizational Settings." *International Journal of Educational Research* 37 (5): 505–519.
- Meyer, John W., Francisco O. Ramirez, Richard Rubinson, and John Boli-Bennett. 1977. "The World Educational Revolution, 1950-1970." *Sociology of Education* 50 (4): 242–258.
- Muralidharan, Karthik. 2006. "Public-Private Partnerships for Quality Education in India." *Seminar* (565). Available online at http://www.india-seminar.com/2006/565/565_karthik_muralidharan.htm.
- Muralidharan, Karthik and Michael Kremer. 2008. "Public and Private Schools in Rural India." In *School Choice International: Exploring Public Private Partnerships* edited by R. Chakrabarti and P. Petersen (eds), pp. 91–110. Cambridge, Mass.: MIT Press.
- Murgai, Rinku and Lant Pritchett, "Teacher Compensation: Can Decentralization to Local Bodies Take India from the Perfect Storm through Troubled Waters to

- Clear Sailing?" India Policy Forum, 2007. Washington, D.C.: Brookings Institution. Also available at http://lpritchett.org/research_education.htm.
- Panagariya, Arvind. 2008. *India: The Emerging Giant*. New York: Oxford University Press.
- Pong, Suet-ling. 1998. "The School Compositional Effect of Single Parenthood on 10th-Grade Achievement." *Sociology of Education* 71 (1): 23-42.
- Pratham. 2005. *Annual Status of Education Report*. New Delhi: Pratham Documentation Center.
- PROBE. 1999. *Public Report on Basic Education in India*. New Delhi: Oxford University Press.
- Rana, K., Rafique, A., and Sengupta, A. (2002), *The Pratchi Education Report: The Delivery of Primary Education*, New Delhi: The Pratchi India Trust.
- Roscigno, Vincent J. 2000. "Family/School Inequality and African-American/Hispanic Achievement." *Social Problems* 47 (2): 266-290.
- Shariff, Abusaleh. 1999. *India Human Development Report*. New Delhi: Oxford University Press.
- Stolzenberg, Ross M. and Daniel A. Relles. 1997. "Tools for Intuition about Sample Selection Bias and Its Correction." *American Sociological Review* 62 (3): 494-507.
- Subramanian, S. (2008), "Externality and Literacy." *Journal of Development Studies*, vol. 44.
- Tooley, James. 2007. "Could For-Profit Private Education Benefit the Poor? Some a Priori Considerations Arising from Case Study Research in India." *Journal of Education Policy* 22 (3): 321-342.
- Tooley, James and Pauline Dixon. 2005. "Private Schools Serving the Poor." Working Paper: A Study from Delhi, India. New Delhi: Centre for Civil Society.