# Variation in Private School Performance
## The Importance of Village Context

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Using Annual Status of Education Report 2009 data, this paper investigates the linkage between private school performance and the context within which these schools operate. The results from this study indicate that the "positive private effect" or the private-public performance gap does vary based on the village context. The private school advantage is reduced in villages with a strong government presence. This government presence in the data is reflected in the provision of various government services, the presence of physical infrastructure, and a robust government-funded and government-supported primary, middle and secondary education system. Public and private schools are not established and do not operate in a vacuum. Public schools may respond to private competition, or they may simply respond to greater government support. Private schools similarly also respond to the presence of robust government-funded services and infrastructure.

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Data indicate a rapid increase in both numbers of private schools and private school enrolment across India (Muralidharan and Kremer 2006; Kingdon 2007; Wadhwa 2009). The debate surrounding the benefits of private education – and the challenges associated with it – is growing equally rapidly. For instance, the *Economic & Political Weekly* recently published an exchange on this issue by Jain and Dholakia (2009), Sarangapani (2009), Ramachandran (2009), Jain and Dholakia (2010), and Jain and Saxena (2010). These debates focus on several different yet related issues. Do private schoolchildren perform better on tests compared to public school students? Do private schools produce the same or better learning at lower costs? Are private schools truly accessible to poor Indian families? Finally, what explains the growth in private schools? That is, are private schools a direct response to parental demand and dissatisfaction with public schools or do other contextual factors matter as well in determining the supply of private schools?

In this paper, I use recent national data from rural India to contribute to this conversation. I specifically look at villages with private schools and compare the difference in performance of private and public schoolchildren in such villages. I am interested in understanding whether children's performance in private schools varies depending on the village where the private school is located. Such variation in private school performance, if it exists, may have two important implications for this area of research. It may offer a deeper understanding of the consistency of the "positive private effect", and it may highlight mechanisms that can be called upon to bridge the private-public performance divide.

### Background

Until recently, few large-scale national-level studies on private schooling have been available. In the section below, I briefly review studies on private school performance and private school location preference that are relevant to my research focus.

**Private School Performance:** The primary challenge in understanding private school performance is taking account of the lack of randomness in private school enrolment. Children do not enrol in the local public or private schools randomly. Their schooling decisions are made by their parents. The choice may reflect several factors, including the parent's ability to pay more to educate their child, their access to information about the available choices, and the value they place on education in

general. In turn, it is also often likely that those parents who choose (or are able to choose) the private options are better off overall: more educated, well-off and better connected. Indeed research from India shows that, in general, children in private schools tend to belong to systematically different and better-off homes than those in the public schools (Goyal and Pandey 2009). Härmä (2011) shows that this may be true even for children attending low-fee private schools.

But research has also shown that the home background is crucial in understanding children's school performance across the world (see, for example, Chudgar and Luschei 2009). Thus, if we find that a child attending a private school performs better than his or her public school counterpart, without proper econometric corrections, it is hard to ascertain whether this higher performance is due to private schooling, or if it simply reflects the more privileged home background of the child enrolled in the private school. Therefore, it is also not surprising that if we compare raw performance differences between public and private schoolchildren, we tend to find that private schoolchildren significantly outperform public schoolchildren, but these raw or "uncontrolled" differences often reduce drastically after home background is taken into account (Wadhwa 2009).

In the Indian context, few studies have employed extensive econometric corrections to account for this selection issue. However, a few studies may shed light on the differences in public and private performance (Kingdon 1996; French and Kingdon 2010; Desai et al 2008; Goyal 2009). Kingdon (1996) and Goyal (2009) rely on data from one and eight districts respectively, while the other two studies have access to national-level rural (French and Kingdon 2010) and rural and urban data (Desai et al 2008). While the econometric approaches these researchers use do have their own limitations (like any such approach), in general, they find that after making appropriate corrections for selection, the positive private effect diminishes, but it does not disappear. In other words, research indicates that the private-public performance gap may be positive.

**Private Schools and the Role of the Context:** Private school students may uniformly outperform public school students where such schools are available, but are private schools being established uniformly across the country? Research indicates that the answer to this question may be negative, due to factors on both the demand and supply sides.

Muralidharan and Kremer (2006) collected data from a representative sample of schools in 20 Indian states. They found rapid growth in private schools, especially in areas where public school performance was lacking. They measured "public school failure" by accounting for teacher absence and non-teaching activity (2006: 9).

While these authors provide a predominantly demand-side explanation for the emergence of private school, Pal's (2010) study adds supply-side considerations. Pal (2010) used data from the PROBE database to understand the context factors associated with private school presence. Her paper adds valuable nuance to understanding the private school phenomenon. She argues that in order for private schools to function efficiently, i e, minimise the cost of production and maximise returns on investment, they need robust public infrastructure. Her analysis shows that private schools are likely to be present not just in areas where public schoolteachers have lower attendance rates but also in areas where more public infrastructure is available, including access to water, roads, electricity, phones, and post offices.

These findings from Pal about the importance of government-sponsored infrastructure are also reflected in a study from Pakistan by Andrabi, Das and Khwaja (2008). Among other things, they found that private schools (especially low-fee private schools) were more likely to be located in villages with sufficient populations of younger, unmarried women who had a secondary school education. These women formed the readily available, low-paid teacher labour force for these low-fee private schools. Such an educated female labour force was available in the villages where the government had invested in girl's secondary education in the last 20 years. In summary then, the emergence of private schools in a given village may be driven not simply by parental demand, but also by the ease and efficiency of supplying private education, given existing government investments.

This brief review of the literature indicates that a family's decision to enrol their child in a private school, as also the private school's decision to operate in a given community, are driven by a host of factors. Not surprisingly, more affluent and educated families are more likely to choose the private option. Also interestingly, providers of private education may not be simply responding to dissatisfaction with government schools but also to local situations that either facilitate or hinder the operation of such schools.

The topic that I investigate in this paper is the linkage between private school performance and the context within which private schools operate. Given that private schools are more likely to be established in certain contexts, are these contextual factors also associated with private school advantage? In other words, is it likely that the private-public gap may be larger in certain types of villages than in certain others? If so, what aspects of the village background may help explain this variation in the private-public gap?

### Data, Variables and Methods

The data used in this study come from the Annual Status of Education Report (ASER) 2009. ASER is the largest volunteer-driven effort undertaken in rural India to provide a basic measure of children's learning levels. Both in India and internationally, the challenges of universal primary enrolment are now being replaced by a focus on improving grade attainment, i e, reducing dropouts and increasing the achievement or learning levels of those students who enrol in schools. For years, various National Sample Survey Office (NSSO) studies have provided nationally representative data on school enrolment and retention. However, until recently, it was harder to access large-scale child-level data on learning levels in India.[1]

In this climate, ASER data, collected since 2005, have been an excellent resource for obtaining basic cross-national statistics on student performance. While the initial rounds of ASER provided information on children's reading and mathematics performance on simple tests across rural India, these data did not contain enough of the necessary home background variables to facilitate more extensive quantitative analysis. Over the years, ASER's data collection efforts have grown to generate several additional sets of information.

The 2009 ASER provides an overview of the evolution of ASER since 2005. The first round in 2005 focused on children age 6-14 years; it collected data on reading and arithmetic tasks and on the child's enrolment status and school type. The survey also involved school visits. It surveyed households in 20 randomly selected villages per district. In 2006, the scope of ASER was increased to include children aged 3-16, and they were tested on additional tasks. The survey collected information on the mother's education and her ability to read. The number of villages per district was increased to 30 but the researchers tried to maintain an overlap with the villages sampled in 2005. Since 2007, a similar pattern was continued with an effort to gather more information about the child's family and village, and a government school in the village.

The 2009 data collection process employed two-staged stratified random sampling that allowed the researchers to select 30 villages per district and 20 households per village. This survey "brings together elements from various previous ASERs" (Pratham 2010: 271). In a procedure carefully explained in the ASER valuable information was collected on each child aged 3-16 including sex, enrolment status, class level, school type, and experience of private tuition and preschool attendance. Children aged 5-16 were tested on a series of tasks including reading and arithmetic and English; the ASER provides extensive details on the actual tasks and how student competence was measured. For all the children the survey gathered information on their father's and mother's school attendance and their actual education levels and on their possession of certain household facilities such as television, mobile phone, toilet and electricity. Finally, the child's mother was asked to read a simple text.[2]

The survey gathered basic information on the village which I used to generate measures of the village context. These variables include presence of private school, availability of pucca road, electricity, long-distance calling facility, access to postal services, bank, ration shop, anganwadi, an Accredited Social Health Activist (ASHA) worker, public and private health clinics, and finally the presence of government primary, middle, and secondary schools. The survey also gathered information from one government school in the village; preferably this was one offering classes first through seventh or eighth, but if that was not feasible then they turned to the government school with the highest enrolment for classes first through fourth or fifth. Thus, while the government school data are not representative of the village, they provide some understanding of the government school context for the village. Together, these data sets provide a unique opportunity to not simply account for the child's home background but also to construct a set of village context covariates.

For this study, I worked with data on children who were currently enrolled in government or private schools (i e, excluding children in Madrassa or "other" school types). Since I am specifically interested in understanding how the private school advantage varies with the village within which the private school is situated, I also made another data-constraining decision. I limited my sample to children attending public and private schools in villages with private schools. (Roughly 10% of the children in the sample attended private schools but their own village recorded no private schools.)

The final study sample consisted of 1,31,553 children from 6,836 villages in 575 districts from 31 states and union territories. If I had included villages without private schools, the study would have contained significantly more villages (over 16,000), but in terms of districts and states and union territories, this complete sample would have looked fairly similar with 576 districts, 31 states and union territories. In terms of specific states, the restricted sample slightly over-represents Rajasthan, Haryana, Uttar Pradesh and Kerala and slightly under-represents Orissa and Jharkhand. This sample was split by class levels as I explain in the variable section below. I included non-private school villages in one descriptive analysis, as I explain when I discuss my results.

**Dependent Variables:** I used the children's reading and mathematics performance as the outcome variables. I split the children in the sample into two groups: those in classes 1-2 and those in classes 3-5. Because the ASER manual notes that performance data for younger children are more reliable, I generated four different outcome variables for these children, and two for the older children. For children in classes 1-2, the variable RD1Y measured their ability to read at least a letter, or more. RD2Y measured their ability to read at least a word, or more. The mathematics task for this group checked their ability to recognise numbers from 1-9 (MT1Y) and their ability to recognise numbers from 1-99 (MT2Y). For children in classes 3-5, the reading task measured their ability to read text from at least standard 1 (RDO). The mathematics task measured their ability to carry out subtractions with borrowing involving two digit numbers (MTO).

**Independent Variables:** I used two sets of independent variables. One set takes into account the attributes of the child and her or his family, and the other set takes into account the attributes of the village. At the level of child and family, the variables in the analysis included the child's sex, age, and class level, and an indicator variable to identify whether the child receives private tuition. The analysis also included variables that indicated if either of the child's parents had attended school, a summative index of various home possessions as a proxy for the family's socio-economic status (SES), the number of household members, and the type of house construction – pucca, semi-kuccha or kuccha. Finally the analysis included an indicator variable to identify whether the child attended

**Table 1: List of Variables, Description and Source**

| Variable Name | Description | Source |
|---|---|---|
| RD1Y | Can read at least a letter, or more (grades 1-2) | Child data |
| RD2Y | Can read at least a word, or more (grades 1-2) | |
| MT1Y | Can recognise numbers from 1-9 (grades 1-2) | |
| MT2Y | Can recognise numbers from 1-99 (grades 1-2) | |
| RDO | Can read at least standard 1 level text (grades 3-5) | |
| MTO | Can carry out subtractions with borrowing involving two-digit numbers (grades 3-5) | |
| Male | Child is male | |
| Age | Age of the child | |
| Tuition | Child receives private tuition | |
| Grade | Child's grade in school | |
| Private | Child attends private school | |
| Parent_school | Did either parent attend school | |
| SES | Socio-economic status as determined by summative index indicating possession of toilet, TV, mobile phone, access to electricity and vehicle ownership (where a larger vehicle such as a car gets more weight than a bicycle). | |
| HH_Type | Type of household construction (pucca, semi-kuccha, kuccha) | |
| HH-Size | Number of people in the household. | |
| V_Infra | Summative index of access to pucca road and electricity connection | Village data |
| V_Private | Summative index of presence of private health clinic, STD booth and bank summative index of access to a post office, government primary health clinic, ASHA worker, | |
| V_government | Angandwadi and a ration shop | |
| V_education | School (3) | |
| V_ATD | Proportion of all regular teachers present on the day of the survey | School data |
| V_SFAC | Summative index of school facilities including access to toilet, water, learning material | |

variables were used in the descriptive analysis but not used for the final regression analysis because significant data were missing. Table 1 provides a comprehensive list and descriptions of all the variables used in the study.

**Methods:** In addition to a simple descriptive analysis, in this paper, I rely mainly on hierarchical linear modelling (HLM). HLM facilitates explicit modelling of the variation in the private school effect (or the private-public gap) across villages, which is the primary focus of this research. Specifically, I estimate the following linear probability model (LPM) where $Y_{ij}$ represents the performance of student "i" in village "j".

private school. It is important to remember that these household and child control variables are necessary as we try to understand the relationship between private school attendance and the child's performance on the reading or math task. However, these controls are not adequate to make a causal link between these two factors. To do so would require more extensive home background measures and more sophisticated econometric techniques, if the data were to allow it. Also, it is foreseeable that with these additional variables and additional econometric corrections, the private effect would most likely attenuate further.

At the village level, I utilised two different sources of information to generate the village background information. I derived one set of variables directly from the village data. Like Pal (2010), I created a variable V_INFRA to identify whether the village had access to a pucca road and an electricity connection. The variable V_PVT indicated if the village had a private health clinic, STD booth, and a bank. In addition, I generated two variables that measured overall government presence in village services and specifically in education. The variable V_GOVT indicated whether the village had access to a post office, government primary health clinic, ASHA worker, anganwadi, and ration shop. The variable V_EDUC measured the village's access to primary school (1), middle school (2), and secondary school (3). I calculated all these variables by simple summation. Finally, I used the data from the one government school per village to generate two basic measures about the government school. Research has shown the importance of teacher attendance as a measure of school quality, so one variable (V_ATD) measured the proportion of all the regular teachers who were present on the day of the survey. Another measure is a summative index of school facilities, including access to a toilet, water, and learning materials (V_SFAC). These two

Model 1: Level 1: $Y_{ij} = b_{oj} + b_{1j}\text{PRIVATE}_{ij} + \alpha\textbf{STUDENT}$
$$+ \delta\textbf{FAMILY} + e_{ij} \tag{1}$$
$$\text{Level 2: } b_{oj} = \gamma_{oo} + u_{oj} \tag{2}$$
$$b_{1j} = \gamma_{1o} + u_{1j} \tag{3}$$

Level 1 is the student-level equation where $b_{1j}$ represents the relationship between student performance and their private school attendance in village $j$. The letters in bold indicate other student/family variable matrices and coefficient vectors. I conducted the level 2 analysis in two steps. First, I investigate if there is a systematic variation in the association between private school attendance and student performance across villages. I did this by estimating Equations (1)-(3). The variation in village-level coefficients for PRIVATE, $b_{1j}$ is provided by the variance of $u_{1j}$ represented as $\tau_{11}$. $\tau_{11}$ is also known as the variance component for PRIVATE. The significance of the $b_{1j}$ variance component indicates significant differences in the private effect across villages or a significant variation in the private-public gap across villages. How well a private school student does compared to a government school student depends, among other things, on the village context within which these schools are situated. That is, the village context may be important in understanding the private school impact.

Model 2: Level 1: $Y_{ij} = b_{oj} + b_{1j}\text{PRIVATE}_{ij} + \alpha\textbf{STUDENT}$
$$+ \delta\textbf{FAMILY} + e_{ij} \tag{4}$$
$$\text{Level 2: } b_{oj} = \gamma_{oo} + \partial_{oj}\textbf{VILLAGE} + u_{oj} \tag{5}$$
$$b_{1j} = \gamma_{1o} + \partial_{oj}\textbf{VILLAGE} + u_{1j} \tag{6}$$

If I find that the variance component associated with $b_{1j}$ is significant, then I next estimate model 2, Equations (4)-(6) by introducing the four village background variables (V_INFRA, V_PVT, V_GOVT, V_EDUC) to investigate if any of these specific village attributes are important in reducing or increasing the private school effect or the private-public gap. In conducting

the HLM analysis, I account for the appropriate sample weight at level 1 in both models.

## Results

Tables 2 and 3 present descriptive statistics that concur with the literature reviewed earlier. Table 2 provides a comparison of village background variables for villages with and without private schools. It is important to remember that the primary analysis in this paper, excluding Table 2, is limited to villages with private schools. However, as shown in Table 2, I specifically analysed data from the villages without private schools to compare them with the primary sample of interest – villages with private schools.

**Table 2: Comparison of Village Background Attributes for Villages with and without Private Schools**

| | Villages without Private Schools | | | Villages with Private Schools | | | Range | |
|---|---|---|---|---|---|---|---|---|
| | N | Mean | Std Dev | N | Mean | Std Dev | Minimum | Maximum |
| V_SFAC | 8,587 | 6.01 | 2.67 | 6,790 | 6.77 | 2.65 | 0 | 12 |
| V_ATD | 5,662 | 0.88 | 0.22 | 5,048 | 0.87 | 0.22 | 0 | 1 |
| V_INFRA | 8,756 | 1.50 | 0.66 | 6,906 | 1.76 | 0.50 | 0 | 2 |
| V_government | 8,756 | 2.71 | 1.28 | 6,906 | 3.76 | 1.25 | 0 | 5 |
| V_education | 8,756 | 2.26 | 1.60 | 6,906 | 3.74 | 1.98 | 0 | 6 |
| V_private | 8,756 | 0.75 | 0.88 | 6,906 | 1.77 | 1.06 | 0 | 3 |

(1) The range is the same for both types of villages.
(2) All means are statistically significantly different at p≤0.001.

The descriptive results in Table 2 generally confirm the observations made by previous studies (Muralidharan and Kremer 2006; Pal 2010; Andrabi, Das and Khwaja 2008). Villages with and without private schools are statistically significantly different on all the variables studied (p≤0.001). In villages with private schools, public schoolteacher attendance is very slightly lower: 87% of teachers present on the day of the survey versus 88% in the comparison villages, indicating that private school establishment may potentially be responding to lower public schoolteacher attendance. Looking at basic school facilities, government schools in villages with private schools actually have more resources, with a difference of 0.3 standard deviations, than the comparison school. Thus, it is unlikely that private school establishment is a response to generally lower quality of government schools. Overall, we find partial support for the argument that the establishment of private schools is a demand-side phenomenon: private schools are potentially more likely to be established in villages where public schoolteachers have lower attendance rates.

However, these data seem to provide stronger support for the argument that private school establishment is a supply-side phenomenon. Private schools are present in villages where existing public infrastructure, government services, private services, and even government schools are significantly more likely to be present. Villages with private schools are slightly more likely to have road access and electricity. These villages are also likely to have significantly more government services, almost an entire standard deviation more. A different way to think about this is that villages where private schools are more likely to set up have an additional government service that the comparison villages do not have. The difference in terms of the presence of the government school system is even more

striking: villages where private schools set up are actually likely to have a stronger government school system present. This may concur with the finding from Pakistan – in order for private schools to function efficiently they need a local, educated pool of teachers. This in turn is more likely in the event that the government has already made substantial and long-term investments in higher levels of education in these areas.

Finally, and not surprisingly, such villages are also more likely to invite other private services such as STD phone services, private health clinics, and banking services, which admittedly may be public as well. In other words, these descriptive data make it amply clear that private schools are not merely a response to greater parental demand; they may also be very much a phenomenon that is supported by existing government investments in infrastructure, resources, and public education.

Table 2 also highlights another important fact. While villages with private schools are on the whole better off, significant variation still exists in the availability of these government services even across these villages. (The minimum to maximum range of each variable applies to both sets of villages.) It is this variation across this subgroup of villages that I hope to exploit in the HLM analysis below.

Table 3 provides information on public and private school students from villages with a private school; these students are the central focus of this study. Specifically, the analysis reported in Table 3 compares their performance and their home background. The children attending public schools perform less well than their private school counterparts on all the six outcome variables. A greater proportion of private school-children are likely to be able to read letters, words, and text, and recognise numbers and perform mathematical operations, compared to their public school counterparts. Once again, all the differences are statistically significant (p≤0.001).

**Table 3: Comparison of Children in Private and Public Schools**
(for children residing in villages with a private school)

| Variable | Public School | | Private School | |
|---|---|---|---|---|
| | N | Mean | N | Mean |
| RD1Y | 28,760 | 0.77 | 15,724 | 0.87 |
| RD2Y | 28,760 | 0.38 | 15,724 | 0.52 |
| MT1Y | 28,575 | 0.78 | 15,600 | 0.87 |
| MT2Y | 28,575 | 0.37 | 15,600 | 0.53 |
| RDO | 46,481 | 0.63 | 20,615 | 0.75 |
| MTO | 46,242 | 0.55 | 20,486 | 0.67 |
| Male | 75,612 | 0.53 | 36,517 | 0.57 |
| Age | 75,612 | 8.61 | 36,517 | 8.47 |
| Tuition | 75,612 | 0.23 | 36,517 | 0.27 |
| Grade | 75,612 | 3.04 | 36,517 | 2.90 |
| Parent_Sch | 75,612 | 0.73 | 36,517 | 0.85 |
| SES | 75612 | 0.78 | 36,517 | 0.92 |
| HH_type | 75,612 | 1.96 | 36,517 | 2.37 |
| HH_size | 75,612 | 6.45 | 36,517 | 6.67 |

All means are statistically significantly different at p≤0.001.

Reflecting the gender preferences in India, we also note that these children attending private schools are slightly more likely to be male. More importantly, in keeping with the literature, we find that children who attend private schools belong to better off households. A greater proportion of their

parents are likely to have attended school and these families enjoy a higher SES and are more likely to live in pucca houses.[3]

Table 4 presents the HLM results from model 1 and model 2 for the six outcomes. In general, the regression analysis upholds several findings supported by the earlier literature. Across all the six outcomes and both model specifications, we find that children whose parents have been to school outperform those whose parents have not. Similarly, we find that belonging to a higher SES as measured by the summative index of home possessions is also associated with a positive performance on reading and mathematics tests for younger and older children. Living in a pucca or kuccha household is not significantly associated with MT1Y performance, but we find that higher quality of household construction is positively associated with higher performance on other math and reading tasks, once again indicating that children from better-off families tend to perform better. Larger household sizes are associated with reduced performance on the tests. Interestingly, boys outperform girls only in the advanced mathematics task (MTO); otherwise we find no significant male-female differences. Also not surprisingly, while the age and class spread is limited in each of these analyses, we do find that older children and children attending higher classes perform better than younger children and those in lower classes. We also find uniform, significant, and positive associations between children's performance on the reading and mathematics tasks and their private tuition attendance.

Finally, we turn to the private school effect, which is of primary interest in this study. In model 1, for each of the six reading and mathematics tasks we find a large, positive, and significant coefficient associated with PRIVATE. In other words, after accounting for some of the basic home and child background variables, we find like previous studies that children who attend private school outperform their counterparts in public schools on various reading and mathematics tasks. But then we move a step forward from the existing research and ask if this positive private school effect is consistent across different villages? The significance of the variance component associated with PRIVATE indicates that the private-public gap may not be equal across all types of villages. The village within which the private school is situated is important in determining the private school advantage.

The estimation of model 2 provides a glimpse into these village attributes, or the context factors that may be associated with variations in private school performance across villages. For the younger children, we find that an increase in government presence in public education (in terms of primary, middle, and secondary public schools) is associated with a reduction in the private school advantage, or a reduction in the gap between private and public school performance. So for instance, for outcome RD1Y, the baseline difference between a private and public school attending child is 0.14 units. This difference is reduced by 0.008 units with greater presence of government schools in the village. All else equal, in a village with government secondary school, the private-public gap on RD1Y will therefore be 0.024 units smaller than a village without a government secondary school.

Similarly, for the older children in classes 3-5 we find that a strong presence of the government services is associated with a smaller private-public gap. For instance, all else equal, in a village without any government services (v_GOVT=0) the private school advantage over public school is 0.17 units for outcome RDO. This private school advantaged will be reduced by 0.09 units in a village where all the government services are present (v_GOVT = 5).

Finally, in one instance (RD2Y), an improvement in government-provided infrastructure also reduces the private-public

**Table 4: Hierarchical Linear Model Results for Three Reading and Three Math Outcome Variables for Children in Villages with a Private School**

| | RD1Y | | MT1Y | | RD2Y | | MT2Y | | RDO | | MTO | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Model 1 | Model 2 | Model 1 | Model 2 | Model 1 | Model 2 | Model 1 | Model 2 | Model 1 | Model 2 | Model 1 | Model 2 |
| Intercept | 0.310*** | 0.242*** | 0.321*** | 0.230*** | -0.386*** | -0.513*** | -0.349*** | -0.471*** | -0.184*** | -0.276*** | -0.303*** | -0.365*** |
| V_infra | | 0.003 | | 0.000 | | 0.002 | | 0.001 | | -0.003 | | -0.024** |
| V_government | | 0.004 | | 0.011** | | 0.016*** | | 0.015*** | | 0.015*** | | 0.014*** |
| V_education | | 0.013*** | | 0.012*** | | 0.010*** | | 0.011*** | | 0.007** | | 0.009*** |
| V_private | | 0.002 | | 0.004 | | 0.016*** | | 0.015*** | | 0.010* | | 0.009 |
| Private | 0.079*** | 0.135*** | 0.073*** | 0.145*** | 0.114*** | 0.184*** | 0.138*** | 0.152*** | 0.093*** | 0.173*** | 0.106*** | 0.120*** |
| V_infra | | -0.006 | | -0.013 | | -0.028** | | -0.004 | | -0.007 | | 0.010 |
| V_government | | -0.004 | | -0.003 | | -0.003 | | 0.001 | | -0.018*** | | -0.014** |
| V_education | | -0.008*** | | -0.010*** | | -0.007* | | -0.008** | | 0.000 | | 0.002 |
| V_private | | 0.002 | | -0.002 | | 0.009 | | 0.009 | | 0.002 | | 0.008 |
| Male | -0.004 | -0.004 | 0.001 | 0.001 | -0.005 | -0.004 | 0.001 | 0.001 | 0.002 | 0.002 | 0.016*** | 0.016*** |
| Age | 0.021*** | 0.21*** | 0.021*** | 0.022*** | 0.035*** | 0.035*** | 0.033*** | 0.032*** | 0.014*** | 0.014*** | 0.015*** | 0.015*** |
| Tuition | 0.066*** | 0.066*** | 0.062*** | 0.062*** | 0.099*** | 0.098*** | 0.117*** | 0.116*** | 0.064*** | 0.063*** | 0.092*** | 0.090*** |
| Grade | 0.156*** | 0.156*** | 0.150*** | 0.149*** | 0.270*** | 0.270*** | 0.250*** | 0.249*** | 0.136*** | 0.136*** | 0.138*** | 0.137*** |
| Parent_school | 0.054*** | 0.054*** | 0.045*** | 0.044*** | 0.056*** | 0.054*** | 0.051*** | 0.049*** | 0.065*** | 0.064*** | 0.059*** | 0.059*** |
| SES | 0.072*** | 0.069*** | 0.081*** | 0.077*** | 0.093*** | 0.088*** | 0.097*** | 0.092*** | 0.069*** | 0.067*** | 0.070*** | 0.068*** |
| HH_type | 0.006* | 0.005 | 0.005 | 0.004 | 0.016*** | 0.015*** | 0.018*** | 0.016*** | 0.021*** | 0.020*** | 0.026*** | 0.026*** |
| HH_size | -0.003*** | -0.003*** | -0.003*** | -0.003*** | -0.004*** | -0.003*** | -0.005*** | -0.005*** | -0.004*** | -0.004*** | -0.005*** | -0.004*** |
| Variance component | | | | | | | | | | | | |
| Intercept | 0.042*** | | 0.042*** | | 0.060*** | | 0.059*** | | 0.065*** | | 0.077*** | |
| Private | 0.020*** | | 0.018*** | | 0.028*** | | 0.022*** | | 0.029*** | | 0.026*** | |

*** p≤0.01, ** P ≤0.05, * p≤0.10.

gap. Overall, in the HLM analysis, we find that the presence of private infrastructure in the village (v_PVT) is not statistically significant in explaining the variation in the private school advantage across villages. This may indicate that the attenuation of private-public gap may not be driven by general well-being of the village, but rather more specifically by a stronger government presence in the service sector. The limited significance of the infrastructure variable may reflect the lower variation in infrastructure facility across villages to begin with (Table 2). Alternatively, it is likely that the presence of infrastructure is highly correlated with the other government based variables (v_GOVT and v_EDUC).

## Discussion and Conclusions

This study makes a contribution to the debate on privatising education provision in India. Before discussing the main findings and their implications, it is important to highlight some of the key limitations of this research. First, the measures of children's learning levels, based on their performance on reading and mathematics, are at best proxies of the more complex cognitive outcomes that we hope an efficient education system produces. However, it is hard to dispute that we would want all our children to be able to perform the simple age-appropriate tasks that are tested by the ASER data collection team. Similarly, the speed and spread of the ASER data collection effort means that we have limited home covariates. While this helps us account for the home background to quite an

extent, these data do not allow us to make causal claims about the relationship between private school attendance and student performance. Finally, given the nature of the central research question guiding this study, the results are limited to villages with at least one private school. However, in spite of our focus on this sub-sample of villages, the sample does contain a fair representation of districts and state and union territories.

With these caveats in mind, the results from this study highlight a few important and interesting patterns. First, the results from HLM model 1 show that the positive private effect or the private-public gap is not consistent across different contexts. Rather, what matters for understanding how well the children in such schools may perform compared to their public school counterparts is the village where the private school is located. This finding means that when we ask if privatisation in education is beneficial, the accurate answer is, "it depends". It depends on the village in which the private school is being established.

We find that the positive private effect is reduced in villages with a strong government presence. This government presence is reflected in the provision of various government services, in one instance the presence of physical infrastructure, and in several instances it is manifested in a robust government-funded and government-supported education system (primary, middle and secondary public schools).

The positive private effect may be lessened in these cases because somehow the private school attending children do not

perform as well in these villages, or perhaps because those attending the government school actually perform better in the villages that have a more robust government investment and presence. A preliminary analysis of the data shows that it may be the latter that is driving the attenuation of the positive private effect. Higher government school performance in these circumstances has in turn two possible explanations. One possibility is that driven by the concerted government investment, government schools were performing well to begin with. Alternatively, government schools may be responding to the private school competition and may be aided in this response by the already present government investment. Regardless, the findings points to the importance of government presence in attenuating the private-public gap.

Finally, if we together consider increasing privatisation, the importance of government-funded services, and public school performance, these findings gain additional significance. The present data and previous research show that private schools are likely to be set up in villages that already have strong government-supported infrastructure for services and education. Now our analysis shows that these may also be the villages where the private-public gap may be smaller, or where the relative private school performance advantage may be smaller.

It is also therefore likely that in these villages, the comparative demand for private schools may actually be lower than villages without a strong government presence – where private schools may have a relative performance advantage and where there truly may be a need for additional, non-government intervention. But we just noted that private schools are less likely to establish in such villages without adequate government presence. Might it be the case then that the private school establishment may not be driven so much by parental demand and low public school performance but rather by supply-side factors? Private schools may be established where, as Pal (2010) noted, they find it efficient and economical to operate. Does it mean then that the "choice" offered by privatisation still eludes the parents and children who may be most in need for alternative, non-governmental services?

The paper began with a list of unresolved debates surrounding increasing privatisation of education in India. These debates are nuanced, technically challenging to resolve and have implications for both efficiency in education production and equity in education distribution. The findings from this study form part of this ongoing conversation. Public and private schools are not established or do not operate in vacuum. Public schools may respond to private competition, or they may simply respond to greater government support. Private schools may respond to the presence of robust government-funded services and infrastructure. More privileged parents may choose private education, and the parents and children most in need may have no private schools to choose from. A better understanding of these related factors is essential. A robust research agenda lies ahead of us as we contemplate privatisation of education in India and the developing world.

## NOTES

1 The India Human Development Survey, 2005, organised by researchers at the University of Maryland and the National Council of Applied Economic Research (NCAER), is an exception to this phenomenon.

2 While variables like preschool attendance, parents' education, and mother's ability to read are all important covariates, I did not include these in my analysis because significant data were missing. Including these variables would have led to the loss of between 10% and 60% of all observations in the final sample.

3 A comparison of the children attending public and private schools in the whole sample shows similar results (table available upon request). The main noteworthy difference is the slightly lower home background status of the children attending public school in the sample as a whole. This indicates that, overall, villages with private schools may be slightly better off. The results from Andrabi, Das and Khwaja (2008) also show this to be true for villages with private schools in Pakistan.

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