

Value for money from public education expenditure in India

by

Geeta Kingdon & the World Bank

Appendix Table 1A: Learning Outcome Scores for Class V								
State	Class V Reading 2012	Class V Reading 2015	Class V Maths 2012	Class V Maths 2015	Class V EVS 2012	Class V EVS 2015	Class 5 All Subjects 2012	Class 5 All Subjects 2015
Tamil Nadu	278	259	279	264	288	267	282	263
Uttar Pradesh	282	248	298	257	284	260	288	255
Punjab	252	249	252	238	245	236	250	241
Odisha	253	232	257	237	253	249	254	239
Gujarat	251	243	256	250	250	247	252	247
Kerala	277	259	244	230	252	240	258	243
Madhya Pradesh	250	229	265	236	264	238	260	234
Bihar	228	208	242	235	236	226	235	223

Table 1a: Change in Earnings due to change in Learning levels for Class 5 govt-school Students

State	Change in Reading Comprehension Scores	Change in Mathematics Scores	Change in EVS Scores	Change in mean score all 3 across subjects	Change in mean score in terms of no. of standard deviations	Change in earnings due to drop in mean score
Tamil Nadu	-19	-15	-21	-18	-0.36	-6.6%
Uttar Pradesh	-34	-41	-24	-33	-0.66	-11.9%
Punjab	-3	-14	-9	-9	-0.18	-3.1%
Odisha	-21	-20	-4	-15	-0.30	-5.4%
Gujarat	-8	-6	-3	-6	-0.12	-2.0%
Kerala	-18	-14	-12	-15	-0.30	-5.3%
Madhya Pradesh	-21	-29	-26	-25	-0.50	-9.1%
Bihar	-20	-7	-10	-12	-0.24	-4.4%

Appendix 1 gives the list of learning outcome assessment scores for 2011 and 2015. NAS sets the standard deviation around the mean of achievement test score at 50.

Table 1b: Absolute Change in Annual Earnings of Class 5 govt school Students, 2011-12 to 2014-15

State	Average Annual Earnings in 2011-12	Average Annual Earnings in 2014-15	Absolute Change in Annual Earnings
Tamil Nadu	27,679	25,852	-1,827
Uttar Pradesh	9,347	8,236	-1,110
Punjab	23,901	23,155	-746
Odisha	13,016	12,313	-703
Gujarat	27,096	26,543	-553
Kerala	24,365	23,078	-1,286
Madhya Pradesh	11,805	10,728	-1,077
Bihar	7,019	6,707	-312

Appendix 1 shows the per capita earnings adjustment figures.

Table 1c: Change in Govt schools' Per Pupil Expenditure, 2011-12 to 2014-15

State	Change in Annual Per Pupil Expenditure
Tamil Nadu	115.7%
Uttar Pradesh	122.9%
Punjab	86.2%
Odisha	48.0%
Gujarat	-15.0%
Kerala	54.2%
Madhya Pradesh	150.0%
Bihar	90.3%
AVERAGE FOR THESE 8 STATES	81.5%
Appendix 1 shows annual per pupil expenditure by state, and how the change in PPE is calculated.	

Government and Private schools' Value for Money Comparison
(using data on children's Literacy Outcomes)

S. No.	Variables	Uttar Pradesh	Bihar	Gujarat	Tamil Nadu	Madhya Pradesh	Kerala	Punjab	Odisha
A	Govt Per Pupil Expenditure (Rs.)	23012	3105	47044	33126	9384	39267	16166	8897
B	Govt Achievement (Reading)	27	45	45	50	28	61	61	50
C	Govt Expenditure per Achievement Units (Rs.) (c=a/b)	859	70	1055	664	338	641	265	178
D	Private Per Pupil Expenditure (Rs.)	1800	4200	5400	10800	3700	8400	7900	7150
E	Private Achievement (Reading)	61	88	64	40	58	71	74	77
F	Private Expenditure per Achievement Units (Rs.) (f=d/e)	29	48	84	269	63	119	107	93
G	Govt./ Private Per Pupil Expenditure Ratio (g=a/d)	12.8	0.7	8.7	3.1	2.5	4.7	2.0	1.2
H	Govt./ Private Numeracy Ratio (g=b/e)	0.44	0.51	0.70	1.24	0.48	0.87	0.83	0.65
I	Private/Govt Efficiency Ratio (g = c/f)	29.3	1.5	12.5	2.5	5.3	5.4	2.5	1.9

PPE estimated from state budgets and SSA PAB data (excludes MDM exp.)

Note: if only 25% of the raw achievement gap between private and govt schools is attributed to the better quality of private schools, then the private/govt eff. Ratio falls, e.g. in MP from 5.30 to 3.25 times.

**Table 2b: Government and Private schools' Value for Money Comparison
(using data on children's Numeracy Outcomes)**

S. No.	Variables	Uttar Pradesh	Bihar	Gujarat	Tamil Nadu	Madhya Pradesh	Kerala	Punjab	Odisha
A	Govt Per Pupil Expenditure (Rs)	23012	3105	47044	33126	9384	39267	16166	8897
B	Govt Achievement (Division)	12	31	14	26	10	26	37	21
C	Govt Expenditure per Achievement Units (c=a/b)	1902	99	3384	1294	938	1534	436	434
D	Private Per Pupil Expenditure (Rs.)	1800	4200	5400	10800	3700	8400	7900	7150
E	Private Achievement (Division)	39	72	35	26	29	50	54	45.40
F	Private Expenditure per Achievement Units (f= d/e)	47	58	155	414	130	169	147	157
G	Govt./ Private Per Pupil Expenditure Ratio (g=a/d)	12.8	0.7	8.7	3.1	2.5	4.7	2.0	1.2
H	Govt./ Private Numeracy Ratio (g=b/e)	0.31	0.43	0.40	0.98	0.35	0.52	0.69	0.45
I	Govt./ Private Efficiency Ratio (g = c/f)	40.9	1.7	21.8	3.1	7.2	9.1	3.0	2.8

Temporal Change in Number of schools, Total enrolment and average enrolment per school, in Govt. and Private Schools (2010-15)

STATE	Number of schools				Total Enrolment				Avg. Enrolment per school				
	Absolute Change (2010-15)		% Change		Absolute Change (2010-15)		% Change		in govt. schools In baseline year	Absolute Change (2010-15)		% Change	
	Govt	Private	Govt	Private	Govt	Private	Govt	Private	2010-11	Govt	Private	Govt	Private
Andhra Pradesh*	-4,269	3,932	-5	16.1	-223,489	294,412	-4	6	78	1	-16	1.3	-8.4
Assam	5,692	5,590	13	59	425,198	285,062	10	27	92	-2	-22	-2	-20
Bihar	3,206	7,659	5	1929	701,365	1,769,302	4	1810	288	-3	-14	-1	-6
Chhattisgarh	859	1,101	2	22	-377,980	293,815	-10	36	82	-9	18	-11	11
Gujarat	121	2,774	0	39	18,040	978,261	0	44	176	0	12	0	4
Haryana	-377	1,977	-3	38	-103,416	663,742	-5	51	140	-4	23	-3	9
Himachal Pradesh	229	288	2	12	-145,950	69,231	-20	24	49	-10	13	-20	10
Jammu & Kashmir	1,198	251	5	5	-187,618	42,618	-15	5	55	-11	0	-20	0
Jharkhand	-124	3,665	0	136	-779,208	831,535	-14	94	138	-19	-58	-14	-18
Karnataka	-914	3,086	-2	24	-489,429	582,932	-11	19	99	-8	-9	-8	-4
Kerala**	-527	4,520	-10	62	-290,984	872,547	-25	40	228	-38	-41	-17	-14
Madhya Pradesh	2,346	4,351	2	18	-1,941,935	87,262	-18	2	95	-19	-28	-20	-14
Maharashtra	-1,590	1,449	-2	5	-1,236,274	955,608	-17	11	108	-16	18	-15	6
Odisha	1,329	2,737	2	39	-416,185	431,168	-7	60	99	-9	15	-10	15
Punjab	-631	6,212	-3	194	-303,225	1,237,983	-14	135	107	-12	-58	-11	-20
Rajasthan	-7,589	10,095	-10	39	-1,163,851	1,307,308	-16	27	92	-7	-14	-8	-8
Tamil Nadu	1,638	486	5	3	-153,910	-378,863	-4	-7	118	-9	-27	-8	-9
Uttarakhand	133	1,163	1	23	-152,974	257,393	-16	39	54	-9	17	-16	13
Uttar Pradesh	9,448	32,524	6	66	-2,593,508	7,474,389	-13	61	130	-24	-7	-18	-3
West Bengal	3,313	4,420	4	51	-1,912,764	465,199	-14	45	170	-30	-5	-18	-4
India (20 states) average	675	4,914	1	139	-566,405	926,045	-10	127	120	-12	-9	-11	-3
India (20 states) TOTAL	13,491	98,280	11	2,778	-1,13,28,097	1,85,20,904							

Source: DISE state report card for each state for each year 2010-11 to 2014-15, downloaded from www.dise.in

*(Data has been taken for year 2013-14 as the data of 2014-15 cannot be taken because of separation of Telangana.)

** (Data has been taken for year 2009-10 and 2014-15 because the data for 2010-11 is not available in DISE)

**Table 6.3: Actual take home salaries of govt school regular teachers#
(in INR) Ramachandran**

State	Primary			Secondary		
	Salary of new appointee	Salary after 15 years	Salary after 25 years	Salary of new appointee	Salary after 15 years	Salary after 25 years
Tamil Nadu	15,345	28,660	50,140	26,370	48,750	84,410
Karnataka (R)	18,794	26,098	33,672	24,272	34,618	44,762
Karnataka (U)	21,814	30,198	38,892	28,102	39,978	51,622
Jharkhand (R)	28,650	39,780	44,400	37,494	57,523	78,637
Jharkhand (U)	31,600	43,260	48,100	39,208	60,160	82,247
Odisha	14,031	26,659	27,347	25,625	37,806	43,034
Rajasthan	26,013	--	--	28,331	--	--
Mizoram	16,504	--	--	--	--	--
Uttar Pradesh	29,293	39,683	44,783	37,226	47,716	52,996
Punjab^ (R)	35,936	59,113	79,288	40,602	66,868	89,699
Punjab^ (U)	36,588	60,194	80,742	41340	68,092	91,346
Simple Average	25,922	40,623	49,653	33,578	51,595	66,793

Source: State reports ; R – Rural; U – Urban # Actual take home salary includes basic pay, grade pay, dearness allowance, HRA, CCA, and other benefits and deductions (if any).

Table 5
Estimates of primary-school teacher salaries as a multiple of per capita GDP

Country/state	Reference year	Estimated ratio of teacher salary to:	
		Per capita GDP	Per capita SDP
OECD average	2009	1.2	--
Asian countries			
China	2000	0.9	--
Indonesia	2009	0.5	--
Japan	2009	1.5	--
Bangladesh	2012	~1.0	--
Pakistan	2012	~1.9	--
India			
Nine Indian states ^a	2004-5	3.0	4.9
Uttar Pradesh ^b	2006	6.4	15.4
Bihar	2012	5.9	17.5
Chattisgarh	2012	4.6	7.2

Source: Table 5.4 in Chapter 5 of Dreze, Jean and Amartya Sen (2013) “*An Uncertain Glory: India and its Contradictions*”. Allen Lane, London.

**Increase in the number of 'small' govt. schools, UP
(schools with 50 or fewer students)**

	Total No. of Govt. Schools	Avg. School Size i.e. Avg. Total enrol- ment	Govt. Schools with a Total Enrolment <=50						
			No. of small govt. schools	No. of pupils in these schools	Average No. of pupils per small school	Average No. of pupils per class	No. of Teachers in these small schools	Pupil Teacher Ratio	Total Expense on salary (crores)
			(a)	(b)	(c = b/a)	(d=c/5)	(e)	(f=b/e)	(g)
2005-06	122,126	179	10,873	324,692	30.0	6.0	N/A	N/A	N/A
2010-11	150,295	129	22,410	726,084	32.4	6.4	50,871	14.3	N/A
2014-15	160,942	106	32,317	1,053,534	32.6	6.6	79,177	13.3	3,800

Table 1B: Small govt. school phenomenon, UP 2014-15

SMALL Govt. schools with a total enrolment of:	Number of small govt. schools	Number of Pupils in these govt. schools	Average school size (Number of kids) per 'small' govt. School	Number of Teachers in these govt. schools	Pupil Teacher Ratio	Total Expense on salary (Rs. crores)
0	237	0	0.0	396	0.0	19
<= 5	514	1,044	2.0	941	1.1	45
<= 10	1316	7,738	5.9	2,619	2.9	126
<= 20	5,135	69,220	13.5	11,204	6.2	538
<= 50	32,317	1,053,534	32.6	79,177	13.3	3,800

Note: Avg. teacher salary Rs 40,000 pm in 2014-15, (NUEPA, 2015), with UP SCERT.

Source: DISE data for UP, www.dise.in/statereportcards/raw

In 2014-15, the Total number of Govt. elementary schools in UP was 160,942; and the Average school size in UP (Number of students) taking schools of ALL sizes, was 106.

Content Area	% correct answers in NAS Cycle 3 (2011)	% correct answers in NAS Cycle 4 (2015)	Change in % correct answers (2011 to 2015)
Reading comprehension			
Locating information	54	49	-5
Grasp of Ideas /Interpretation	47	42	-5
Inference/evaluation	55	49	-6
Mathematics			
Operations	54	49	-5
Geometry	52	48	-4
Measurement	47	43	-4
Number system	51	45	-6
Environmental Science			
Family & environment	58	54	-4
Food	49	45	-4
Shelter	58	52	-6
Water	64	59	-5
Travel	49	46	-3
Earth & Space	44	42	-2

Monthly Fee levels in Private Unaided Schools, children aged 6-14, by state, 2014-15

		Mean				Median		
State		Rural	Urban	Total		Rural	Urban	Total
ANDHRA PRADESH		595	858	783		500	708	667
ASSAM		459	754	622		354	475	417
BIHAR		539	560	553		300	392	350
CHHATTISGARH		181	738	639		167	417	358
DELHI		800	2098	2017		667	1800	1563
GUJARAT		602	709	688		333	475	450
HARYANA		786	1118	1010		667	708	700
HIMACHAL PRADESH		709	800	738		520	700	558
JHARKHAND		473	671	617		208	567	446
KARNATAKA		662	1011	926		583	750	683
KERALA		736	897	833		642	745	700
MADHYA PRADESH		355	548	485		250	375	308
MAHARASHTRA		775	1133	1053		563	750	667
ODISHA		299	632	503		250	417	333
PUNJAB		824	919	882		692	600	658
RAJASTHAN		413	632	535		333	417	375
TAMIL NADU		1006	1022	1016		885	900	900
TELENGANA		681	902	838		583	708	667
UTTAR PRADESH		189	525	342		117	250	150
UTTARANCHAL		704	792	768		333	650	600
WEST BENGAL		381	1384	1124		192	1000	596
Total		450	801	663		292	542	417

% of 6-14 year old Private Unaided School attendees who pay fee below given thresholds, by state, 2014-15											
S.N o.	State	<=100 per month	<=200 per month	<=500 per month	<=750 per month	<=1000 per month	<=1500 per month	<=2000 per month	<=2500 per month	Reimbur sement Amount	% of pupils whose fee level is less than RTE reimb. level
1	Andhra Pradesh	1.9	5.3	38.9	61.1	73.6	92.0	96.9	98.5		
2	Assam	5.7	15.7	58.5	74.8	87.4	93.7	95.6	98.1		
3	Bihar	6.0	20.9	69.2	77.6	87.4	94.9	97.5	98.3		
4	Chhattisgarh	7.6	30.8	64.7	74.8	81.3	87.9	90.9	97.5		
5	Delhi	1.3	3.4	12.5	24.9	33.5	48.1	58.8	68.7	1190.0	35.2
6	Gujarat	4.9	21.9	61.2	74.2	85.9	90.5	93.2	96.3		
7	Haryana	1.1	4.6	36.2	56.1	68.4	85.8	92.2	95.0		
8	Himachal Pradesh	2.0	6.1	46.7	66.5	78.2	90.4	97.5	99.0	1593.0	91.9
9	Jammu & Kashmir	2.9	12.0	71.2	86.1	92.7	97.1	98.8	99.6		
10	Jharkhand	6.9	22.6	53.8	70.2	81.2	94.9	98.9	99.3		
11	Karnataka	3.4	10.0	38.6	53.9	71.0	82.1	90.0	95.1	987.0	66.0
12	Kerala	1.6	4.5	31.9	55.1	74.1	91.4	97.3	98.4		
13	Madhya Pradesh	9.8	27.7	71.1	81.9	90.7	96.3	97.9	99.4		
14	Maharashtra	6.7	13.0	42.1	53.9	67.0	80.2	85.8	90.7		
15	Orissa	11.3	29.9	69.7	86.6	91.3	96.1	97.8	98.3		
16	Punjab	2.5	7.8	41.2	58.2	72.3	85.9	91.4	96.4		
17	Rajasthan	3.6	18.0	69.1	81.4	89.6	94.8	97.2	99.0	1383.0	92.8
18	Tamil Nadu	0.6	2.3	20.8	40.6	60.0	83.6	93.0	97.0		
19	Uttar Pradesh	32.3	61.5	84.0	89.2	92.6	96.4	97.7	98.5	450.0	80.6
20	Uttarakhand	2.4	14.3	44.5	63.1	82.1	87.5	92.9	98.8	860.0	71.0
21	West Bengal	11.0	26.8	45.8	54.5	61.7	74.9	83.6	88.5		
Source: Author's analysis of raw data from the National Sample Survey, 71st round NSS, 2014-15											

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Sources of low VFM – 1. Low learning levels

- If VFM is to increase, single most important reform - increase children's learning levels.
- RTE Act - improve quality via lower pupil teacher ratios (30:1); teachers certification; availability of basic infrastructure
- But this inputs-based approach not evidence-based. There's need to strengthen teacher accountability and effort.
- On the contrary, RTE recognition requirements are compelling the (higher value yielding) private schools to close down due to non-compliance with recognition norms imposed by over-zealous state governments.
- According to NISA, 5500 PUA schools have closed and another 15,083 got closure notice.
- Ironically the lower-value-yielding govt schools do not have to fulfil the RTE infrastructure norms and are not closed down for non-compliance with RTE norms.

Sources of low VFM – 2. high public educ. spending

- There are various ways of benchmarking the size of public expenditure on education in India. One is to compare with other countries, e.g. comparing India's "per pupil expenditure on education as a proportion of the country's per capita GDP" with the same quantity in other countries. Another way is to compare govt schools' per pupil expenditure with private schools' within India.
 - China and India comparison of public education expenditure
 - Table 5.4 in Drèze and Sen (2013) is reproduced
 - the ratio of teacher salary to per capita GDP
 - China spends only one-third as much on teacher salary as India, when expressed as a multiple of national per capita income.
 - This was before the wage inflation generated by the Sixth Pay Commission, whereby teacher salaries approximately doubled in one go (Kingdon, 2010).
 - Public and private school comparison of per-pupil-expenditure
- Already shown; based largely on teacher salary levels.

Sources of low VFM – 3. Non-productive expenditures

- Expenditures on unproductive inputs, i.e. on items that have no relation with student learning
- One example: expenditure to reduce PTRs, e.g. in RTE Act 2009. Evidence shows no consistent relation with student learning (Hanushek, 2003; Altinok and Kingdon, 2014). Reducing PTR very expensive reform
- Another e.g. is across-the-board increases in govt teacher salaries via Pay Commissions, when these salaries are already high compared to other developing countries, and are also upto 10 times the salaries of contract teachers, and upto 25 times the teacher salary in private schools
- Imp. to make analytical distinction between efficiency and equity concerns.
- 3 studies show : learning levels among children taught by contract teachers were no less, though their salary was upto one-tenth of regular teachers' salary.
- Also learning levels of children attending private schools are not lower, despite teacher salaries being upto 1/25th.
- One idea is to link salary hikes to increased accountability, or a mild form of perf related pay.
- Other expenditures arguably more value-enhancing, e.g.: investments in school leadership training; in teacher competence; monitoring and inspection expenditure; learning surveys; increased parental information about school quality; research and innovation; teaching-learning materials; computers; student exchanges; etc.

Sources of low VFM – 4. Maintaining small schools

Sources of low VFM – 5. Wastage of expenditure due to non-genuine enrolment

Sources of low VFM – 6. Low teacher attendance rates