


NCAER Working Papers on Decentralisation and Rural Governance in India

## The Impacts of Public Spending, Private Spending and School Governance on Schooling Outcomes in Rural India



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No	8
December	2012

# **The Impacts of Public Spending, Private Spending and School Governance on Schooling Outcomes in Rural India**

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## **Abstract**

This paper studies the idea (hypothesis) that increasing government spending on education should improve the quality of the education and access and thus bridge the gap between the private schools and public schools' performance leading to indifferent choice between the school types and similar outcome. Nationally representative village, schools, and household level data from rural India allow us to study the impact of the spending on the school choice and measure performance gap (if there is any) between the types of schools and their impact on the welfare of the society as a whole. We find that even after the big government spending on education to improve the quality and access, the gap between the public private school's performance still exists and that lead to the difference in the welfare (outcome) as a whole.

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## **1. Introduction:**

In this paper we explore the following overall question: Central, state and local governments are spending more on public schools, but parents are increasingly sending kids to private schools.

Why is this happening? In order to answer this question, we ask whether private schools systematically outperform public schools in terms of literacy, and find that they do. Our findings are similar to those of Muralidharan and Kremer (2007) in tests focusing more on mathematics.

In order to answer these questions, we have to first explain the choices that parents make in sending children to school, and to which school to send the children, in terms of the attributes of the child, the household, the schools and teacher behavior. We find that all these factors play a significant role in these choices. The estimated equations then allow us to predict the choices of the parents and to use these predictions in the subsequent analysis of the question of school performance. This approach allows us to overcome the problem of endogeneity of parental choices in the explanation of the performance of school types. Specifically we ask whether the performance differences across schools types are associated with differences in resources and teacher attributes and behaviors, because of differences in the efficiency of using the resources, or because of selection of wealthier and better nourished children into the private school. Again we find that all factors influence performance and that the difference is primarily associated with the difference in the infrastructure and governance at the school as well as role of the mother via the participation in the meetings related to the issue of the schools.

In this paper we provide an explanation for factors that determine enrollment and the extent to which labor markets could influence households in choosing to send their children to schools.

The paper also explains the factors that determine school choice. What are the factors that enable parents choose between public, private, and Panchayat schools. Is there any gender variegation in

this school choice? Why do various types of schools perform differently? If self selection is not an issue ?then there must be other factors related to school infrastructure, involvement of the local community, finances, quality of teachers etc that must be causing these differences. Can such differences be narrowed or eliminated and, if so how? Is there a role for the Panchayats, village communities, or enabled bodies such as the PTAs and the VECS? Earlier we pointed out that one of the concerns of both policy makers and activists alike was the increased level of privatization of primary education. Is it non optimal for communities if households increasingly choose to send their children to private schools?

## **2. Background**

### **i) Enabling panchayats**

The Government of India is committed to ensuring access to education for all classes of households in rural India. The Constitution of India (Article 243-G, 73rd Amendment Act) mandates the Gram Panchayat to participate in the delivery and management of services related to education. Therefore functions related with the delivery of primary education services and the responsibility of ensuring the proper functioning of educational institutions at the village level becomes a Constitutional obligation for the Panchayats. Panchayats are expected to address the issues pertaining to social and economic access as well as, quality of the educational facilities. The management of delivery mechanisms related to education at the village level is expected to be carried out by involving the members of the village-in particular the parents of the children. It is that given the proximity of Panchayats to the community, the direct involvement of the Panchayats could make the education system more accountable and transparent. Nevertheless, Amendment of the Indian Constitutions and, the 93rd Amendment Bill emphasizes the sharing of

responsibilities associated with the management and delivery of services related education among various levels of government.

In education policy and programs, particular emphasis has been laid on specific segments of the population such as girl children and illiterate adults. There is particular emphasis on improving the quality of primary education. Given the inadequacy in terms of functionaries and resources available to the Panchayats under the 73<sup>rd</sup> Amendment, a number of programs have been initiated and some of the existing ones strengthened. These include the Sarva Shiksha Abhiyan (SSA), Mid Day Meal Scheme (MDM) and the National Literacy Mission (NLM). Under SSA (introduced in 2001), concerted efforts have been made to mobilize the community to promote education, help in development of educational facilities and to monitor the functioning of Education guarantee scheme (EGS) and of Alternative Innovative Education (AIE) centers in the States. Nevertheless, there remained a perception that the elected Panchayats were unable to effectively implement their roles and functions in strengthening the education system at the village level. Therefore special bodies such as the village education committee (VEC) and the Parents teacher's associations (PTAs) have been created within the ambit of the SSA to strengthen the Panchayats. Of all the parallel institutions created, the Village Education Committees (VECs) are considered by many to be a crucial element in the management of elementary education

#### **ii) Sarva Shiksha Abhiyan (SSA)**

Sarva Shiksha Abhiyan (SSA), which is the major flagship program of the Government of India, covers all States and Union Territories and is expected to affect an estimated 2.04 million children in 1.23 million habitations in the country. Under the SSA, special focus is on the girl child, children belonging to SC/ST (the scheduled caste and scheduled tribes) communities, other

weaker sections, and children belonging to the minority religious communities. While as expected the enrollment of children attributable to this program has gone up, significantly it has reduced the dropout rates of children belonging to the age cohort 6-14 by up to 4 percent (Give a source). Greater emphasis is also being given to quality of education and improved infrastructure with specific provisions for learning enhancement, remedial teaching and teacher training. The financial resources have been significantly increased with 50 percent of the budget being set aside for quality enhancement.

There are several positives that have emerged from the SSA. These include improved access to education by rural households, increased rates of enrollment, greater gender parity, lowered dropout rates, improved student teacher ratio, and increased enrollment of children with special needs. Data from the Department of School Education and Literacy, Government of India, claims that 99 percent of the rural population now has access to a primary school within a radius of 1 kilometer from their place of residence. Furthermore, a total of 3, 00,895 new schools had been opened till December 2009. The gross enrollment ratio (GER) at the primary level witnessed an increase in the 6-14 year age cohort from 96.3 in 2001-02 to 114.61 in 2007-08 and from 60.2 in 2001-02 to 77.50 in 2007-08 at the upper primary level. Estimates show that the gender parity index (GPI) in the country improved from 0.83 in 2001-02 to 0.98 in 2007-08 at the primary level and from 0.77 to 0.92 at the upper primary level. The drop-out rates of children from primary schools is estimated to have reduced by 13.48 percent between years 2001-02 to 2007-08 (39.03 percent in 2001-02 to 25.55 percent in 2007-08). The drop-out rate of the girl child also witnessed a decline by 15.06 percent points during the same period. The student-teacher ratio (STR) has also witnessed an improvement at the national level. While the STR at the primary level was 46:1 in 2007-08, it was 35:1 for the upper primary level. In addition more than

100,000 teachers had also been recruited by December 2009. The enrolment of children with special needs is one of the key focus areas of the SSA. This has been quite successful given that out of the 0.296 million children identified, 0.248 million had been enrolled by the end of 2009-10. (Give source of data)

There however are significant problems associated with the quality of learning i.e., the ability to read and write, and to carry out basic routines in arithmetic. The ASER 2011 report indicates that the ability of children in villages to read and write has declined in most states across India. This trend is pronounced in states in Northern India where, the proportion children enrolled in grade 5 who can read and write a text prescribed for grade 2 children of the same school has declined from 53.7 percent in 2010 to 48.2 percent in 2011. In some states like Gujarat, Punjab and Tamil Nadu, the results are better. The figures are unchanged for states like Karnataka and Andhra Pradesh. In fact these trends are similar for grade 3 when asked to read and write a paragraph from a text prescribed for the grade 1 children of the same school.

The ability of these children to carry out basic routines in arithmetic has also declined in almost all states. Nationally, the proportion of grade 3 children able to solve a 2 digit subtraction problem has declined from 36.3 percent in 2010 to 29.9 percent in 2011. The only states that are an exception to this decline are Andhra Pradesh, Karnataka and Tamil Nadu who have actually shown improvements over the same period. Students enrolled in grade 5 who were asked to perform this same task exhibited similar trends and the figures dropped from 70.9 percent in 2010 to 61.0 percent in 2011.

If the statistics quoted earlier in this section related to certain outcomes such as budgetary outlays, enrollment, access, etc, of the SSA are indeed correct, then the poor outcomes pertaining

to student abilities are surprising. Is increasing the financial resources for public schools, and the ones run by the Panchayats then the solution? Do policy makers know of the mechanics that could lead to improvements in learning abilities of children enrolled in various types of schools? Should government withdraw itself from trying to manage schools and instead create incentives for parents of children to choose the optimum schools? Should governments instead focus on issues such as preventing discrimination against the girl child by providing incentives to households for enrolling their girl children in schools?

### **iii) Related literatures:**

Why do households in rural India increasingly prefer to send their children to Private schools? Is this because of relatively better quality of learning in private schools, prestige, or just better access? Is teacher quality an optimal predictor of student performance? Kramer and Muralidharan (2002, 2007) provide important insights into this phenomenon. They find that as of 2002, 28% of the rural households accessed private schools and, attribute private school preference to better quality teaching, and a favorable student to teacher ratio (this is also found in Andrabi et al (2002) using data from Pakistan). Superior teacher performance in private schools is attributed to their salaries being higher compared to those in Public or Panchayat schools. They also are able to show that there is better matching of teacher types in private schools - compared to other types of schools- with student types. However using a case study of Uttar Pradesh in India, Kingdon (1996), cautions against linking teacher quality with student outcomes. Since there is both teacher heterogeneity as well as unobserved heterogeneity of student types (along with other pathologies such as discrimination by teachers against certain students-not necessarily based on Jati but in a more generic manner) teacher quality will be an inaccurate predictor of student outcomes. Hanushek (2008) argues that merely focussing on



efficiency of utilisation of school inputs will be misleading since lack of teacher incentives could lead to unobserved heterogeneity of teacher quality as well. Therefore cannot attribute low performance of students can neither be entirely attributed to teacher quality nor with resource use.

Pal (2009) however shows that much of the increased preference for private schooling is due to such schools compared to other school types. Better access is due to improved quality of infrastructure within villages leading to not only an increased supply of private schools but also an increase in the incidence of parents sending their children to such schools. Andrabi et al (2009) using data from Pakistan show that the constraints related to the construction of public schools is systemic and a private school is three times more likely to be constructed during any given period. These constraints are mostly related to governance and procedural difficulties.

The findings of Pritchett and Murgai (2006) are interesting. They find for a small area around New Delhi that government teachers are paid on an average 7.5 times more than private unregistered schools. However, they also find that the government teachers are half as likely to be teaching when observed, students of public schools are more dissatisfied with teachers compared private unregistered schools, parents of children enrolled in public schools are dissatisfied with these schools, and most importantly even the teachers in these public schools were dissatisfied with almost all parameters of their jobs except their pay. Pritchett and Murgai conclude that the present policy is both “anti teacher” and “anti schooling”<sup>1</sup>.

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<sup>1</sup>Pritchett in one of commentaries (Indian Express, Tuesday, November 8, 2011) suggests that the problem with schooling in rural India is mostly attributable to improper selection of teachers and the non involvement of parents in this process. He suggests that the methods of selections of teachers even under the SSA is one of extending political patronage and much of the poor quality learning that one finds in surveys conducted by agencies such as PRATHAM (through its ASER reports) can therefore be attributed to non involvement of parents in the process of school management.

Will equalizing school attributes such as student teacher ratio, reducing teacher absenteeism, or, infrastructure matter? Deaton and Case (1999) have found that equalizing student teacher ratios between black and white schools do not help in equalizing learning outcomes across these two types of schools. Houtenville and Conway (2008) show that school infrastructure and parental involvement in matters related to governance of schools, and children's learning are substitutes. Increases in school resources will therefore crowd out parental involvement. That is, any attempt at changing the school infrastructure will come at the expense of parental involvement. This finding is of particular interest in the Indian context where, policy has focussed on both improving infrastructure of schools as well as increasing parental involvement through the PTAs and the VECs.

Financial allocations for education are being increased. Increasingly financial powers are being devolved to the Panchayats for improving the quality of schooling. There are other attempts such as reducing the class size in schools in order to improve the quality of the learning experience. What effect will they have for example on learning and, private spending by households on their children's education? Das et al(2011) study the relationship between school inputs, public grants, test scores and the reaction of households to increased school inputs. Using data from India and Zambia they find that anticipated increases in public funding will crowd out private spending by households and unanticipated increases in public funding improve test scores (perhaps due to the fact that private spending remains high and parental involvement as a consequence will be significant). Though much has been said about the relationship between class size and student performance, a policy that caps this will then render this variable useless as an explanatory variable. As shown in Urquiola and Verhoogen (2009), -using data from Chile-existence of such caps will violate the underlying assumptions made while estimating a school production function

since the relationships between school choice and household characteristics become discontinuous.

The literature also provides evidence of self selection in choice of schools, impact of involvement of mothers in household human capital formation, and impact of ineffective utilization of school resources. Glewwe and Patrinos (1999) for example show that the better of households tend to send their children to private schools. Behrman et al (1999), and Behrman and Rosenzweig (2002)- using data from rural India and Minnesota – show that parental involvement and in particular mother's time spent at home and in the process of schooling improves child performance in schools. Ineffective utilization of resources could be a reason for poor performance of schools. Harbison and Hanushek (1992) and, later Hanushek (1995) show that in developing countries there is no compelling evidence to suggest that the quantum resources is the matter but suggest that incentivization of different kind ,viz., decentralization in decision making may be the solution.

This paper provides an analytical insight into school choice, factors that drive performance of children in schools, role of governance and ultimately the impact of school choice on community welfare-proxied by the village literacy rate. It is both a synthesis of the extant literature as well as articulating the role the role of governance in improving school quality. We are therefore able to provide answers to the questions raised at the end of section 2(i) at which point it was unclear how some of the significant shortcoming of school service delivery could be overcome.

### **3. Data and Descriptive Statistics**

We use data from the Rural Economic and Demographic Survey (REDS) conducted by the National Council for Applied Economic Research (NCAER). These surveys were started in 1969

and represent a panel of 241 villages representing 17 major states of India. . In addition to information included in standard multi-purpose household surveys, the REDS contains data on Preferences of the parents for schooling of their children, school choice,, child level data on the reading and writing ability as measured by a test given to all the children in the sample, data on school infrastructure and quality of each school, and data on the teachers qualification as well as participation by the parents of the child in the process of schooling. . Community level data provides us the information on the school infrastructure, expenditure on the school maintenance in the given year, and data on school governance. The last point is important for this paper given that we wish to show that it is eventually the quality of governance and parental involvement in this process that ultimately matters in improving the learning ability of children.

Our sample consists of 5858 children under the age of 14, of which 4793 are enrolled in public schools, 875 are enrolled in private schools and, 190 are enrolled in Panchayat schools. We provide data on public, Panchayat and private schools separately. The Panchayat schools are often the oldest schools in the villages that are fully controlled and partly funded by the village Panchayats. The remainder of their finances is provided by the state government. The management of these schools is by a VEC. The Public schools are owned and managed by the State education departments with finance reaching the schools both directly and via the Panchayats. Both the Panchayat and public schools are helped in governance by the VECs. The private schools however are not under the control of the Panchayati system. These schools include those that are recognized by the state and central boards of education and others that are not. Some of these are run by religious bodies. The Muslim Wakfs Board, certain churches for example, control certain types of schools. They are not under the control of the state or the central governments and derive finances from various religious groups and individuals.

We have summarized the relevant household, village, and school quality data in tables 1 and 2. Tables 3 and 4 explain the impact of political reservations on indicators of school management. The relationship between existence of VECs and functioning of the gram Sabhas, and financial expenditures for schools in villages is explained in table 5. And, table 6 provides qualitative evidence of the dichotomy between expected expenditures by the Panchayats on public services and the actual expenditures incurred.

**Table 1: Quality of Schools**

<b>VARIABLES</b>	<b>Public</b>	<b>T- test</b>	<b>Panchayat</b>	<b>T- test</b>	<b>Private</b>	<b>T- test</b>
Male-Female ratio of enrolment	0.561		0.546		0.566	
Average age of children (years)	11.738		10.204		11.785	
Average Years of schooling of mother of the child (years)	4.972	**	2.748	***	5.222	***
Average Years of schooling of Father of the children	6.815	***	5.06		7.251	***
Teacher absenteeism (days/month)	6.292	***	12.177	***	2.892	***
Student-Teacher Ratio	41.726	***	59.35	**	35.235	***
Separate rooms for each grade (% of schools)	0.784	***	0.194	**	0.927	***
Seating Arrangement in the Schools (Bad=1, Good=0)	0.471	***	0.713	***	0.285	***
Density of Black board in schools	0.889	***	0.618	*	0.993	***
Functional toilets (% of schools)	0.758	*	0.243	**	0.841	**
Availability of playgrounds (% of schools)	0.876	***	0.363	*	0.945	***
Availability of clean drinking water (% of schools)	0.977	***	0.672	***	0.99	***

Table 1 shows that all three school types have similar student gender ratios. The Parental education of children enrolled in Panchayat schools is the lowest Panchayat compared to those in public schools and private schools. This difference is particularly large when we compare Panchayat and private schools. Mother's education in particular is the lowest for children enrolled in Panchayat schools. This could impact child outcomes in multiple ways and less

educated mothers might not effectively participate in VECs, the quality of governance of schools as well as the parental ability to influence child learning directly will be limited.

**Table 2: Student, Household and Village characteristics**

	Mean	Std. Dev.
<i>Student's characteristics</i>		
Ability to Read and write	0.4378	-----
% Children not enrolled	0.1546	-----
<i>Household's characteristics</i>		
Mother's education (years)	3.0800	4.2154
Education of head of household (years)	4.8900	4.5262
Proportion of eligible male children enrolled	0.8069	0.4091
Proportion of eligible female children enrolled	0.7508	0.4241
Proportion of girl children	0.4758	0.1461
Household net income (in Rupees measured in constant prices)	44824.1600	68234.7600
Poverty status (Dummy=1 if currently poor)	0.2936	-----
Log of household school expenditure	6.3572	1.1318
Log of change in household school expenditure	8.759	1.21317
Current household expenditure on schooling (annual)	13319	11315
Household expenditure on schooling during the previous Panchayat period (annual)	8510	7674
% of children's mothers participating in the VEC meetings	0.4811	-----
<i>Village characteristics</i>		
Distance from town (kilometres)	13.3722	10.9193
Distance from pucca road (kilometres)	0.7151	0.4514
Number of formal loan sources in the Panchayat	6.8199	1.6316
Proportion of electrified households (%)	0.4617	0.3177
Villages with privately run schools (%)	0.3369	-----
Log of Panchayat expenditures on schools	12.9911	1.7995
Log of change in Panchayat expenditures on schools	10.227	1.9021
Panchayat expenditures on school (Current Panchayat period)	68437	12646
Panchayat expenditures on school (Previous Panchayat period)	42253	9358
% Panchayats reserved for woman	0.3042	-----
Regime change of Pradhan from other to own Jati	0.0668	-----
Number of issues related to schools discussed during gram Sabha meetings (current Panchayat)	2.2905	2.0996
% of villages with VEC	0.7615	-----

School infrastructure also differs across school types. The Panchayat schools fare the worst in all of the infrastructure attributes. Teacher absenteeism for example is the highest is the highest. The Panchayat schools have the worst student teacher ratios at 59 students per teacher, versus 41 students in public schools and 35 in private schools. They also have the poorest facilities in

terms of separate rooms different grades, seating arrangements, black boards (only 88% of all classrooms in public schools, 61% of classrooms in Panchayat schools and in Private schools almost every classroom has a black board), clean toilets, drinking water and, playgrounds. All these indicators are the best for the private schools and intermediate for public schools, but generally much better for public than Panchayat schools.

In table 2 we summarise the various relevant household and village characteristics. We find that Panchayat expenditures for schools went up by 10.22 percent between the current and the previous Panchayat periods. During this same period (i.e., 5 years) the private expenditures on schools by household went up by 8.759 %. We also note that there is a wide variation in the levels of schooling of both the parents of the child with mother's education being on an average lower. There is still significant percentage of households where at least one child eligible for schooling (across all genders) who is not enrolled (it is 15.46% during the current Panchayat period). More revealing is the fact that 25% of all girl children eligible for schooling are at present not enrolled. This figure is 20% for the male child. We cannot at this juncture conclude that non enrolment could be due to labor markets being a competition for schooling or gender discrimination.

Only 43.7% of all children are able to read and write a short paragraph belonging to a grade lower than what they are currently enrolled in?. Even though 76% of all villages across the various Panchayats have a VEC only 48.1% of all mothers of children currently enrolled have attended VEC meetings. The number of Gram Sabha meetings during the current Panchayat period in which schooling was on the agenda and was discussed is slightly more than 2. There is also a significant variation in such meetings.

**Table 3: Impact of political reservation (caste based) on quality of governance**

	Not Reserved	- Reserved	Difference and T-Statistics		
	Mean	Mean	Difference	Std. Error	T-Stat
Number of Gram Sabha meetings where school quality on the agenda	7.17	9.43	-2.26	0.28	-8.22***
Prop. of Gram Sabha meetings in which school quality or administration was actually discussed.	0.25	0.31	-0.06	0.04	-1.39
Total Panchayat expenditure on schools	42958.03	86464.59	-43506.56	5573.52	-7.81***
Share of Panchayat school expenditure to total expenditure	0.05	0.12	-0.07	0.01	11.44***
Presence of VECs	0.73	0.78	-0.05	0.02	-3.27**
Proportion of mothers of children participated in the VEC meetings	0.0466	0.0516	-0.007	0.002	-3.26**

**Table 4: Impact of political reservation (gender) on quality of governance**

	Not Reserved	Reserved for Women	Difference and T-Statistics		
	Mean	Mean	Difference	Std. Error	T-Stat
Number of Gram Sabha meetings where school quality was on agenda	8.55	9.19	-0.64	0.28	-2.30*
Proportion of Gram Sabha meetings during which school quality and administration was actually discussed.	0.241	0.201	0.04	0.04	10.01***
Total Panchayat expenditure on schools	58814.8	106146.08	-47331.27	5565.92	-8.50***
Share of Panchayat school expenditure to total expenditure	0.09	0.14	-0.05	0.01	-8.15***
Presence of VECs	0.73	0.83	-0.1	0.02	-6.21***
Proportion of mothers of children participated in the VEC meetings	0.0466	0.0591	-0.0145	0.005	-2.81**

Indian legislation includes reservations of the position of the Village head (Pradhan or Sarpanch) for scheduled castes and tribes on the one hand, and for women on the other hand. While reservations of the Pradhan's position to scheduled castes and tribes depends on their total share in the village population, and does not change over time, the reservations for the position of the



Pradhan for women are through a random allocation. For reservations for women (table 4) we therefore can see the impact of female reservations on governance in the villages directly from the two way table, while the two way tables for caste reservations do not allow us to do so, as these impacts may be confounded by village fixed effects.

In tables 3 and 4 we see that in Panchayats reserved either on a caste or gender basis there are more meetings dealing with education and more issues discussed in the meetings relate to schools. The Panchayats also spend much more financial resources on schools (more than 50 percent greater than in unreserved Panchayats and slightly greater than 100% in Panchayats that are reserved for women). It is not just the levels of expenditures on schooling that go up but the proportion of such expenditures in overall Panchayat level expenditures also increase due to political reservations. The reserved Panchayats are more likely to have a functioning VEC, and the VEC meetings are more likely to be attended by mothers of the currently enrolled children. All these differences are statistically significant. All of the preceding implies that reservations by gender have a very significant impact on school governance. Since the results look similar for caste-based reservation, it is more likely than not that they also reflect significant causal impacts.

Do the VECs matter? The statistics shown in table 5 suggest that they do, although there is also the possibility of reverse causation from more active Gram Sabhas to the existence of a VEC. In villages where VECs exist, there are more gram Sabha meetings where school quality and administration is both on the agenda and discussed compared to villages in VECs are not present.(9.1 meetings compared to 7.5 such meetings). Larger numbers of issues related to schools are discussed in Gram Sabha meetings and the annual expenditure by the Panchayats on schooling is more than 50% higher.

**Table 5: Impact of VEC on quality of governance**

	VEC does not Exist in the villages	VEC Exist in the villages	Difference and T-Statistics		
	Mean	Mean	Difference	Std. Error	T-Stat
Number of Gram Sabha meetings held where school quality was on the agenda	7.53	9.12	-1.59	0.3	-5.32***
Proportion of Gram Sabha meetings where school quality and administration was actually discussed.	0.285	0.343	-0.058	0.04	-13.36***
Total Panchayat expenditure on schools (current Panchayat period)	49416.62	80711.28	-31294.65	6051.92	-5.17***
Share of school expenditure to total expenditure in Panchayat	0.04	0.12	-0.08	0.01	-11.77***

The share of Panchayat expenditures going to schools is three times as high at 12 percent in villages with VECs..Even though all these differences are statistically significant, since we are unable to control for either village or school fixed effects ascribing causality between presence of VECs and quality of governance germane to schools at the Panchayat level is not prudent.

We also find from the survey that there is a significant gap between the expenditure shares for education that the households expect the Panchayats to make for education compared to actual expenditure share. This could be indicative of the preferences of households not being matched with Planner's preferences. In table 6, we find that, even in Panchayats with political reservation (either presently or at sometime in the past) these differences are of the same magnitude and persist. However what is important to note is that impact of reservations on expenditures persists beyond the period of reservation at almost the same level, a very significant legacy impact. Another feature in this table is that the gap between expectations and actual get reduced due to

political reservations (19% in never reserved Panchayats compared to roughly 14 to 15% in Panchayats that had been reserved at least once or currently reserved).

**Table 6: Household's preferred and actual expenditure share on children's schooling**

	<b>Households' preferred expenditure shares on schooling</b>	<b>Actual expenditure shares on schooling</b>
Ever Reserved	0.27 (0.14)	0.12 (0.14)
Reserved in current period	0.27 (0.14)	0.13 (0.16)
No reservation	0.25 (0.13)	0.06 (0.09)

## 4. Empirical Strategy

### 4.1 Labor Market and Household's Decision on Schooling of Their Children

Do labor markets retard the rate of enrollment of children? If not then what might be the factors that keep children of school going age out of school? We estimate the impact of the labor market on the decision of parents to send their children to school. The dependent variable in the equation has been characterized as 1 if at least one child is not going to school and 0 otherwise. Given the qualitative nature (binary) of the dependent variable and, assuming that cumulative density function is standard normal, we use the following likelihood model.

$$D_{ijv} = \alpha + \beta \mathbf{X}_i + \gamma \mathbf{H}_{ij} + \delta S_{jf} + \varepsilon_{ijv} \quad (1)$$

Where,  $D_{ijv}$  is a binary indicator taking on the value 1 if at least one child of school going age in the household  $j$  in village  $v$  is not attending school and, 0 if all eligible children are enrolled,  $X$  is a vector of child's characteristics which includes predicted  $z$  scores (height for age). Since actual  $z$  scores could be correlated with the outcomes and cause the coefficients to be biased upwards, we predict these using the characteristics of the child's grandparents such as education level and level of wealth.  $H$  is a vector of the household characteristics including: gender of the head of the household, father's age, and schooling of father, proportion of girl children in the household and, predicted inherited wealth. We use predicted inherited wealth of the household in the model for identification and to control for reverse causality with the outcome variable.  $S$  is a vector that includes: school characteristics of the school attended by the child, village level variables such as total number of schools in the village, teachers' education level, and village level nonfarm wage.  $\varepsilon_{ijv}$  is an error term, and  $\alpha$ ,  $\beta$ ,  $\gamma$ , and  $\delta$  are coefficient vectors to be estimated

#### **4.2 Determinants of School Choice and Household level School Expenditure**

School choice and private expenditures on schooling by households are determined jointly. We shall assume that the parents of the children observe the characteristics of school, wage rates, performance of their own children in schools thus far, school availability, and even the level of Panchayat expenditures. The last point is on account of decentralisation that accords the opportunity for households to be able to participate in the gram Sabha meetings to ascertain the magnitudes of financial allocation for various public services including schooling. . Given this information set, the parents then make a rational choice of the school that will optimise their private expenditures and lead to increases in household welfare. We estimate both the probability of choice of the type of school and level of private household education expenditures using the following equation.

$$E_{ijv} = \alpha + \beta_1 X_{ij} + \beta_2 H_{ij} + \beta_3 S_{ijv} + \beta_4 G_{ijv} + \varepsilon_{ijv} \quad (2)$$

Equation 2 is really a system of 4 equations. The first three have binary dependent variables, and the last has the level of private school expenditures (in logs). These also represent the first stage estimates of the village level literacy about which we shall discuss in a later section. The vector  $E_{ijv}$  is conditioned on  $X_i$ , which is a vector of household characteristics,  $S_{ijv}$  which consists of the observable school characteristics, and  $G_v$  which is a vector of governance variables both generic and germane to schools, and, other village characteristics. A few variables in these vectors could be endogenous. These include the ability of the child to read and write, participation in the process of governance, and wealth. We predict the ability of children to read and write (which will capture the both observed and unobserved child characteristics), using various controls. Similarly, the predicted values of inherited wealth and participation in Gram Sabha meetings are used in the regressions.

i) *Predicting Reading and Writing Ability of a Child:*

The choice of school type by the parents for their children may be endogenous to the reading and writing ability of the children. Hence to arrive at a consistent estimate of the impact of a child's reading and writing ability on school choice, we first estimate the ability of the child to read and write as follows:

$$A_{ijkv} = \alpha_i X_i + \beta_j H_{jv} + \delta_k S_{kv} + \gamma_v V_v + \phi_i$$

Where,  $X_i$  is the vector of control for child characteristics,  $H_{jv}$  is a vector of household characteristics,  $V_v$  is a vector of village level controls, and,  $S_{kv}$  is a vector of school

characteristics in which child is currently enrolled. We use the household, village and school level fixed effect to remove any bias in the estimates. Which are the identifying variables?

*ii) Predicting School Issues Discussed in Gram Sabhas*

The Gram Sabhas are empowered bodies under the constitutional amendment to ensure that the Panchayat takes decisions in the interests of the households. Participation in these is a sign of empowerment as well as a process through which elected members of the Panchayat are held accountable. This variable is of particular interest to us since it measures the ability of households and members thereof to be able to have an effect on school quality and administration; acquire information about financial allocations towards schooling at the village level as well as on school choices available, and raise issues on specific matters such as teacher selection, absenteeism, functioning of the mid-day meal scheme etc. Participation in Gram Sabha (GS) meetings related to schools is predicted as follows:

$$\ln GS_{vi} = \alpha_v S_{vi} + \delta_m V + \phi_i \quad (i=1, 2, 3 \dots)$$

Where,  $S_{vi}$  is the vector of school characteristics and,  $V$  is a vector of village level controls. These include dummies for whether the Panchayat is currently or were previously reserved for women. What are the identification variables?

*(iii) Predicted participation of the mother in VEC meetings*

Participation of mother in the village education committee could be correlated with school choice. To deal with the problem of endogeneity due to this simultaneity in the information flow through the participation and choice of the school, we predict the participation of the mother in the VEC. The participation equation of the mother can be presented as follow.

$$Y_i = \alpha + \beta X_j + \varepsilon_{ij}$$

Where,  $Y_{it}$  is a vector of binary value taking on 1 if mother participated in the village education committee and 0, otherwise.  $X_{it}$  is a vector of household, mother and village characteristics such as education level of the mother, gender of the head of the household, variance in the education level in the household and inherited wealth and village characteristics such as whether village is reserved for women and other development indicator.

### *iii) Inheritance of Wealth by the Household*

Wealth is an important determinant of school choice. This variable affects outcomes in three ways. First, it is an indicator of selection whereby wealthier households may choose to send their children to private schools. Second, wealth widens the choice for the parents in terms of school choice. Household wealth could become a substitute for public expenditures on schooling. This would then imply that increases in public expenditures will have a insignificant impact on households who are either currently wealthy or are likely to inherit. Thirdly, inheritance of wealth might alter intra household dynamics in favour of women. If women inherit a share of this wealth then this could lead to greater private expenditure on children (in particular on the girl child)

However using wealth directly will lead to biased estimates as it is endogenous to one or more of the outcome variables. Hence we use predicted wealth using Foster and Rosenzweig (2002) in the following manner<sup>2</sup>.

$$\ln W_{ht} = \kappa_h L_{ht} + \eta_{ht}$$

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<sup>2</sup>Predicted inherited wealth is used wherever wealth is to be used as one of the controls for the same reasons outlined here. We have used it earlier for example, to explain the incidence of a family keeping one of the eligible children out of school.

The vector  $L_{ht}$  includes all variables that will lead to household splits such as variance of education within the household, household size, age of the current head, inherited wealth, presence of non-co-resident father, non-co-resident brother and, non-co-resident sister, in the previous survey period.

### **4.3 Impact of choice of schools and private household expenditures on student literacy**

Why should school choice matter for policy? If there is increased privatization of the schooling sector does it have any negative effects on the community? If households are increasingly spending more on schooling of their children is this a negative outcome? Given our findings based on the estimation in 4.1 and 4.2 we are able show that growth in private schooling owing to parental choice in that direction significantly promotes village level literacy. Additionally, we find that the elasticity of the literacy rate with respect to private expenditure on schooling is positive and significant. Whether private spending by households on education has an adverse effect on their consumption is not part of the mandate of this paper.

Since the error terms of the school choice equation and the village literacy rate could be correlated, we estimate the following equation along with equation 2 as a two stage instrumental variables regression. We estimate the impact of school choice and private expenditures on schools by households on student literacy (whether the student can read and write), as

$$\text{follows: } V_i = \alpha + \beta_1 \hat{E}_{ijv} + \beta_2 VEdu_{vt-1} + \varepsilon_{ijv}$$

Where  $V_v$  is the average village literacy rate,  $\hat{E}_{ijv}$  is the predicted school choice by households, and, their predicted private expenditure on schooling.  $VEdu_{vt-1}$  is average village literacy rate 8 years before and is a proxy of initial human capital endowment at village level. Village-specific fixed effects have been controlled for. The equation is estimated with village fixed effects.



#### 4.4 Factors determining the performance of Schools

We next look at the determinants of school performance, by estimating a similar equation as equation 2, but with detailed school and teacher characteristics, and some household characteristics. This enquiry is designet to answer the following questions. A) Why do students of the same age enrolled in different types of schools perform differently? B) Can these differences be attributed to self selection, infrastructure or governance? C) If we take account of measurable characteristics of students, schools, and households, will there remain an impact of unobservable school characteristics associated with private, public and Panchayat schools? Or, do unobservable attributes such as school management and governance still matters? Underlying these questions are three hypotheses. i) Self selection has no impact on either school choice or school performance. ii) Equalizing measurable variables such as human and (or) financial resources across school types will not equalize learning. iii) Quality of local governance and factors such as participation by the parents of children in the process of governance through VECs will have no impact on school outcomes. While we are able to substantially reject hypothesis 1 and 2, hypothesis 3 is completely rejected. We find that the efficiency of resources significantly go up in the presence of effective participation by the mothers of the children in the process of governance. We further investigate whether the impact of measurable characteristics on school performance varies across the three school types, by including interaction terms between the measured variables and the school types. The following equation is estimated using a maximum likelihood estimator.

$$z_{ijv} = \alpha + \beta_{1i} X_i + \beta_{2i} H_i + \beta_{3ij} S + \beta_{4ij} G_{jv} + \beta_{5ij} I_{ij} + \varepsilon_{ijv},$$

Where  $z_{iv}$  is the binary indicator variable for whether children can read and write in school  $j$  and village  $v$ .  $X_i$  is the vector child characteristics which includes age, gender, predicted  $z$ -score for height for age,  $H_i$  is the household and parental characteristics of the children and includes education of the child's parents and predicted inherited wealth. Vector  $S_j$  is the school characteristics which includes school type, teacher absenteeism in a given month, teacher student ratio, quality of seating arrangement, availability of separate classrooms for each grade, density of blackboards, presence of a functional and clean toilet, availability of clean drinking water and, presence of playgrounds.  $G_{jv}$  is the vector of governance variables. These include the presence of village education committee, and predicted participation by the mother of the child in the VEC, The vector  $\mathbf{I}$  includes the various interaction terms. This equation has three unobservable fixed effects i.e. child, family, and, the village (or) school if there is more than one school of any given type within the village.

## **5 Results**

### **5.1 Determinants of school enrolment and role of labour market**

We explore the factors which influence the parent's decision of sending their children to the schools. We control for variables such as availability of schools in the village, school type, non-agriculture wage rate, household type (caste), quality of schools, and a village level development indicator. The results are shown in table 7. We find that female headed (including those headed by widows or women separated from their husbands) households are significantly less likely to take a child out of school, indicating a strong preference of the single mothers for education. More educated fathers also are less likely less, while older fathers are more likely to do so. If there are a higher proportion of girls in the household it is also more likely that a child will be

taken out of school, but better nourished children, as measured by their predicted z-score are less likely to be taken out. The higher the predicted wealth of households, the less likely they are to take a child out of school. The scheduled castes, scheduled tribes and other backward casts are more likely to take children out of school. The characteristics of school, matters and explain the difference in the performance, which includes mid-day meals, electricity and other infrastructure variables, reducing the likelihood that children will be taken out of school.

Other points worth noting include the negative impact on the probability of taking children out of school of the perceived quality of teachers, the proportion of female teachers, and the presence of private schools while a higher student teacher ratio and a higher off-farm wage have the reverse effect. If the parents perceive a higher quality of teachers in school then they are less like to take even one child out of school. There is also a strong preference for private schooling as suggested by the magnitude and sign of the coefficient on the dummy “whether the only school available in village is private as opposed to any other type?”. There is a nearly 40% reduction in the chance that even one child will be taken out of school. We also find that the off farm wage rates continue to play a role in non enrolment (there is 8% chance that one child will not be enrolled if the nonfarm wage rates go up)

These results are important for policy. Governments’ incentives to households for ensuring enrolment of their children include a broad range of improvements in school quality and infrastructure, improved nutrition in the mid day meal schemes, and reducing biases against the vulnerable groups like the scheduled castes and tribes.

**Table 7: Determinants of at least one child not attending schools**

<b>VARIABLES</b>	<b>At least one child not enrolled</b>
Female headed household	-0.0791*** (0.0222)
Father's age (Years)	0.0133** (0.00641)
Father's schooling & college	-0.0717*** (0.0201)
Share of girl children in household	0.526*** (0.0547)
Predicted Inherited Wealth	-0.342*** (0.0855)
Z-score for height for age	-0.348* (0.182)
Presence of Mid-day meal scheme in the schools	-0.0790*** (0.0190)
SC	0.0615*** (0.00661)
ST	0.185*** (0.0299)
OBC	0.0517** (0.0241)
Whether only school available is Private?	-0.401*** (0.0404)
Total number of school with electricity	-0.0719 (0.0705)
Total or average? number of class room in the schools	-0.0160 (0.00975)
Number of black boards	-0.00185 (0.00943)
Share of teacher with adequate training	-0.0363*** (0.00232)
Student-teacher ratio	0.186*** (0.00184)
Share of female teachers in schools	-0.219*** (0.0242)
Nonfarm wage rate	0.0811*** (0.0202)
Village Fixed Effect	Yes
Wald Chi2	438.34***
Observations	5,858

Robust standard errors in parentheses

\*\*\* p&lt;0.01, \*\* p&lt;0.05, \* p&lt;0.1

## **5. 2 Determinants of school choice and private expenditures on schooling by households**

What are the determinants of school choice by the households? Can we identify the triggers of growth in private expenditures on schooling? The estimates arising from equation 2 provide us with answers. Equation 2 also represents the first stage in the estimation strategy for examining the impact of school choice and change in private expenditures on schools by households on village level literacy. The results are shown in table 8.

We find that availability of schools matter, as seen by the fact that the attendance in each of the three school types increases at the expense of the other two types when it is the only school in the village. Availability of only a one school type available in the village increases private expenditures on schooling, which suggests that restricting choice means that those who want to use another school have to pay more to send their children there, or have to compensate by increasing their private expenditures on the only school available. The expenditures increase most, however, if only private schools are available, namely by 81 percent. We have seen in table 7 that if the only school that is available was private as opposed to either public or Panchayat, then the probability of withdrawing children declines sharply. The results also show that parents are more likely to send children to private schools when the quality of education as measured by qualified teachers, etc is a factor, or if the presence of religious instruction is important. They also send children to private school if they have higher predicted wealth. In each case the private household expenditures on schooling goes up.

We also find that if the observed student outcomes in terms of their ability to read and write goes up then the parents are marginally more likely to send their children to private schools. We find that the private expenditures on schooling go up when the child has a higher predicted ability to

read and write, which suggest that parental spending on children will go up irrespective of school type if the expected student outcomes go up. Even in cases where parents are likely to withdraw at least one child from school the private expenditures on schooling go up. This suggests that parents are spending more on the remaining school going children. However such parents prefer sending children to public schools. If at least one child is predicted not to go to school, the remaining children are more likely to be sent to public schools, and private expenditures of the household go down.

Governance plays a critical role in school choice and level of private expenditures on schooling by households. Increased expenditures by the Panchayats on schools seem to be signal of school quality and parents increasingly prefer to send their children to Panchayat schools. Public financial allocations of this type crowd out private expenditures. Political reservations, regime change, discussions in Gram Sabha meetings, participation in VECs, all have significant impact on school choice and private school expenditures. Political reservations for women increase school attendance for all types of schools, but most so for public schools. It also leads to higher household school expenditures. Election of a female Pradhan therefore appears to increase awareness of the value of education all around. Regime change (based on the electoral process) leading to a congruence between the Jati of the household and that of the Pradhan increases attendance in public schools at the expense of private schools and reduces the households' education expenses. This decline might indicate private benefits accruing to such households (in the form of being chosen for scholarships etc)

**Table 8: Determinants of School choice and private education expenditure**

VARIABLES	(1) Public School	(2) Panchayat School	(3) Private School	(4) Log of HH School Exp
Only Public schools in the village	0.109*** (0.0172)	-0.0625*** (0.00611)	-0.0464*** (0.0163)	0.268*** (0.0627)
Only Panchayat schools in the village	-0.272*** (0.0255)	0.363*** (0.00906)	-0.0904*** (0.0242)	0.0729 (0.0930)
Only Private schools in the village	-0.198*** (0.0147)	-0.0164*** (0.00522)	0.214*** (0.0140)	0.813*** (0.0536)
Quality of education (qualified teacher etc.)	-0.0248* (0.0140)	-0.0104** (0.00497)	0.0351*** (0.0133)	0.178*** (0.0511)
Presence of religious instruction	-0.0900*** (0.0187)	0.0185*** (0.00665)	0.0716*** (0.0178)	0.215*** (0.0683)
Predicted Wealth	-0.06170*** (0.00125)	-0.0591*** (0.00444)	0.761*** (0.0119)	0.149*** (0.0456)
Predicted probability to read and write	0.0585* (0.0309)	0.0309*** (0.0110)	0.0893*** (0.0294)	0.601*** (0.113)
Predicted probability of one child not going to school	0.373*** (0.0596)	0.0179 (0.0212)	-0.391*** (0.0567)	-0.760*** (0.218)
Panchayat expenditure on schools	0.0302 (0.135)	0.0530*** (0.00481)	0.00832 (0.0129)	-0.0653*** (0.00494)
Women reservations for pradhan)	0.128*** (0.0132)	0.0158*** (0.00470)	0.0286** (0.0126)	0.1977*** (0.0483)
Regime change other jati to own jati	0.0411* (0.0242)	0.00426 (0.00860)	-0.0453** (0.0230)	-0.245*** (0.0883)
Predicted issue discussed in the gram sabha (school)	-0.00348 (0.00562)	0.00715*** (0.00200)	-0.00367 (0.00535)	-0.103*** (0.0205)
Does VEC exist in your village	0.0480 (0.0397)	0.0449*** (0.0141)	-0.00313 (0.0378)	0.285** (0.145)
Does mother participate in the VEC	0.0378* (0.0196)	0.0137** (0.00697)	0.0241 (0.0187)	0.0192 (0.0716)
Constant	0.774*** (0.0312)	0.0559*** (0.0111)	0.170*** (0.0297)	7.040*** (0.114)
Observations	5,877	5,877	5,877	5,877
R-squared	0.157	0.394	0.128	0.225

Standard errors in parentheses

\*\*\* p&lt;0.01, \*\* p&lt;0.05, \* p&lt;0.1

Discussions about schools in the Gram Sabha meetings signal the commitment of the community and the elected officials towards improving efficiency, and increases attendance in Panchayat schools leaving the other school types unaffected. The Gram Sabha thus appears to be especially influential in schools that it controls directly. It also suggests that the community is able to hold the elected officials to account with respect to the schools directly controlled by the Panchayat. More important is the role of the VEC. The very presence of a VEC increases private school expenditures by 28% and increases enrolment in Panchayat schools by 4.3%. Predicted participation of the mother of the child in the VEC increases the choice of public schools and Panchayat schools by a roughly equal percentage, but has not impact on household school expenditures.

### **5.3 Impact of school type and village characteristics on student literacy**

Equation 3 is the second stage of the estimation strategy. We estimate equations 2 and 3 as two stage instrumental variables regressions. The observations are the test scores of the children that are enrolled in school. We use village fixed effects to for village-specific unobservable effects. Dummy variables are included for the private and the Panchayat Schools so that the performance of the public school is the base. The results from the various tests viz. (a) excluded instruments, (b) the Anderson canonical correlation likelihood ratio test under the null hypothesis that equations are under identified, (c) the Cragg–Donald F-statistic under the null of weak identification and (d) the Sargan test of over-identification are all rejected. This suggests that (1) there are no redundant instruments that have been used, (2) the equations are not under identified, (3) there are no weak instruments, and (4) the over-identification test is rejected. The Wu–Hausmann F test<sup>3</sup> suggests that the regressors are endogenous and the two-stage approach

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<sup>3</sup> This is the test of endogeneity and performs under the null that the regressors are exogenous.



used here is the preferred method of estimation. Similarly, the Durbin–Wu–Hausmann chi square test shows that only the two-stage instrumental variable estimation is consistent (compared to GLM)<sup>4</sup>.

We find that predicted probability of students being able to read and write are 32 percent higher for private schools than public schools, whereas they are 12 percent lower for Panchayat schools, This then suggest that private school in the village are significant contributor to the village literacy rates and managing the overall literacy rate. An increase in household's predicted expenditure increases the probability of a child being literate: A ten percent increase in the expenditures would raise the probability of being literate by 2 percent. We have controlled for previous village level literacy rate: A ten percent increase in the past village literacy rate increases the predicted probability of being literate by 8.3 percent. A one km increase in the distance to the nearest town, on the other hand, decreases predicted literacy by 2 percent. This suggests that being nearer to an urban centre has positive impacts on literacy rates. The spill over effect of the urbanization and urban education is higher in nearby villages compared to more distant ones. An increase in the electrification rate of village homes by ten percent increases predicted literacy rates in the village by 3.3 percent, also a highly significant impact. School performance therefore depends on school type, private education expenditures, distance from urban centres and household electrification.

#### **5.4 Explaining performance gaps.**

We have thus far explained determinants of enrolment, school choice, private household expenditures on schools and literacy. Of significant concern are the persistent gaps in school

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<sup>4</sup> This test balances the consistency of instrumental variables estimation against efficiency of the least squares estimation. It tests under the null that instrumental variables estimation and least squares estimation are both consistent.

outcomes across school types. Policy must address this as such persistent gaps skew school outcomes and affect welfare. We have seen that increased preference for private schooling will be accompanied by increased private household education expenditures which will especially affect the welfare of poorer and vulnerable households. There is therefore a need to better understand performance gaps across school types.

**Table 9: Impact of School choice and village characteristics on literacy**

<b>VARIABLES</b>	<b>(1) Literate or not</b>
Predicted probability of attending Panchayat School	-0.1435*** (0.0319)
Predicted probability of attending Private School	0.316*** (0.0529)
Predicted Log of HH school expenditure	0.198*** (0.0381)
Village literacy rate in 1999	0.831*** (0.0195)
Average. distance from this village to nearest town	-0.0189*** (0.00166)
Proportion of village electrified	0.326*** (0.0608)
Constant	1.539*** (0.589)
Observations	5,877
R-squared	0.557
Anderson Canonical Correlations LM statistic	101.034***
Cragg-Donald Wald F statistic	29.984***
Tests of endogeneity	
Wu-Hausman F test:	97.089***
Durbin-Wu-Hausman chi-sq test:	290.988***

Standard errors in parentheses  
 \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Persistent gaps in the performance of children belonging to the same grade across different types of schools could be attributed to differences in: (i) individual and family characteristics, (ii) the

infrastructure and financial resources available with the schools and,(iii) quality of governance of schools. In table 10 we run similar regressions as in table 9 of literacy on the above characteristics We use equation (4) to differentiate between the effects caused by variables that occur regardless of the school type and resources, and impact on learning due to the measurable school resources and the remaining difference associated with the school type once the measurable factors are accounted for. We further interact the explanatory variables with school types, in order to measure whether the impact of the measurable variables differ in the different school types. We then test whether these interaction terms are jointly significant. In order to introduce these interaction terms, we have to run two separate regressions: In the first we include only students in public and in Panchayat schools and introduce a dummy variable for private schools that is also interacted with the other explanatory variables. In the second regression we compare students in Panchayat schools with those in public schools by introducing a dummy variable for Panchayat schools and corresponding interaction terms. We have to use actual schools in these regressions, rather than predicted school type which we used in the regressions of table 9. In this manner we are able to find out which of the characteristics of schools that can be influenced by government are most important to bring about greater equalization of school performance, and whether they are particularly important for some school types rather than others.

The results are shown in table 10. The results show that after controlling for the included observable variables, i.e. the entire individual, household, village, governance, and infrastructure characteristics, unobservable school characteristics still lead to 30 percent performance gap between private and public schools, an 11 percent gap between public and Panchayat Schools. In

order to bridge the gap with private schools, measurable characteristics of public schools would have to be brought to higher levels than in the private schools, and similarly to bridge the gap between public and Panchayat schools. When interaction effects are included in the regressions, the gap associated with unobservable private school characteristics increases substantially, while the gap for panchayat schools goes down.

The regression coefficients for the observable variables are all significant, except for availability of separate classrooms, where only the interaction effect with private schools suggests that they have a larger impact in such schools than the other school types. It is clear that school performance is affected by a large number of factors from all classes of observable variables. The tests for the interaction terms are statistically significant in both types of regressions, suggesting that productivity of school resources is not the same across school types. More specifically we find in the regression of private versus public schools that seven interaction terms are not statistically significant, four are positive and one is negative. This suggests that private schools use some, but not all resources more effectively than public schools. The reverse is the case for comparing public to Panchayat schools. Four interaction terms are significant and negative, suggesting poorer use of resources in Panchayat schools, whereas the opposite is the case for two resources. What emerges is therefore not a simple picture.

#### **5.4.2 Do individual and household characteristics matter?**

We first focus on individual and household characteristics. Across all specifications we find that girls three to four percent better than boys in terms of literacy, An increase in the child's age by one year, on average, increases the probability of being literate by 6 percent across all school types and specifications.

Of particular interest is the impact of z scores on performance of children.. The z-score measures the impact of past and long term nutrition deficiencies. These can be improved by better nutrition programs in the Anganwadis during early childhood. While we have seen that the presence of mid day scheme acts as an incentive to parents to send their children to schools, we have not included this variable here and are not able to say whether it also improves school performance. Mothers' years of schooling improves literacy by a little over one percent per year of her schooling, and more so in private schools. A ten percent increase in inherited wealth increases school performance by around one tenth of a percent across all specifications, without any interaction with school type.

#### **5.4.3 Does Infrastructure matter?**

Much public debate and literature (cited earlier) suggest that a way of improving performance and bridging the learning gaps between school types can be attained through providing improved infrastructure. These include teacher absenteeism, student teacher ratio, availability of separate classrooms and quality of seating arrangements, density of black boards, sanitation, drinking water and play grounds. All but separate classrooms improve school performance significantly in the linear specification, and even separate classrooms may have a positive impact in private schools. The results show that reducing absenteeism, improving the student teacher ratio, and improving the quality of seating arrangements, and, increasing the density of blackboards will improve student performance across school types, with good seating arrangements and blackboards have impacts of around 15 percent and between 20 and 40 percent respectively. One can conclude from this that policy that focuses on increased spending on infrastructure matters.

Do observable factors have a specific effect for each school type? If for example teacher absenteeism in public schools is brought down to the same levels as that in private schools what will be its impact on the students enrolled in public schools? Inherited wealth, teacher absenteeism, seating arrangements, and discussions in Gram Sabha Meetings have the same impact across all school types. Functioning toilets do more for private and Panchayat schools than for public schools, while blackboards have less of an impact in both these types of schools, than in Panchayat schools. Mother's schooling, mothers' participation in VEC, and separate classrooms are particularly helpful in private schools. Higher z-scores and lower student teacher ratios are particularly helpful in Panchayat schools. Drinking water does less for Panchayat schools than for the other two types, while playgrounds do less for private schools and more for Panchayat school performance than for public schools.

The conclusion then is that while policy should focus on increased spending on infrastructure for schools, the expectation that such a policy will readily and fully equalize school performance is not supported. We saw this being pointed out with respect to specific inputs in the literature and our paper confirms this for virtually all infrastructure inputs. Hence as stated earlier hypothesis 2 is partially rejected.

#### **5.4.4 Does governance matter?**

The government of India through the 73<sup>rd</sup> amendment and the SSA has created institutional instruments for exercising oversight on school performance. The VECs for example are meant to monitor absenteeism, teacher selection, quality of classrooms, sanitation, mid day meals etc. In addition the Gram Sabhas are expected to discuss and help implement matters germane to schools. Do any these have any effect?

We find that discussions of school issues in Gram Sabha meetings do increase school performance of all school types about equally. The VECs are more specifically empowered to deal with school issues. Much of the VEC is comprised of the community members and there is a sole representative from the Panchayat. The impact of mother of the child participating in the VEC is to improve the child's school performance more compared to discussions of school related issues in the Gram Sabhas. Hence we are able to reject hypothesis 3.

**Table 10: Determinants of student performance across school types**

VARIABLES	Private and Public School		Panchayat and Public School	
	(1) Model-(1)	(2) Model-(2)	(3) Model-(3)	(4) Model-(4)
Gender	0.032* (0.016)	0.031* (0.016)	0.039** (0.018)	0.040** (0.018)
Age	0.061*** (0.003)	0.062*** (0.003)	0.063*** (0.003)	0.063*** (0.003)
z-score for height for age	0.014*** (0.0011)	0.015*** (0.0012)	0.014*** (0.0012)	0.017*** (0.0012)
z-score for height for age*School Type		-0.003 (0.024)		-0.216* (0.125)
Mother's Years of schooling	0.013*** (0.002)	0.011*** (0.002)	0.012*** (0.002)	0.011*** (0.002)
Mother's Years of schooling*School Type		0.010* (0.005)		0.023 (0.020)
Predicted Inherited Wealth	0.009** (0.004)	0.012** (0.005)	0.012** (0.005)	0.012** (0.005)
Predicted Inherited Wealth*School Type		-0.014 (0.012)		0.001 (0.058)
Teacher absenteeism	-0.006** (0.003)	-0.005* (0.003)	-0.005* (0.003)	-0.005* (0.003)
Teacher Absenteeism*School Type		-0.006 (0.009)		0.085 (0.075)
Student teacher ratio	-0.008*** (0.001)	-0.008*** (0.001)	-0.009*** (0.001)	-0.008*** (0.001)
Student teacher ratio *School Type		0.004 (0.003)		-0.036* (0.022)
Availability of Separate Classrooms	-0.005 (0.027)	-0.030 (0.029)	-0.029 (0.029)	-0.031 (0.029)
Separate Classrooms*School Types		0.191***		0.091

Sitting Arrangement (Bad=1, Good=0)	-0.151*** (0.019)	(0.074) -0.157*** (0.020)	-0.154*** (0.020)	(0.329) -0.157*** (0.020)
Seating Arrangement*School Type		0.042 (0.053)		0.285 (0.283)
Availability of Blackboard	0.297*** (0.082)	0.406*** (0.076)	0.403*** (0.073)	0.400*** (0.073)
Blackboard*School Types		-0.687*** (0.103)		-0.618*** (0.018)
Functional Toilets in Schools	0.133*** (0.022)	0.113*** (0.024)	0.112*** (0.023)	0.113*** (0.024)
Functional Toilets in Schools *School Types		0.101* (0.061)		0.321* (0.190)
Playground	0.026 (0.027)	0.049* (0.029)	0.054* (0.029)	0.049* (0.029)
Playground*School Types		-0.183* (0.102)		0.574*** (0.009)
Drinking water facility	0.204*** (0.060)	0.213*** (0.063)	0.184*** (0.061)	0.212*** (0.062)
Drinking water facility*School Types		-0.114 (0.229)		-0.634*** (0.009)
Predicted Issue Discussed in Gram Sabha (School)	0.047*** (0.008)	0.048*** (0.008)	0.048*** (0.008)	0.049*** (0.008)
Predicted Issue Discussed in Gram Sabha (School)*School Types		-0.004 (0.024)		0.009 (0.083)
Predicted Mother's Participation in VEC	0.064*** (0.010)	0.082*** (0.011)	0.081*** (0.011)	0.083*** (0.011)
Predicted Mother's Participation in VEC*School Types		0.087*** (0.029)		0.015 (0.113)
Predicted probability of attending Private in first two regressions, Panchayat in second two regressions	0.30*** (0.022)	0.519*** (0.125)	-0.110* (0.059)	-0.070*** (0.001)
Test for Interaction (Joint) F (Chi2)		36.51		83.76
LR chi2	1644.95	1684.26	1484.70	1512.36
Pseudo R2	0.2510	0.2570	0.2622	0.2671
Observations	4,773	4,773	4,109	4,109

Standard errors in parentheses  
\*\*\* p<0.01, \*\* p<0.05, \* p<0.1



## **6 Conclusions**

This paper finds that female headed households are less likely to withdraw a child from school. But if there are more girls, withdrawal is more likely. If children are better nourished, they are less likely to be withdrawn from school. The scheduled castes, scheduled tribes and other backward casts are more likely to be withdrawn from school, while wealthier parents are less likely to take children out of school. Midday meals, electricity and other school infrastructure, lower student-teacher ratios, more female teachers reduce withdrawal from school. These results are important for providing several policy handles. Governments' incentives to households for ensuring enrolment of their children include a broad range of improvements in school quality and infrastructure, improved nutrition in the mid day meal schemes, and reducing biases against the vulnerable groups like the scheduled castes and tribes.

We show the determinants of schools choice and expenditures. We find that political reservations, regime change, discussions in Gram Sabha meetings, participation in VECs, all have significant impact on school choice and expenditures. Political reservations for women lead to more attendance in all types of schools, but mostly so to public schools. Private expenses go up if there is less school choice, if there is a VEC, where quality and religious instruction matter, and for wealthier parents. The result has also shown that an increased Panchayat expenditures increases participation in Panchayat schools and reduces private spending on education. Participation of mother in the VEC increases participation in public and Panchayat schools.

We find that predicted probability of students being able to read and write is 32 percent higher for private schools than public schools, whereas they are 12 percent lower for Panchayat schools. This suggests that private education expenditures raise the probability of being literate in rural

India. The distance to the nearest town decreases predicted literacy, suggesting an urban spill over effect. The result has shown that an increase in the electrification of village homes by ten percent increases predicted literacy rates by 3.3 percent.

Finally we find that after controlling for the individual, household, village, governance, infrastructure and other observable school characteristics, there remains a 30 percent performance gap between private and public schools, and an 11 percent performance gap between public and Panchayat Schools. In order to bridge the gap with private schools, measurable characteristics of public schools would have to be brought to higher levels than in the private schools, and similarly to bridge the gap between public and Panchayat schools. When interaction effects are included in the regressions, the gap associated with unobservable private school characteristics increases substantially, while the gap for panchayat schools goes down.

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