

Improving learning outcomes through information provision: Experimental evidence from Indian villages

Farzana Afridi (ISI, Delhi)

Bidisha Barooah (3ie)

Rohini Somanathan (Delhi School of Economics)

RISE Conference, 2017

Motivation

- Lack of accountability is often cited as a reason for poor quality of education services.
- Insufficient accountability and low stakeholder awareness can co-exist in the provision of education, leading to poor learning outcomes in schools.

Motivation

- *High enrolment and near universal access to schools in India*
- *But abysmal learning levels*
 - 50% of grade 5 students in public schools cannot read a grade 2 text (ASER)
- *Accompanied by steady increase in private schooling*
 - 30% of students aged 6-14 enrolled in rural private schools (ASER)
 - Better learning outcomes but high variation in quality

This paper

- *Effect of information provision*: Randomized private provision of information on quality of schooling with no induced community dialogue or mobilisation.
- *Different sides of the market*: In each treatment either households or schools or both were provided a report card on the performance of students in curriculum based tests designed and administered by us.
- *Nature of information*: Treatments provided either intra or both intra and inter learning performance to stake holders.
- *School choice effects*

Preview of findings

- We find significant improvement in test scores of private schools students in response to provision of information on *relative* learning levels to both households and schools.
- There is no improvement in the learning outcomes of public school students in any treatment.
- But strong and persistent effects on school choice as a result of information provision for both public and private school students.

Our context

Ajmer district of northern state of Rajasthan in India

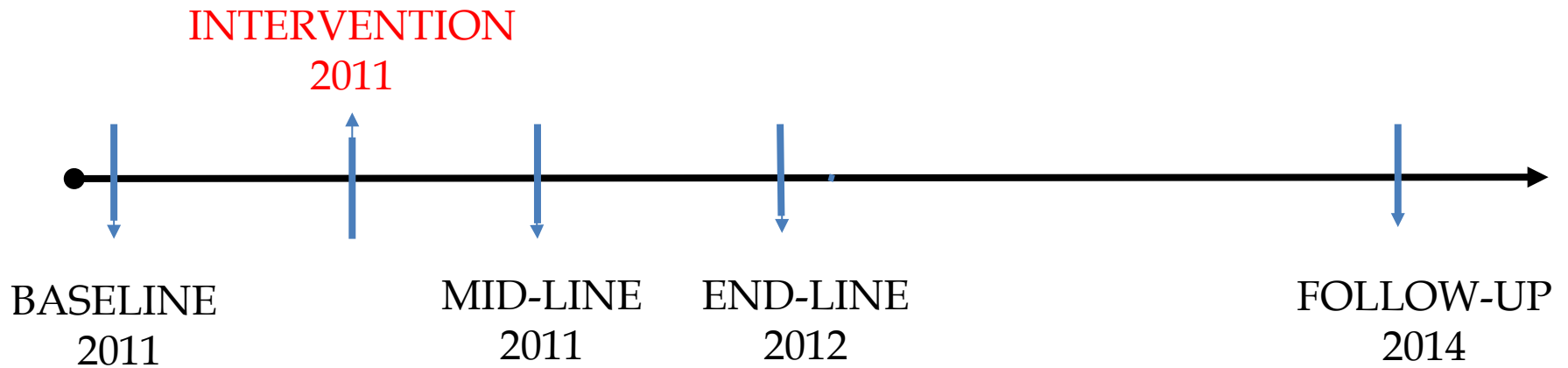
Low level of adult literacy

High urbanisation

High primary school enrolment

High prevalence of private schools

Timeline



Note: academic years

Study Design

Randomized experiment

- 159 schools from 72 villages assigned to one control and 4 treatment groups.
- Both public and private primary schools included.
- Standardized tests administered to all students in grades 4 and 5.
- Household survey of 1499 randomly selected students.

Report card intervention

P1: Parental Report Card (*Intra school*)

- Student's score in each subject and her rank in class

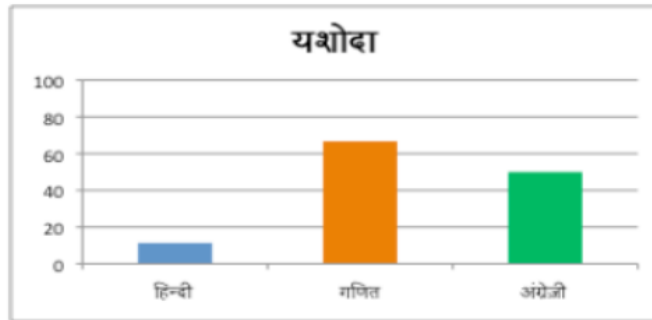
P2: Parental Report Card (*Inter school*)

- Student's rank in panchayat

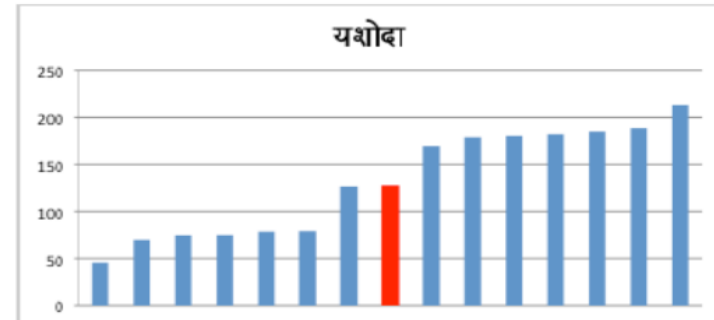
Parental (P) report cards

PARENTAL REPORT CARD P1

Student's score in 3 subjects

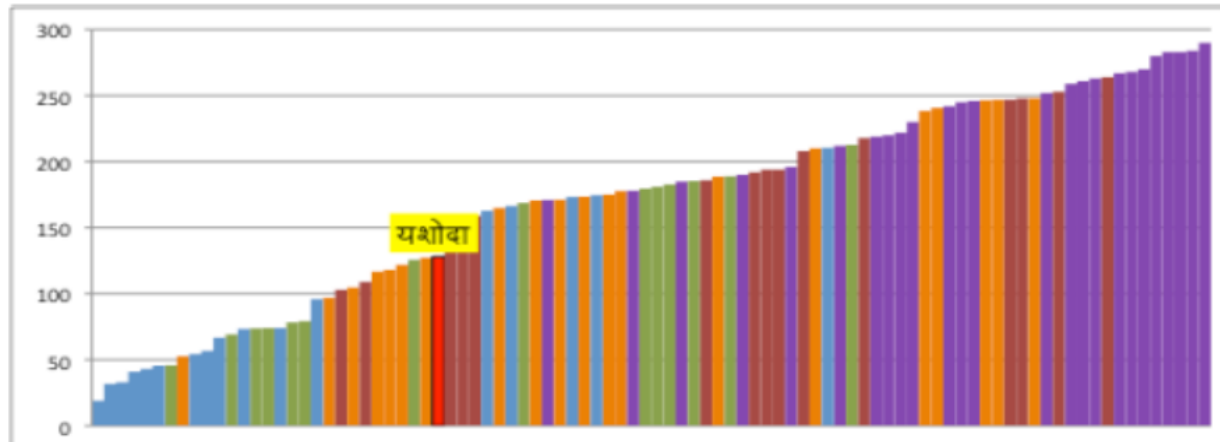


Student's rank in class (combined score)



PARENTAL REPORT CARD P2

Student's rank in panchayat (combined score)



School 1
School 2
School 3
School 4
School 5

Report card intervention

S1: School Report Card (*Intra school*)

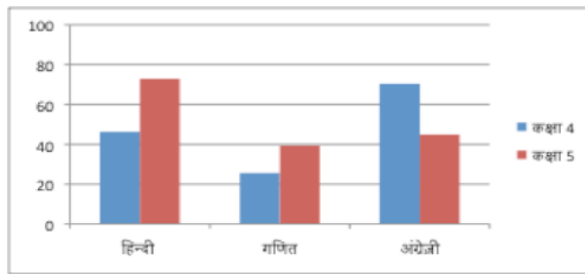
- Average score of each grade in each subject and proficiency in specific skills

S2: School Report Card (*Inter school*)

- Rank of school in panchayat

School (S) report cards

SCHOOL REPORT CARD S1
Average School Score (Max=100)



Number of student achieving proficiency

हिन्दी	कक्षा 4	कक्षा 5	गणित	कक्षा 4	कक्षा 5	अंग्रेजी	कक्षा 4	कक्षा 5
वर्णमाला लिखना और शब्दों का पहचान			गिनती			वर्णमाला लिखना और शब्दों का पहचान		
शब्द और वाक्य लिखना			जोड़ i) 1-अंक ii) 2-अंक iii) 3-अंक			शब्द लिखना		
सरल कहानी समझना			घटाव i) 1-अंक ii) 2-अंक iii) 3-अंक			सरल कहानी समझना		
कठिन कहानी समझना			गुणा i) 2-अंक X 1-अंक ii) 2-अंक X 2-अंक					
अनुच्छेद लिखना			मापना- तौलना					
			ज्यामिती					
			वाक्य पढ़कर हल करना					

SCHOOL REPORT CARD S2

Average School Score in Three Subjects (Max=100)

Class 4	School Name		Hindi	Math	English
1	RAJKIYA MADHYAMIK VIDHALYA, SAIDARIYA	Saidriya	26	24	18
2	RAJKIYA PRATHMIK VIDHALYA, RAIL KI BAADIYA	Saidriya	45	50	57
3	RAJKIYA UCCH PRATHMIK VIDHALYA, BARGAON	Badgaon	38	35	29
5	SATYANAND PUBLIC SCHOOL, BADGAV	Badgaon	77	81	85
6	SRI NAMDEV VIDYA MANDIR, BADGAON	Badgaon	68	61	74

Class 5	School Name		Hindi	Math	English
1	RAJKIYA MADHYAMIK VIDHALYA, SAIDARIYA	Saidriya	27	34	28
2	RAJKIYA PRATHMIK VIDHALYA, RAIL KI BAADIYA	Saidriya	69	70	78
3	RAJKIYA UCCH PRATHMIK VIDHALYA, BARGAON	Badgaon	54	55	63
5	SATYANAND PUBLIC SCHOOL, BADGAV	Badgaon	85	92	87
6	SRI NAMDEV VIDYA MANDIR, BADGAO	Badgaon	73	73	75

Report card intervention

	Control	T1	T2	T3	T4
Report card recipient			Type of report card		
Household	None	P1	P1	P1	P1 and P2
School	None	None	S1	S1 and S2	S1 and S2
<i>Number of schools</i>	35	29	37	28	30
Public	18	16	26	16	20
Private	17	13	11	12	10
<i>Number of students</i>	1064	860	1319	918	996
Public	523	499	858	486	599
Private	541	361	461	432	397

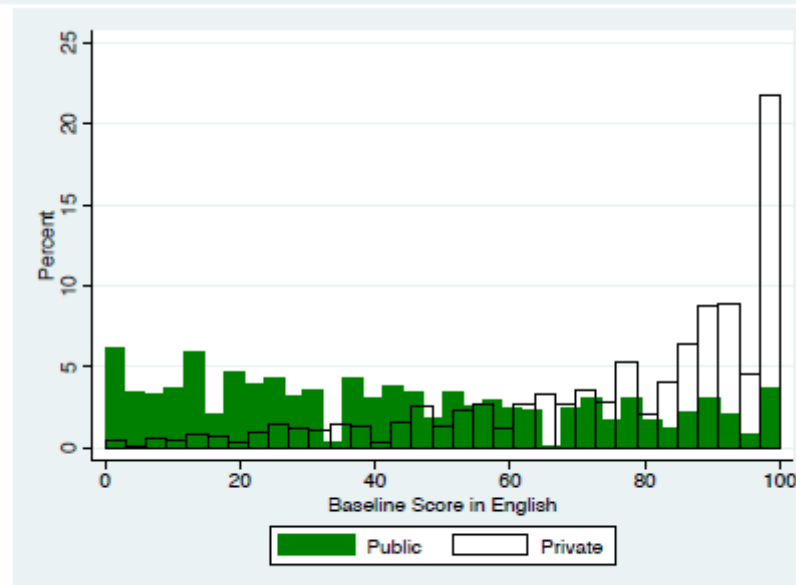
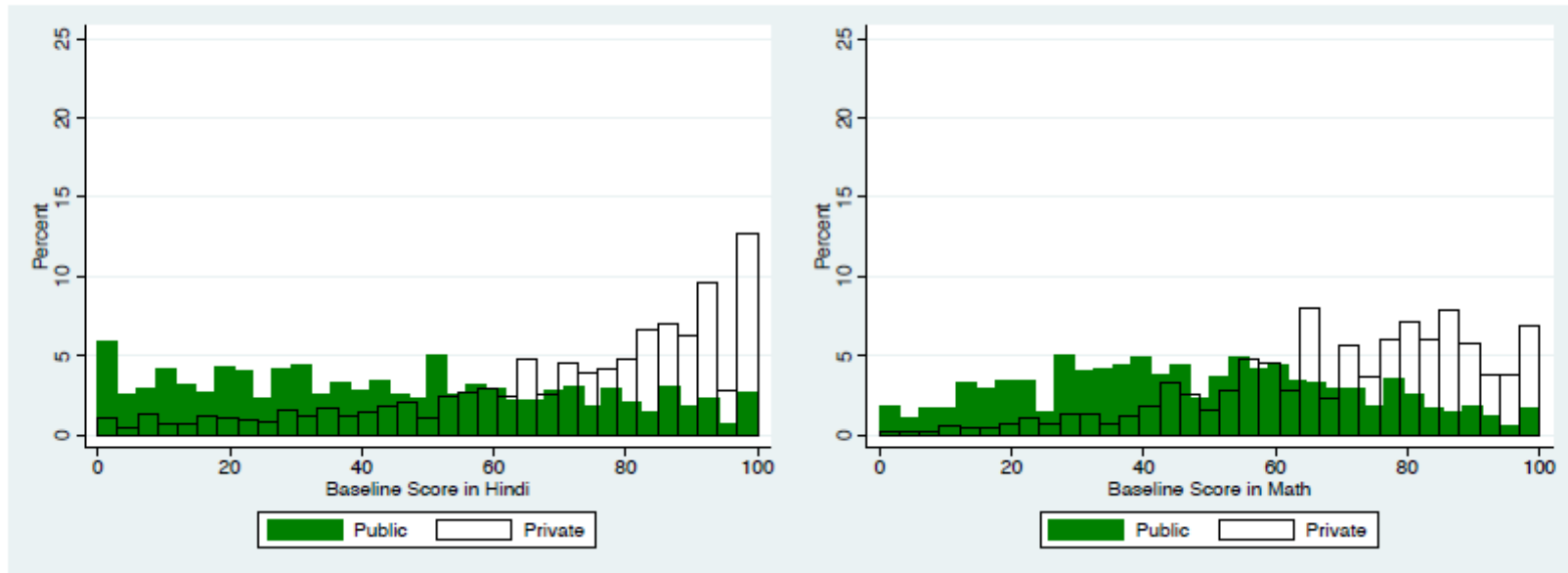
Data

Divergence between parental expectation and student performance at baseline

Scholastic skill	Public Schools			Private Schools		
	Parental Perception	Student performance	Diff	Parental Perception	Student performance	Diff
	(1)	(2)	(1)-(2)	(3)	(4)	(3)-(4)
<i>Hindi</i>						
Alphabet recognition	0.98	0.71	0.267***	0.99	0.91	0.087***
Word construction	0.93	0.81	0.117***	0.99	0.96	0.027***
Sentence construction	0.64	0.49	0.149***	0.89	0.87	0.018
Comprehension	0.50	0.68	-0.176***	0.80	0.89	-0.091***
<i>Math</i>						
Count	0.98	0.87	0.115***	0.99	0.97	0.029***
2-digit operation without carry over	0.85	0.87	-0.016	0.98	0.97	0.004
3-digit operation without carry over	0.58	0.26	0.323***	0.87	0.60	0.269***
<i>English</i>						
Alphabet recognition	0.93	0.67	0.264***	0.99	0.91	0.082***
Word construction	0.51	0.74	-0.236***	0.80	0.95	-0.153***

Significance *** 1% **5% *10%.

Public school students perform worse at baseline



Results

Treatment improved learning outcomes of private school students

Treatment - Control			
Treatment	Baseline	Endline	Difference
	(1)	(2)	(1) – (2)
<i>Private Schools</i>			(N=1338)
T 1	-0.040	0.081	0.122* (0.063)
T 2	-0.088	0.051	0.139** (0.061)
T 3	-0.171	-0.190	-0.019 (0.059)
T 4	0.178	0.279	0.101* (0.059)
<i>Public Schools</i>			(N=1658)
T 1	-0.319	-0.355	-0.036 (0.089)
T 2	0.040	-0.046	-0.085 (0.077)
T 3	-0.114	-0.247	-0.133 (0.086)
T 4	0.065	0.032	-0.033 (0.085)

Empirical methodology

Impact on test scores

$$Y_{isp} = \alpha + \sum \beta_k T(k)_p + \varphi Y^0_{isp} + \mathbf{Z}_{isp} + \varepsilon_{isp}$$

Y_{it} : normalized score of student i in school s in panchayat p

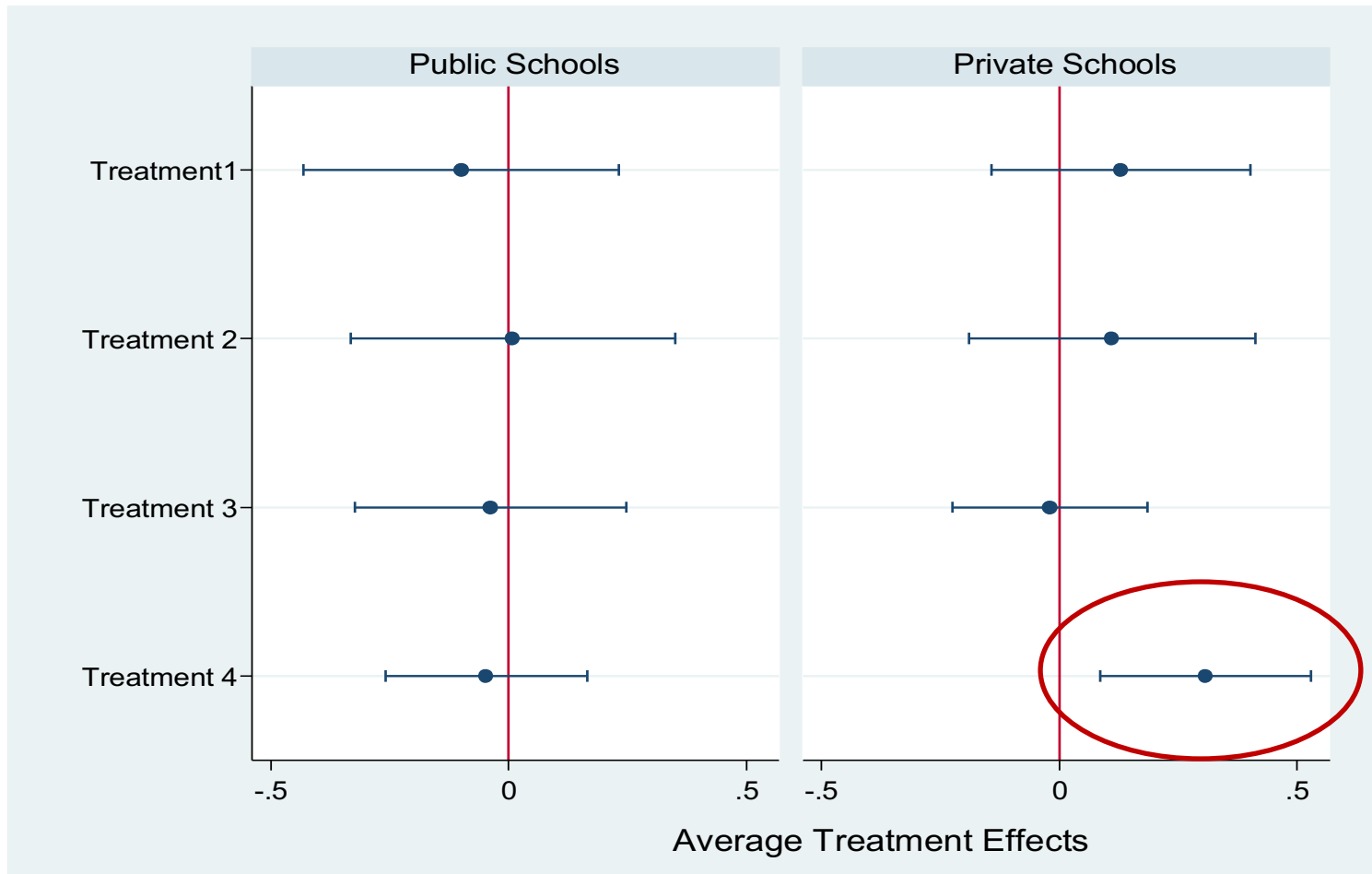
$T(k)_p$: dummy for treatment $k=1,2,3,4$

Y^0_{isp} : normalised baseline score of student

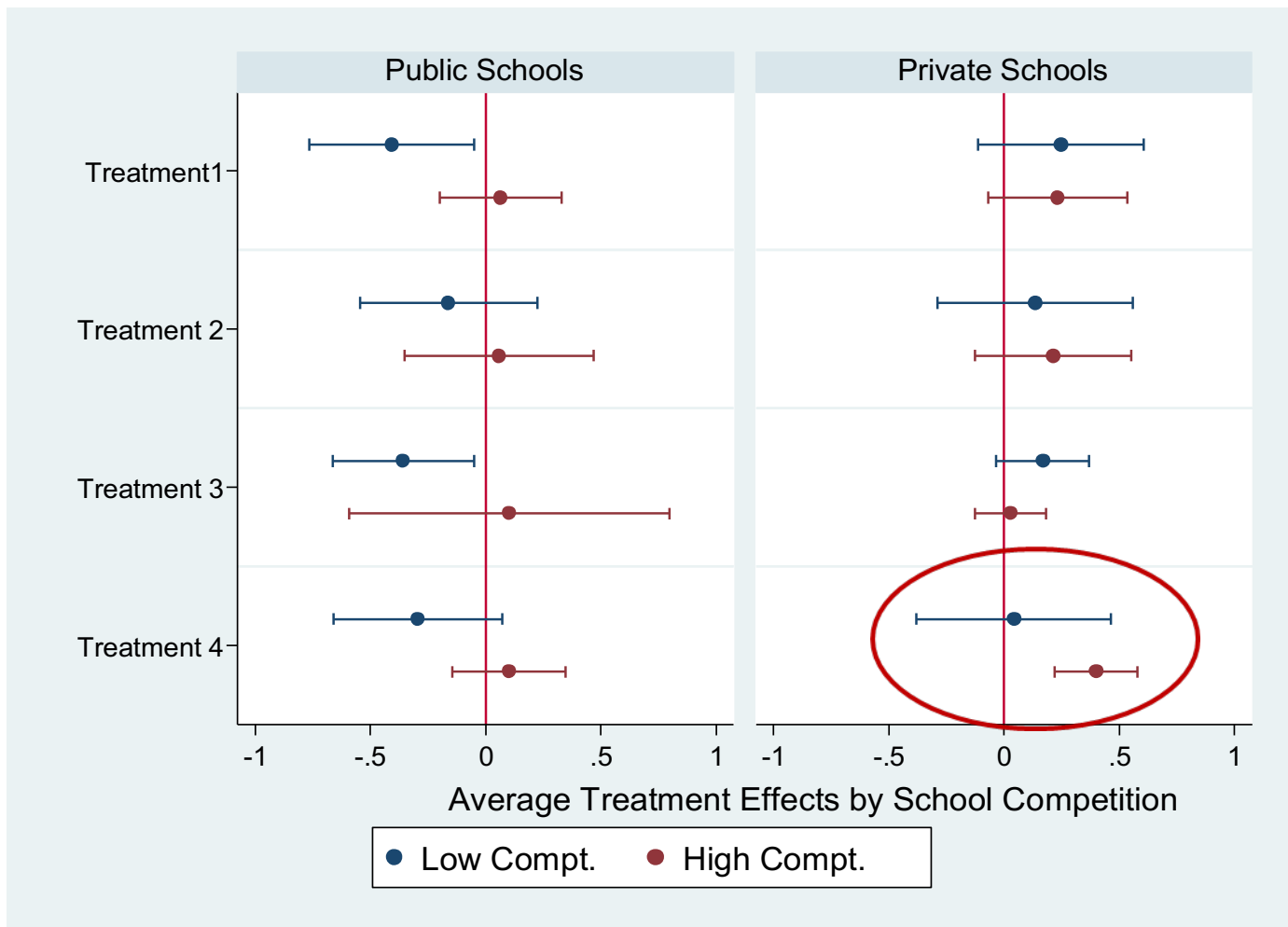
\mathbf{Z}_{isp} : student, school and village characteristics

ε_{it} : error term

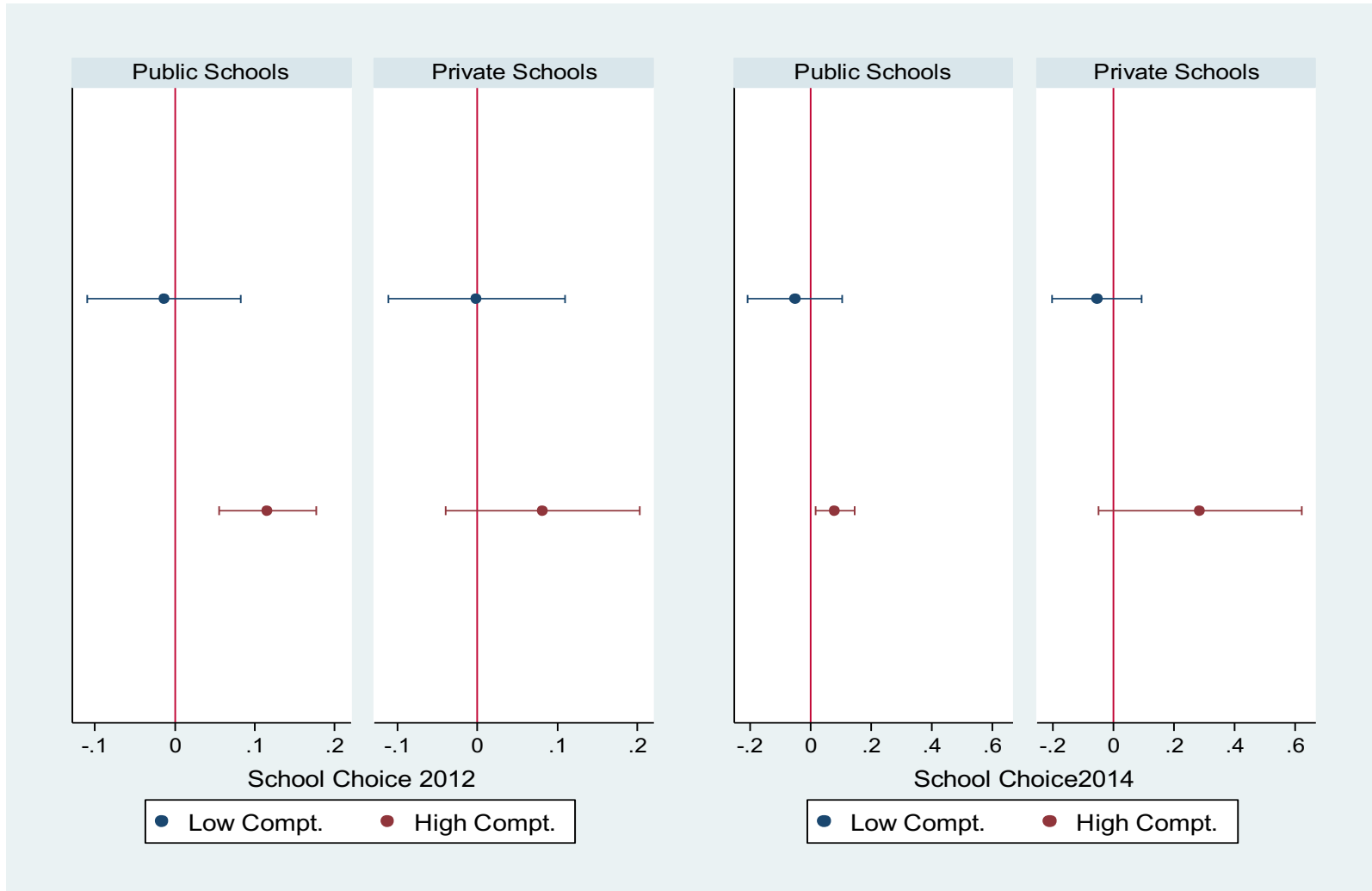
Improved learning in T4 for private school students (2012)



Improvement in T4 for private school students driven by school competition (2012)



Private and public school students exercised school choice (2012 and 2014)



But private schools students chose higher ranked schools (2012)

	Private	Public
T 1-3	0.023 (0.042)	-0.017 (0.027)
T4	0.070* (0.040)	0.036 (0.038)
Constant	0.069 (0.121)	0.004 (0.064)
All controls	Yes	Yes
R ²	0.056	0.033
N	525	747

The dependent variable equals 1 if the rank of child's school at
endline is higher than school rank at baseline. School rank is based on
student's overall score at the school and panchayat level at baseline.
The sample consists of students whose households were surveyed.
Standard errors clustered at panchayat-level in parenthesis.
Significance *** 1% **5% *10%.

Robustness

High and selective attrition

	All		Private		Public	
	N	Proportion of baseline	N	Proportion of baseline	N	Proportion of baseline
Baseline	5157		2192		2965	
Baseline and midline	4000	78	1825	83	2175	73
Baseline and endline	2996	58	1338	61	1658	56

Robustness

Inverse probability weights

	Private	Public
T1	0.420*** (0.115)	-0.0617 (0.301)
T2	0.329*** (0.107)	-0.0542 (0.077)
T3	0.241** (0.111)	-0.135 (0.109)
T4	0.487*** (0.118)	-0.0948 (0.093)
N	1338	1658

Robustness

Lee bounds

	Private				Public			
	T1	T2	T3	T4	T1	T2	T3	T4
Lower bound	-0.0125 (0.080)	-0.0743 (0.123)	-0.349*** (0.097)	0.163** (0.068)	-0.529*** (0.144)	-0.118 (0.109)	-0.395*** (0.134)	-0.143 (0.135)
Upper bound	0.266*** (0.087)	0.0935 (0.086)	0.132 (0.109)	0.486*** (0.060)	-0.232* (0.127)	0.0635 (0.127)	0.0116 (0.154)	0.149 (0.117)
N	902	1002	973	938	1022	1381	1009	1122

Robustness

GGM standard errors

	Private	Public
	(1)	(2)
T 1	0.120 (0.169)	-0.115 (0.203)
T 2	0.098 (0.192)	0.012 (0.321)
T 3	-0.029 (0.105)	-0.035 (0.137)
T 4	0.310** (0.155)	-0.052 (0.114)
Baseline z - score	0.584*** (0.000)	0.608*** (0.000)
Constant	-0.160 (0.317)	0.325 (0.333)
Controls	Yes	Yes
N	1338	1658
R2	0.368	0.277

Notes: Bootstrapped, clustered standard errors reported in parentheses.
Significant at *** 1% **5% *10%.

Summary

- Test scores in private schools improve when both parents and schools know relative school quality.
- Public schools may not be able to adjust resources or have the incentive to respond.
- Public school students' households respond on school choice but their response is not sufficient to improve learning outcomes.
- Private school students respond by exercising improved school choice.

Conclusions

- Private provision of information to both sides of the market, even in the absence of induced community participation, can lead to better outcomes.
- Providing relative information on student performance may lead to greater stakeholder responsiveness.
- School choice results suggest that markets can potentially be leveraged to improve service delivery in the long run.