

# **Contract Teachers: Experimental Evidence from India**

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# Background

Large scale expansion of primary education in developing countries (MDG's, EFA, SSA, etc)

- Has led to significant increases in access and enrollment
- But has also led to difficulties in maintaining and improving school quality
- ~60% of 6-14 age cannot read at 2<sup>nd</sup> grade level though ~95% enrolled

Hiring and deploying enough teachers has been a big challenge

- Fiscal difficulties (teacher salaries are ~90% of education spending)
- Logistical challenges (the most qualified teachers are less willing to be deployed to underserved areas)

A common response has been to staff unfilled teaching positions with locally-hired contract teachers (not civil-service employees)

Main characteristics of contract teachers include:

- Fixed-term renewable contracts – limited job security
- Typically less qualified and much less likely to be formally trained
- More likely to be from the local area (and hired by school committees)
- Typically paid much lower salaries

Different countries' contract teacher systems have various combinations of the above, while in India all of these are typical

# Regular vs. Contract Teachers (in sample)

	Regular Teachers	Contract Teachers	P-value (H0: Diff=0)
<b>Male</b>	63.1%	31.8%	0.004***
<b>Age</b>	40.35	25.81	0.000***
<b>College Degree or Higher</b>	84.3%	45.5%	0.000***
<b>Formal Teacher Training Degree or Certificate</b>	98.3%	9.1%	0.000***
<b>Received any Training in last twelve months</b>	93.5%	54.5%	0.000***
<b>From the same village</b>	7.2%	81.8%	0.000***
<b>Distance from home to school (km)</b>	11.9	1.1	0.000***
<b>Teacher Salary (Rs./month)</b>	8698	1000 (1500)	0.000***

# Motivation/Contributions

The use of contract teachers is probably the most prominent policy innovation in primary education in the past 20 years in India and other developing countries

The use of contract teachers is highly controversial  
-But, limited evidence on effectiveness of contract teachers

We present experimental evidence on the impact of an additional contract teacher on student learning outcomes

- And compare with non-experimental estimates of regular civil-service teachers
- Also, provide context by comparing to private school teachers

First experimental study of an “as is” expansion of a current contract teacher policy

- Random assignment in a representative sample of schools

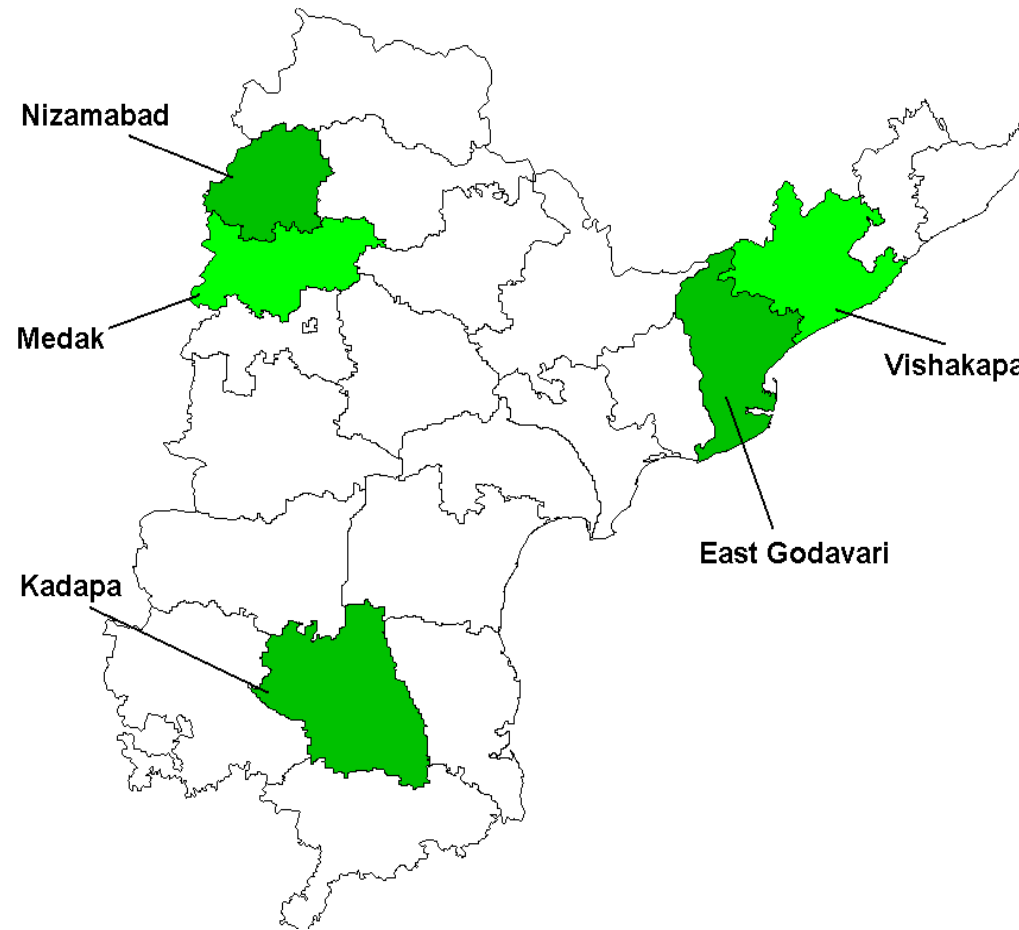
# Location of Study



- Indian State of Andhra Pradesh (AP)
  - 5<sup>th</sup> most populous state of India
    - Population of 80 Million
  - 23 Districts (2-4 Million each)
- Close to All-India averages on many measures of human development

	<b>India</b>	<b>AP</b>
<b>Gross Enrollment (6-11) (%)</b>	95.9	95.3
<b>Literacy (%)</b>	64.8	60.5
<b>Teacher Absence (%)</b>	25.2	25.3
<b>Infant Mortality (per 1000)</b>	63	62

# Sampling



# Context

Typical rural school is quite small

- 80-100 students across grades 1-5
- Around 3 teachers/school
- One teacher teaches all subjects in a grade
- Multi-grade teaching is quite common

All regular teachers are civil-service employees

- Salary determined by experience, education, and rank
- Mean salary: over Rs. 8,000/month ( $\sim 4 \times$  GDP/Capita)
- No performance-based component (promotions based on seniority)

Substantial accountability problems for regular teachers

- 25% absent on any given day;  $\sim 50\%$  not found teaching
- Teacher unions are strong and disciplinary action for non-performance is rare:
  - Only 1 head teacher in an all-India sample of  $\sim 3000$  schools reported firing teacher for reported absence

# Design Overview

		<b>INCENTIVES (Conditional on Improvement in Student Learning)</b>		
		<b>NONE</b>	<b>GROUP BONUS</b>	<b>INDIVIDUAL BONUS</b>
<b>INPUTS (Unconditional)</b>	<b>NONE</b>	<b>CONTROL (100 Schools)</b>	<b>100 Schools</b>	<b>100 Schools</b>
	<b>EXTRA CONTRACT TEACHER</b>	<b>100 Schools</b>		
	<b>EXTRA BLOCK GRANT</b>	<b>100 Schools</b>		



# Summary of Experimental Design

Study conducted across a representative sample of 200 primary schools in 5 districts of AP

Conduct baseline tests in these schools (June/July 05)

Stratified random allocation of 100 schools to treatment and control (2 schools in each mandal to each group) (August 05)

Schools hire extra contract teacher (by September 05)

Monitor process variables over the course of the year via unannounced monthly tracking surveys (Sep 05 – Feb 06)

Conduct 2 rounds of end of year tests to assess the impact of various interventions on learning outcomes (March/April 06)

Repeat in the school year 2006 - 07

# Summary of Experimental Results

The provision of an extra contract teacher significantly improved test scores in program schools in both years

- After 2 years, students in program schools scored 0.16 SD higher on math and 0.10 SD higher on language across all grades

Consistent evidence of differential program effects

- Students in remote schools, smaller schools, and schools with poorer facilities benefit more from the extra contract teacher

- The youngest students (grade 1) benefit the most in both years of the program

Contract teachers seem to have better incentives than regular teachers on multiple dimensions

- Lower absence, greater teaching activity

- These measures are correlated with renewal probability

# Regular vs. Contract Teachers

## Regular teachers:

- More qualified
- Hired on a state-wide labor market
- Wage premium reflects:
  - Higher outside options (more educated)
  - Compensating differential to locate to rural areas
  - Government employee/Union premium/rent
  - Salaries set in state capital - nominally fixed around state
- Limited accountability (almost impossible to fire)

## Contract teachers:

- Less qualified
- Hired in a local labor market
- Superior accountability

Efficient production will equate ratios of marginal costs and marginal productivity:

- Need to estimate the ratios of marginal productivity

# Regular vs. Contract Teachers

The richness of the data collected allows us to study the relative effectiveness of regular and contract teachers in 4 different ways

First, we can look at the gain in test scores of students based on whether they had a CT or an RT (with school fixed effects)

Second, we can look at the subset of students who had different teacher types across the 2 years (student fixed effects)

Third, we can look at the impact of the percentage of CT's in a school holding the total number of teachers constant

Finally, we can study the effect of reducing school-level pupil-teacher ratios (PTR) by hiring an additional RT versus a CT

We find in all 8 estimates (4 methods x 2 estimation samples each) that CT's and RT's appear equally effective

- But, the CT's cost 5 times less

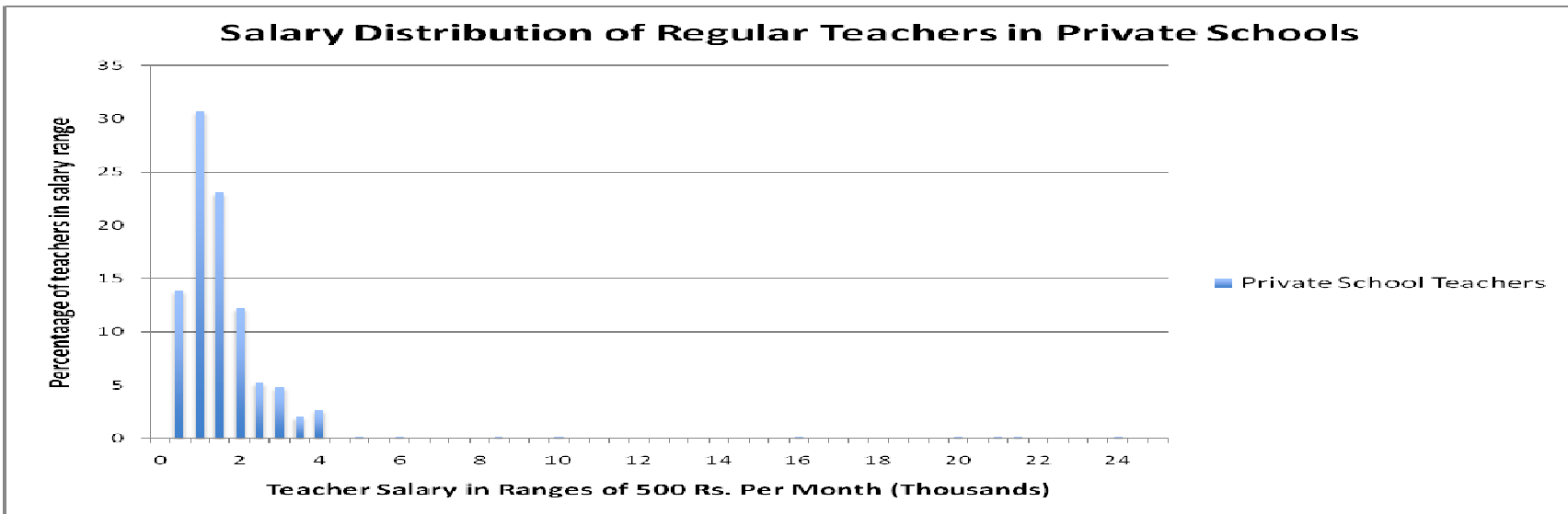
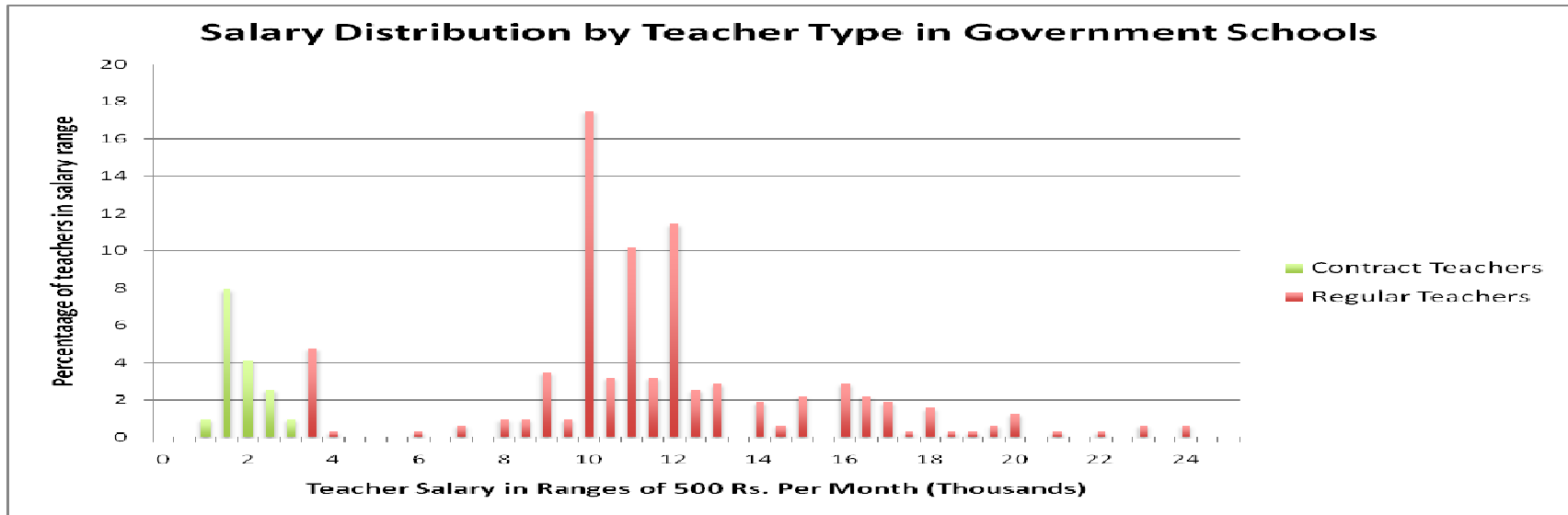
# enchmarking with Private Schools

Public school systems may not have the incentives to optimize efficiency of education production

One option for getting benchmark data on efficient production in education may be to look at the input choices of private schools

As part of a different (ongoing) study on school vouchers in the same districts, we also collect detailed data on private school teacher characteristics

# Salary Distribution by School and Teacher Type



# Public Vs. Private Schools (Muralidharan & Kremer, 2005)

	Public	Private	Difference	Difference with State FEs	Difference with Village FEs
Mean Total Enrollment	141.9	98.3	43.6***	49.6***	80.7***
Mean Number of Teachers	3.6	5.2	-1.6***	-1.48***	-0.87***
Pupil-Teacher Ratio	43.43	19.16	24.3***	29.6***	34.43***
Log Pupil-Teacher Ratio	3.58	2.78	0.8***	0.93 ***	1.05 ***

The main operating difference between private and public schools in India is that the former pay teachers much lower salaries, but hire many more teachers

The combination of lower pupil-teacher ratio and lower teacher absence (higher teaching activity) leads to a child in a private school having 3-4 times more teacher contact time

# Policy Implications (1 of 2)

Expanding contract teacher programs (at the margin) can be a cost effective way of improving learning outcomes in primary education in developing countries

The relevant policy comparison is not one regular versus one contract teacher, but one regular versus several contract teachers

- Several developing countries have focused on policies to get highly qualified teachers to move to backward areas
- It may be more effective to hire several local contract teachers as opposed to an additional regular teacher – especially for primary schooling

Private schools in rural India mostly follow this model

- Expanded use of contract teachers could get schools closer to the productive efficiency levels of private schools while preserving the public characteristics of schools



# Policy Implications (2 of 2)

Three main concerns about expanding use of contract teachers

- De-professionalizing education by promoting use of untrained teachers
- Sustainable of such a two-tier system would be problematic
- Political economy concerns – once you have enough contract teachers, they will all lobby to become civil-service teachers and the incentive and cost benefits are both lost

One possible solution is to create a career ladder for teachers whereby all new teachers are hired locally as contract teachers, and become eligible for bonuses/promotions on the basis of performance over a period of 5 – 7 years

- Continuous measurement of performance during this period
- Adjunct versus tenure-track faculty model

Addresses several practical concerns by integrating the two types of teachers into a career track as opposed to creating a permanent cadre of non-professional teachers

Can also think about using the contract teacher model to expand backwards to ECD from ages 3 to 6