

How do Government and Private Schools Differ? Findings from two large Indian states

Sangeeta Goyal and Priyanka Pandey*

Abstract

This paper uses survey data from government and private schools in two states of India, Uttar Pradesh and Madhya Pradesh, to explore systematic differences between the two school types. Private school students have higher test scores than government school students. However, in both private and government schools the overall quality is low and learning gains from one grade to the next are small. There is large variation in the quality of both school types; and observed school and teacher characteristics are weakly correlated with learning outcomes. Most of the variation in teacher effort is within schools and is weakly correlated with observed teacher characteristics such as education, training, experience. There is considerable sorting among students; those from higher socio-economic strata select into private schools. Private schools have lower pupil-teacher ratios and seven to eight times lower teacher salaries but do not differ systematically in infrastructure and teacher effort from government schools. After controlling for observed student and school characteristics, the private school advantage in test scores is not robust. Private unrecognized schools do better than private recognized schools. Given the large salary differential, private schools would clearly be more cost effective even in the case of no absolute difference in test scores.

* South Asia Human Development, World Bank. We gratefully acknowledge generous financial support from the EPDF trust fund for this work. We thank Samuel Carlson, Amit Dar, Lant Pritchett, Michelle Riboud and James Tooley for very helpful comments.

1. Introduction

Private schools offering primary education have grown at a rapid rate in India. According to recent estimates, 25% of all enrolment in primary education in India is in private schools (SRI, 2005; DISE 2006-07). Attendance in these schools is not limited to the non-poor or children in urban areas. A large number of children belonging to poor households study in private schools which charge low fees; nearly 30% of villages in India have access to a private school within the village itself (Kremer and Muralidharan, 2006; De et al. 2002).

Parents value good quality education and are willing to pay for it. Apart from tuition fees, parents incur considerable expenditure to send a child to a private school spending money on uniforms and textbooks, which they can otherwise avail for free in a government school. Poor quality of education in government schools is considered as a major reason for the rapid growth in the number of private schools. Parents perceive private schools to be more accountable and offering better quality education. The Probe Report (1999) notes that “In a private school, the teachers are accountable to the manager (who can fire them), and, through him or her, to the parents (who can withdraw their children). In a government school the chain of accountability is much weaker, as teachers have a permanent job with salaries and promotions unrelated to performance. This contrast is perceived with crystal clarity by the vast majority of parents.”

Evidence from surveys in a number of developing countries including India, show that learning outcomes in private schools, as measured by test scores, are on average better than government schools. In most studies, the private school advantage remains even after controlling for a large set of observable student family, school and teacher characteristics (LEAPS, 2007; Goyal 2006a and b; Kremer and Muralidharan, 2006; Tooley and Dixon, 2006; Kingdon, 1996a and b).

Evidence on the comparative quality of public and private schools has led to a strong policy debate on the conditions of provision of education by the government. It is argued that the government school system is expensive and wasteful and fails in imparting even minimum skills to students; private schools not only do better but also provide learning at a much lower unit cost (Tooley and Dixon, 2006). The set of reforms advocated for government schools range from making teachers and schools accountable for performance (using sticks or carrots or both) to making government schools compete for students with private schools (for example, by giving students vouchers to be used in a school of their choice).

While there is a strong case to be made for reforming the government school system, it is important to note that the evidence on private schools comes mostly from studies (including this one) based on data that show correlation and not causation between school type and outcomes. Any private school effect cannot be attributed to the school if students select into schools. However with lower per student cost private schools would still have a cost advantage.

We use data from government and private schools in two large states of India, Uttar Pradesh and Madhya Pradesh, to explore the differences between the two school types. Both these states have historically lagged in terms of educational outcomes compared to

the Indian average (literacy rate according to the 2001 census – 65.4%). Madhya Pradesh (literacy rate 2001 - 63.7 %) to its credit has taken long strides to improve; whereas Uttar Pradesh (literacy rate 2001 – 56.3 %) continues to carry the burden of inertia. There is considerable presence of private schools in both states, including in rural areas. More than a quarter of all enrolment is in the private sector, and more than half of this enrolment is in rural areas (Table 1).

Comparing mean test scores, we find that private school students do better than government school students, a finding that is consistent with other studies. However the overall quality is low in both government and private schools as evident in low average scores in these schools. Learning gains from one grade to the next are also small for both school types. There is a large variation in the quality of both private and government schools. About half the variation in test scores is between schools and the remaining is within schools, similar to what other studies in India find (Pandey et al. 2008, Goyal 2006a and b). And observed school and teacher characteristics account for little of the variation in quality between schools.

Once we control for child and family background characteristics and school characteristics, whether there is a significant private school advantage in test scores varies by state, school type, grade and subject. Private unrecognized schools do better than private recognized schools. This is unlike the findings from studies on other states of India and even other developing countries where a significant private school advantage remains almost always, after controlling for sample characteristics. As our data is non-experimental, we cannot make any claims about which of the individual characteristics cause the loss of the private school advantage.

Instead we compare mean differences in characteristics across school types, which may matter for learning. Socio-economic characteristics of students, such as caste, gender, parental literacy and household wealth favor private schools implying considerable sorting of students between school types, and this is likely to be one source of the private school advantage. Other sources of private school advantage lie in lower pupil teacher ratios and substantially lower teacher salaries.

The paper is structured as follows. The second section describes the context and the motivation for the study. Section 3 describes the data. Section 4 presents learning outcomes and an analysis of the variation in learning outcomes. Section 5 provides an analysis of differences in mean characteristics of government and private schools in terms of student, school and teacher characteristics. Section 6 discusses and concludes. All tables are collected in the appendix to the paper.

2. Background

A number of studies in India find that even after four and five years of schooling, children in government schools do not acquire the basic skills in literacy and numeracy (Pandey et al, 2008; ASER 2005, 2006, 2007; PROBE 1999). Many reasons have been put forward for the poor quality of government schools. Earlier studies considered poor school resources and the poverty and illiteracy of parents as the prime reasons. Recent research highlights the pervasiveness of teacher absence and inactivity in government schools.

Researchers have also looked at the relative learning achievements across government and private schools. On raw scores alone, in most studies, private schools have a distinct advantage over government schools. Based on a survey in urban and semi-urban areas of Hyderabad in south India, Tooley and Dixon (2003, 2006) find that private school children, including those in unrecognized schools, outperform government school children. The size of the difference falls substantially when background variables are controlled for but the difference continues to be significant. A study of rural primary schools in Punjab province of Pakistan finds that after adjusting for school and student characteristics, significant differences remain in test scores between government and private schools (LEAPS, 2007). Similar results are found for schools in the Indian states of Orissa and Rajasthan (Goyal 2006a; Goyal, 2006b). Some also report large variation in scores for government and private schools implying there are good and bad schools within each (Goyal 2006a, 2006b).

Studies indicate that the sources of private school advantage lie in the following factors: a. private schools have higher teacher attendance and activity b. private school teachers get a fraction of the salary of government school teachers, and c. private schools have smaller class sizes (LEAPS 2007; Goyal 2006a and 2006b; Kremer and Muralidharan 2006; Tooley and Dixon, 2006; Kingdon 1996a and b).

3. Data and Methods

Data for this study come from school surveys conducted in the states of Madhya Pradesh and Uttar Pradesh in India between November 2006 and February 2007. Six districts were selected in each state, covering every geographical region of the state as defined by the National sample survey organization (NSSO) of India. Madhya Pradesh is divided into six geographical regions, South, South Western, Northern, Vindhya, Central and Malwa. These six regions are roughly even in the number of districts, each with 6 to 10 districts. One district was randomly selected from each of these regions. Uttar Pradesh is divided into four geographical regions, Eastern, Western, Central and Southern. The eastern and western regions have more than twice as many districts (26-28 districts in each) as in the other two regions (8-10 in each). Given the unequal sizes of regions, two districts from each of the two larger regions and one from each of the two smaller regions were randomly selected.

In each district, two blocks were randomly selected and in each block six *gram panchayats* and urban wards were randomly selected.¹ The ratio of urban wards and *gram panchayats* were kept the same as the ratio of urban and rural population in the state. All primary schools, government or private, were surveyed in each *gram panchayat* and urban ward in the sample. Fifteen students randomly selected from each of the grades 4 and 5 in the sample schools were tested in language and mathematics. Data on teacher attendance and activity were collected by making three unannounced visits to a school. In each visit field investigators recorded whether the teacher was present in school and what they were doing at the time of the visit. Teacher activity is constructed as 1 if teacher is

¹ A *gram panchayat* is the lowest administrative unit in rural areas consisting of two to three revenue villages on average. The lowest administrative unit in urban areas is an urban ward. A block is an administrative unit between a district and a *gram panchayat*/urban ward.

teaching, writing on the board, supervising written work, teaching by rote, 0 if teacher is absent, chatting, sitting idle/standing outside classroom, keeping order in classroom but not teaching, doing other non teaching work. Although we have data on all teachers teaching grades one to five, as multi grade teaching is widespread in the sample, we use school level averages of teacher attendance and activity in the analysis.

Data on school and teacher characteristics were also collected. Data on sample student characteristics were collected from parent interviews conducted in their homes in the presence of the student.

Types of schools: There are three types of private schools in India. There are private aided and private unaided schools. Private aided schools are privately managed, but have teacher salaries and other expenses funded by government. Their teachers are paid at government-teacher salary rates directly from the state government treasury and are recruited by a government-appointed Education Service Commission rather than by the school. Private unaided schools are entirely privately managed and privately funded, and are of two types, recognized and unrecognized. These schools run entirely on revenue from fees.

To understand the real dimension of the private education sector in India, the distinction between recognized and unrecognized schools is important. While government educational data collection exercises are intended to be a census of all schools in the country, they cover the recognized schools and do not cover the unrecognized private schools. The recognized schools have met the regulatory requirements of the state, while unrecognized schools have either not applied for, or have not succeeded in gaining, recognition.² Students from private unrecognized schools cannot appear for any state or central examinations. In reality, many recognized private schools may not fulfill all the conditions of recognition (Kingdon, 1994).

Because we sampled all schools in the selected *gram panchayats* and urban wards, our sample has four types of schools: government schools, private aided schools, private unaided recognized schools and private unaided unrecognized schools. In Madhya Pradesh, there were no private unaided unrecognized schools in the sampled *gram panchayats* or urban wards.

To find all the schools in any location, the field teams were briefed on how to identify and classify different school types. In every village or urban ward, the team sat down with the village head (*gram pradhan*) and few other people who knew the village to make a list of schools in each neighborhood. They then visited each neighborhood to check the list of schools. The field teams in Madhya Pradesh did not find any private unrecognized schools in any of the locations they visited. All six teams in the state, each of which went to a separate district, found 'zero' unrecognized schools.³

² In the Uttar Pradesh, a recognized school must be a registered society, have an owned rather than a rented building, employ only trained teachers, pay salaries to staff according to government prescribed norms, have classrooms of a specified minimum size and charge only government-set fee rates (Kingdon, 1994).

³ On further probing it came out that in MP, all schools which have up to grade 5 have to have a registration number at least. This registration number is not unique to schools but unique to an umbrella organization like an NGO/trust/society. Because of this, schools up to grade 5 are perceived as recognized by the

Descriptive statistics of the sample are in Tables 2-8. Private aided schools are a very small fraction of schools in the sample. For this reason, averages presented by school type do not report on private aided schools. Student and teacher level regression analyses include private aided schools but results on these school types are not reported since the number of observations is small.⁴

The statistical strategy employed is the Ordinary Least Squares regression. Standard errors are clustered at the school or block level as appropriate, unless stated otherwise.

3.1 The Tests

The tests were based on the National Council of Educational Research and Training (NCERT) tests for grade 4 in language and mathematics. The language tested is *Hindi*, the language in use in both states. All the tests were in the multiple choice format. Both grades 4 and 5 students took the same test.

Reading Comprehension Test: The test consisted of 34 items aimed at assessing the student's ability to understand comprehend paragraphs.

Word Meaning Test: The test consisted of 35 items aimed at assessing the student's ability to identify synonyms and antonyms.

Mathematics Test: The test consisted of 33 items aimed at assessing the students' ability to do simple additions, subtractions, multiplications, fractions, area and weight analysis.

The test items correspond to competencies that children are expected to have mastered by end of grade 4. Each child's score on a test is the number of questions he or she answered correctly converted into a percentage

4 Learning Decomposition

4.1 Unadjusted test scores

Mean test scores, overall and by type of school management are presented in Tables 9 and 10. The scores are low in absolute terms and certainly much lower than 60% which is the government's own indicator for a child's acceptable level of competency on a test.

Each question had four or five options to choose the answer from. Therefore, even if a child was randomly guessing the answer, he or she could score an average of 20-25%. Accounting for guessing would imply even smaller level of learning.

The standard deviations of the test scores are high. High variation implies there are few students who do exceedingly well but the majority perform poorly. If we were to take the differences between the mean scores between grades 5 and 4 as an indicator of average

villagers but may not necessarily be so. The distinction between recognized and unrecognized schools in MP is therefore blurred or ambiguous and this should be kept in mind when interpreting the results.

⁴ We did a check by doing the analyses both with and without private aided schools. The results stay similar in both cases.

gain in learning between the two grades, the mean gain is only about 3-4 percentage points in each area. The variation in scores also increases which implies a further pulling away of the top scorers with little improvement in the test scores of the majority.

Tables 11 and 12 give the distribution of scores by percentile. . The distribution of scores of government schools is to the left of private schools. But learning is poor in all school types. If we take scoring 50-60% on a test as a bench-mark of acceptable levels of learning (NCERT uses 60%), government schools in both states achieve this standard somewhere between the 90th and 95th percentile, whereas private schools do so between the 75th and 90th percentile.

4.2 How do test scores vary within and across schools?

The total variation in test scores is the sum of variation arising due to differences between schools and variation within schools. What share each source of variation contributes can be computed using ordinary least squares regression analysis with test scores as the dependent variable and the school attended as the only independent variable. The amount of variation ‘explained’ in this case is the share of the variation coming from differences between schools. The remaining (out of 100 percent) is that due to sources of differences within schools (i.e. what happens if all the schools were identical).

Variation between schools accounts for 30-56% of the total variation in scores (Figures 1-2, appendix). The remaining variation in scores is within schools. We repeated the above analysis separately by school type. The results (available with the authors) are not very different from those of the overall sample. *This implies there are good and bad schools within all school types.* School quality differences matter, however differences across students within schools also matter considerably for test scores. From the point of view of policy, there is opportunity for improving education outcomes both by pursuing policies that improve school quality and also policies directed towards students.

4.3 Is there a private school effect?

We analyze the private school effect before and after controlling for differences in observed student and school characteristics. Tables 13 (Uttar Pradesh) and 14 (Madhya Pradesh) show the unadjusted and adjusted difference in mean scores between private and government schools. The adjusted differences in mean test scores are the remainder differences after controlling for a set of characteristics. Scores have been adjusted using two models: (a) the model uses as controls child and family background characteristics, school characteristics, district of location dummies and rural location dummy⁵; and (b) same as (a) except the district and rural location dummies are replaced with village dummies.

The remaining effect of school type is not totally unbiased because there is a likelihood of systematic selection into various types of school correlated with unobserved children

⁵ Child and family background characteristics included as controls are child’s age, gender and caste, sibling size, whether the child takes private tuition or not, mother’s and father’s education levels, father’s occupation, and land ownership. School characteristics included as controls are infrastructure, mid-day meal provision, free textbook provision, and average teacher characteristics at the school level – female, education level, training and experience.

and family characteristics. If more able or motivated students select private schools then any private school advantage over government schools in test score, after controlling for observed student and school characteristics, cannot be attributed to school-type. In fact, as we see later, there are reasons to believe that ‘better’ students attend private schools and this may be partly responsible for the higher average private school test scores. To obtain an unbiased private school estimate when selection is going on, one needs a way to correct for selection bias. In the commonly used approaches to correct for selection bias, one needs a valid instrument which belongs in the selection equation but not in the outcome of interest equation. Since we do not have a convincing instrument, we do not correct for selection bias.

Without adjusting there is a significant private school effect in every test and grade. Results change once controls are included. The advantage varies by state, type of private school and grade. In Uttar Pradesh, private schools have an advantage in grade 5. Private unrecognized schools outperform private recognized schools in having a greater number of significant differences from government schools. In Madhya Pradesh, there is no robust private school advantage in either grade.

5. Where do government and private schools differ?

We present unadjusted and adjusted mean differences in the socio-economic characteristics of students, school and teacher characteristics between government and private schools using two different model specifications. In the first model we control for the district and rural dummies. In the second model we adjust for the village where the school is located.

5.1 *Socio-economic characteristics of students in government and private schools*

For both states, most factors of disadvantage are less represented in the private school, and all the differences across government and private schools are significant at the 1% level (Tables 15-16). Private schools have fewer students from SC and ST households, are more likely to be male, have parents educated above primary school. They also are more likely to have fathers who are not agricultural laborers, and come from households that own more than the median landholding in the sample.

The adjusted mean differences in these characteristics between school types become larger in magnitude, and are larger for private unaided unrecognized schools. These results suggest considerable sorting of students across school types. It is likely that sorting is also going on along unobserved family and student characteristics such as attitude and motivation.

5.2 *School Inputs*

There are few consistent differences in infrastructure between private and government schools but private schools have significantly lower pupil-teacher ratios (Tables 17-20). Mean teacher attendance and activity at the school level do not differ between private and government schools, except for private unrecognized schools in UP that have higher activity even when district or village effects are included.

5.3 Do teachers differ across school types?

Demographics: Teachers in private schools are more likely to be younger than teachers in government schools (Table 21). In MP, teachers are also more likely to be from the local area than teachers in government schools (Table 22).

Professional credentials and salary: Overall, teachers in government schools are more likely to be trained, have greater experience and a higher salary than teachers in private schools. Teacher salary in government schools is eight times that in private schools. The differences in these characteristics are bigger between regular teachers in government schools and teachers in private schools. Regular teachers are also more

5.3.2 Teacher Effort

Government and private schools are similar in rates of teacher attendance, but differences in rates of teacher activity vary by state and by the type school.

Private recognized and unrecognized schools have similar rates of attendance and higher rates of teacher activity compared to government schools in UP. Activity rates are 11-18 percent points higher in private schools (Table 23). After controlling for teacher characteristics and district or village fixed effects, teachers in private and government schools are similar in mean attendance and activity rates, except for private unrecognized schools that have higher teaching activity. In MP, private schools are similar to government schools in rates of teacher attendance and activity, before and after controlling for teacher characteristics and district/village fixed effects (Table 24).

5.3.3 Variation in teacher effort between and within schools

Differences between schools explain 40 percent or less of the variation in teacher effort. This implies more than 60 percent of the variation in rates of teacher attendance and engagement in teaching is within schools. Only a small fraction of the variation in effort within schools is explained by observed teacher characteristics.

The r-square from a regression of teacher attendance (and activity) on school fixed effects gives the percentage of variation in teacher effort that is due to differences across schools and villages. The remaining variation would be attributable to variation in within school variables such as observed and unobserved teacher characteristics, classroom characteristics etc.

We then add observed teacher characteristics to the school fixed effect regression to see how much of the within school variation can be explained by these. The vector of teacher characteristics includes age, gender, caste, education, whether teacher has pre service training, number of years of service, number of days of in service training in last school year, whether teacher's appointment is on a contract basis and whether teacher is a resident of the village.

There are two main themes here. First, most of the variation in teacher effort is within schools. Variation in teacher attendance that is explained by differences between schools and villages is 15% in Madhya Pradesh and 16% in Uttar Pradesh (Figure 3). Variation in teacher activity that is explained by differences between schools and villages is 40% in

Madhya Pradesh and 20% in Uttar Pradesh. In particular, whether the school is government or private recognized or private unrecognized contributes less than 2 percent of the variation in teacher effort. Secondly, observed teacher characteristics explain very little of the variation in teacher effort within schools. These observations are consistent with the findings of other studies, although mainly from developed countries, that find: a) substantial variation in teacher quality within schools, and b) observed teacher characteristics explain very little of the variation in teacher quality within schools (Rockoff, 2004; Rivkin, Hanushek and Kain, 2005).

5.3.4 Are teachers rewarded for their effort differently in government and private sectors?

The unadjusted salary difference for presence compared to absence seems highest for regular teachers in government schools. We then compute the adjusted salary difference due to attendance by regressing salary on attendance and other teacher characteristics such as education, experience, residence, gender and age (Table 25). Salaries of teachers in private schools and of regular teachers in government schools are not correlated positively with attendance. Salaries of contract teachers in government schools are positively correlated with attendance. The salary difference is 13 percent of salary between an always present contract teacher and a never present contract teacher who is otherwise similar.

6. Discussion

This study looks at the performance of government, and private schools in Uttar Pradesh and Madhya Pradesh.

We find that mean test scores are low in both states. Although students in private schools perform better than students in government schools, the average score as well as the gain in learning from one grade to the next are low for both school types. The test is in a multiple choice, subject to random guessing. If a child was randomly guessing every answer, he or she can score an average of 20-25%. Accounting for guessing will imply even lower actual learning.

There is a great degree of variability in test scores within and between schools for government as well as private schools. Observable school and teacher characteristics are weakly correlated with test scores. Most of the variation in teacher effort is within schools and has weak links with observed teacher characteristics that are commonly used by school administrators as indicators of teacher quality such as training, experience and education. This suggests rewarding teachers on the basis of their credentials may not be effective in raising effort. Existing salary structure is related to effort neither in government nor in private schools, except for contract teachers in government schools. It fails to reward those more present and active in the classroom.

After controlling for student and school characteristics, the private school advantage in scores varies by state, type of private school, grade and subject. In Uttar Pradesh, private unrecognized schools outperform private recognized schools in having a greater number

of significant differences from government schools. In Madhya Pradesh, there is no robust private school advantage. This is unlike the findings from other studies in India where after adjusting for student and school characteristics the private school advantage usually remains significant. One reason for the difference in results can be that our sample is largely rural. The urban areas in the sample are small towns located within the same block as the villages and are more likely to resemble the villages than the larger cities where private schools are found to perform better after controlling for sample characteristics as in studies such as Tooley and Dixon (2006) and Kingdon (2004). Another reason can be that our data are from two states lagging in most development outcomes, where just as the public sector has low accountability, the private sector may be functioning in a largely unregulated environment. And parents who largely have little education in the sample may be making school choices based on perceived school quality.

The sources of private school advantage lie in the types of students choosing these schools, lower pupil teacher ratios and much lower teacher salaries. Private schools differ considerably in the types of students who attend even within the same district or village. Students in these schools are less likely to belong to low caste. They are likely to have educated and wealthier parents. It is likely that sorting is also going on along unobserved family characteristics such as attitude and motivation. Private and government schools do not differ in physical facilities but private schools have a lower pupil-teacher ratio which implies greater teacher-time per student. Teachers in private schools are less likely to be trained and are less experienced. Teacher attendance and activity are similar for private and government schools, except for private unrecognized schools in Uttar Pradesh which have higher rates of teaching activity. Teacher salary in private schools is between one-seventh and one-eighth of government schools.

Since data indicate considerable sorting among students into school types, it is not surprising that the private school effect is less systematic after controlling for observed student and school characteristics. In the cases where the private school effect remains, we cannot be sure this effect is attributable to school type as there may be sorting on unobserved characteristics. Nevertheless, as teacher salaries in private schools are one-seventh or one-eighth of government schools and assuming salaries form a large fraction of the operating cost as is the case for government schools, private schools would unambiguously be more cost effective even in the case of no absolute advantage in test scores.

Our results may suggest at first that government regulations are redundant, and it is the market in schooling that is more effective in determining quality: private unrecognized schools, which account for half of all private schools in the sample in Uttar Pradesh, do better than private recognized schools. But this is not so clear. In both states, evidence suggests that learning standards are not strictly enforced either in government or in private recognized schools. Government schools have a minimum level of learning framework, but no functioning mechanism that ensures this standard. Private recognized schools can pay bribes to get recognition without meeting the required criterion for obtaining formal registration. The market does not ensure good quality education either since the un-regulated schools are also way off the mark in basic competencies; moreover, we cannot disentangle the sorting effect from school quality effect on learning outcomes. Private schools may choose to locate above but close to government schools

along the quality spectrum because it is rational for them to do so given supply side (government regulations, enforcement) and demand side (poverty and illiteracy of parents) characteristics. It is costly for schools to adhere to enforced standards of quality. We speculate that if the government were to enforce learning standards on all schools, there would be a change in the composition of supply of private education with low cost (and low quality) private schools likely leaving the market.

References:

Aggarwal, Y. (2000), Government and private partnership in primary education in India: a study of unrecognized schools in Haryana, New Delhi (New Delhi, National Institute of Educational Planning and Administration).

Annual Status of Education Report (ASER) 2005, 2006, 2007, Pratham Foundation
<http://www.pratham.org/aser-report/>

Chaudhury, Nazmul, Jeffrey Hammer, Michael Kremer, Karthik Muralidharan and F. Halsey Rogers (2004), Teacher Absence in India, World Bank.

De, A., Majumdar, M., Samson, M. & Noronha, C. (2002), Private schools and universal elementary education, in: R. Govinda (Ed.) India education report: a profile of basic education (Oxford, Oxford University Press), 131–150

Goyal, S (2006a), Learning Achievements in India: A case-study of primary education in Orissa, World Bank, Manuscript.

Goyal, S (2006b), Learning Achievements in India: A case-study of primary education in Rajasthan, World Bank, Manuscript.

Kingdon, Geeta G. (1994), *An Economic Evaluation of School Management-types in India: A Case Study of Uttar Pradesh*, Unpublished D.Phil. thesis, Economics Department, Oxford University.

Kingdon, Geeta G. (1996a), The quality and efficiency of private and government education: a case study of urban India, *Oxford Bulletin of Economics and Statistics*, 58.1, 57-81

Kingdon, Geeta, 1996b. Private Schooling in India: Size, nature and equity effects, *Economic and Political Weekly*, 31, No. 51, December 1996.

Jishnu Das, Priyanka Pandey and Tristan Zajonc (2006), Learning Levels and Gaps in Pakistan, *Policy Research Working Paper No. 4067*, World Bank

Priyanka Pandey, Sangeeta Goyal, Venkatesh Sundararaman (2008), Public Participation, Teacher Accountability, and School Outcomes: Findings from Baseline Surveys in Three Indian States, *Policy Research Working Paper No. 4777*, World Bank.

Hansuhek Eric and Ludwig Woessman (2007), The Role of Education Quality for Economic Growth, NBER working paper.

Muralidharan, Karthik and Michael Kremer (2006), Government and Private Schools in Rural India, Manuscript, forthcoming in *School Choice International*, edited by Paul Peterson and Rajashri Chakrabarti

PROBE Team (1999), *Government Report on Basic Education in India*, New Delhi: Oxford University Press.

Rockoff, Jonah (2004), The Impact of Individual Teachers on Student Achievement: Evidence from Panel Data. *American Economic Review*, May 2004, Vol. 94(2).

Rivkin, Steven, Hanushek, Eric and John Kain (2005), Teachers, Schools and Academic Achievement. *Econometrica*, Vol. 73 (2).

Sen, Amartya (1970), The crisis of education in India.

Tooley, James and Paula Dixon (2003), *Private Schools for the Poor: A Case Study from India*, CfBT Research and Development.

Tooley, James and Paula Dixon (2006), *De facto' privatization of education and the poor: implications of a study from sub-Saharan Africa and India*, *Compare* Vol. 36, No. 4, December, pp. 443–462

Watkins, K. (2000), The Oxfam education report (Oxford, Oxfam in Great Britain).

World Bank, (2007), Learning and Educational Achievements in Punjab Schools (LEAPS): *Insights to inform the education policy debate*

Annex

Figure 1: Within and Between School Variations in Test Scores, Uttar Pradesh

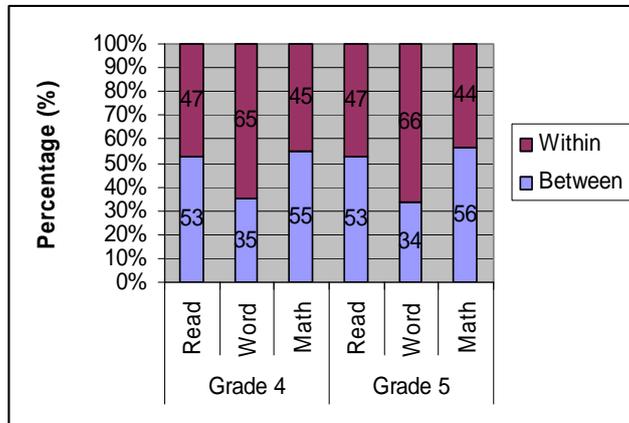


Figure 2: Within and Between School Variations in Test Scores, Madhya Pradesh

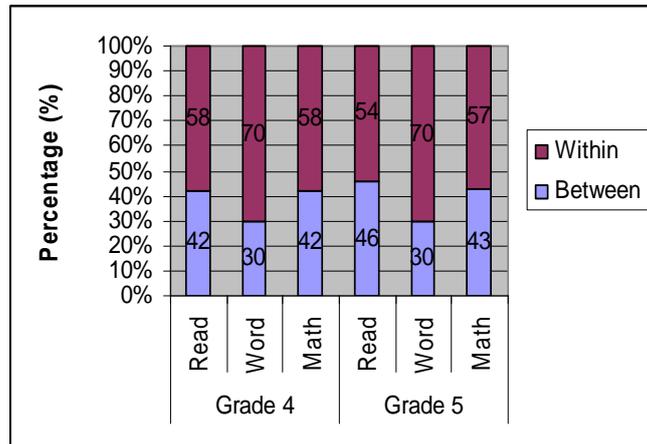
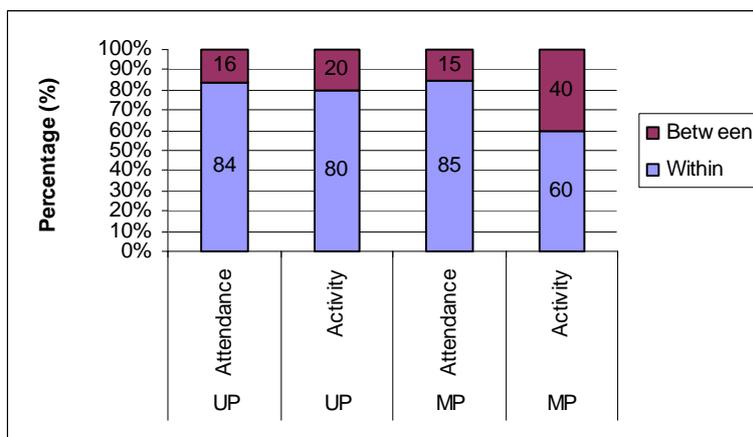


Figure 3: Within and Between School Variations in Teacher Effort, Uttar Pradesh and Madhya Pradesh



**Table 1: Private Schools and Enrolment in Madhya Pradesh and Uttar Pradesh
DISE 2006-07**

	Private Schools (%)	Private School Enrolment (%)	Private School Enrolment Rural (%)	Private School PTR (Government School PTR)
Madhya Pradesh	16	27	15	32 (41)
Uttar Pradesh	24	28	24	53 (53)

Table 2 Types of Sample Schools by Management

	Government	Private Aided	Private Aided Recognized	Private Aided Unrecognized	Total
Uttar Pradesh	112	4	42	41	199
Madhya Pradesh	125	1	73	-	200

Table 3 Mean Sample Statistics

	Uttar Pradesh	Madhya Pradesh
Total	3435	4268
Grade (%)		
4	1696	2137
5	1739	2131
Gender (%)		
Male	54	53
Female	46	47
Caste (%)		
General	11	15
SC	26	22
ST	0	7
OBC	62	55
Other	2	0.5
Father's education (%)		
<i>Illiterate</i>	34.26	10.65
<i>Below Primary</i>	3.54	11.35
<i>Primary</i>	14.16	25.34
<i>Secondary and Below</i>	14.56	24.97
<i>Higher Secondary and Below</i>	28.43	21.13
<i>Graduate/Professional</i>	5.06	6.57
Mother's education (%)		
<i>Illiterate</i>	71.94	33.20
<i>Below Primary</i>	5.22	26.25
<i>Primary</i>	11.42	24.23
<i>Secondary and Below</i>	5.97	10.02
<i>Higher Secondary and Below</i>	4.68	5.65
<i>Below</i>	0.77	0.65

	Uttar Pradesh	Madhya Pradesh
<i>Graduate/Professional</i>		
Father's Occupation (%)		2.03
<i>Government Service</i>	1.57	3.09
<i>Private Service</i>	10.13	
<i>Non-Agricultural Laborer</i>	42.36	33.21
<i>Agricultural Laborer</i>	27.60	45.29
<i>Businessman</i>	2.31	3.04
<i>Professional</i>	0.74	1.25
<i>Self-Employed</i>	15.27	12.11
Average Number of Siblings		
<i>Below 18 years</i>	3	2
<i>Above 18 Years</i>	2	0
Land Ownership (%) (Above Median)	45.49	47.30
Takes Tuition (%)	6	13
Students by School Type (%)		
<i>Government</i>	61	65
<i>Private Aided</i>	2	1
<i>Private Unaided Recognized</i>	22	34
<i>Private Unaided Unrecognized</i>	15	0
Rural (%)	92	79
School Incentives (%)		
<i>Free Dress</i>	29	30
<i>Free Book</i>	56	57
<i>Mid-Day Meal</i>	55	67

Table 4 Mean School physical facilities by Management

	Uttar Pradesh				Madhya Pradesh		
	Government	Aided	Unaided recognized	Unaided un-recognized	Government	Aided	Unaided recognized
Number of usable classrooms	3	2.75	1.75	1.4	2.15	7	3.5
Whether toilet	.37	.5	.51	.27	.40	1	.69
Whether girls toilet	.26	.5	.16	.06	.23	1	.52
Whether electricity	0	.5	.4	.15	.13	1	.74

Table 5 Mean School level inputs by Management

	Uttar Pradesh				Madhya Pradesh		
	Government	Aided	Unaided recognized	Unaided unrecognized	Government	Aided	Unaided recognized
Enrollment	213	203	115	97	122	76	88
Number of	3.87	6.5	5	5	3	6	6

teachers							
Pupil-teacher ratio	.57	.30	.25	.21	.45	.13	.16
Multi grade teaching	.76	.75	.69	.51	.83	0	.27
Teacher attendance	.69	.77	.74	.73	.81	.77	.82
Teacher activity	.27	.31	.45	.37	.69	.77	.63

Table 6 Average teacher attendance and activity

	Uttar Pradesh		Madhya Pradesh	
	Attendance	Activity	Attendance	Activity
Govt All	.69	.27	.80	.70
Govt Regular teachers	.69	.26	.84	.72
Govt Contract	.70	.28	.81	.74
Former contract	-	-	.73	.62
Aided	.80	.29	.78	.78
Unaided Recognized	.77	.45	.82	.63
Unaided unrecognized	.76	.39	-	-

Table 7 Average teacher characteristics by management, Uttar Pradesh

% unless indicated otherwise	Government	Government Regular teachers	Government contract teachers	Private aided	Private unaided recognized	Private unaided unrecognized
Male	.55	.68	.43	.74	.60	.69
Age (years)	34	41	27	30	28	32
SC/ST	.12	.12	.12	.17	.19	.09
OBC	.42	.42	.41	.26	.44	.39
College degree	.38	.29	.47	.48	.42	.36
Graduate degree	.28	.34	.21	.30	.24	.22
Teaching experience (years)	9	14	4	7	5	7
Pre service training	.5	.93	.07	.09	.12	.09
Distance to school (km)	7	12	2	11	3	3
Local (Village resident)	.49	.10	.69	.43	.36	.47
Monthly Salary (rupees)	6350	10461	2315	546	873	786

Table 8 Average teacher characteristics by management, Madhya Pradesh

% unless indicated otherwise	Government	Government Regular teachers	Government contract teachers	Government Former contract	Private aided	Private unaided recognized
Male	.65	.74	.58	.53	.67	.46
Age (years)	38	44	32	33	22	27
SC/ST	.33	.28	.41	.35	0	.09
OBC	.28	.27	.32	.27	0	.47
College degree	.29	.30	.27	.29	.33	.40

Graduate degree	.26	.25	.26	.29	.17	.19
Teaching experience	14	20	6	9	3	6
Pre service training	.35	.39	.36	.26	0	.05
Distance to school	5	5	6	5	1	2
Local	.35	.42	.27	.28	.83	.67
Monthly Salary	6681	10326	2696	3054	933	1006

Table 9: Mean Scores, Uttar Pradesh

	Grade 4		
	Read	Word	Math
Overall	30 (17)	44 (18)	23 (13)
Government	24 (12)	40 (12)	19 (10)
Private Aided	37 (24)	50 (20)	33 (22)
Private Unaided Recognized	37 (18)	50 (18)	26 (13)
Private Unaided Unrecognized	40 (21)	52 (18)	31 (16)
	Grade 5		
	Read	Word	Math
Overall	34 (19)	48 (19)	26 (14)
Government	30 (14)	43 (18)	22 (12)
Private Aided	44 (25)	59 (22)	42 (29)
Private Unaided Recognized	43 (20)	56 (18)	31 (13)
Private Unaided Unrecognized	44 (24)	57 (21)	32 (17)

Note: Standard Deviation in Parentheses

Table 10: Mean Scores, Madhya Pradesh

	Grade 4		
	Read	Word	Math
Overall	30 (21)	42 (22)	25 (17)
Government	24 (18)	38 (22)	21 (15)
Private Aided	25 (8)	49 (12)	18 (6)
Private Unaided	40 (21)	49 (22)	32 (17)
	Grade 5		
	Read	Word	Math
Overall	36 (22)	47 (23)	29 (17)
Government	30 (18)	45 (22)	25 (15)
Private Aided	40 (14)	56 (17)	27 (15)
Private Unaided	48 (24)	54 (23)	37 (18)

Note: Standard Deviation in Parentheses

Table 11 Percentile Distribution of Scores, Uttar Pradesh

		Read							
		5th	10th	25th	50th	75th	90th	95th	99th
Grade 4	All Schools	6	12	21	26	35	53	65	82
	Government	6	9	18	24	29	38	44	59
	Private Aided	12	15	21	28	44	78	82	82
	Private Unaided Recognized	12	18	24	35	50	65	74	82
	Private Unaided Unrecognized	10	15	26	35	53	72	79	88
Grade 5	All Schools	9	15	21	29	41	62	76	91
	Government	6	12	21	26	35	44	50	74
	Private Aided	15	18	24	35	68	88	88	88
	Private Unaided Recognized	18	21	26	38	56	71	79	94
	Private Unaided Unrecognized	12	18	26	38	59	82	91	97
		Word							
		5th	10th	25th	50th	75th	90th	95th	99th
Grade 4	All Schools	11	20	31	46	57	66	74	89
	Government	9	14	29	40	51	60	63	80
	Private Aided	11	17	40	49	66	77	83	89
	Private Unaided Recognized	20	26	40	51	60	74	80	94
	Private Unaided Unrecognized	20	29	40	53	63	74	83	94
Grade 5	All Schools	14	23	37	49	60	71	83	94
	Government	11	20	34	43	54	66	71	86
	Private Aided	26	34	43	54	69	97	97	97
	Private Unaided Recognized	26	34	46	57	66	80	86	94
	Private Unaided Unrecognized	20	29	43	57	71	86	91	97
		Math							
		5th	10th	25th	50th	75th	90th	95th	99th
Grade 4	All Schools	6	9	15	21	27	39	45	70
	Government	3	6	12	18	24	30	36	48
	Private Aided	9	10	18	27	58	67	70	75
	Private Unaided Recognized	9	12	18	24	33	39	45	73
	Private Unaided Unrecognized	9	12	21	27	39	54	63	81
Grade 5	All Schools	6	9	15	24	33	45	55	76
	Government	6	9	15	21	27	36	45	64
	Private Aided	0	3	15	45	67	79	82	82
	Private Unaided Recognized	12	18	21	27	36	48	58	73
	Private Unaided Unrecognized	9	15	21	30	42	61	64	79

Table 12 Percentile Distribution of Scores, Madhya Pradesh

Read									
		5th	10th	25th	50th	75th	90th	95th	99th
Grade 4	All Schools	0	0	15	26	41	59	71	85
	Government	0	0	12	24	32	47	59	62
	Private Aided	9	13	24	26	32	34	35	35
	Private Unaided Recognized	0	15	26	38	59	71	76	88
Grade 5	All Schools	0	9	21	32	50	68	76	88
	Government	0	6	18	26	38	53	65	85
	Private Aided	24	26	32	35	44	62	71	71
	Private Unaided Recognized	0	18	29	47	65	79	85	91
Word									
		5th	10th	25th	50th	75th	90th	95th	99th
Grade 4	All Schools	0	0	29	46	57	69	74	91
	Government	0	0	26	41	54	63	71	89
	Private Aided	31	33	37	50	57	63	66	66
	Private Unaided Recognized	0	17	40	51	63	74	80	94
Grade 5	All Schools	0	14	37	49	63	77	86	94
	Government	0	11	34	46	57	71	80	94
	Private Aided	37	37	43	51	69	77	91	91
	Private Unaided Recognized	0	29	43	54	69	86	91	97
Math									
		5th	10th	25th	50th	75th	90th	95th	99th
Grade 4	All Schools	0	0	12	24	33	48	55	73
	Government	0	0	9	21	30	39	48	70
	Private Aided	3	9	15	18	21	24	27	27
	Private Unaided Recognized	0	9	21	33	45	55	61	76
Grade 5	All Schools	0	6	18	27	39	52	58	75
	Government	0	6	15	24	33	45	52	69
	Private Aided	12	12	12	24	36	48	58	58
	Private Unaided Recognized	0	15	27	39	48	58	67	79

Table 13: Difference between private and government schools (private-government), Uttar Pradesh

Grade 4		Private Unaided Recognized	Private Unaided Unrecognized
Read	Unadjusted	13**	16**
	Adjusted ^a	3.38	9.47
	Adjusted ^b	9.68	16.17*
Word	Unadjusted	11**	12**
	Adjusted ^a	0.95	2.90
	Adjusted ^b	22.06**	27.04**
Math	Unadjusted	7**	11**
	Adjusted ^a	1.36	7.24
	Adjusted ^b	3.64	6.67
Grade 5		Private Unaided Recognized	Private Unaided Unrecognized
Read	Unadjusted	15**	16**
	Adjusted ^a	13.16*	17.49*
	Adjusted ^b	26.64**	33.40**
Word	Unadjusted	13**	13**
	Adjusted ^a	14.07**	16*
	Adjusted ^b	31.64**	36.57**
Math	Unadjusted	9**	11**
	Adjusted ^a	7.20	11.1*
	Adjusted ^b	24.34**	28.69**

- 5% significance level; ** 1% significance level
- ^a Controls + District FE + rural dummy
- ^b Controls + Village FE

Table 14: Difference between private and government schools (private-government), Madhya Pradesh

Grade 4		Private Unaided Recognized
Read	Unadjusted	17**
	Adjusted ^a	8.33
	Adjusted ^b	0.95
Word	Unadjusted	11**
	Adjusted ^a	7.45
	Adjusted ^b	3.32
Math	Unadjusted	11**
	Adjusted ^a	8.20*
	Adjusted ^b	-0.83
Grade 5		Private Unaided Recognized
Read	Unadjusted	18**
	Adjusted ^a	14.2**
	Adjusted ^b	9.52
Word	Unadjusted	9**
	Adjusted ^a	9.83*
	Adjusted ^b	17.44
Math	Unadjusted	12**
	Adjusted ^a	11.35**
	Adjusted ^b	4.47

- 5% significance level; ** 1% significance level
- ^a Controls + District FE + rural dummy

- ^b Controls + Village FE

Table 15: Difference in student characteristics between private and government schools (private-government), Uttar Pradesh

Mean Share	Unadjusted Difference		District FE + rural dummy		Village FE	
	Unaided Recognized	Unaided Unrecognized	Unaided Recognized	Unaided Unrecognized	Unaided Recognized	Unaided Unrecognized
SC	-0.073**	-0.11**	-0.13**	-0.14**	-0.2**	-0.21**
OBC	0.03**	0.033**	0.09**	0.05**	0.15**	0.11**
General	0.04**	0.08**	0.04**	0.09**	0.05**	0.10**
Female	-0.10**	-0.15**	-0.11**	-0.18**	-0.15**	-0.23**
Tuition	0.04**	0.055**	0.04**	0.06**	0.07**	0.09**
Father's Education Primary School and Below	-0.09**	-0.16**	-0.12**	-0.13**	-0.17**	-0.26**
Mother's Education Primary School and Below	-0.11**	-0.12**	-0.10**	-0.10**	-0.15**	-0.13**
Father Agricultural Laborer	-0.06**	-0.031**	-0.04**	0.04**	0.07**	-0.01**
Land owned more than median	-0.007	0.075**	0.024*	0.11**	0.15**	0.11**

* 5% significance level; ** 1% significance level

Table 16: Difference in student characteristics between private and government schools (private-government), Madhya Pradesh

Mean		District FE + rural dummy	Village FE
	Unaided Recognized	Unaided Recognized	Unaided Recognized
SC	-0.15**	-0.15**	-0.23**
ST	-0.065**	-0.083**	-0.078**
OBC	0.058**	0.087**	0.18**
General	0.15**	0.15**	0.13**
Female	-0.093**	-0.12**	-0.18**
Tuition	0.08**	0.06**	0.05**
Father's Education Primary School and Below	-0.28**	-0.28**	-0.3**
Mother's Education Primary School and Below	-0.23**	-0.19**	-0.19**
Father Agricultural Laborer	-0.05**	0.08**	0.15**
Land owned more than median	0.05**	0.16**	0.23**

* 5% significance level; ** 1% significance level

Table 17: Difference in school characteristics between private and government schools (private-government), Madhya Pradesh

		District FE + rural dummy	Village FE
	Unaided recognized	Unaided recognized	Unaided recognized
Number of usable classrooms	1.35*	.65	.78
Functional -toilet	.28**	.09	.00

-girls toilet	.29**	.09	-.04
-electricity	.61**	.44*	.30
-water	.16	.05	-.06
-playground	-.10	-.29**	-.29*

Table 18: Difference in school characteristics between private and government schools (private-government), Uttar Pradesh

			District FE +rural dummy		Village FE	
	Unaided recognized	Unaided unrecognized	Unaided recognized	Unaided unrecognized	Unaided recognized	Unaided unrecognized
Number of usable classrooms	-.86	-1.21*	-1.07*	-1.38**	-.85	-1.25
Functional -toilet	.15	-.09	.01	-.19	-.01	-.15
- girls toilet	-.10	-.19*	-.16	-.23*	-.10	-.20
- electricity	.4**	.15	.31**	.11	.25*	.10
- water	-.03	-.19	-.04	-.25*	-.11	-.28
- playground	-.20	-.07	-.06	-.08	-.06	-.14

* 5% significance level; ** 1% significance level

Table 19: Difference in school characteristics between private and government schools (private-government), Madhya Pradesh

			District FE + rural dummy	Village FE
	Unaided recognized	Unaided unrecognized	Unaided recognized	Unaided recognized
Enrollment	-.34		-.55*	-.58
Number of teachers	2.59**		2.01**	1.68
Pupil-teacher ratio	-.29**		-.30**	-.24**
Multi grade teaching	-.55*		-.44**	-.35
Teacher attendance	.01		.00	.03
Teacher activity	-.06		-.06	-.04

* 5% significance level; ** 1% significance level

Table 20: Difference in school characteristics between private and government schools (private-government), Uttar Pradesh

			District FE +rural dummy		Village FE	
	Unaided recognized	Unaided unrecognized	Unaided recognized	Unaided unrecognized	Unaided recognized	Unaided unrecognized
Enrollment	-.96**	-1.14**	-.97*	-1.21**	-.93*	-1.34*
Number of teachers	1.28**	1.40*	1.21*	1.14	.67	1.04
Pupil-teacher ratio	-.33**	-.37**	-.32**	-.35**	-.30**	-.39*
Multi grade teaching	-.07	-.25*	-.15	-.25	-.12	-.19
Teacher attendance	.05	.04	-.01	.04	-.01	.05
Teacher activity	.18**	.11**	.10	.09*	.09	.11*

* 5% significance level; ** 1% significance level

Table 21: Difference in teachers between private and government schools (private-government), Uttar Pradesh

Percent unless	District fixed effect + rural dummy			
	Unaided	Unaided	Unaided	Unaided

stated otherwise	recognized	unrecognized	recognized	unrecognized
Age (yrs)	-6.28**	-2.62**	-5.74**	-2.93**
Male	.04	.12**	.11*	.19**
Local	-.04	.07	-.06	.11*
Pre-service training	-.38**	-.41**	-.33**	-.43**
Graduate degree	-.04	-.06	-.03	-.08
Experience (yrs)	-3.38**	-1.78**	-3.33**	-1.73*
Salary (rupees)	-5477**	-5564**	-5435**	-5700**

Table 22: Difference in teachers between private and government schools, Madhya Pradesh

		District fixed effect + rural dummy
Percent unless stated otherwise	Unaided recognized	Unaided recognized
Age (yrs)	-11.53**	-12.10**
Male	-.19**	-.04
Local	.32**	.21**
Pre-service training	-.30**	-.30**
Graduate degree	-.08**	-.09**
Experience (yrs)	-7.72**	-8.34**
Salary (rupees)	-5675**	-5732**

Table 23: Difference in teacher effort between private and government schools, Uttar Pradesh

		Unadjusted (1)	Adjusted District FE + rural dummy (2)	Adjusted ^a District FE + rural dummy + controls (3)	Adjusted ^a Village FE + controls (4)
Attendance	Private Unaided Recognized	.06	.01	.00	-.03
	Private Unaided Unrecognized	.06	.06	.05	.05
Activity	Private Unaided Recognized	.18**	.08	.06	.04
	Private Unaided Unrecognized	.11**	.10*	.08*	.11*

^a Controls are a full set of teacher characteristics

Table 24: Difference in teacher effort between private and government schools, Madhya Pradesh

		Unadjusted (1)	Adjusted District FE + rural dummy (2)	Adjusted ^a District FE + rural dummy + controls (3)	Adjusted ^a Village FE + controls (4)
Attendance	Private Unaided Recognized	.02	-.01	.06	.09
Activity	Private Unaided Recognized	-.06	-.08	-.08	-.02

^a Controls are a full set of teacher characteristics. *significant at the 5% level; **significant at the 1% level

Table 25: Difference in salary between teachers with 100% and 0% attendance

Salary difference in rupees→	Uttar Pradesh		Madhya Pradesh	
	Unadjusted (1)	Adjusted ^a (2)	Unadjusted (3)	Adjusted ^a (4)
Private Aided	250	-38	-	-

Private Unaided Recognized	112	228	-756**	-458*
Private Unaided Unrecognized	-184	-286	-	-
Contract teacher- public	391**	308**	307	346*
Former contract-public	-	-	277**	182*
Regular teacher-public	1270*	101	-478	-789

^aAdjusted for district fixed effects, rural dummy and a full set of teacher characteristics. *significant at the 5% level; **significant at the 1% level