Enhancing Excellence:

Socially Motivated Private Schools of Nepal*

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Abstract: Social motivation can promote efficiency of public service delivery though its role in providing schooling is little understood. We provide both theoretical and empirical insights as to why not-for-profit private schools could enhance excellence in schooling, using Nepal as a case study. Results suggest that socially motivated trust schools outperform all other types of schools irrespective of whether we consider standardised test scores, absolute or relative to school expenditure per student. Results are robust and highlight that trust school's social objective, coupled with private financing, ownership and management that minimises its agency costs, is key to their value for money.

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1. Introduction

That unselfishness and social motivation can be important drivers of many efficiency-improving activities has long been recognised in several strands of the economic literature, such as charity and giving (Andreoni, 1989), agency (Besley & Ghatak, 2005), and public good provision (Bennett & Iossa, 2010). In developing countries, not-for-profit and other private schools co-exist with public schools catering to various income groups from the very rich to the very poor (Dahejia, DeLeire, Luttmer, & Mitchell, 2007; EdInvest, 2000; Tooly & Dixon, 2003).[1]

In this context, we ask: how good are not-for-profit private schools? Can they deliver good secondary schooling amidst competition from other schools? Surely these are important questions, but remain rather underexplored especially for low-income countries. We provide both theoretical and empirical insights to these questions, using a unique dataset from Nepal.

There are four types of schools in Nepal; two of them are largely run/financed by the state and two are private -- trust-run and company-run schools. In the official nomenclature, public schools are called 'community' schools and they are of two types -- 'aided' and 'unaided'. In the aided school government takes the responsibility of appointing and paying for teachers. In the unaided school, they provide only a grant for teachers' salaries, but remains privately managed. We will call the first type fully funded 'government' school and the second type private aided (PA) school. The private unaided schools are registered as either 'company' or 'trust' (Bhatta & Budathoki, 2013).

The regulatory framework of education in Nepal is given by the Education Act, 2028, passed in 1971, which has been amended several times since then. The fifth amendment enacted in 1992 made way for private institutional educators' entry, but also made a distinction between for-profit and not-for-profit schools (Government of Nepal, 2010). Accordingly, a private school in Nepal must register

itself as either a (not-for-profit) trust or a profit-seeking (and tax-liable) company. The trust schools may have different stated objectives, tuition fees and selection criteria, but because of their common not-for-profit status we call them 'socially motivated' (see discussion in section 2). The trust schools are a minority. There are only 14 such schools in our sample of 122 private schools and 432 schools altogether (i.e. 3.2% of the total). However, these schools hold a reasonable student share – over 600 out of a total 7000 students (i.e. 8.5%), and they are drawn from 11 districts that represent the whole of Nepal, covering from the Eastern Development Region and the more prosperous Central Development region to the remote and underdeveloped Far Western Development Region.[2]

We analyse Nepal's School Leaving Certificate (SLC) exam data of nearly 7000 students from 432 different types of schools from 2002 to 2004 and examine if the trust school students perform better (or worse) than students from other schools.[3] Papers most relevant to ours are McEwan and Carnoy (2000), Somers, McEwan, and Willms (2004), Newhouse and Beegle (2006), Desai, Dube, Vanneman, and Banerjee (2009), Chudgar and Quin, (2012), Muralidharan and Sundararaman (2015), Singh (2015)[4] and Thapa (2015). While these studies provide a mixed verdict on the private-versus-public school efficiency question, none looks at the diversity of private schools.

Any estimation of school efficiency is fraught with school selection bias, unless school admissions are random. Generally, household wealth creates a bias for expensive private schools. Student's ability, on the other hand, may create a bias in favour of the school that is perceived to be good – public or private. Newhouse and Beegle (2006) show that in Indonesia the ability bias works in the direction of the public schools and public schools are more efficient than private schools. A similar result is found for Chile by McEwan and Carnoy (2000). Nepal's situations are somewhat different as dictated by its Education Act, 2028, as people think poorly of the government schools (Bhatta & Budathoki, 2013). We will try to correct for the combined selection bias, but not individual biases of income and ability due to data limitations.

We develop a simple theoretical model of school choice based on which we hypothesize that

for a low-income household the choice may come down to mainly between a government school and a low-cost private school; the former ends up with mostly the low ability children and the latter attracts the high ability children, from the poor families. At higher income levels, the choice is between different types of private schools. The trust schools are more likely to attract the middle class and high ability children, while the expensive company schools would attract rich households regardless of child's ability. Although we capture some aspect of school competition in our theoretical model, we cannot directly incorporate that in our empirical analysis due to lack of data.

Nevertheless, we empirically model school choice and correct for the consequent selection bias for determining school performance, using the 2SLS instrumental variable (IV) method (see further discussion in Section 4). In our aggregate model of private versus public schools, our instrument for the private school is the number of private schools in the village or municipality where the child resides.

In the disaggregate model of four school types, we have three separate village/municipality level IVs for PA, trust and company-run schools (government schools being the reference category). These are the number of private schools (for the company school), the share of non-Hindu population (for the trust school), and the walking time to school (for the PA school). The rationale for the IVs is discussed in Section 4.3.

We regress student's standardised test score on the IV of the school type, after controlling for several student characteristics. The estimated coefficient of the school IV gives a measure of 'absolute efficiency' (AE). We also define a 'value for money' measure of efficiency – 'relative efficiency' (RE) – by the student (standardised) test score relative to the school expenditure per student.[5] For each of the efficiency measures, our estimation runs on two dimensions – broader school types (i.e., public vs. private) and individual school types. We find that in terms of the AE scores the private schools as a group are far superior to the public schools regardless of whether the school selection bias is corrected or not. But in terms of the RE scores private schools do not seem to be any better. The higher expenditure of the private schools seems to offset their test score advantage.

But the results of the disaggregate school types are surprising. Both in terms of the AE and RE scores the trust school is the best school. In the AE model, the company school comes a distant second, followed by the government school and the PA school in that order; the PA school is significantly inferior to the government school. In the RE model, all other schools, except Trust schools, are equally inefficient. Furthermore, the efficiency rankings are primarily driven by schools' performance in rural Nepal, which is not surprising.

Finally, for robustness we consider subject fixed effects (that allows us to exploit the student's unobserved subject-level omitted factors that may influence SLC scores) and a lagged value-added (VA) model. The scope for a VA model arises from the fact that we observe student performance twice prior to the SLC exam -- in grade 9 and then in a send-off exam at grade 10. The VA model allows us to control for the unobserved students' ability as well as persistence of learning (Andrabi et al., 2011). In all cases, the trust school remains the best school. We also show that if both the government school and PA school are clubbed together, our results still hold.

Unfortunately, given our data limitations we cannot fully explain *why* the trust school outperforms all others. We conjecture that the not-for-profit status forced the trust schools substantially spend their revenues on students or teachers, which helped recruiting more trained teachers contributing to good student performance. A company school, on the other hand, would cut costs to increase profit. We provide some suggestive evidence in this respect.

Our paper makes at least three contributions. (i) Not-for-profit private schools *can* effectively deliver good quality education in developing countries. (ii) For Nepal such schools appear better than both public and for-profit schools, (iii) in terms of both absolute and relative efficiency.

In what follows, Section 2 discusses the data and Section 3 presents the theoretical model. Section 4 explains the empirical strategy. In Section 5, we discuss and analyse the results, while robustness is checked in Section 6. Section 7 concludes.

2. Data and School Types

Our dataset is taken from a national survey commissioned by the Ministry of Education of Nepal to assess student- and school-level determinants of SLC performances from 2002 to 2004 (Bhatta, 2005). We focus on students who are non-boarding and sitting in SLC for the first time.[6] There are 7000 such students distributed over 432 schools.

Fifty percent of our schools are government having a share of nearly 67% of the SLC students; the PA schools constitute 22% of the schools accounting for 18% of the students, while the company-run schools hold a sizable share of 25% among all schools but they have only 11% of the SLC students. Trust schools are a minority, having a school share of 3.2% and a student share of 8.5%. The trust schools are drawn from 11 out of 77 districts, about 14.29% of the districts and 21% of total population (as per 2001 census). But more importantly these schools represent four out of five 'development regions' covering not just the prosperous Central Development Region, but also the Eastern Development Region and the Mahakali province of the remote underdeveloped Far Western Development Region.[7] Eleven of the fourteen trust schools are in the rural areas, and they present great variations in terms of the number of SLC students. While three schools have as many as 75 to 98 SLC students, three other schools have as few as 5 to 9 SLC students.

2.1. Comparison of various school types

In Table 1, we summarise the key school and household characteristics. The mean aggregate raw and standardized scores correspond to six compulsory subjects (which include Nepalese, English, Maths and Science). The mean score of both the trust and the company-run schools are substantially higher than the public schools. The mean relative test score is calculated by dividing the standardised test score by school expenditure per student. Here, the company school seems far better than the trust school.

School fees are taken for tuition, library and examinations. We report two figures for fees – one inclusive of all fees including boarding expenses and another without the boarding fees. The company

schools are evidently expensive, -- more than twice the trust schools and nearly six times the government school. The trust schools are three times costlier than the government school; they also register smallest variance in fees.[8]

Company schools are expectedly smaller as they register the smallest pupil teacher ratio – 19.2:11 as opposed to 43.12:1 in government schools. They also spend the most – 6000 Rupee per student – 66% higher than the government school. Closely behind are the trust schools; PA schools are the least spender. Interestingly, the salary of the government school teachers is highest, twice that of company-run schools. The trust schools also pay well to their teachers.

Richer and educated households tend to prefer company schools and the least educated and poorest households prefer the PA schools, as predicted in our theoretical model. The proportion of the lowest caste (Dalit) is highest in the government schools and lowest in the company schools.

Table 1. Descriptive statistics of key school and household characteristics 2002-04

Variables	Govt. schools	PA schools	Trust schools	Company schools
		School characteristics		
Mean aggregate (raw) test scores	373.46	370.83	487.13	489.39
	(81.70)	(90.57)	(112.95)	(83.29)
Mean aggregate standardized test scores	-0.10	-0.13	1.04	1.06
	(0.82)	(0.91)	(1.13)	(0.84)
Mean aggregate relative standardized test scores	-0.20	-0.51	0.05	0.77
	(1.45)	(5.31)	(1.91)	(0.63)
Mean annual expenditure per student (000 Rupees) *	3.87	2.65	5.36	6.00
	(5.51)	(2.72)	(5.32)	(3.844)
Mean annual school fee (in rupees)	1842	3170	5316	12153
	(5000)	(9048)	(4644)	(17471)
Mean annual school fee (day school)	1499	2511	4978	11594
	(3420)	(6863)	(3778)	(25433)
Mean annual salary of teacher (000 Rupees)	117.13	80.09	85.86	53.75
	(231.17)	(43.90)	(71.13)	(20.00)
Mean share of teacher's salary in total expenditure	0.82	0.83	0.68	0.74

	(0.21)	(0.47)	(0.15)	(0.24)
Mean pupils per teacher*	43.12	43.42	25.72	19.21
	(22.98)	(21.49)	(9.66)	(3.59)
Parent-teacher associations	0.61	0.80	0.31	0.25
	(0.49)	(0.40)	(0.46)	(0.01)
Share of schools in total schools	0.50	0.22	0.03	0.25
Share of schools in total students	0.67	0.18	0.04	0.11
		Household characteristics		
Father's schooling (years)	8.83	8.09	10.02	11.10
	(13.75)	(13.63)	(14.51)	(11.84)
Mother's schooling (years)	2.77	2.06	3.94	6.32
	(8.77)	(8.18)	(9.60)	(10.88)
Log(cash income)	1.685	1.683	1.77	1.90
	(0.57)	(0.54)	(0.59)	(0.62)
Dalit	0.04	0.034	0.02	0.01
	(0.18)	(0.18)	(0.15)	(0.11)

Source: Sample data, our own calculation. Standard deviations are in parentheses.
* To arrive at these figures, we take account of all students of the schools (not just year ten). Note that annual school fee includes fees on admission, readmission, tuition, library and examination.

2.2 Social motivation of trust schools

An important question is how to ascertain that the 'trust' schools are socially motivated. There are three ways the present day 'trust' schools could come into existence. One is new entry; some schools were set up after 1992 with the clear intent to be different from the 'company' schools; there are three such trust schools in our sample. If these new schools wanted to be profit-motivated they could have registered as 'company'. Moreover, if the trust status was a convenient disguise to make profit, we would have seen faster growth of trust schools than the company schools. But that is not the case.

The second way of gaining the status of a trust school is historical; some schools were started by philanthropist or missionaries during 1980s or earlier; a natural transition for them after 1992 was the trust status. The third way some schools became trust schools is simply by the force of regulation. The Education Act, 2028 clearly specifies that a previously unregistered private school must be given the status of a trust, and not company, if it had been running on a government or publicly owned or 'privately donated' building or land (Government of Nepal, 2010, pp. 7-8).

Some examples: We now present a few examples of the trust schools from our sample.

(i) *Lalitpur Madhyamik Vidhyalay*, a mixed gender English medium secondary school, founded in 1981, aims to offer quality education at low cost according to its website.[9] It admits 150 poor children free of charge every year and offers scholarship to 45 girl students from poor families thanks to assistance from a foreign NGO. In 2004, it had 98 students appearing for the SLC exam and 60% of its teachers were trained teachers. The same year the school's monthly (average) tuition fee was Rs 900, roughly 25% of the average tuition fee of the trust schools in our sample.

(ii) *Mahesh Sanskrit Gurukul*, a Hindu religious school that professes to emphasise on ancient Sanskrit and Vedic literatures along with modern subjects was established in 1993 by a Hindu guru. It is an all-boys school and run primarily on private donations. This school was started after 1992, and it could not possibly be a company school.

(iii) There is another category of trust schools that were set up by NGOs. From our sample, we mention two such schools -- *Prabhat English Higher Secondary School* and *Siddhi Ganesh Higher Secondary School*. The former was set up in 1990 by a group of social workers and educationists ostensibly to create 'one graduate in every family of Bhaktapur (where the school is located)'.[10] In 2004 its monthly tuition fee was merely Rs 1925 and it had a pupil-teacher ratio of 5.9. The second school, run by a foreign NGO, charges a very small tuition fee – only Rs 150 per month.

Since 10 out of 14 trust schools in our sample are in the rural areas, we needed to ensure that the characteristics of the rural households (e.g., parental schooling, income, wealth and caste)[11] do not correlate with the characteristics of the trust school. We have verified that the household characteristics from the villages which have trust schools are no different to the household characteristics from those villages that do not have trust schools (see endnote 11).

We also find that presence of both the trust and company schools are negatively correlated with the total test score of the government schools, which suggests their responsiveness to demand.[12] Trust schools are located mainly in the rural areas, supporting our hypothesis about their social motivation.

Trust school characteristics. We now compare the essential characteristics of company and trust schools with a view to further identify any other aspects of social motivation. Table 2 shows the linear probit estimates of trust vs company schools. Trust schools are older than the company school, and their age varies from 5 to 49 years, with the average being 32 years as opposed to 15 years of the company schools.[13] The trust school also hires significantly more trained teachers, have a lower pupil-teacher ratio and are more likely to be headed by its founder.

Table 2. Comparison of trust and company school characteristics

VARIABLES	(1) All Trust school	(2) Urban Trust school	(3) Rural Trust school
School's age	0.00563***	0.0107***	0.00236***
	(0.000792)	(0.00146)	(0.000814)
Founder as head	0.177***	0.165***	0.109***
	(0.0165)	(0.0218)	(0.0275)
Pupils per teacher	-0.00280***	-0.00677***	0.00145**
	(0.000795)	(0.00113)	(0.000631)
Has parent-teacher association	0.0285	0.0364	-0.0362**
	(0.0176)	(0.0280)	(0.0160)
Has trained teachers	0.491***	0.526***	0.361***
	(0.0330)	(0.0389)	(0.0875)
Rural	-0.0397***		
	(0.0118)		
Constant	-0.124***	-0.114***	-0.144***
	(0.0228)	(0.0312)	(0.0409)
VDC dummies	Yes	Yes	Yes
SLC year dummies	Yes	Yes	Yes
Observations	2,509	1,567	942
R-squared	0.497	0.442	0.807

Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1. This regression is run only on the subsample of trust and company schools for the sample over 2002-04; the dummy for Trust school=1 if it is a trust school and 0 for company schools, thus ignoring other school types of schools.

Next, Appendix Table 2A shows the estimates of the effect of the school types on the school expenditure (columns 1 and 2) and the teachers' salary (columns 3 and 4). Compared to the government school, the expenditure per student is significantly higher in the trust school.

To further verify the trust school's focus on academic performance, we estimate the probability

of a trust school student's progression from SLC to higher education or work, about which we have data. About 73% of the (non-boarding) students, who passed SLC at the first attempt, chose to study further. We show in Appendix Table 2B that the trust school students are most likely to progress to higher education.

3. A theoretical model of school choice

Consider a household with one child and four schools – one government school (suffixed *G*), and three types of private schools of which one is a trust school (suffixed *R*) and two others are company schools.[14] One of them is high-cost (suffixed *C*) and the other is low-cost (suffixed *P*). The cost of attending school *G* is F_G, which we assume to be small. School *P* entails a slightly higher fee F_P. The fees of school *R* and *C* are F_R and F_C, respectively. We assume $F_G<F_P<F_R<F_C$; all fees are given.

The household's income is *Y*, and the child's ability is *a*. The economy-wide income distribution is given by some distribution function. Ability is random -- either high (a_H) or low (a_L). There is no correlation between income and ability. The household knows its income and the child's ability.

The household values child's test score *t*, which is random and follows a cumulative distribution function H_s ($s = G, P, R, C$) with density h_s, sensitive to the school type and the child's ability. The support of the test score distribution is [0, 1]. The household's expected utility from consumption and school choice for the child with ability a_j ($j=H, L$) is assumed to be given by

$$Eu_s(Y; a_j) = \int_0^1 ct\, h_s dt = \int_0^1 (Y - F_s) t h_s dt = (Y - F_s) \int_0^1 t h_s dt = (Y - F_s)\tau_s^j \qquad (1)$$

In equation (1) we have substituted the budget constraint $Y=c+F_s$. The household's (indirect) expected utility becomes a linear function of the expected test score, $\tau_s{}^j$.

Government school. We assume that the average score (τ_G) of school *G* does not vary with the child's ability or school's expenditure (x_G). This assumption conforms to the general perception that the state schools fail the high ability students.

Low-cost company school. School *P* does better than the government school in the sense that it produces a higher expected test score for the high ability child. Specifically, we assume $\tau_P^H > \tau_G > \tau_P^L$. The low cost private school helps mainly the high ability poor students.

Trust school. School *R* charges a much higher fee than school *P*. It can scale up student-specific assistance in a significant way.[15] So, the expected test score is higher for both high and low ability children than for both *G* and *P*, and $\tau_R^H > \tau_R^L > \tau_G$, $\frac{\partial \tau_R}{\partial x_R} > 0$.

High-cost company school. School *C* has similar effects on the expected test scores like the trust school, i.e. $\tau_C^H > \tau_C^L > \tau_G$ and $\frac{\partial \tau_C}{\partial x_C} > 0$. But it also offers something else – a status good. The expected utility of choosing school *C* is $Eu_C = (Y - F_C)\tau_C + zY$.

School choice. *Choice between school P and school G.* Suppose a household with income at least F_P contemplates between school *G* and *P*. For a low ability child, the household will clearly choose school *G*, unambiguously. For a high ability child, it will choose school *P*, if $(Y - F_P)\tau_P^H > (Y - F_G)\tau_G$, i.e. if its income exceeds a critical level

$$Y_1 = \frac{F_P\tau_P^H - F_G\tau_G}{\tau_P^H - \tau_G}. \qquad (2)$$

Choice between school P and school R. Suppose the same household, i.e. of child ability a_H, can also afford school *R*. Will it choose school *R* or *P*? School *R* is chosen if $(Y - F_R)\tau_R^H > (Y - F_P)\tau_P^H$, i.e. if its income exceeds

$$Y_2^H = \frac{F_R\tau_R^H - F_P\tau_P^H}{\tau_R^H - \tau_P^H}. \qquad (3)$$

It can be checked that $Y_2^H > Y_1$ if (F_R - F_P) is sufficiently greater than (F_P - F_G).

Choice between school R and school C. What if the same household's income exceeds F_C? Assuming z + $\tau_C^H > \tau_R^H$, we derive the critical level of *Y*, namely Y_3^H, above which the household will choose *school C* instead of school *R*:

$$Y_3^H = \frac{F_C\tau_C^H - F_R\tau_R^H}{z + \tau_C^H - \tau_R^H}. \quad (4)$$

Assuming F_C and z sufficiently large and $\tau_C{}^H$ not too smaller than $\tau_R{}^H$, we can ensure that $Y_3{}^H > Y_2{}^H$.

To summarise, for a high ability child the household will switch from the government to the low-cost company school, and then to the trust school and eventually to the high-cost company school, as it gets progressively richer.

What if the child has low ability? The choice between school *R* and *C* is determined in the same way as above. We derive analogously

$$Y_3^L = \frac{F_C\tau_C^L - F_R\tau_R^L}{z + \tau_C^L - \tau_R^L}. \quad (5)$$

Above $Y^L{}_3$ the household will choose school *C*, and below it, the choice will be between *R* and school *G*. School *P* will never be chosen for the low ability child. We derive a new critical income level $Y_2{}^L$:

$$Y_2^L = \frac{F_R\tau_R^L - F_G\tau_G}{\tau_R^L - \tau_G}. \quad (6)$$

Households (of low ability child) with $Y \in (Y_2^L, Y_3^L)$ will choose the trust school and with $Y \in [Y_G, Y_2^L]$ will choose the government school. Generally, a low ability child's choice is confined to the government school or expensive trust or company school.

Furthermore, we ascertain $Y_2{}^H < Y_2{}^L$. That is, when the child's ability is low switching to the costly trust school would occur at a much higher level of income.[16] But we cannot ascertain whether $Y_3{}^H < Y_3{}^L$ without further assumptions.

We summary discussion provides leads for the empirical work.

(1) Richer households select company schools. Higher ability of the child also favours company school selection against the government school, but between the trust and company schools the bias may go either way. In poorer household the ability bias would go for the low-cost company school.

(2) High ability students are likely to be distributed across all types of private schools. But the low ability students are likely to be concentrated in government schools or expensive private schools.

4. Empirical Strategy

4.1 Test score determination

We assume the following education production function, which is standard in the literature:

$$T_{is} = T(sc_s, fc_i) + u_{is} \quad (7)$$

where T_{is} is the test score of student i in school s, sc_s is a vector of the characteristics of the student's school s, and fc_i are the family/individual characteristics of student i, and u is the random noise varying across s and i. To relate this to our theoretical model, T_{is} is a realisation of the variable t_s, and the expected score τ_s^j is an expectation conditional on ability of T_{is}. Also, note that in our empirical model all company schools are treated as a homogenous category, which was not the case in our theoretical model. There are some low-cost company schools in our sample. The lowest annual fee for a company school is Rs 880 which fit the description of a low-cost company school.

Since sc_s and fc_i are not fully observed, their unobserved components will end up in the error term causing our result biased, we proxy sc_s by a homogenous private school dummy variables S_0 (keeping the combined government and PA schools as the base) to capture the effect of various unaccounted and unobservable school characteristics. This gives equation (8) as

$$T_{is} = T(S_0, fc_i) + u_{is} \; . \quad (8)$$

We extend equation (8) to the case of full diversity of schools, by replacing S_0 by three dummies for the company, trust and PA schools as S_1, S_2 and S_3 respectively, keeping the government school as the reference category, and write the disaggregated version of equation (8) as

$$T_{is} = F(S_{1i}, S_{2i}, S_{3i}, fc_i) + u_{is} \quad (9)$$

Finally, we linearize equations (8) and (9) respectively as

$$T_{is} = a_0 + a_1 S_{0i} + \gamma(fc_i) + u_i \quad (10)$$

$$T_{isk} = b_0 + b_1 S_{1i} + b_2 S_{2i} + b_3 S_{3i} + \gamma(fc_i) + u_i \quad (11)$$

The parameters a_1, b_1, b_2, and b_3 yield the estimates of absolute efficiency (AE), where efficiency is measured by the marginal gain in total standardised score (aggregated over six compulsory subjects) for each school type. We also define relative efficiency (RE) as T_{is}/S_x, where S_x is per capita expenditure of the school. In our theoretical model, we did not discuss RE for the sake of economy.

4.2 School Choice and test score determination

The OLS estimates of a_1, b_1, b_2, and b_3 are likely to be biased as unobservable factors may correlate school choice with test scores, making the school dummies endogenous. Hence, we try to correct for endogeneity using the two-stage IV method.

In the first stage, we model school choice by introducing instrument(s). For the aggregate school types model, the school choice is given by

$$Y_{is}^* = \alpha_0 + \alpha_1 z_{is} + \alpha_2 W_i + e_{is} \quad (12)$$

For any given type of school *s*, the dependent variable *Y** is unobservable, but it is related to the observable variable S_0, which takes a value 1 if the student goes to a private school, and zero otherwise. For the disaggregate school types model, *Y** depends on S_s, which is equal to 1, if *s*=1,2,3 as defined before, and 0 otherwise. The set of variables, *W* refers to a set of individual (e.g. gender, age) and household characteristics (e.g. parents' education, income and caste). But the key identifying variable of interest is *z*, which is our instrument for school choice and it is going to be different for different school types.

Next, using the first stage estimates of individual school choice regressions, we predict the value of the potentially endogenous variables and replace the school dummy by the predicted value. That is, we replace S_{0i} by S_{IVi} in equation (10), and S_{1i}, S_{2i}, S_{3i} in equation (11) by S_{1IVi}, S_{2IVi} and S_{3IVi}, respectively. The final equations for obtaining the IV estimates are:

Homogenous private schools: $$T_{is} = a_0 + a_1 S_{IVi} + \theta(fc_i) + u_i \quad (13)$$

Heterogeneous private schools: $$T_{isk} = b_0 + b_1 S_{1IVi} + b_2 S_{2IVi} + b_3 S_{3IVi} + \gamma(fc_i) + u_i \quad (14)$$

While equations (13) and (14) refer to the determination of test scores with a view to determine AE, we also estimate the corresponding equations for determining RE.

4.3. Instruments

For the aggregate school model, our instrument (z in equation (12)) is the number of private schools in the VDC of the child's home.[17] The variation in the number of private schools in the VDC captures the scope of choosing a suitable school, as the private school expansion in Nepal during our study period primarily was a response to growing demand, rather than a reflection of quality competition. Even if the schools competed on admission, extending the competition all the way to the SLC exam is unlikely, because the SLC exam would occur in five (and in many instances ten) years after the child's admission. Changing school midway is rare, even if the student finds herself struggling. Thus, the number of private schools is unlikely to be correlated with individual student's test score. Indeed, our econometric test of exogeneity of the instrument confirms this. Another potential concern is that the location of private schools may correlate with local household characteristics. We do not think that is the case, because Nepal (like other South Asian countries) do not have a catchment area policy; private schools locate in areas with good transport link (Pal, 2010), or areas favoured by government policy (Caddell, 2007a). Figure 1 in Appendix explains the relevance of our instruments.

For the disaggregate school model, our (VDC level) instruments are the number of private schools for company-run school, the share of non-Hindu population for trust-run school and average walking time to school for the PA school. The rationale for the company school IV is same as the above given in the aggregate school model. For the trust school, the population share of the non-Hindu population (minority in Nepal) has a *negative* effect on the likelihood of its choice (Figure 1). Historically, many trust schools were set up by Hindu philanthropists causing a Hindu bias, which in turn might have

discouraged the minorities (Caddell, 2007a, 2007b). Even when the trust school founders are fully secular, the trust school would appeal for their liberal outlooks more to the secular section of the majority community than the minorities.

One likely concern is whether the religious minorities have lower academic performance in general, as is seen in neighbouring India. In our sample, 92% of the students are Hindu, and they score slightly less on average than non-Hindus.[18] Given a potential (but weak) negative correlation between Hindu identity and test scores, we test the validity of instruments.

For the PA school, the competition is with the government school. When one is priced out of the private schools, one's choice is restricted to PA and government school, and the distance to school is likely to be important. If the local government school is oversubscribed, a student may need to walk longer to attend a PA school. Hence, there will be a *positive* relation between the distance and PA school choice, which we observe beyond a minimum walking time 0.4 hour (Figure 1). Furthermore, households typically do not relocate to avail good schools as there is no catchment policy. Hence, distance to the school would be exogenous to test scores, which is also econometrically corroborated.

Control variables. We pool observations for three years 2002-04 and take only one observation per student at their first appearance in the SLC exam. As such, all standard errors are clustered at the school level to minimise autocorrelation of errors, if any. We include characteristics of the child (male, age, square of age, if received any peer help, 'no grade repetition in year 9', which is an approximate measure of ability), years of schooling of each parent, log of annual cash earnings of the household, caste (*Janajati*, *Dalit*, *Chhetri*) and rural/urban location. We also include dummies for the SLC years and the districts to account for the unobserved SLC year-level (i.e., exam papers, marking etc.) and district-level factors that may affect test scores. Note that the set of instruments z_s are excluded from the final equations (13) and (14).

Our tests of exclusion restrictions (see Section 5) validate the argument that these IVs do not influence SLC test scores directly. Further the Hansen J-statistics for over-identification test indicate

that the test score equation is exactly identified.

To control for the unobserved parental preferences on school choice and student performance, we ideally needed a household fixed effects model. But we were unable to do this as we do not have SLC information for all the siblings living in a household over the sample years 2002-04. Hence, we control for all observable and relevant parental characteristics to account for school choice.

5. Results

5.1 Determinants of school choice

We first estimate the school choice equation (12) using a linear probability model. For the baseline model of public-versus-private school choice, the key identifying variable is the number of private schools in the VDC.[19] The resultant marginal effects of the main variables of interest are shown in Table 3 column 1. We see that the number of private schools in a VDC positively affects the choice of a private school (trust or company), thus justifying its relevance as an IV.

Household income and parental education – especially mother's education, are expectedly significant determinants of private school choice. Higher ability (captured by 'no repetition of grade 9') and being a male student favour the choice of a private school.

Next, we extend the school choice model to individual school types, where the probability of each type of school's choice is estimated against the choice of all other schools combined. Columns (2) - (4) of Table 3 report these estimates. Significantly, a higher income creates a positive selection bias for the company school, but a negative (weakly significant) bias for the trust school. This is consistent with our theoretical prediction; in comparative terms between a trust school and any other school, the preference would be away from the trust school. This is also because trust schools may offer scholarship to poor families. Except for the company schools, there is no gender bias in school selection.

Table 3. Linear probability estimates of school choice

	(1)	(2)	(3)	(4)

VARIABLES	Pvt Sch.	Company Sch.	Trust Sch.	PA Sch.
Number of Pvt Sch.	0.0117***	0.0328***		
	(0.00266)	(0.00235)		
Non-Hindu pop. share			-0.243***	
			(0.0362)	
Time to walk to Sch.				0.000442**
				(0.000183)
Constant	0.840***	0.466***	0.307***	0.00732
	(0.778)	(0.0683)	(0.0445)	(0.0907)
Other controls	Yes	Yes	Yes	Yes
District & year dummies	Yes	Yes	Yes	Yes
Observations	7,070	7,070	7,573	7,573
R-squared	0.301	0.244	0.172	0.171

Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1.
Other controls include individual gender, age, age square, binary indicators of health problems, peer help and grade repetition in year 9, each parent's schooling years, annual income, castes (Janajati, Dalit, Chhetri) and a dummy for rural regions.

5.2. The effect of School Choice on School Performance: Absolute efficiency measure

Homogeneous private Schools: In Table 4 we report the school effects for the aggregate model of private and public schools (as in equation 13). In column 1 we have the OLS estimate of the school effect, which shows that private schools yield 0.009 higher test scores than public schools. The IV estimates presented in column 2 show that the private school effect (after correction) is much larger; it is 0.039 higher, suggesting a negative (overall) selection bias.

Table 4. Non-IV and IV estimates of efficiency: Homogeneous private schools

VARIABLES	(1) Non-IV AE	(2) IV AE	(3) Non-IV RE	(4) IV RE
Pvt Sch.	0.009***		0.004**	
	(0.001)		(0.002)	
IV Pvt Sch.		0.039*		0.035
		(0.021)		(0.034)
Constant	0.031***	0.003	0.040***	0.009
	(0.002)	(0.018)	(0.006)	(0.028)
Other controls [1]	Yes	Yes	Yes	Yes
District & Year dummies	Yes	Yes	Yes	Yes
IV exclusion test: F(p-		0.00(1.00)		0.00(1.00)

value)				
Observations	6,188	5,828	6,188	5,828
R-squared	0.471	0.390	0.341	0.130

Robust standard errors in parentheses;*** p<0.01, ** p<0.05, * p<0.1.
For 'Other controls' see note to Table 3.

In this context, it is important to test the validity of the IV exclusion restrictions: *z* satisfies the exclusion condition if cov(*z*, *u*)=0 in equation (13) for homogenous private schools case. The latter requires that z is uncorrelated with the disturbance, *u* in equation (13), i.e. *z* has no explanatory power with respect to T_i, after conditioning on other *x*'s. It is difficult to test this condition directly because *u* is unobservable; we develop a test using the estimated residuals for student performance equation (13) which is reported in Table 4. Clearly the relevant *F*-statistic is low with a very high p-value, thus allowing us to accept the null hypothesis that the IV is not statistically significant to explain the estimated residuals of the test score regression (13). This validates the exclusion restriction of the IV.

Heterogeneous Private Schools. Next, we present the estimates of the effects of individual school types (equation (14)) in Table 5. From the OLS estimates (column 1) we see that the trust schools are the best, closely followed by the company-run schools, while the PA schools are no different from the government school. From the IV estimates (column 2), which correct for the selection bias, we see that the efficiency gaps between the schools drastically widens. The trust school stays on top yielding 0.06 higher test scores than the government school, and 0.046 higher than the company school. The PA school is significantly worse than the government school.

Columns 3 and 4 of Table 5 show the rural-urban diversity. It is not surprising to see that the national level efficiency ranking is mainly driven by the rural sector, whereas in the urban sector the two private schools are no different from the government school. As has been widely discussed in the development literature government schools are often plagued with various inefficiencies, and in rural areas the problem is far worse.

Table 5. Estimates of absolute efficiency (AE) – heterogeneous private schools

VARIABLES	(1) All	(2) All	(3) Rural	(4) Urban
PA Sch.	0.001			
	(0.001)			
Company Sch.	0.009***			
	(0.001)			
Trust Sch.	0.010***			
	(0.002)			
IV PA Sch.		-0.038***	-0.028**	-0.035*
		(0.012)	(0.011)	(0.021)
IV Company Sch.		0.014*	0.025***	0.006
		(0.007)	(0.006)	(0.010)
IV Trust Sch.		0.060***	0.051***	0.031
		(0.017)	(0.011)	(0.034)
Other controls	Yes	Yes	Yes	Yes
Constant	0.031***	0.013**	0.012**	0.030**
	(0.003)	(0.006)	(0.005)	(0.012)
District & SLC year dummies	Yes	Yes	Yes	Yes
IV exclusion test: F(p-value)	-	0.00(1.00)	1.43 (0.24)	0.55 (0.65)
IV over-id p-value Hansen J-stat[1]		0.00	0.00	0.00
Observations	6,188	5,828	3,974	1,854
R-squared	0.472	0.400	0.383	0.420

Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1. [1] Hansen J-stat of 0 indicates that the equation is exactly identified.

Why do the trust schools perform better than the company schools? We do not have a definitive explanation. But we may speculate based on Table 2 and Appendix Table 2A that the social motivation of trust schools driving them to choose a lower pupils-teacher ratio, hire better trained teachers and hold parent-teacher meetings more frequently, resulting in better student performance. Second, head teachers are more likely to be the founders of trust schools, which help reduce the agency problems. In sum, the trust schools probably combine private financing and management to promote better education.

5.3. School effects: Relative efficiency

Examining the data on expenditure we see that although the trust and company schools spend a similar amount of money per student, their composition of inputs on which the money is spent is vastly different. As noted above, compared to the company schools, the trust schools pay more to the teacher, have better trained teachers and spend more on learning infrastructure, even though their tuition fee is lower. Clearly, which school is value for money is an important consideration for the parents and policy makers alike.

As the RE estimates for the aggregate model show in Table 4 columns 3 and 4, in contrast to the AE estimates, the private schools as a group do not fare better than the public schools (IV estimates in column 4). The AE score advantage of the private schools is just offset by the high fees.

Table 6. IV estimates of relative efficiency (RE) – heterogeneous private schools

VARIABLES	(1) All	(2) All	(3) Rural	(4) Urban
PA Sch.	0.003			
	(0.002)			
Company Sch.	0.007***			
	(0.002)			
Trust Sch.	0.001			
	(0.004)			
IV PA Sch.		-0.010	-0.020	0.030
		(0.019)	(0.020)	(0.039)
IV Company Sch.		0.013	0.008	0.025**
		(0.012)	(0.013)	(0.012)
IV Trust Sch.		0.086***	0.096***	-0.005
		(0.021)	(0.019)	(0.048)
Other controls	Yes	Yes	Yes	Yes
Constant	0.040***	0.007	0.020*	0.020
	(0.006)	(0.008)	(0.010)	(0.015)
District/SLC year dummies	Yes	Yes	Yes	Yes
IV exclusion test: F(p-value)		0.00 (1.00)	0.19 (0.91)	1.18 (0.31)
IV over-id Hansen J		0.00	0.00	0.00[1]

stat[1]				
Observations	6,188	5,828	3,974	1,854
R-squared	0.344	0.134	0.136	0.176

Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1
[1] Hansen J-stat of 0 indicates that the equation is exactly identified.

However, that is not the whole picture. There is a significant difference between the trust school and the company-run school on this. Individual school IV estimates, as reported in columns 1 and 2 of Table 6, show that it is only the trust school that is 'value for money'. After adjusting for the money spent per pupil, trust schools account for 0.086 higher score than the government school. Company schools are no better than the government school in relative efficiency unit.

Columns 3 and 4 of Table 6 show the rural-urban split of RE estimates. The superiority of the trust school holds only in the rural areas, similarly to the AE scores. The company school, on the other hand, is superior only in urban areas. Combining the national and the rural/urban pictures we conclude that trust schools are the only value for money school.

5. Robustness check

We now try to rule out several competing explanations.

Both types of public schools clubbed together. One may argue that the government school and the PA school are just two variants of the public school, and their separation may influence the estimates. To examine this possibility, we club these two schools together, as we did in our aggregate model, but differentiate between the trust and company schools. Table A1 in Appendix presents both the OLS and IV estimates of AE and RE scores. As can be seen from the IV estimates (columns 2 and 4) that the trust school comes out as the best school of the three types of school. Relative to the base category of the (aggregate) public school a trust school student scores 5.434 higher score, while a company school student scores only 2.136 higher score. However, the difference between the two private schools is significantly less when it comes to RE scores.

Persistence of learning. It is important to examine if the relative superiority of trust schools holds when we control for the persistence of learning through a lagged value-added model. Although we have cross-section data, we observe three test scores for each student: SLC test score, send-off test score in the school's own exam (conducted 3 to 6 months prior to the SLC exam) and the end of year 9 test score. This allows us to construct a panel of three observations per student each for the year 9 test score, send-off test score and the final SLC score. We then follow Andrabi et al. (2011) and Singh (2015) to estimate the following dynamic version of our model.

$$T_{it} = b_0 + b_1 S_{1IVi} + b_2 S_{2IVi} + b_3 S_{3IVi} + b_4 T_{it-1} + \gamma(fc_i) + u_{it} \qquad (9)$$

where T_{it-1} is the lagged test score of the *i*-th student.

We estimate this model for both AE and RE scores along with the rural-urban split using the 2004 sample for whom we can observe the grade 9 scores. The estimates of this model are given in Table A2 in Appendix. The estimated coefficient of the lagged score indicates 0.6% to 0.8% persistence of learning from grade 9 depending on the AE or RE scores and rural or urban regions. The persistence effects are small but statistically significant. As for individual types of school, we see that trust school students graduate with good scores in most cases.

Subject fixed effects. We rearrange the student-level data for 2004 to generate subject-level standardised scores for six compulsory SLC subjects for each student. This allows us to exploit the inter-subject variation in the test scores for a given student, thus eliminating student-level time-invariant omitted factors, e.g., ability. The IV estimates for both AE and RE scores (for rural and urban areas) are shown in Table A3 in Appendix.

These estimates, whether for national or rural-urban regions or for AE or RE, are in line with the estimates of Table 4-6. Generally, the trust school is the most efficient school, followed by the company and other schools.

6. Conclusion

Recent literature highlights the benefits of social motivation in the provision of public goods, especially when there are incentive problems. Challenges for the government schools to provide quality schooling are well discussed in the literature (see Day Ashley et al., 2014; Chaudhury et al., 2006). In this context, the paper assesses the role of not-for-profit private schools in enhancing schooling performance. In doing so, the paper utilizes a unique database from Nepal and shows that the socially motivated trust schools do systematically better than the profit motivated company schools, using 2SLS IV estimates. It appears that while for-profit schools can attract large private investment, they may not sustain high test performance.

Our results may have implications for contracting of services in the schooling sector where contracts likely to be complex and incomplete. Therefore, policy makers and donors can be more confident if the contracted party can be trusted, even if contract monitoring is difficult. Where appropriate, funding for the not-for–profit private trust schools can be increased like in the health sector as argued in Agg (2006).

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Endnotes

[1] NGOs are important channels for health care (Reinikka & Svensson, 2010) and foreign aid (Agg, 2006). For the historical role of missionaries in spreading education in India and the British Empire see Castello-Climent, Chaudhary, and Mukhopadhyay (2016) and Jenz (2012), respectively.

[2] Caddell (2007a, 2007b) discuss how philanthropists and missionaries spread education in the country, which was once exclusive to the royal family and the elite.

[3] The full dataset contains over 11,000 observations. But due to missing values we lose nearly 1/3rd of these.

[4] Newhouse and Beegle (2006) attribute the success of the public schools to unobserved higher quality of inputs used in public schools. Chudgar and Quin (2012) show that low-fee paying private schools in India are no better than the public schools. They emphasize the need for recognizing heterogeneity among profit-motivated schools.

[5] Existing studies estimate the conventional test scores by school type (Andrabi, Das, Khwaja, & Zajonc, 2011) or voucher experiment as in Muralidharan and Sundaram (2015) and simply compare the average school expenditure per student by school types/voucher to identify the low-cost school type. Use of the composite RE measure allows us to obtain marginal value for money for each school type.

[6] We exclude the repeaters because of different issues. We also drop the boarding students, because their school choice cannot be explained by the factors permitted by our data.

[7] The districts of the trust schools are: Kanchanpur (Far Western Development Region), Arghakhachi, Tanahun (Western Development Region), Kavrepala, Lalitpur, Dhanusha, Bhaktapur (Central Development Region), Saptari, Solukhumb, Udayapur, Jhapa (Eastern Development Region). Of these Kavrepala, Lalitpur and Bhaktapur districts have two schools each.

[8] The government schools are not free, except for girls and poor students.

[9] English-medium instruction is very common in most private schools, as Liechty (2003) notes: 'English proficiency is simultaneously the key to a better future, an index of social capital, and part of the purchase price for a ticket out of Nepal'.

[10] For more see the following website: http://www.educatenepal.com/institutions/detail/prabhat-english-higher-secondary-school-mahakalishtan-bhaktapur

[11]

	Rural with Trust schools	Rural without trust schools	T-statistic
Father school years	8	9	-1.40
Mother school years	3.2	3.4	-0.2392
Log(cash income)	1.73	1.72	0.2021
Dalit	0.04	0.03	0.8482
Wealth decile	5.77	5.51	1.1228

[12] We regress (separately) the presence of company and trust schools on total scores of the government schools. The coefficients for the company and the trust school are -0.0000602 and -0.0003 respectively, both significant at 1% level.

[13] This difference is statistically significant.

[14] We ignore the PA school for simplicity.

[15] In our sample, there are low-fee charging trust schools as well.

[16] $Y_2^H < Y_2^L$ implies $\frac{(F_T-F_P)}{(F_T-F_G)}\frac{\tau_P^H}{\tau_T^H}\frac{\tau_T^L}{\tau_G} + \frac{(F_P-F_G)}{(F_T-F_G)}\frac{\tau_P^H}{\tau_T^H} < 1$. The left-hand side of this inequality is a weighted average to two numbers, both of which are less than 1.

[17] The choice of our IVs is consistent with the literature not only for developed (Figlio and Ludwig, 2000), but also for developing countries (Alderman, Orazem, & Paterno, 2001; Newhouse and Beegle, 2006).

[18] The average score is 383 for Hindu students and 390 for non-Hindu students and the difference is significant at 5%.

[19] An implicit assumption is that the same number of schools existed in the past when the parents made the school choice.

Appendix

1. Social motivation of Trust schools

Appendix Table 2A. Comparison of expenditure and salary per student across school types

VARIABLES	(1) Rural Exp./student [1]	(2) Urban Exp./student	(3) Rural Salary/student [1]	(4) Urban Salary/student
Trust Sch.	1.909**	-1.026***	-0.490	-1.227***
	(0.908)	(0.347)	(0.717)	(0.397)
Company Sch.	-0.371	-3.506***	-1.457**	-1.794***
	(0.354)	(0.509)	(0.598)	(0.424)
PA Sch.	-1.179***	-1.529***	-0.710***	-0.581***
	(0.095)	(0.198)	(0.108)	(0.211)
Age	0.020***	-0.086***	0.017***	0.005
	(0.007)	(0.010)	(0.004)	(0.009)
Founder as head	2.390***	-0.160	1.244***	-0.181
	(0.206)	(0.172)	(0.452)	(0.484)
Trained teachers	0.483***	0.278	0.798***	0.281**
	(0.136)	(0.237)	(0.161)	(0.113)
Pupil per teacher	-0.019***	-0.062***	-0.033***	-0.060***
	(0.002)	(0.010)	(0.003)	(0.009)
Parent teacher association	-0.391***	-2.575***	-1.121***	-2.404***
	(0.138)	(0.189)	(0.224)	(0.181)
Rural	-	-	-	-
Constant	3.524***	12.380***	4.381***	6.988***
	(0.434)	(0.733)	(0.415)	(0.582)
VDC dummies	Yes	Yes	Yes	Yes
Observations	4445	1,938	4367	2055
R-squared	0.406	0.393	0.12	0.21

Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1.

[1] Expenditure/student and also salary per student are measured in 000 Nepalese Rp.

Here we regress school expenditure/salary per student on a set of school characteristics (as in Table 2A) plus the dummies for trust, company and PA schools to account for any unobserved school specific characteristics for the full sample, which may also influence school expenditure and salary per student. The reference school category is the group of government schools.

Appendix Table 2B. Effect of school choice on further study after completing SLC

VARIABLES	(1) studying	(2) Rural Studying	(3) Urban Studying
Company school IV	-0.101	0.0244	-0.247***
	(0.0665)	(0.0818)	(0.0804)
Trust school IV	0.362*	0.642***	0.0565
	(0.209)	(0.234)	(0.214)
PA school IV	-0.0257	0.0966	-0.245**
	(0.0738)	(0.0958)	(0.114)
Rural	-0.0104	Dropped	Dropped
	(0.0231)		
Selection correction	-0.0570***	-0.0379	-0.0804**
	(0.0193)	(0.0270)	(0.0356)
Constant	1.244***	1.187***	0.0428
	(0.177)	(0.235)	(2.810)
District dummies	Yes	Yes	Yes
SLC year dummies	Yes	Yes	Yes
Other controls	Yes	Yes	Yes
Observations	2,821	1,612	1,209
R-squared	0.063	0.074	0.088

Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1.
Other controls are as in Table 4a.

2. Robustness tests and Figures

Table A1. School effects with the government and PA schools clubbed together

VARIABLES	(1) AE	(2) AE	(3) RE	(4) RE
Company Sch.	1.097***		0.771***	
	(0.036)		(0.046)	
Trust Sch.	1.035***		-0.122	
	(0.057)		(0.109)	
IV Company Sch.		2.136***		2.289***
		(0.129)		(0.194)
IV Trust Sch.		5.434***		2.846**
		(1.530)		(1.136)
Constant	2.663***	1.505***	3.375***	2.407***
	(0.210)	(0.302)	(0.652)	(0.629)
Other controls	Yes	Yes	Yes	Yes
District and year dummies	Yes	Yes	Yes	Yes

Observations	6,188	5,828	6,188	5,828
R-squared	0.375	0.276	0.112	0.134

Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Table A2. Lagged value added models: IV estimates of AE and RE

VARIABLES	(1) All AE	(2) Rural AE	(3) Urban AE	(4) All RE	(5) Rural RE	(6) Urban RE
PA Sch. IV	-0.014	-0.006	-0.031	0.044	0.013	0.012
	(0.015)	(0.018)	(0.020)	(0.036)	(0.035)	(0.021)
Company Sch. IV	-0.005	0.011**	-0.018**	-0.040	-0.049	0.014
	(0.006)	(0.005)	(0.009)	(0.036)	(0.040)	(0.011)
Trust Sch. IV	0.029**	0.030**	-0.009	0.107	0.082*	-0.014
	(0.014)	(0.012)	(0.042)	(0.079)	(0.045)	(0.038)
Lagged score	0.007***	0.006***	0.007***	0.008***	0.008***	0.007***
	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)	(0.001)
Constant	0.014*	0.006	0.016	-0.019	0.007	-0.011
	(0.008)	(0.007)	(0.034)	(0.029)	(0.022)	(0.042)
Other controls	Yes	Yes	Yes	Yes	Yes	Yes
District & year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2,336	1,568	768	2,336	1,568	768
R-squared	0.690	0.636	0.788	0.289	0.325	0.581

Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1. Other control variables are as in Table 4.

Table A3. Subject FE estimates: IV estimates of efficiency

VARIABLES	(1) All AE	(2) Rural AE	(3) Urban AE	(4) All RE	(5) Rural RE	(6) Urban RE
PA Sch.	-0.109***	-0.064***	-0.242***	-0.072	-0.080	-0.244***
	(0.020)	(0.023)	(0.041)	(0.062)	(0.078)	(0.083)
Company Sch.	0.011***	0.025***	0.002	0.005	0.005	0.028***
	(0.002)	(0.002)	(0.002)	(0.006)	(0.009)	(0.004)
Trust Sch.	0.035***	0.027***	0.018	0.060***	0.052**	-0.006
	(0.008)	(0.009)	(0.016)	(0.020)	(0.021)	(0.032)
Constant	0.037***	0.024***	0.009	0.024	0.038*	0.022
	(0.005)	(0.006)	(0.028)	(0.016)	(0.021)	(0.043)
Other controls [1]	Yes	Yes	Yes	Yes	Yes	Yes
District & year FEs	Yes	Yes	Yes	Yes	Yes	Yes
Observations	13,446	9,014	4,432	13,446	9,014	4,432
R-squared	0.629	0.634	0.643	0.235	0.239	0.347

Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1. Other control variables are as in Table 4.

3. V identification strategy

Figure 1. IV identification strategy