Participation in a School Incentive Program in India

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Abstract

Education policy has recently focused on improving accountability and incentives of public providers for actual learning outcomes, often with school-based rewards programs for high performers. The Learning Guarantee Programme in Karnataka, India, is prominent among such efforts, providing cash transfers to government schools that achieve learning at specified high levels. This study examines whether schools that self-selected into the incentive program are different than those that did not. The answer has important implications for how to evaluate the impact of such a program. Although we find no significant differences in resources and characteristics, we do find significant and substantial differences in test scores prior to selection into the program, with better performing schools more likely to opt-in. These findings also provide insight into how incentive-based programs that focus on levels of (rather than changes in) achievement can exacerbate inequality in education. Failing schools, since they are more likely to opt-out of incentive programs, are likely to require other targeted programs in order to improve. In addition, our findings reinforce the value of randomized controlled trials to evaluate incentive programs since evaluations that rely on matching schools based on resources (if, for instance, pre-program test scores are unavailable) will be biased if resources poorly predict test scores.

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1. INTRODUCTION

Can incentive programs that provide rewards for greater achievement levels lead to improvements by unleashing some hitherto hidden and untapped potential in schools? In particular, will those schools that are at the lower end of performance, that is, the most poorly performing ones, join such programs, and then improve? Performance differences across schools have usually been explained by either: (1) education production functions and differential resources (Hanushek, 1997 provides a review); (2) household and neighborhood differences from which a school's student population is drawn (Alderman et al, 1997; Glewwe and Jacoby, 1994); or (3) institutional variations in how schools are managed and held accountable for learning outcomes. This third area has recently become the focus of policy discussions in developing countries (see the conclusions of World Bank, 2004) and in the United States (Education Commission of the States 2004) that has led to experimentation with a variety of incentive programs.

Incentive programs have different mechanisms for deciding which schools will participate. Sometimes participation is mandatory, particularly when the program is part of a country-wide government initiative (e.g., "No Child Left Behind" policy of the United States). Alternatively, an incentive program can be voluntary, with individual schools deciding whether to opt-in or not. This is more common for programs conducted by private organizations or foundations, or by the government when funds are limited. In many developing countries, where country-wide initiatives are often difficult to fund, some combination of geographic or district targeting and self-selection usually determines enrollment into these programs.

As a result, an issue of real concern is whether poorly performing schools have a motivation to participate in these incentive programs. We focus here on incentive programs with an absolute bar for achievement (e.g., average scores must be above a certain threshold) rather than a relative requirement (e.g., schools in the top 25% receive an award) or changes requirement (e.g., schools that improve at least 15% on average test scores receive an award). If poorly performing schools are in fact less likely to opt-in to incentive programs than schools that already perform better, then such programs are likely to exacerbate quality differences across schools. The state of Karnataka in India hosts a unique incentive-based initiative in government primary schools known as the Learning Guarantee Programme (LGP). In 2003, at the time when this program was being piloted in a few districts of Karnataka, we collected data on school characteristics and performance from a random sample of schools that self-selected to participate in the program and those that did not. This provides a unique opportunity to study the participation decisions of schools willing to opt voluntarily into the program.

The LGP is a joint effort between Azim Premji Foundation (APF), a local non-governmental organization, and the Government of Karnataka (GoK). The program was designed by a team of education experts from APF, the GoK and outside academics. It reflects many of the ideas of performance-based awards in improving incentives and accountability of service providers. The creators of the program aspired to certify some schools as those that could guarantee learning, and reward them for their performance both through a cash "prize" as well as a public acknowledgement ceremony. This is expected to simultaneously change school incentives and parents' information base, motivating interaction between communities and schools and generating pressure for higher quality education. Participation in the program is

voluntary and the decision to join is made by school insiders -- the teachers and elected parental bodies that monitor school performance, called School Development and Monitoring Committees (SDMC). The program was piloted between November 2002 and December 2004 in eight of the most disadvantaged districts of the state of Karnataka, where learning achievements lag the rest of the state.

All 9272 public primary (and upper primary) schools in the program districts were directly contacted by APF in the early months of 2003, and provided with materials to sign-up for the LGP. APF monitored this solicitation process closely to ensure that no school was unaware of the existence of the program. In June 2003, APF confirmed with 896 schools that they were participants of the program and would be evaluated between July and September 2003. That is, the first LGP evaluation of schools was designed to take place immediately after schools were confirmed as participants (Azim Premji Foundation 2005).

Detailed data on school characteristics and functioning were collected from over 100 schools in one of the program districts, Bellary, between September and October 2003. After the completion of the first-round LGP evaluation exercise, 77 were drawn randomly from the group of schools that requested the LGP prospectus and 51 drawn randomly from the group that did not. The LGP evaluation was extended to the non-participating schools in the sample to facilitate performance comparison with participants. This paper analyzes the determinants of participation, presenting evidence on the differences between schools that never expressed interest in the LGP and those that did. Understanding the participation decision is critical to thinking about appropriate evaluation methodologies.

In brief, we find that participating and non-participating schools had remarkably similar characteristics and resources as measured by the survey in the first few months of the program. Yet when students in sample schools were tested on state-prescribed competencies in language and mathematics, those in schools that expressed interest in the LGP program outperformed those that did not by over 18 percentage points. This difference in performance reflects self-selection of better performing schools into the program, with the poor performers being more likely to opt-out. This follows intuitively from that fact that the reward is based on the level of—not the change in—performance. As such, schools achieving high standard levels prior to the start of the initiative are most likely to win the incentive, regardless of their actual effort made whilst in the program. This selection effect could result in the entrenchment of pre-existing inequalities if better-off schools participate in the program, garner financial rewards, and invest them in the schools. This paper thus presents evidence that suggests that to reach and improve poorly performing schools, voluntary incentive programs with level performance requirements are inappropriate.

Furthermore, the paper makes a methodological contribution to the program evaluation literature. With the exception of test scores (which are not always available), there is a lack of other observable differences across participating and non-participating schools. This supports the need to use randomized controlled trials to evaluate such programs, rather than rely on retrospective studies that use matching techniques. This is because these studies are at a minimum unlikely to adequately address the selection-bias arising from voluntary participation when test-scores are unavailable.

Section 2 provides a review of the literature on incentive programs in education. Section 3 describes some details of the design and implementation of the LGP. Section 4 presents evidence on selection into the program. Section 5 then discusses implications of self-selection for evaluation of program impact, and section 6 concludes.

2. BACKGROUND LITERATURE

Recent studies in developing countries have focused on rigorously evaluating the impact of different education initiatives, both the inputs-oriented initiatives (e.g., adding teachers to the classroom, providing wall-charts, textbooks or in-school health initiatives such as de-worming) and those that are incentive-oriented (e.g., providing rewards to families, teachers or schools for excellent performance). Traditional inputs such as textbooks and flip-charts, that showed significant impact in retrospective analysis, have been shown to have no measurable impact when prospective techniques of randomized experiments were used to evaluate impact (Glewwe, Kremer et al. 2004). The underlying problem is that retrospective analysis is constrained in addressing the selection bias—schools or teachers that elect to use textbooks and flip-charts are more likely to be high performers, thereby upwardly biasing impact estimates.

In contrast, relatively new and innovative inputs in remedial teaching and school-based health programs have demonstrated success when evaluated using the randomized experimental techniques. Remedial teaching assistants, selected and managed by an NGO, and provided to schools in Mumbai and Vadodara raised test scores by 0.15 standard deviations in the first year of the program and 0.25 standard deviations in the second year (Banerjee, Cole et al. 2004). De-worming services offered in schools in Kenya improved health and school participation not only

in program schools but also in neighboring schools because of reduced disease transmission (Miguel and Kremer 2004). The fact that these successful programs have been designed, managed, and implemented by committed NGOs has emphasized the need to understand whether the success of inputs-based initiatives depends upon the incentives of implementing agents.

Policy attention has recently shifted to incentive-based initiatives ranging from decentralization, to performance-based pay for teachers, to conditional awards to schools, to vouchers and school choice. In a debate on the relative input-effectiveness versus the incentive-based approach to improving educational outcomes, Hanushek (1995) and Kremer (1995) agreed on the desirability of experimenting with new incentive systems for schools. We now review a growing literature of randomized trials of incentive programs intended to improve teaching and school performance.

A new study has highlighted that teacher incentives may encourage large-scale teacher absenteeism in developing countries, which in turn is associated with lower student attendance and test scores (Banerjee and Duflo 2006). New and systematic data has recently been collected on absenteeism of teachers through independent surveys, and shows for India that average absence rate is higher than 24 percent (Chaudhury, et al, 2005). Alongside this research effort, some experimental studies were undertaken to improve incentives for teachers to come to school more regularly. Duflo and Hanna (2005) studied single-teacher non-formal education centers run by an NGO, Seva Mandir, in Rajasthan, India. Seva Mandir gave some randomly selected teachers a camera with a tamper-proof date and time function, required them to take photographs of themselves with their classrooms at the start and end of a teaching day, and conditioned teacher salary increases on their attendance, as corroborated by their photographs. This

intervention not only increased teacher attendance, but one year later test scores in program schools were 0.17 standard deviations higher than in the comparison schools (Duflo and Hanna 2005).

The importance of objective monitoring in the success of such incentive schemes, as in the investment by Seva Mandir on cameras, is highlighted by a program in Kenya which delegated to head teachers the task of monitoring their colleagues. The Dutch NGO Internationaal Christeljik Steunfonds (ICS) ran the "Early Childhood Education Project," which included an incentive program awarding pre-school teachers a bonus of up to 1,000 Kenyan shillings ($13) depending on the number of unexcused absences in the month. Kremer and Chen (2001) found that head teachers who were responsible for giving bonuses to teachers generally disbursed the payment regardless of teacher absence. The "incentive" payment ended up replacing regular salaries for pre-primary teachers, which were normally funded by parents (Kremer and Chen 2001).

Similarly, the importance of program design is illustrated by contrasting evidence from two different programs of performance-based pay for teachers, one in Israel and another in Kenya. Lavy (2005) studied a set of high schools in Israel, which were below the national mean matriculation rate of 45%. Teachers of English, Hebrew, Arabic, math and other subjects in these high schools competed in a tournament where their students' performance relative to each other earned teachers bonus pay from the Ministry of Education. Being in the highest quartile in both mean performance and matriculation pass rate would earn the teacher an award of $7,500, which is significant compared to the average gross annual income of high school teachers of $30,000. This incentive system, based on relative improvements in performance, led to significant

improvements in mean test scores (Lavy 2005). In contrast, in Kenya, a program that sought to improve teacher incentives by rewarding teachers conditional upon student test scores was associated with higher performance only in the short run. ICS provided prize money for teachers in grades 4 to 8 of public schools based on the performance of the school as a whole on the district exams in each year. Twelve schools were awarded for highest performance and twelve were awarded for the largest improvements versus an established baseline. The teachers in winning schools received awards ranging from 21% to 43% of an average monthly salary. The study found no long-term gains in learning achievement, in increases in teacher attendance, or in changes in teaching methods. Instead, the teachers responded by conducting test preparation sessions and administering more tests (Glewwe, Ilias et al. 2002).

Incentive programs targeted at individuals have also been shown to increase learning directly, rather than through teacher attendance or performance. In Kenya, ICS also ran a Girls Scholarship Program that offered a grant and school fees (in total about $38) to girls in public schools who scored in the top 15% on their 6th grade district exam, which led to improved test scores for girls (and some boys) (Kremer, Miguel et al. 2004). A Ministry of Education program in Israel provided small cash incentives to students in low-performing high schools to take their matriculation exams, and larger cash incentives were awarded to students who passed the exams. The maximum award a student could get for passing all achievement milestones was NIS10,000 ($2,400). The program increased matriculation rates by 6-8 percentage points, but was mainly effective at pushing students near the pass cutoff over it. It was also controversial and the government was forced to discontinue it (Angrist and Lavy 2004).

When a new incentive directly benefits the individual who is required to contribute more effort, we generally expect more effort to be produced. At a theoretical level, the effectiveness of school-level incentives is not as clear as individual incentives. On one hand, rewarding the school with cash to be used for school purposes may not be a strong enough incentive for teachers to increase their individual attendance or effort, even in a small school where teachers can easily monitor each other. Nothing in the LGP design prohibits schools from sharing an award among teachers as a "bonus," but it is far from guaranteed that any teacher would benefit individually if the program recognized her school. Teachers whose efforts increase stand to gain a reputation benefit of working in an LGP-recognized school, but their financial gain is uncertain and includes the likely possibility of no bonus at all. On the other hand, instituting incentive pay for individual teachers raises the possibility of reducing cooperation among teachers and of crowding out intrinsic motivation, thus leaving individual incentives in place may be preferable (Frey and Jegen, 2001).

The introduction of new initiatives such as increasing school autonomy and promoting community participation in school management has been suggested to improve child attendance and learning by making schools more responsive to their beneficiaries (Jimenez and Sawada 1999; King and Ozler 2000). However, a rigorous evaluation of the impact of such programs is constrained by the ability to correct for selection bias in the program. In recent and on-going work, Banerjee et al (2006) experimentally implemented different strategies of empowering village communities in the state of Uttar Pradesh in India to demand higher quality education services from their village schools. Their findings from the baseline survey prior to the interventions, and field experience in undertaking the interventions, suggest that there is a

general apathy among citizens to improving education through local collective action. This work cautions against excessive optimism of community-based approaches to improving education. External facilitation of rewards programs like the LGP to change teacher incentives therefore continues to be an important policy instrument to explore and design better to attain the intended impact of improved learning.

3. LEARNING GUARANTEE PROGRAMME

The LGP is one of the flagship programs of the Azim Premji Foundation (APF), a non-profit, non-governmental organization created in 2001 in the southern Indian state of Karnataka with the objective of improving the quality of public education in the country. Its founder, Mr. Azim Premji, is a leading industrialist and philanthropist in India. One of the central concerns of the LGP was to devise a methodology to evaluate the extent to which students were developing practical competencies of problem solving and analysis, as opposed to learning by rote concepts of which their understanding is limited (Azim Premji Foundation 2005).[1] The test to be administered to students for such an evaluation was developed by a pedagogical team composed of APF staff and outside experts. The evaluation tool was also conceived as an instrument for strengthening incentives for school quality by rewarding high performers, and setting them as an example for poor performers to demonstrate that it is possible to improve. For this purpose, the program set specific criteria for determining whether a school could be designated a "Learning Guarantee School", which is summarized in Table 1, and differential rewards for the level of learning achieved.

[1] See the LGP concept note posted on the APF website: http://www.azimpremjifoundation.org/downloads/LGPconcept.pdf

Table 1: Criteria to be a "Learning Guarantee School"

Criteria	Learning Guarantee School: Category A	Learning Guarantee School: Category B	Learning Guarantee School: Category C
Enrollment	100% of children (ages 6-14) in the habitation area of the school		
Attendance	90% of the enrolled to have attended at least 75% of school days		
Learning	80% of all enrolled in grades 2-5 score at least 90% on competency-based test	70% of all enrolled in grades 2-5 score at least 90% on competency-based test	60% of all enrolled in grades 2-5 score at least 90% on competency-based test
Award	Rs. 20,000 (approx. US$500)	Rs. 10,000 (approx. US$250)	Rs. 5000 (approx. US$125)
Source: (Azim Premji Foundation 2005)			

Including a criteria for enrollment and attendance of children at the "habitation" level (a village or collection of hamlets serviced by a government school) addresses the risk of school administrators focusing only on the brightest or most advantaged students to attain high test scores (and even worse, forcing poorly-performing students to leave the school). The testing under this program was scheduled to be undertaken in the months of July-September, which is the beginning of a new academic year in India, immediately following summer vacations, so the children are assessed for competencies they are expected to achieve at the end of their previous grade.

The LGP was launched in November-December 2002 with an orientation program for all Block Education Officers (BEOs) in the 8 program districts in the state of Karnataka, the Block being the lowest jurisdictional level to which the management of public schools is directly assigned. The schools themselves were contacted in early 2003, with APF soliciting

"prospectuses" (written information from each school on its relevant statistics) to join the LGP from all 9272 government primary schools in the program districts. The solicitation process was extensive and involved personal visits by APF workers to each school and SDMC, as well as obtaining signatures of the head teacher and an SDMC member upon receipt of the information package. APF placed considerable emphasis on monitoring this solicitation process to ensure that no school was unaware of the existence of the program. Less than 1900 of the more than 9000 schools, about 20 percent, sent back a completed prospectus and expressed interest in the program. Since APF went through considerable effort to ensure that all schools were informed about the program (and have the signatures of school authorities upon receipt of the materials to prove this), the likely reasons the majority of schools did not express interest in the program are that they did not want to expend effort completing the detailed APF prospectus and that they did not want to expose school records to the scrutiny of external evaluators.

In June 2003, APF confirmed with 896 schools that they were part of the program and would be evaluated between July and September 2003. This first round of the LGP evaluation appears to have functioned largely as a pilot to refine the evaluation methodology and to understand how schools were performing at the start of the program (Azim Premji Foundation 2005). A team of external evaluators unaffiliated with the government assessed the schools. APF hired and trained 37 area coordinators and 584 evaluators to take on the task of testing students and checking records in all schools. They inspected school records to assess enrollment and attendance, and administered math and language learning tests to assess student competency. The

tests were both oral and written and administered over a four-day period to students in Class II - V in each school.[2]

In the second program year, APF evaluated 1,443 participating schools between July-September 2004. Based on school records and registers, the team of APF evaluators concluded that 94% of the 1,443 program schools fulfilled the enrollment criteria, and of these 94% nearly 55% also fulfilled the criteria of attendance, again, as measured by entries in school registers (Azim Premji Foundation 2005). Every child in grades 2-5 in the schools was tested for language and math competencies.

None of the participating schools was able to qualify under categories A and B (as per Table 1), and only 84 schools qualified as Learning Guarantee Schools under category C—that is, schools where at least 60% of the children tested were able to score 90% or above on the competency test designed by APF. Hence, of the total population of public primary and upper primary schools in the program districts in Karnataka, only 16% of schools agreed to be evaluated, and fewer than 6% of the participating schools were able to qualify for the lowest Learning Guarantee award. No school qualified for the higher levels of the award. The participating schools that did not win any award were significantly lagging the winning schools in average test scores, which were 55% in the former compared to 93% in the latter. This distribution of actual performance by LGP participant schools suggests that the program winning criteria were set high compared to the level at which schools were performing prior to the program.

[2] APF reports that an award function (for the first round) was held in the district of Gulbarga in February 2004 attended by teachers and community members of award-winning schools, but does not provide data on how many schools won and at what level of performance.

APF reports that an award function for the second year of the program was held in December 2004 in Bellary district and was attended largely by teachers and community members from the 84 winning schools and not by the other participants that did not win the LGP award. Following the award function APF organized a team of 42 volunteers to visit each of the 1,443 participating schools during March 2005 to provide feedback on their performance to the Head Teachers. APF also facilitated meetings among government education functionaries in two of the program districts in May 2005 to deliberate upon the methodology and results of the evaluation and come up with strategies to improve performance. From the description provided by APF, it appears that the thrust of program implementation occurred between December 2004 and May 2005 with the provision of feedback to all participating schools on their performance, and facilitation of discussion amongst education functionaries on how performance could be improved.

By the end of the third year of implementation, APF reports that participation in the program went up to 1,889 schools (20% of the total), and 144 schools (8% of the participants) won the Category C award. Again, no school won the awards in the higher categories. At this time, APF organized larger and multiple award functions that were held in each of the program districts for their participating schools. In addition to awarding the LGP prizes to the 144 winning schools, these award functions also recognized the other participating schools by presenting them with a feedback report and a set of books as a memento of their participation.

APF reports that the LGP was extended in different forms in Karnataka and other major states of India. The evaluation methodology of the LGP is in the process of being adopted by the

Government of Karnataka to replace its traditional testing and examination system in primary schools.

The program experience described above provides suggestive support for the argument of this paper that observed differences in our sample between participating and non-participating schools is due to self-selection rather than program impact. First, the program was not fully implemented until early 2005, when specific feedback was provided to participating schools on their performance and discussion was facilitated on how performance could be improved. This feedback and discussion process had been conceived as critical in APF's early writings on the design of the LGP to enable schools to improve performance (APF, 2002). APF publications indeed describe the initial implementation of the first round of the LGP as a "learning journey", when program details were still being ironed out (APF, 2005). This suggests that the period during which our data was collected to analyze program participation, September-October 2003, was too early in the program's life cycle to expect incentive impact because the program was not fully implemented as conceived.

Second, the program's targets for learning were set so high that only a few schools even among participants were able to achieve them, and even these "winning" schools achieved only the lowest level of the award. Although this is *ex-post* knowledge for us, the outside observers and the APF team, it is not unreasonable to expect that many schools would already have this knowledge when they were reviewing the program criteria and deciding whether to participate.[3] It is also not unreasonable to expect that at the beginning of the program schools would expect benefits from program participation only if they "won." That is, even if the program evolves to provide other forms of benefits to all participating but non-winning schools, such as technical

[3] Except of course the schools that are uninformed of the level of learning of their own students.

assistance and information that might help schools to improve their performance, schools might not know this at the start of the program. This characteristic of the program—that it set very high standards for rewards that very few schools would be able to achieve—is more likely to have led to self-selection of higher-end performers at least in the first year of the program when program benefits for non-winners were most uncertain.

4. DATA & EVIDENCE ON PROGRAM PARTICIPATION

During September and October 2003 we undertook a survey of over 100 schools in collaboration with APF. About half were randomly selected from the list of schools that never expressed any interest in the program, and the other half were taken from the pool of schools that expressed interest in the program and joined the program in its first year.[4] All of these schools were located in Bellary - one of the eight program districts. Detailed data on school resources and parental participation in the school were collected through structured interviews of teachers and local school committee members as well as through direct observation of school functioning by the interviewing teams. The surveys captured information on items such as school inputs purchased the previous year, facilities available by the survey date, official enrollment and attendance statistics, teacher education, experience, and their reported job satisfaction, and finally school committee membership and activities. Data on village or town census area characteristics, such as literacy, social composition, and availability of public services, from the 2001 Census of India provide information on "neighborhood" characteristics prior to the program's launch.

[4] Some of the schools on this list turned out to have only expressed interest in the program but had not completed the paperwork to formally enroll in the program. In the empirical analysis below we present results including these 13 schools in the sample of participants, and note if the results are different when these 13 schools are excluded from the list of participants and included instead in the group of non-participants.

Additionally, students in the 3rd and 5th standards were tested between July and October, 2003 for basic competencies in math and their language of instruction using the LGP evaluation methodology. The test was administered 8 to 10 months *after* the program was announced to schools, and 1 to 4 months after participation status of schools was confirmed. Ideally, to answer the question we pose here, these tests would have been administered *before* the program announcement in order to more precisely estimate the participation decision. However, we do have test results *prior* to program announcement for a subset of the sample: district authorities provided grades for the "Seventh Standard Leaving Exam" from March 2002 (nine months before the LGP was announced) for the 61 "upper" primary schools in the sample, which extend up to the seventh standard. These 7th standard test scores, since they were obtained *prior* to the announcement of the LGP incentives, are the best measure of any participation bias with respect to test scores. However, there are two drawbacks of relying just on these scores to understand differences between LGP participants and non-participants, first because we only have these data for 61 upper primary schools out of the 100 schools, but perhaps more importantly because the testing methodology upon which the scores are based might not be as high quality as the LGP test to discern performance differences across schools.

We use these data to answer the main question of this paper: How do schools that express interest in participating in the LGP differ from schools that showed no interest at all, and what can we learn from this about potential program impact? The evidence presented in this section has been analyzed using two techniques. The first compares mean values of school and village characteristics of schools that expressed no interest in the program to those that ended up joining the program (or had expressed preliminary interest). The second method estimates the

probability of a school joining or at least expressing interest in the LGP using multivariate regression and probit models. We explore differences between interested and not-interested schools along four broad dimensions: 1) school performance, as measured by test scores and child attendance; 2) school inputs and measurable resources, such as teacher-student ratios, teacher education, textbooks, chairs and desks, cash resources, and availability of facilities such as toilets, electricity, and running water; 3) community participation, as measured by the activities of village-level governance bodies, and the extent to which school teachers have ties to the local community; and 4) neighborhood characteristics available from the Census 2001 that are likely to be correlated with the population's demand for quality education.

Table 2 compares sample means of measures of school performance, school-specific resources and inputs, student and teacher characteristics, community participation, and neighborhood characteristics between schools that expressed interest in participating in the program and schools that did not. Table 3 omits from the analysis the 13 schools that expressed interest in the program but did not formally join, and presents differences between the schools that expressed no interest in the program and those that actually joined. The striking pattern emerging from these tables is that participating schools are significantly more likely to be better performing schools as measured by test scores and child attendance, and more likely to experience community participation, but no different in the availability of school-specific resources and inputs.

Among the 61 schools in our sample that are upper primary schools for which the Seventh Standard Leaving Exam scores are available *prior* to program announcement, the

average "total marks"[5] is 25.7 points higher for Interested/Joined schools than for the Not Interested schools. This difference in test scores corresponding to expressing interest in the program is equivalent to 0.22 standard deviations and is significant at the 90% level. The difference in the average first language scores taken alone is 6 points higher for the Interested/Joined schools, a significant difference at the 95% level. Math scores are 4 points higher as well, but this difference is not statistically significant. Figure 1 demonstrates this primary finding of the paper that program participants are likely to be better performing schools as measured by test scores, with the poor performers choosing to opt-out. It shows the kernel density estimate of the distribution of test scores on the Seventh Standard Leaving Exam administered prior to program announcement, broken down by whether or not the schools expressed interest in the LGP.

The difference in average "total marks" on the Seventh Standard Leaving Exam between the group of schools that actually joined the LGP (31 schools) and the group that expressed no interest (21 schools), reported in Table 3, is positive but not statistically significant. However, the difference in first language score is positive and significant at the 90% level.

As mentioned earlier, the 7th Standard Leave Exam scores are obtained prior to program announcement and are therefore reflecting self-selection of particular types of schools into the program rather than program impact on performance. However, this testing data is only available for 61 schools that are not representative of a typical primary school in the district (which does not go beyond grade 5). Furthermore, the examination methodology underlying these scores is not likely to be as discerning of student learning achievement as is the LGP test. The LGP test score measured 1-4 months after schools were confirmed as participants in the program shows

[5] Total Marks is comprised of six individual exam marks: three languages, math, science, and social studies.

even larger differences in performance between interested and not-interested schools. We find that the average student test score combining math and language tests was 58% for Interested/Joined schools but only 40% for Not Interested schools. The difference between these scores is statistically significant at the 1% level for the comparison of "not-interested" schools with both "interested and/or joined" (in Table 2) and "formally joined" schools (in Table 3).

We measure student absenteeism, another aspect of school performance likely correlated with learning, by examining attendance registers for July 2003 (1 month after school participation in the program was confirmed). We find less absenteeism —only 6% of students in interested schools attend for less than 20 days in the month, compared to 9% in non-interested schools. We also measure attendance by conducting a single surprise visit on one randomly picked day. We find 77% attendance at Interested/Joined schools and 69% at Not Interested schools.

Schools are statistically indistinguishable in inputs and resource availability as measured by: availability of running water, electricity, and toilets; student supplies such as desks, chairs, notebooks/textbooks, cash per student; percentage of teachers per school holding an education above that of secondary school; and student-teacher ratio.

As mentioned earlier in section 2, one of the problems with public education systems in developing countries that recently received a lot of research and policy attention is that of teacher incentives and absenteeism (Chowdhury and Hammer, 2005; The World Bank, 2004). This study did not collect data directly on teacher absenteeism, but we did ask school head teachers to identify the percentage of teachers in their school that are indigenous to the village, under the assumption that if teachers are native to the village they are more likely to reside there and thus

have lower costs of attendance. Teachers that belong to the village where the school is located might also have greater ties to the community and experience informal pressure to care for the school's performance. The converse, of course, could also be true, if they belong to powerful elite families in the village and are less accountable to poor villagers.

Quite interestingly, we find a significant difference between participating and non-interested schools in this dimension of teacher background. Among the group of schools that joined the program 20% of teachers on average are native to the village, compared to 11% in schools that expressed no interest, and this difference is significant at the 90% level (Table 3). There is no evidence that this difference is due to schools' response to the program. That is, the school survey does not show that significant numbers of new local teachers were hired within the few months time between participation in the program and the fielding of the survey.[6]

The family background of children enrolled in the school might also matter for participation. In India in particular, a school has a higher proportion of children coming from particular social groups designated Scheduled Castes and Tribes that are historically disadvantaged, then it might feel less pressure to participate, or might be a laggard performer and decide not to participate.[7] We measured the proportion of children enrolled in a school that belong to Scheduled Castes and Tribes and find no difference between the schools along this dimension.

[6] We asked the school head teachers how long each teacher currently employed by the school had been at the school. Only 41 teachers in the whole sample of 377 teachers had been at their school less than 5 months, and only 7 of these recent hires were native to the village. These 7 were almost equally divided between LGP and non-LGP schools, with the former accounting for 4 of the 7 new local hires.

[7] Pandey (2005) and Hoff and Pandey (2004) provide new evidence on the importance of caste identity in India for school and child performance.

Community participation is measured by activities of a local school governance body—the School Development and Monitoring Committee (SDMC)—which consists of parents elected by the community to monitor school performance. Villages in India also have a general institution for community participation in all types of public services—the Gram Sabha, which is a village-wide gathering of all adult citizens to deliberate upon matters of local public services. We asked all survey respondents about various SDMC activities and about whether school affairs were discussed at the most recent Gram Sabha in the village. We find that a higher proportion of participating schools were likely to have an SDMC discussion about teacher attendance, a critical area that SDMC's are empowered to monitor (64% of Interested/Joined schools, and 39% of Not Interested schools reported that the SDMC discussed teacher attendance at a staff meeting). There are no differences between the groups of schools in the extent to which the Gram Sabha discussed education.

This difference in SDMC activity between participating and not-interested schools could easily be in response to the program. Indeed, school committees such as the SDMC that want to improve learning outcomes in response to the new incentives should probably strive to improve teacher attendance and performance. However, even if the evidence of greater SDMC monitoring of teachers in participating schools is a response to the program, this difference in community participation still suggests that committees are more likely to be active in participating schools.

The neighborhood characteristics likely to have an impact on school performance that we focus upon are those that have been emphasized in the literature on education in India—female literacy, proportion of disadvantaged social groups in the population (Scheduled Caste and Scheduled Tribe, in the Indian terminology), distance from the nearest town, and the number of

middle schools in the census area.[8] The only difference is in the physical location of participating schools—rural schools that were interested in the program are likely to be located in villages that are closer to towns (17.87 km for Interested/Joined schools and 20.74 km for Not Interested schools). Rural participating schools are also more likely to be in villages that have Post and Telegraph Facilities (87% for Interested/Joined schools and 67% for Not Interested schools). This location difference might explain why participating schools are likely to have a higher proportion of teachers indigenous to the village.

Thus, from a simple comparison of means we find an interesting pattern—schools interested in participating in the program are better performing schools, as measured by student test scores, student attendance, and community participation in monitoring teachers, but do not differ systematically in easily observable school inputs. Since the LGP tests were administered and data on attendance and community participation was collected *after* the program began and not before, this difference could have been driven by selection (only the best schools sign up), or alternatively by the actual impact of the program (schools improved their performance in order to win the award). We will address this issue in some more detail in the next section, but first we report whether these differences between participating and non-participating schools are robust in multivariate regression analysis.

Table 4 presents the multivariate regression analysis of program participation using a linear probability model. All models include fixed-effects at the *taluk* level (a jurisdictional level below the district—Bellary district, from which the study sample is drawn, has 7 *taluks*) to account for differences in general public administration quality across schools. Column 1 of

[8] Most villages in India have at least 1 primary school owned by the government. However, coverage of middle schools is substantially lower, so that the existence of multiple middle schools in a village is more likely to capture the population's demand for schooling.

Table 4 presents the regression for interest and participation in the LGP including the 7th Standard Leaving Exam score as a predictor, and neighborhood characteristics as measured by the 2001 Census, that is, variables on which data was collected prior to the program. We find that these test scores prior to the program are significant in predicting a school's interest in the program at the 90% level of confidence, even after controlling for neighborhood characteristics. School location is an insignificant predictor in this multivariate setting, and for this smaller sample.

Column 2 of Table 4 presents the determinants of interest/participation in the LGP for all 128 schools in our sample focusing on school resources and teacher, student, and neighborhood characteristics. Teacher characteristics and student-teacher ratios are not significantly different across the two types of schools. Cash resources per student are very slightly larger (significant at the 90% level of confidence), while textbooks per student are slightly lower in participating schools (at the 95% level of confidence). We also include enrollment of children from disadvantaged social groups (Scheduled Castes and Scheduled Tribes) but do not find this to be a significant predictor of participation. We find that schools located in villages that have post and telegraph facilities are more likely to participate in the program.

Column 3 of Table 4 considers the LGP test score, student attendance and community participation as predictors of a school's interest in the program, while controlling for neighborhood characteristics. These performance variables continue to be significant in this multivariate setting, and taken together explain an additional 25% of the variation in program participation, after accounting for neighborhood characteristics and *taluk* fixed effects. Column 4 of Table 4 adds school resources to the model, thus including almost all the variables whose

means were presented in Table 2. The only significant predictors of program participation are LGP test scores and community participation.

Table 5 presents the analysis using probit specification, finding approximately the same results with a few minor exceptions. Post and telegraph facilities and cash received per student are not statistically significant predictors of participation in this specification (Column 2, Table 5). Texts received per student are significant predictors in the probit specification only when included along with LGP test scores, and the coefficient continues to be negative (Column 4, Table 5). Further, test scores and community participation are even larger predictors of a school's interest in the program under this specification.[9]

In sum, we find that the only robust and substantial differences between schools that expressed interest in or joined the program and those that did not are in LGP test scores, student attendance, and community participation, with no robust differences in measurable school inputs and teacher characteristics.

[9]Most of these results are robust to the removal of 13 schools that expressed interest in the program, but never actually joined. When the sample is restricted this way, we re-run all 8 model-specification pairs and find the differences in the restricted samples are:

- The 7th standard leaving exam is no longer significant in predicting strict joining when the schools that expressed interest but did not join are omitted
- ST population becomes significant at 10% level in one model – the restricted probit model 3
- "Post & Telegraph" becomes significant at 5% level in one additional model, restricted probit 2
- Distance to nearest town becomes significant at 5% level in restricted models 3 and 4 under both linear probability and probit model specifications
- Cash becomes significant at 5% level in one more model – the restricted probit model 4
- Textbooks lose their significance in one model – the restricted probit model 4
- Teacher % originally from this location becomes significant at 10% level in one of the two models where it appears – restricted probit model 2
- Community participation (discussion of teacher absence in SDMC meeting) loses its significance in two models – restricted probit models 3 and 4
- LGP test scores remain significant and substantial predictors of program participation

5. IMPLICATIONS FOR EVALUATING PROGRAM IMPACT

The significant relationship between interest in the LGP and higher test scores, student attendance, and community participation can be interpreted alternatively as program impact or self-selection of better performing schools into the program. For three reasons outlined below, we argue that the difference in test scores is due to self-selection of better performing schools, not because of the impact of the program.

First, although the LGP tests were administered after the enrollment of schools in the program, the schools only had a few months to make changes at their school prior to administering the tests. This short time period makes the difference highly unlikely to be from the programme's impact. If test scores in Joined schools were the same as test scores in Did Not Join schools before the announcement of the program, then participants would have had to increase their scores by 55 percent of the average (0.89 standard deviations) in the 4-6 months of teaching-time available outside of school exams and holidays. Compared to the randomized control trials of the Balsakhi program in Mumbai and Vadodara, which found at most a 0.25 standard deviation increase in test scores *when a teaching assistant was provided*, this seems unlikely. The highest gain from pre- to post-test in the first year of the Balsakhi program was a 15.8 percentage point or 46 percent increase (from 34% to 49.8%) in verbal scores for fourth standard students in Vadodara (Banerjee, Cole et al. 2004). Thus, a program impact interpretation for the LGP case would mean that Joined schools increased test scores by 22 percentage points or 55 percent in less than six months, given no additional inputs of any kind, but rather simply in response to the possibility of winning a prize. This seems unrealistic when compared to the magnitude of impact found in the Balsakhi and other interventions.

Second, the 7th standard exams, taken *before* the launch of the LGP incentives, provide the cleanest evidence that the schools differ on selection, showing that schools that expressed interest in the LGP incentives were higher achieving schools beforehand.

Finally, as a part of our survey, teachers in program schools were asked what changes they expected due to the LGP. They consistently answered this open-ended question in broad and vague terms of improved attendance, learning levels, overall improvements, or better teaching. Of the 183 teachers asked what changes they anticipated in their school, none answered in a manner that indicated the schools had any concrete plans by which they were attempting to improve student attendance or performance in order to increase their chances of earning the LGP award.

We do find differences between program and non-program schools in student attendance and community participation specifically directed to the issue of teacher attendance. We are unable to distinguish whether these are part of the self-selection of the better schools into the program, or due to program impact. Yet, in either case the evidence here highlights the importance of non-tangible and difficult to observe processes at the community-level that shape the incentives of both providers and beneficiaries.

Given the significance of village location, that occasionally appears in our analysis, an interpretation could be that better-located schools attract better teachers and serve communities that care more about education. The interesting point here is that the suspected advantages of well-performing schools are not obviously derived from easy-to-measure school-level inputs (such as textbooks, desks or chairs), but rather from largely unobservable phenomena of teacher and student commitment.

Another interpretation of the significance of village location is that it captures the socio-economic well being of households. If villages located closer to towns or with post and telegraph facilities are more likely to have better-off households that can provide a better learning environment for their children, and are more demanding of quality services, then this might be driving the correlation with school performance and decision to participate in the incentive program.

We explore this point further by analyzing the correlates of variation in school performance as measured by LGP test scores. In Column 1 of Table 6, we include school resources, teacher characteristics, percent of enrolled children belonging to SC/ST groups, and neighborhood characteristics as determinants of variation in LGP test scores. In Column 2 we also include student attendance and community participation variables as predictors, although these are likely to be endogenously determined along with test scores. We find no significant or robust correlation between LGP test results in a school and its resources, teacher and neighborhood characteristics. The only significant covariant of test scores is student attendance—schools with higher rates of attendance among enrolled students (as measured in a surprise visit by our surveyors) are also schools where the students score higher on the LGP test. However, we do not find significant correlation between test scores and community participation, measured particularly as monitoring of teacher attendance. The difference in test scores between participating and non-participating schools is therefore unlikely to be due to differences in community participation across schools, which is the instrument that schools could have used immediately to respond to the program's incentives.

Our findings suggest that the specific design of the rewards program has important distributional implications. The LGP conditions the cash reward to a school on its absolute level of student enrolment, attendance, and achievement, irrespective of prior performance. This may lead to better schools participating in the program, with the poorer performers opting out, and hence this could exacerbate inequality across schools.

There is also an important methodological implication brought out by this study. Adding to the finding of omitted variables bias in retrospective versus prospective data to measure the effectiveness of flip charts in primary schools in Kenya (Glewwe, Kremer et al. 2004), a proper evaluation of the impact of this kind of levels-based incentive program must also consider the selection bias of those who voluntarily join. Here we find that observable information cannot predict the decision to join, yet the Interested/Joined and Not Interested schools differ significantly on test results. This suggests that non-program characteristics that account for some schools being better than others cannot be easily measured using standard survey instruments and are therefore likely to be neither appropriately "controlled for" nor "matched upon" to evaluate program impact. A matching exercise, for instance, would fail to control properly for omitted variable bias and a randomized control trial might be the only reliable methodology to measure program impact.

6. CONCLUSION

Programs such as the LGP, which aim to improve outcomes by creating direct incentives to schools, are becoming popular around the world. We find schools that participate in a *level-target (not improvement-target)* incentive-based program have better test scores and student attendance than non-participating schools, but otherwise cannot be distinguished (i.e., observable

school inputs are the same, but outcomes differ in important ways). The self-selection into such programs is important: rewarding improvements rather than rewarding fixed levels may address some of this problem, but it also raises other problems. Schools that start out at different levels and need to exert different effort levels to improve, will respond differently to the same incentive structure. Much care needs to be taken in the design of these programs in order to avoid undesirable distributional outcomes whereby school quality is made more unequal, and the worst performing schools are actually targeted *out*, not *in*, of the program.

More generally, the finding that participating schools perform much better on outcomes such as test scores and student attendance, but are similar in physical resource availability, is suggestive of the importance of unobservable resources that affect incentives for learning. Programs such as the LGP that aim to improve incentives and accountability have promise, but the self-selection of well-performing schools suggests that a challenge lies in reaching out to the weaker-performing schools. Further work is required to design programs that do not leave the weakest schools behind.

Figure 1: Kernel Density, Pre-LGP 7th Standard Exam Marks

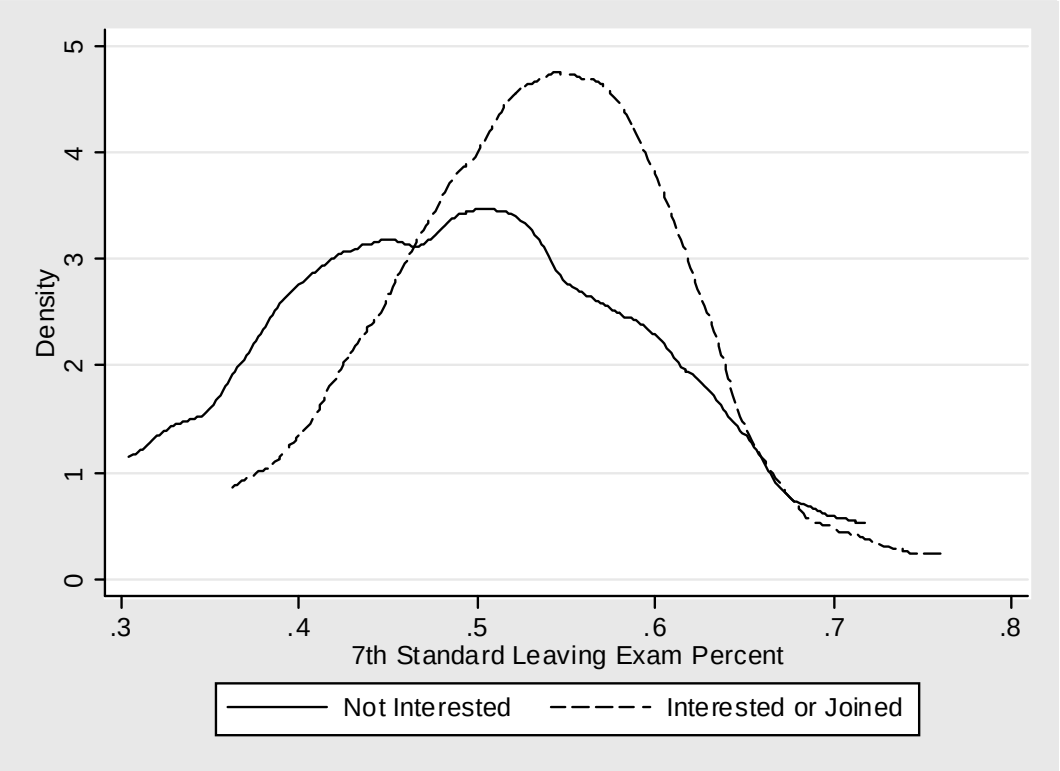

TABLE 2: Comparison of Mean School Characteristics by School Response to Program: "Not Interested" versus "Interested or Joined"

		Not Interested			Interested/ Joined			Interested/ Joined – Not interested
		N	Mean	Standard Deviation	N	Mean	Standard Deviation	Difference in Means
School Performance	Average 7th Standard Leaving Exam Language %	21	0.51	0.12	40	0.57	0.09	-0.06**
	Average 7th Standard Leaving Exam Math %	21	0.47	0.14	40	0.51	0.11	-0.04
	Average 7th Standard Leaving Exam Total %	21	0 .49	0 .11	40	0.53	0 08	-0.04*
	Average LGP Language Test %	48	0.45	0.25	77	0.59	0.24	0.14***
	Average LGP Math Test %	48	0.35	0.23	77	0.57	0.24	0.23*
	Total average of LGP Test %	48	0.40	0.23	77	0.58	0.23	0.18***
Student Attendance	School records % students attend > 20 days July 2003	51	0.87	0.10	77	0.90	0.09	0.03
	School records % students attend 11-19 days July 2003	51	0.05	0.06	77	0.02	0.05	-0.03***
	School records % students attend 1-10 days July 2003	51	0.04	0.05	77	0.04	0.05	0.00
	School records % students attend 0 days July 2003	51	0.04	0.06	77	0.04	0.06	0.00
	Student attendance - surprise visit	51	0.69	0.16	77	0.77	0.16	0.08***
School Inputs and Resources	Desks Received Per Student	51	0.02	0.01	77	0.03	0.03	0.01
	Chairs Received Per Student	51	0.07	0.05	77	0.07	0.07	0.01
	Notebooks Received Per Student	51	0.33	0.33	77	0.34	0.27	0.01
	Textbooks Received Per Student	51	3.41	1.06	77	3.06	1.36	-0.35
	Cash Received Per Student (Rs.)	51	67.34	112.39	77	138.71	305.18	71.37
	% Schools that Have Electricity	51	0.33	0.48	78	0.35	0.48	0.01
	% Schools that Have Running Water	51	0.49	0.50	78	0.62	0.49	0.13
	Students per toilet	51	55.10	90.34	78	60.58	97.51	5.48
Teachers	%Teachers with education beyond SSC	51	0.80	0.28	78	0.79	0.30	-0.01
	Student: Teacher Ratio	51	42.69	16.84	78	43.07	20.51	0.38
	%Teachers originally from this location	51	0.11	0.21	78	0.17	0.28	0.06
Student Composition	% enrolled students belonging to Scheduled Castes	51	0.25	0.27	77	0.27	0.29	-0.02
	% enrolled students belonging to Scheduled Tribes	51	0.23	0.04	77	0.20	0.03	0.03
Community Participation	SDMC contribution per student (Rs.)	51	15.64	42.70	77	26.88	65.14	11.24
	Last Gram Sabha discussed school (% Yes)	51	0.43	0.50	78	0.50	0.50	0.07
	SDMC discussed teacher attendance at staff meeting	51	0.39	0.49	78	0.64	0.48	0.25***
2001 Census Data For Neighborhood Characteristics	% Literate Females	50	0.44	0.16	78	0.44	0.14	-0.01
	% Scheduled Caste population	51	0.25	0.27	77	0.27	0.29	0.02
	% Scheduled Tribe population	51	0.23	0.25	77	0.20	0.22	-0.03
	% With Post & Telegraph Facility (for Villages)	43	0.67	0.47	67	0.87	0.34	0.19*
	Distance to Nearest Town (km) (for Villages)	43	20.74	9.04	67	17.87	8.76	-2.88*
	Number of Middle Schools	43	1.02	1.39	67	1.21	1.46	0.19

* Difference in means is significant at 90% level of confidence ** Significant at 95% ***Significant at 99%

TABLE 3: Comparison of Mean School Characteristics by School Response to Program "Not Interested" versus "Joined"

		Not Interested			Joined			Joined – Not interested
		N	Mean	Standard Deviation	N	Mean	Standard Deviation	Difference in Means
School Performance	Average 7th Standard Leaving Exam Language%	21	0.51	0.12	31	0.57	0.10	-0.06*
	Average 7th Standard Leaving Exam Math %	21	0.47	0.14	31	0.51	0.12	0.04
	Average 7th Standard Leaving Exam Total %	21	0.49	0.11	31	0.53	0.10	-0.04
	Average LGP Language Test %	48	0.45	0.25	64	0.62	0.23	0.17***
	Average LGP Math Test %	48	0.35	0.23	64	0.61	0.22	0.26***
	Total average of LGP Test %	48	0.40	0.23	64	0.62	0.22	0.22***
Student Attendance	School records % students attend > 20 days July	51	0.87	0.10	64	0.90	0.10	0.03
	School records % students attend 11-19 days	51	0.05	0.06	64	0.02	0.06	-0.03***
	School records % students attend 1-10 days July	51	0.04	0.05	64	0.04	0.05	0.00
	School records % students attend 0 days July	51	0.04	0.06	64	0.04	0.06	0.00
	Student attendance - surprise visit	51	0.69	0.16	64	0.77	0.17	0.08***
School Inputs Resources	Desks Received Per Student	51	0.02	0.01	64	0.03	0.03	0.01
	Chairs Received Per Student	51	0.07	0.05	64	0.07	0.07	0.01
	Notebooks Received Per Student	51	0.33	0.33	64	0.35	0.27	0.02
	Textbooks Received Per Student	51	3.41	1.06	64	3.07	1.29	-0.34
	Cash Received Per Student (Rs.)	51	67.34	112.39	64	140.49	322.25	73.15
	% Schools that Have Electricity	51	0.33	0.48	65	0.32	0.47	-0.01
	% Schools that Have Running Water	51	0.49	0.50	65	0.60	0.49	0.11
	Students per toilet	51	55.10	90.34	65	58.26	100.82	3.16
Teachers	%Teachers with education beyond SSC	51	0.80	0.28	65	0.77	0.32	-0.03
	Student: Teacher Ratio	51	42.69	16.84	65	44.02	21.57	1.34
	%Teachers originally from this location	51	0.11	0.21	65	0.20	0.30	0.09*
Student Composition	% enrolled students belonging to Scheduled	51	0.25	0.04	64	0.26	0.03	-0.01
	% enrolled students belonging to Scheduled	51	0.23	0.04	64	0.22	0.03	0.01
Community Participation	SDMC contribution per student (Rs.)	51	15.64	42.70	64	29.05	70.32	13.41
	Last Gram Sabha discussed school (% Yes)	51	0.43	0.50	65	0.52	0.50	0.09
	SDMC discussed teacher attendance at staff	51	0.39	0.49	65	0.66	0.48	0.27***
2001 Census Data For Neighborhood Characteristics	% Literate Females	50	0.44	0.16	65	0.43	0.15	-0.01
	% Scheduled Caste population	51	0.25	0.27	64	0.26	0.28	0.02
	% Scheduled Tribe population	51	0.23	0.25	64	0.22	0.23	-0.01
	% With Post & Telegraph Facility	43	0.67	0.47	55	0.87	0.34	0.20**
	Distance to Nearest Town (km)	43	20.74	9.04	55	16.89	8.81	-3.85**
	Number of Middle Schools	43	1.02	1.39	55	1.22	1.55	0.19

* Difference in means is significant at 90% level of confidence ** Significant at 95% confidence level ***Significant at 99% confidence level

Table 4: Probability of "Expressing Interest or Joining" using linear probability model

	(1)	(2)	(3)	(4)
7th Standard Leaving Exam (overall average %)	1.335*			
	[0.783]			
Literate female population (%)	-0.618	-0.359	-0.196	-0.215
	[0.764]	[0.536]	[0.438]	[0.439]
SC population %	-0.027	0.085	0.193	0.173
	[0.690]	[0.378]	[0.297]	[0.300]
ST population %	-0.350	0.070	0.378	0.382
	[0.574]	[0.334]	[0.280]	[0.283]
Post & telegraph facility available in village (Y/N)	-0.034	0.274**	0.121	0.159
	[0.353]	[0.131]	[0.117]	[0.122]
Distance to nearest town (Kms.)	0.005	-0.004	-0.007	-0.007
	[0.010]	[0.007]	[0.005]	[0.005]
Middle schools in census area (#)	0.019	-0.003	0.022	0.021
	[0.066]	[0.040]	[0.035]	[0.034]
Urban school (Y/N)	0.295	0.243	-0.016	0.045
	[0.427]	[0.246]	[0.194]	[0.210]
Cash received per student (Rs.)		0.000*		0.000
		[0.000]		[0.000]
Text received per student (#)		-0.091**		-0.046
		[0.038]		[0.030]
Teachers educated above SSC (%)		0.056		
		[0.159]		
Teachers originally from this location (%)		0.162		
		[0.182]		
Student: teacher ratio		0.002		
		[0.003]		
SC students enrolled (%)		-0.099		
		[0.183]		
ST students enrolled (%)		-0.212		
		[0.274]		
LGP Test Score (overall average %)			0.743***	0.733***
			[0.166]	[0.168]
Student attendance, surprise visit (%)			0.403	0.356
			[0.251]	[0.258]
Value of SDMC contributions per student (Rs.)			0.000	-0.000
			[0.000]	[0.001]
Gram Sabha discussed school in last meeting (Y/N)			0.037	0.040
			[0.079]	[0.081]
Teacher attendance discussed in last SDMC-staff meeting (Y/N)			0.291***	0.284***
			[0.082]	[0.084]
Constant	0.374	0.938**	0.124	0.242
	[0.716]	[0.461]	[0.313]	[0.326]
Observations	61	123	123	123
R-squared	0.155	0.195	0.406	0.417
Adjusted R-squared	-0.103	0.037	0.304	0.303
Root MSE	0.503	0.479	0.406	0.407

Taluk level fixed effects included in all specifications. Robust standard errors in parentheses.
* Significant at 90% level of confidence ** Significant at 95% ***Significant at 99%.

Table 5: Probability of "Expressing Interest or Joining" using probit specification

	(1)	(2)	(3)	(4)
7th Standard Leaving Exam (overall average %)	1.325*			
	[0.702]			
Literate female population (%)	-0.619	-0.371	-0.271	-0.281
	[0.632]	[0.532]	[0.513]	[0.502]
SC population %	-0.052	0.155	0.173	0.132
	[0.598]	[0.419]	[0.394]	[0.388]
ST population %	-0.295	0.131	0.640	0.637
	[0.499]	[0.353]	[0.404]	[0.395]
Post & telegraph facility available in village (Y/N)	-0.026	0.320	0.174	0.248
	[0.266]	[0.140]	[0.156]	[0.169]
Distance to nearest town (Kms.)	0.003	-0.005	-0.010	-0.011
	[0.008]	[0.007]	[0.007]	[0.007]
Middle schools in census area (#)	0.024	-0.004	0.016	0.009
	[0.054]	[0.042]	[0.046]	[0.048]
Urban school (Y/N)	0.218	0.217	-0.062	0.033
	[0.204]	[0.177]	[0.252]	[0.240]
Cash received per student (Rs.)		0.000		0.000
		[0.000]		[0.000]
Text received per student (#)		-0.103**		-0.082*
		[0.044]		[0.042]
Teachers educated above SSC (%)		0.061		
		[0.174]		
Teachers originally from this location (%)		0.193		
		[0.202]		
Student: teacher ratio		0.002		
		[0.003]		
SC students enrolled (%)		-0.138		
		[0.204]		
ST students enrolled (%)		-0.242		
		[0.271]		
LGP Test Score (overall average %)			1.067***	1.087***
			[0.249]	[0.253]
Student attendance, surprise visit (%)			0.690**	0.588*
			[0.342]	[0.358]
Value of SDMC contributions per student (Rs.)			0.000	0.000
			[0.001]	[0.001]
Gram Sabha discussed school in last meeting (Y/N)			0.033	0.042
			[0.110]	[0.108]
Teacher attendance discussed in last SDMC-staff meeting (Y/N)			0.391***	0.397***
			[0.103]	[0.102]
Predicted Probability	0.762	0.653	0.696	0.703
Observations	61	123	123	123
Pseudo R-squared	0.139	0.166	0.382	0.399
Pseudo Log Likelihood	-33.806	-68.239	-50.531	-49.140

dy/ dx reported. Taluk level fixed effects included in all specifications. Robust standard errors in parentheses.
* Significant at 90% level of confidence ** Significant at 95% ***Significant at 99%.

Table 6. OLS estimates of LGP test results

	(1)	(2)
Literate female population (%)	-0.214	-0.219
	[0.249]	[0.245]
SC population %	-0.091	0.038
	[0.169]	[0.176]
ST population %	-0.305*	-0.185
	[0.165]	[0.168]
Post & telegraph facility available in village (Y/N)	0.039	0.040
	[0.065]	[0.066]
Distance to nearest town (Kms.)	0.002	0.002
	[0.003]	[0.003]
Middle schools in census area (#)	0.002	0.016
	[0.022]	[0.020]
Urban school (Y/N)	0.137	0.160
	[0.098]	[0.105]
Cash received per student (Rs.)	0.000	-0.000
	[0.000]	[0.000]
Text received per student (#)	-0.015	-0.011
	[0.023]	[0.023]
Teachers educated above SSC (%)	0.109	0.022
	[0.081]	[0.085]
Teachers originally from this location (%)	0.168	0.137
	[0.103]	[0.098]
Student: teacher ratio	-0.002	-0.001
	[0.001]	[0.002]
SC students enrolled (%)	0.080	0.024
	[0.088]	[0.090]
ST students enrolled (%)	0.141	0.127
	[0.120]	[0.130]
Student attendance, surprise visit (%)		0.395**
		[0.166]
Value of SDMC contributions per student (Rs.)		0.001
		[0.001]
Gram Sabha discussed school in last meeting (Y/N)		0.032
		[0.046]
Teacher attendance discussed in last SDMC-staff meeting (Y/N)		0.004
		[0.044]
Constant	0.473**	0.168
	[0.219]	[0.297]
Observations	123	123
Adjusted R-squared	0.13	0.20
R-squared	0.28	0.36

Robust standard errors in brackets. Taluk level fixed effects included in all specifications.
* Significant at 90% level of confidence ** Significant at 95% ***Significant at 99%.

REFERENCES

Alderman H., J. Behrman, S. Khan, D. Ross and R. Sabot (1997). "The Income Gap in Cognitive Skills in Rural Pakistan." Economic Development and Cultural Change 46(1): 97-123

Angrist, J. and V. Lavy (2004). "The Effect of High Stakes High School AChievement Awards: Evidence from a School-Centered Randomized Trial." IZA Discussion Paper (No. 1146).

Azim Premji Foundation (2002). Concept Note Of The Learning Guarantee Program.

Azim Premji Foundation (2005). "Learning Guarantee Programme: A Learning Journey: 2002-2005."

Banerjee, A., S. Cole, et al. (2004). "Remedying Education: Evidence from Two Randomized Experiments in India." M.I.T. Poverty Action Lab working paper.

Banerjee, A. and E. Duflo (2006). "Addressing Absence." *Journal of Economic Perspectives*, 20(1): 117-132.

Banerjee, A., R. Banerji, E. Duflo, R. Glennerster, and S. Khemani. (2006) "Can information campaigns spark local participation and improve outcomes?" Policy Research Working Paper No. 3967, Development Research Group, The World Bank, Washington DC

Chaudhury, N., J. Hammer, M. Kremer, K. Muralidharan, and H. Rogers. (2005). "Teacher Absence in India: A Snapshot." Journal of the European Economic Association, 3(2-3):-658-667.

Duflo, E. and R. Hanna. 2006. "Monitoring Works: Getting Teachers to Come to School," Mimeo, Department of Economics, MIT, Cambridge: MA

Education Commission of the States (2004). ECS Report to the Nation -- State Implementation of the No Child Left Behind Act.

Frey, B.S. and R. Jegen (2001) "Motivation Crowding Theory." Journal of Economic Surveys 15(5): 589-611.

Glewwe, P., N. Ilias, et al. (2002). "Teacher Incentives." Brookings Institution working paper.

Glewwe, P. and H. Jacoby (1994). "Student Achievement and Schooling Choice in Low-Income Countries: Evidence from Ghana." Journal of Human Resources 29(3): 843-864

Glewwe, P., M. Kremer, et al. (2004). "Retrospective vs. Prospective Analyses of School Inputs: The Case of Flip Charts in Kenya." Journal of Development Economics 74: 251-268.

Hanushek, E. A. (1997). "Assessing the Effects of School Resources on Student Performance: An Update." Educational Evaluation and Policy Analysis 19(2): 141-164

Hoff, K. and P. Pandey (2004). "Belief Systems and Durable Inequalities: An experimental investigation of Indian Caste." World Bank Policy Research Working Paper No. 3351, June 2004

Jimenez, E. and Y. Sawada (1999). "Do Community-Managed Schools Work? An Evaluation of El Salvador's EDUCO Program." World Bank working paper.

King, E. and B. Ozler (2000). "What's Decentralization Got To Do With Learning? Endogenous School Quality and Student Performance in Nicaragua." DECRG World Bank working paper.

Kremer, M., E. Miguel, et al. (2004). "Incentives to Learn." Harvard University working paper.

Miguel, E. and M. Kremer (2004). "Worms: Identifying Impacts on Education and Health in the Presence of Treatment Externalities." Econometrica **72**(1): 159-217.

Pandey, P. (2005). "Are Institutions Malleable? Effects of History, Mandated Representation, and Democratization on Public Schools in North India." Mimeo. The World Bank

World Bank (2004). World Development Report 2004: Making Services Work for Poor People. Washington, DC.