Effects of the Right to Education Act on the Students Enrollment, Learning Outcome, and School Construction in India

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Abstract. *This paper examines the impact of a free and compulsory education policy (Right to Education Act) in India. Main objective is to find the impact on the students' enrollment in middle schools (8^{th} grade). Further, this paper also studies the program's impact on the students learning outcomes. I used the sizeable household-level micro data provided by the ASER Center. I employ a difference-in-difference approach where 11 states as treatment and other ten states as control and find that, on average, there is an increase in enrollment of almost 7.04% in treated states after the policy implemented. This suggests that the Right to Education Act policy increases the 8^{th} - grade student enrollment. Another finding that math scores and reading scores have improved in the treated group. But, there is a negative impact on government school construction and a positive impact on private school construction.*

Keywords: *RTE*, *Enrollment*

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1. Introduction

Education is the key to lifts people out of poverty, and everyone has the fundamental right to pursue elementary education. The United Nations passed the International Bill of Human Rights to free education at the primary levels. As indicated by UNESCO's Education for all (Global Monitoring Report 2010)[9], around 135 nations have constitutional established arrangements for free and compulsory education for all. India has taken an interest in the alliance of more than 130 countries with legitimate assurances to give free and compulsory schooling to kids by passing the Right to Education Act. Prior research has also found that the United States encountered an increase in educational attainment during the 20^{th} century because statewide policies such as compulsory schooling and child labor restrictions led to significant educational attainment (Lang and Kropp 1986; Acemoglu and Angrist 2000; Lleras-Muney 2002)[10]. However, it is essential from the policy point of view to introduce some strategies to help the economically poor and backward children to attend schools.

The governments across the developing world have instituted a wide range of policies aimed at encouraging school enrollment. School lunches are one such policy. They are thought to increase enrollment through two main channels. First, they lower the cost of schooling, thereby providing an implicit subsidy to parents. Second, by improving child nutrition, school lunches are thought to foster learning, thereby increasing education returns. School feeding programs are popular in the developing world and beyond despite an extensive empirical literature on the relationship between feeding programs and educational attainment, reviewed in (Bundy et al., 2009)[2]. While several policies are present for the primary schools and have achieved considerable progress (Praveen et al., 2014)[14]: Net enrollment in primary schools has increased from 83% in 2000 to 95.92% in 2007 through schemes like Mid-Day Meal, there is still a significant gap in upper primary/ secondary school level. Still, now several distinctive education policies were implemented later, in 2008, 6.9% of kids were still out of school (Das 2013)[6], and 84.4% of rural children couldn't read and do basic math (ASER 2008).

Free and compulsory Education policy mainly focuses on changing the aggregate supply. Studies suggest that (Duflo, 2001)[7]; (Burde and Linden, 2013)[3]; (Kazianga et al., 2012)[13] constructing schools have a positive impact on enrollment but may not be cost-effective (Muralidharan and Prakash, 2017)[12]. Upper primary to secondary or higher secondary schools requires qualified teachers, laboratories, and infrastructure to increase costs substantially. So, to improve school enrollment, improving access to school can be a cost-effective solution. We should not consider that constructing new schools will improve the enrollment of students. As the investigated Cycle program (Muralidharan and Prakash, 2017)[12], that policy initiative for improving girls' appropriate enrollment in a secondary school and reduced the gender gap in age-appropriate secondary school enrollment in India.

Prior research (K Muralidharan and M Kremer, 2006)[11] shows that the private unaided fee-charging schools' construction increases in rural India, where the government school does not perform well. The number of English medium schools is growing rapidly with both demand-side and supply-side availability of educated unemployed youth willing to join a job at a meager salary. Private school teachers' salaries are only about one-fifth of those paid by public school teachers. Still, these private schools have maintained enough teachers-students ratio, and one most important thing is the private school teachers are more likely to be teaching than public school teachers.

Literature shows (Geeta Gandhi Kingdon, 2020)[8] that more parents wish their children to go to private schools, therefore government schools' emptying. The migration from government schools has delivered a great extent of them financially unviable, with more salary expenditures for teachers. Hence, the government decided that extent in three states (Rajasthan, Maharashtra, and Chhattisgarh) closed approximately 24000 government schools. A most common reason for the rapid growth of small private schools is their inexpensiveness. Most private schools have offered an education at low fees when bench-marked against the state's per capita income and daily wages. As per the Right to Education Act norms, the resources to comply with school infrastructure should be in good condition. This is a serious

difficulty facing the low-fee private schools in India, and government schools cannot comply with these norms. Still, the government school's shutdown due to insufficient students and private schools due to RTE norms.

In this paper, I evaluate a free and compulsory education policy, the Right to Education Act (RTE), in the 11 states, India. The program was aimed at children between the ages of 6 and 14 (i.e., 1st to 8th grade). The hope was that providing free and compulsory education is good for everyone. I want to see the effect of the Right to Education Act on 8th grade students' enrollment because students' drop-out rate after upper primary school happens to be more in India. I employ a difference-in-difference estimation strategy for this analysis. I also further estimate that the math test score and the reading test score of students.

This paper is ordered as follows. Section 2 describes the program description and related literature; Section 3 describes the data; Section 4 describes the analytical approach and identification strategy, assumption, and event study; Section 5 presents the main results and robustness; Section 6 Conclusion.

2. Program Description and Related Literature

The government of India announced the Education policy on August 4, 2009, called the Right to Education Act (RTE), which gives the good quality of free and compulsory education for all children whose age in between 6 to 14 years (i.e., 1st to 8th grade) in India. This Act passed under the Indian constitutional amendment to secure all Indian children's fundamental rights in public and private schools to new educational policy requirements. India got one of 135 nations to make education a fundamental right of each child when the RTE came into power in 2010, and also other some countries such as China, Afghanistan, and Switzerland have this free and compulsory education policy (Shah, Manisha, and Bryce Steinberg. 2019)[16]. The main motive of such a policy is to express education as a fundamental human right. The RTE Act has several norms and guidelines, but here I consider the most important goal of this RTE act as follows:

First, the Right to Education Act ensures that every child between the ages of 6 and 14 has a fundamental right to secure admission in any nearby government school without fees. But there is no mandate that a child must join only neighborhood school. Second, all private schools in the neighborhood have 25 percent reserve seats for economically weaker backward people (i.e., Poor, Scheduled Caste, and Scheduled Tribes) and disadvantaged groups. Still, the private schools compensate for the costs these students fee from the respective state government. Lastly, the right to education act mandated that all schools provide primary and upper primary education must have good infrastructure. It is defined by a weather-proof building, toilets for both boys and girls, a library, drinking water, etc. The most important is quality education indicators such as teacher-pupil ratio below 1:30 for primary and 1:35 for upper primary. Teachers should have a good qualification to teach students.

The Right to education act was first proposed to the parliament in 2006, but officials rejected that because of the in-sufficed fund. After two years, the Union Cabinet approves RTE act in 2008 and then finally passed through the Lower and Upper House of the Indian parliament in 2009, announce it as national law. However, each state government implemented the right to education act by passing it in their own state legislatures. The all states passed the right to education act in their own state at different year (i.e., 2010, 2011, and 2012) [1]. Although the right to education act passed nationally in August 2009, only 11 states were first passed this act in their own state legislatures in 2010 (i.e., I called it Group-I [2]), another 13 states was passed this act in 2011 (i.e., I called it Group - II [3]), and About other 10 states was not passed the act in their legislatures until the year 2012 (i.e., I called it Group-III [4]), (Taneja et al., 2011)[18]. In figure 1, we can see the variations in treatment timing of the RTE Act.

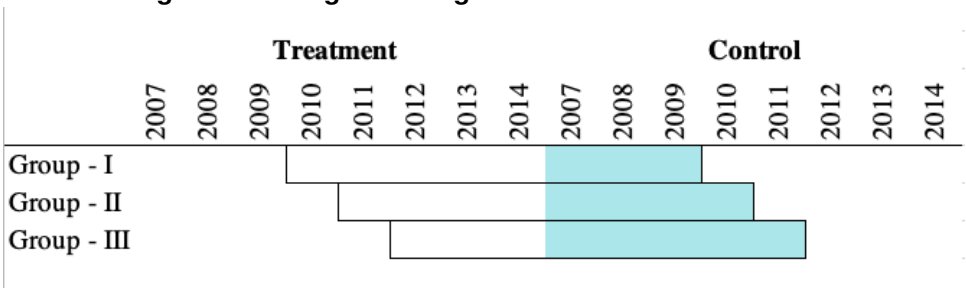
[1] *Note:* Implementation of RTE Act rules individual state were downloaded from https://mhrd.gov.in/rte_state_rules

[2] *Notes:* Group - I has 11 states/UT: Andaman & Nicobar Islands, Andhra Pradesh, Arunachal Pradesh, Chandigarh, Chhattisgarh, Dadra Nagar Haveli, Daman & Diu, Lakshadweep, Manipur, Odisha, and Sikkim.

[3] *Notes:* Group - II has 13 states: Assam, Bihar, Haryana, Himachal Pradesh, Jharkhand, Kerala, Madhya Pradesh, Meghalaya, Mizoram, Nagaland, Rajasthan, Tripura, and Uttarakhand

[4] *Notes:* Group - III has 10 states: Delhi, Goa, Gujarat, Karnataka, Maharashtra, Puducherry, Punjab, Tamil Nadu, Uttarakhand, and West Bengal.

Figure 1. Timing of the Right to Education come in force



(Manisha Shah and Bryce Steinberg, 2019)[16] finds positive trends in enrollment and negative trends in the test scores for currently enrolled children aged between 6 to 16. The test scores in both math and reading drop sharply in the years 2011 to 2014. They considering these changes happen in enrollment and test scores because after implementing the RTE Act, the enrollment is increasing, and school capacity is not; this might increase student-teacher rations. From another point of view (Geeta Kingdon, 2017)[8] shows a rapid migration of students towards private schools and emptying government schools. (Dhruva Bhat, 2017)[5] the previous literature find that the RTE act had a positive effect on government school infrastructure and teacher absence. It harmed the learning outcome of government school students. In this paper, my main focus is on the causal impact of the RTE Act on various factors:

1. Did student's enrollment in 8^{th} grade increase or not due to the Right to Education?
2. Do 8^{th} grade students have basic skills in both math and reading?
3. Do the government and private school's construction increase or not?

(Chatterjee, Chirantan and Hanushek, Eric A. and Mahendiran, Shreekanth 2020)[4] shows that RTE act causal impact on private supplemental education by comparing the growth of these private tutorial institutions in a highly competitive educational district with the less competitive educational district. They find a limited indication of any effect of RTE's introduction on private school registrations but consistently strong causal evidence that RTE induced an expansion of private tutoring.

3. Data

[1] ASER: The Annual Status of Education Report has conducted a household survey in every district in India to estimates the enrollment status of Children and basic learning, such as reading and math skills. This survey starting in 2005 and mostly conducted in the rural part of India each year. The household survey is designed to format defined as 30 villages are randomly selected and, in every village, has 20 households are randomly picked for further studies. I use ASER annual household survey data from the year 2007 to 2011 [5], it has a 35,924 total number Observation. ASER covers 564 districts in all 29 States and all 7 union territories of the country and provides vital information for policy formulation and preparation of district elementary education. The data denote the child status, such as enrolled in a government school, enrolled in private school, going to non-formal school, dropped out, or never been to school. I have created a new variable that states that the child enrolled equal to one if they report being "enrolled in government or private or non-formal school," and zero if they report having "dropped out or never been to school." Math score is categories from 0-4. If the child can not recognize anything, then it is 0. If the child can recognize the numbers from 1 to 9, then it is 1; if the child can recognize the number from 10 to 99, then it is 2; if the child can subtract two-digit numbers, then it is 3. Lastly, if the child can divide two-digit numbers, then it is 4. Similarly, the reading scores are categories; if the child can not recognize anything, then it is 0; if the child can recognize letters, then it is 1; if the child can read word, then it is 2; if the child can read a paragraph, then it is 3, and lastly, 4 if they can read a story. I use the (Shah, Manisha, and Bryce Steinberg, 2019)[16] strategy to create the test scores variable.

[2] DISE: Another dataset I have used in this paper is the District Information System for Education (DISE), the most comprehensive information system in India's education sector. The Ministry of Human Resource Development initiated the formation of DISE under the District Primary Education Program (DPEP) in 1994 and decided to design and develop a school-based computerized information system, the main responsibility for which was entrusted to the National Institute of Educational Planning and Administration (NIEPA), New

[5] *Notes:* The ASER data collection process was carried out on one random day in the school year 2010 in October–November period, and most of all Group - I states implemented the RTE Act in April-June 2010.

Delhi. DISE data covers school characteristics under different captions like location, school management (number of public/ private schools, etc.), school categories (Primary, middle schools, secondary, etc.), facilities (school building condition, drinking water, library, toilet, playgrounds, computers), enrollment and teacher (no. of boys, girls, teachers, teachers' qualification, etc.). DISE also covers enrollment from grade 1st to 8th. I use this DISE Administrative survey data from the year 2007 to 2011; it has 105 total number Observation.

4. Analytical Approach and Identification Strategy

4.1. Two−Way Fixed Effect:

In this paper, the first question is: Due to the Right to Education policy, did student's enrollment in 8th grade increase or not? As we can see above section 2, the policy was implemented in multiple time periods in different groups/states and has variations in treatment timing. Hence, I am using a "two-way fixed effects" (TWFE) regression model to determine the impact of RTE Act.

$$Y_{it} = \beta_0 + \beta_1 RTE_{it} + \alpha_t + c_i + \theta X_i + \epsilon_{it} \tag{1}$$

Where Y_{it} is the outcome of interest, the individual i enrolled in 8th grade (cohort being aged 13 or 14), α_t is a time fixed effect, c_i is an "state/district/individual/group" fixed effect, RTE_{it} is a treatment indicator that is equal to one if an individual i is treated at time t and zero otherwise, X_i is a vector of household observed characteristics, and ϵ_{it} is an error term. I use ASER annual household survey data from the year 2007 to 2014, it has a 410,704 total number Observation. In this case the β_1 coefficient is of intrinsic interest and in table 3 column (2) shows the main result, which represents the increase in students' enrollment of 8th grade. Also, there is a positive effect of RTE on students learning outcomes.

4.2. Difference in Difference Estimation:

To answer the above same question, I restricted the ASER data from the year 2007 to 2011 and compared Group - I with Group - III. Now, I am using a simple Difference-in-Difference

regression model to find out the impact of RTE Act on enrollment.

$$Y_{ist} = \beta_0 + \beta_1 Treat_{is} \times Post_t + \beta_2 Treat_{is} + \beta_3 Post_t + \epsilon_{ist} \tag{2}$$

In this model, the dependent variable Y_{ist} is the individual i enrolled in 8th grade (cohort being aged 13 or 14), in-state s, and at time t. The treatment is the Right to Education Act, gives the free and compulsory education for children between the age of 6 to 14 years (i.e., 1st grade to 8th grade) in 11 states during the year 2010. Therefore, these 11 states are the treatment states (Group - I). I can use the other 10 states as a control (Group - III), which did not have a Right to Education act until the year 2012. The treatment is as follows:

$$Treat_{is} = \begin{cases} 1 & \text{if the Child i is in Group - I} \\ 0 & \text{if the Child i is in Group - III} \end{cases}$$

The $Treat_{is}$ dummy captures the possible differences between Group I and Group III before the policy. Similarly, the policy's pre-period is 2007 & 2008 & 2009, and the policy's post-period is 2010 & 2011. Therefore, the time dummy Post as follows:

$$Post_t = \begin{cases} 1 & \text{if Year is 2010 or 2011} \\ 0 & \text{if Year is 2007 or 2008 or 2009} \end{cases}$$

The time dummy captures the aggregate factors that would affect change in Y_{ist} even if the policy is not present. The Y_{ist} dependent variable is as follows:

For Enrollment

$$Y_{ist} = \begin{cases} 1 & \text{if the Child i is enrolled in 8}^{th} \text{ grade} \\ 0 & \text{if the Child i is never enrolled or dropout} \end{cases}$$

The dependent variable Y_{ist} is dummy, which describes whether child i is enrolled in 8th grade or not. In this model, the parameter of interest is, β_1. Another two dependent variables, math score and reading score, are constructed as follows.

For Math Scores

$$Y_{ist} = \begin{cases} 1 & \text{if the child can subtract two-digit numbers or divide two-digit numbers} \\ 0 & \text{if the child can recognize the number 0-9 or 10-99 or nothing} \end{cases}$$

For Reading Scores

$$Y_{ist} = \begin{cases} 1 & \text{if the child can read a paragraph or read a story} \\ 0 & \text{if the child can recognize letters or word or read nothing} \end{cases}$$

The β_1 tells us the average treatment effect of the Right to education act on the 8th grade students of Group - I compared to Group - III. Refer to the first row of column (2) of table 4, which estimates the above simple DID regression model (Equation 2).

The most important assumption in DID is called Parallel-Trend Assumption. It requires that the difference between the treatment and control group is constant over time in the absence of treatment. I test for parallel trends of student enrollment growth in Group - I and Group - III in the three years before the program (2007 to 2009), and I do not reject the null hypothesis of parallel trends; see the results in table 5. However, parallel trends imply equal growth rates in student enrollment before the RTE act was implemented, as Group - I and Group - III have enrollment figures which vary substantially. To identify the average treatment effect (ATT) and their function, I impose the following assumptions.

4.3. Limitations of Difference-in-Difference Model (Parallel Trend):

Assumption 1: (Sampling) $\{Y_{i1}, Y_{i2}, ..., Y_{iT}, Treat_{i1}, Treat_{i2}, ..., Treat_{iT}\}$ i = 1,..,n is independent and identically distributed (IID).

Assumption 2: (Parallel Trend) One of the most common problem in DID model is the failure of the parallel trend assumptions. In this model, if

$$E[(\epsilon_i|Treat = 1, Post = 1) - (\epsilon_i|Treat = 1, Post = 0)]$$

$$-E[(\epsilon_i|Treat = 0, Post = 1) - (\epsilon_i|Treat = 0, Post = 0)] \neq 0$$

Then the estimator I get would be biased. This means, in Group - I, there is a trend of γ, and in Group - III, there is a trend of $\gamma + \delta$. However, this is not the case in this model (Equation 2), as I do not reject the parallel trend's null hypothesis.

4.4. The Difference in Difference estimator with fixed effects:

I introduce the fixed effects in the above model (Equation 2). I control for the time invariant unobserved characteristics of each district which affect the enrollment of the students. The idea is, whatever effects the time invariant unobserved variables have on the student's enrollment, the effects are the same (fixed) at a later time. Let us control for the district fixed effects in this model. Similarly, the year fixed effects control for the secular trend in the enrollment. The model will look like as follows:

$$Y_{it} = \beta_0 + \beta_1 Treat_{it} + \theta_i + \gamma_t + \epsilon_{it} \tag{3}$$

In this model, Y_{it} is the dependent variable, the enrollment of individual i in 8$^{\text{th}}$ grade, γ_t is year fixed effects, θ_i is an "individual/group/district" fixed effect. $Treat_{it}$ is a treatment indicator equal to one if an individual i is treated at time t and zero otherwise, and ϵ_{it} is an error term. The treatment group, control group, pre-period, post periods are the same as before in equation 2. The coefficient of interest is β_1, which is the treatment effect. In table 4, column (3) shows the fixed effect results.

In equation (3), I add time-varying household and village characteristics (covariates), which can influence the students' enrollment. The type of material house is made/ house condition, household has a toilet, household has television, mother attended school, village had a good road, village had a electricity, and village had a government school. District fixed effects are controlling all the fixed ones. With all district fixed effects and household & village characteristic controls X_{it}, the main estimation model will look like this.

$$Y_{it} = \beta_0 + \beta_1 Treat_{it} + \theta_i + X_{it} \times \lambda + \gamma_t + \epsilon_{it} \tag{4}$$

4.5. Event Study:

In this section, we examine the dynamic effect of the Right to Education Act on the enrollment of 8^{th} grade students. I decompose the effect into 4 to 5 years and see how it changes over time. The specification of the event study framework I applied is as follows, the only difference from the equation(2) is we decomposed the interaction term of group dummy and year dummy, $T^{j}_{s(i)t(i)}$, into specific years.

$$Y_{ist} = \beta_0 + \sum_{j=-3}^{j=2} a_j T^{j}_{s(i)t(i)} + \delta_{s(i)} + \rho_{t(i)} + \epsilon_{ist} \tag{5}$$

Where the RTE Act dummy variables, $T^{j}_{s(i)t(i)}$ equals one only when individual i is in Group - I and $t(i)$ is -j^{th} year before RTE Act when j is negative or j^{th} year after RTE Act when j is non-negative, otherwise, $T^{j}_{s(i)t(i)}$ equals zero. If the estimated coefficients of $T^{j}_{s(i)t(i)}$ is statistically insignificant when $j < 0$, then the pre-treatment parallel trend assumption is fulfilled. or if the one year before the policy implemented year estimated coefficients is zero then parallel trend assumption satisfied.

Figure 2 shows the effect of Right to Education on the enrollment of 8^{th} grade students. I use a 5 years time window spanning from 3 years before the Right to Education act until 2 years after the Act. The blue vertical lines represent a 95% confidence interval, and the horizontal line represents zero. If the blue vertical lines interact with the horizontal line, it means the Right to Education Act's effect in that year is insignificant. I also observed the effect of the RTE Act in the years 2009 and 2008 close to zero to compare how each year's effect changed over time.

In table 6 and figure 2, we can see that in second years (i.e., in 2011) after the Right to Education Act, the effect became significant and last for two years, and the magnitude has been increasing during that periods. We do not see more significance in the first year after the Right to Education Act because the policy implementation needs some time to react to it. Overall we can see that enrollment of students in the 8^{th} grade increase after the implementation of the RTE Act.

5. Presentation of results:

5.1. Impact of Right to Education Act on Student Enrollment

This paper's first target is to estimate the average effect of the Right to Education Act on the 8^{th} grade students' enrollment in the Group - I states. The Simple Difference-in-Difference estimates, based on equation (2) without control, are presented in table 4 (column 1). It shows that the Right to Education Act positively influences the 8^{th} grade students enrollment in Group - I states, increasing enrollment by 7.97%. The same table (column 5) shows fixed effects estimates, based on equation (4) with household and village characteristic controls, suggest the average treatment effect is 7.04% of more students going in 8^{th} grade in the Group - I states as compared to Group - III. It means that Group - I has increased the enrolled by 7.04%. The results are statistically significant. One important note should make is that there is a very slight change in R-square value when I add covariates. This suggests that the covariates do not significantly influence the students' enrollment in 8^{th} grade.

5.2. Impact of Right to Education Act on Student Learning Outcome

The subsequent goal is to see the impact of the Right to Education Act on 8^{th} grade students learning outcomes in Group - I states. I observed both math and reading scores. We can see that in table 7, column (3) has DID estimate with district and year fixed-effect, 14.6% of more students in Group - I can do basic calculation (i.e., division and subtraction) compared to Group - III. In column (6) show 8.19% of more students in Group - I can read paragraph and story compared to Group - III. I consider all children the individuals who are presently enrolled, dropout, and never enrolled. ASER/Pratham survey on educational fulfillment in 2005 in India found that 44% of students 7 to 12 years old can't peruse a fundamental skill of paragraph reading, and 50% can't do subtraction and division calculation [Pratham/ASER, 2005][15]. However, most children are enrolled in school. But where widespread absenteeism by students, Hence the learning results are low. The above results show a huge impact, similar in extent to a portion of the remedial education and computer-assisted learning program interventions in this specific situation (Banerjee, Abhijit V., Shawn Cole, Ester Duflo, and Leigh Linden. 2007) [1].

5.3. Impact of Right to Education Act on School Construction

Lastly, to answer the third question in mind about school construction, we can see that in table 9, the number of government schools decreases (shut down) by 2.74% and the number of private schools increases (construction of new school) 15.6%. Results are not significant, maybe because I have a limited amount of observation. The previous literature (Simran and Rani, 2014)[17] shows that after implementing the Right to Education Act, 1170, private schools have close down, affecting more than 40,000 students' education. The RTE Act has a strong norm and standards to give free and compulsory education to children between the ages of 6-14-year-old. Also, the norm for school infrastructure, fulfillment of these norms for small private schools are very difficult. They do not have the proper building, small classroom size, and other facilities. Hence, the Government of India shut down these schools.

5.4. Robustness checks

One of the most common problems in the DID model is the failure of the pre-parallel trend assumptions and the absence of omitted variables. To verify the above DID results, I have tested the parallel trend assumptions; see more description in section 4.3 and table 5. The second I have performed the event study is more details in section 4.5.

While the results in Tables 4, 5, 6, and Figure 2 strongly suggest a positive causal impact of the Right to Education Act on 8^{th} grade students enrollment. Specifically, free and compulsory education, 25% reservation in private schools, the school's good infrastructure, and all other facilities may have a greater impact on student enrollment. For robustness check, I use another data set (DISE) to find the impact of the RTE Act on enrollment. I implement the same Difference-in-Difference analysis by equation (4), adding school characteristics controls and district and year fixed effect. Table (8) shows the estimates that 8^{th} grade students enrollment increases by 7.52% in Group - I states. Both data sets I use in this paper show near similar results.

6. Conclusion

In this paper, I have used two comprehensive datasets on enrollment information, learning outcome, and school information (i.e., ASER and DISE) to measure the causal effect of the

Right to Education Act. I find that enrollment, math score, and reading score have improved in Group - I states. But, the government schools are shut down, and the private schools are growing. The household drives the decision to get enrolled in school. I am using ASER household data in this paper, and hence, the household characteristics that affect the enrollment increase. For instance, (Muralidharan and Prakash, 2017)[12] explain that if the household head is educated, then the child's probability from that household enrolled in a school is higher.

(Manisha Shah and Bryce Steinberg, 2019)[16] find the increasing enrollment trend and decreasing the test score for grade 1^{st} to grade 8^{th} after the RTE implemented, they assume that some of the test score drops are due to the RTE act. One explanation that could help to explain this pattern is the overcrowded classroom size may decrease learning. In the case of a learning outcome, my results show a positive effect of the RTE Act for the 8^{th} grade.

The above finding in this paper conclusively proves that the RTE Act has successful. Maybe Group - III is an unsatisfactory control group for better results, and two years after the RTE Act implementation might be too short a time to see the full impact of RTE. In future research should use different identification strategy to determine the effect of the RTE Act.

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Table 1: Descriptive Statistics (ASER Data)

	Group - I	(Treat)	Group - III	(Control)
	(1)	(2)	(3)	(4)
Variables	Mean	SD	Mean	SD
Dependent Variable				
Enrollment of Students in 8^{th} grade	0.693	0.461	0.826	0.379
Reading Score	0.761	0.427	0.835	0.371
Math Score	0.715	0.451	0.755	0.430
Independent Variable				
Treat	1	0	0	0
Treat $\times$ Post	0.363	0.481	0	0
Village Control Variables				
Village had a tarred metal road	0.737	0.440	0.801	0.399
Village had electricity	0.925	0.263	0.976	0.154
Village had a post office	0.417	0.493	0.577	0.494
Village had a Govt. school	0.904	0.295	0.906	0.292
Type of House	1.666	0.792	2.130	0.777
Household Control Variables				
Household has toilet	0.394	0.489	0.444	0.497
Household has television	0.472	0.499	0.608	0.488
Mother attended school	0.427	0.495	0.529	0.499
Number of Observation	11,245		24,679	

Notes: The above table shows summary statistics of the various variables, which I used in this paper. "Enrollment of Students in 8^{th} grade" is the main outcome variable 1 if the child enrolled in school and 0 if the child not enrolled or dropout. Similarly, other variables are defined as dummies "1 or 0" except "Type of House." The "Type of House" variable is a categorical variable. It's defined as 1 for "Katcha," 2 for "semi-pucca," and 3 for "pucaa." This is ASER data from the year 2007 to 2011. Group-I has 11 states implementing the Right to Education Act in 2010, and Group - III has other 10 states which does not implement the RTE Act.

Table 2: Descriptive Statistics (DISE Data)

	Group - I	(Treat)	Group - III	(Control)
	(1)	(2)	(3)	(4)
Variables	Mean	SD	Mean	SD
Dependent Variable				
Log Enrollment of students in 8^{th} grade	12.45	2.232	14.79	1.572
Log Number of Private Schools	5.439	2.890	8.292	1.479
Log Number of Government Schools	7.236	2.672	9.424	1.715
Independent Variable				
Treat	1	0	0	0
Treat $\times$ Post	0.400	0.494	0	0
Schools Control Variables				
Log Total Number of Schools	7.444	2.664	9.743	1.640
Log Total Number of Single Classroom Schools	3.953	3.534	5.868	2.584
Log Total Number of Single Teacher Schools	4.374	3.668	6.126	2.673
Log Total Number of Schools with common toilets	6.661	2.701	9.055	1.743
Log Total Number of Schools with girls toilets	6.623	2.700	9.457	1.614
Log Total Number of Schools with drinking water	7.353	2.619	9.688	1.610
Log Total Number of Schools with Blackboard	2.939	4.015	4.042	4.907
Log Number of Schools with good Building	2.126	3.284	2.744	3.705
Log Number of Schools without Building	4.919	3.148	5.917	2.206
Number of Observation	55		50	

Notes: This is summary statistics for the DISE data from the year 2007 to 2011. It describes the various variables which I used in this paper. "Log Enrollment of students in 8^{th} grade" is the main outcome variable which I have created this taking a natural log of the total number of students enrolled in each state. Similarly, I have created other variables.

Table 3: Two-way fixed effect Results - Effect of the RTE Act

Dependent Variable	(1) Enrollment in 8^{th} Grade	(2) Enrollment in 8^{th} Grade	(3) Math Score	(4) Reading Score
RTE	**0.0914****	**0.0909****	**0.1539****	**0.0997****
	(0.01567)	(0.01544)	(0.0479)	(0.0354)
Type of material house is made		0.0485***		
		(0.00213)		
Household has toilet		0.0553***		
		(0.00368)		
Household has television		0.0804***		
		(0.00370)		
Mother attended school		0.171***		
		(0.00426)		
Constant	0.967***	0.881***	0.869***	0.827***
	(0.01561)	(0.01662)	(0.0140)	(0.0156)
Observations	410,704	279,419	365,442	353,619
R-squared	0.114	0.185	0.110	0.107
District Fixed-Effect	Yes	Yes	Yes	Yes
Year Fixed-Effect	Yes	Yes	Yes	Yes
Household Control	No	Yes	No	No

Notes: Column (1) presents the result of two-way fixed effect regression model. I have added the household level control it shows in column (2). The main result is the β_1 coefficient which represents the increase in students' enrollment of 8^{th} grade in all-over India. Standard errors, clustered at district level, are shown in parentheses. * 10% significance ** 5% significance *** 1% significance. I have used the ASER data from the year 2007 to 2014.

Table 4: Difference-in-Difference Results - Effect of Right to Education Act (ASER Data)

Dependent Variable	(1) Enrollment in 8th Grade	(2) Enrollment in 8th Grade	(3) Enrollment in 8th Grade	(4) Enrollment in 8th Grade	(5) Enrollment in 8th Grade
Treat × Post	**0.0797*** **	**0.0796*** **	**0.0703*** **	**0.0695*** **	**0.0704*** **
	(0.0195)	(0.0195)	(0.0183)	(0.0242)	(0.0255)
Treat	-0.182***	-0.182***			
	(0.0279)	(0.0280)			
Post1 2010		0.0168	0.0164	0.0172*	0.0196*
		(0.0122)	(0.0115)	(0.00950)	(0.0102)
Post2 2011		0.0305**	0.0345***	0.0257**	0.0214*
		(0.0119)	(0.0114)	(0.0110)	(0.0113)
Type of house				0.0310***	0.0340***
				(0.00576)	(0.00617)
Household has toilet				0.0718***	0.0729***
				(0.0116)	(0.0125)
Household has television				0.0571***	0.0534***
				(0.00942)	(0.0102)
Mother attended school				0.123***	0.128***
				(0.00976)	(0.0101)
Village had a good road					0.000487
					(0.0130)
Village had electricity					0.00333
					(0.0285)
Village had a post office					-0.0212*
					(0.0109)
Village had a Govt. school					-0.00460
					(0.0179)
Constant	0.806***	0.807***	0.759***	0.577***	0.595***
	(0.0164)	(0.0164)	(0.00622)	(0.0146)	(0.0556)
Number of Observations	35,924	35,924	35,924	18,670	16,353
R-squared	0.028	0.028	0.157	0.216	0.222
District Fixed-Effect	No	No	Yes	Yes	Yes
Year Fixed-Effect	No	Yes	Yes	Yes	Yes
Household Control	No	No	No	Yes	Yes
Village Control	No	No	No	No	Yes

Notes: Column (1) presents the result of simple Difference-in-Difference regression model. While column (3) shows the results with district and year fixed effect. In column (5), I have added the household and village level control. The main result is the coefficient with the double interaction term, which represents the increase in students' enrollment of 8th grade in the 11 states (Group - I) due to right to education act with control another 10 states (Group - III). Standard errors, clustered at district level, are shown in parentheses. * 10% significance ** 5% significance *** 1% significance. I have used the ASER data from the year 2007 to 2011. Group - I has 11 states implementing the Right to Education Act in 2010, and Group - III has other 10 states which does not implement the RTE Act.

Table 5: Testing the Parallel Trends Assumption (ASER Data)

	(1)
Dependent Variable	Enrollment in 8^{th} Grade
Treat × PreYear	**-0.000734**
	(0.0260)
Treat	-0.183***
	(0.0287)
2008	0.0221*
	(0.0117)
2009	0.0206
	(0.0190)
Constant	0.785***
	(0.0204)
Number of Observations	22,982
R-squared	0.036

Notes: A table is the results of the test for parallel trends for 8^{th} grade students? Enrollment in upper primary level (8^{th} grade) in Group - I state before the policy. Standard errors, clustered by district Code, are in parentheses, * 10% significance ** 5% significance *** 1% significance. I have tested parallel trends using the DID regression model (equation 2) for the period 2007, 2008, and 2009 (i.e., before policy); I consider 2007 and 2008 as pre-period and 2009 as post-period and find that I do not reject the null hypothesis of parallel trends, with the double interaction term's coefficient, is close to zero. *Data source:* ASER Data

Table 6: Event Study - Effect of Right to Education Act (ASER Data)

	(1)
Dependent Variable	Enrollment in 8th Grade
2007	-0.0429*
	(0.0250)
2008	-0.00251
	(0.0257)
Post1 2010	**0.0453***
	(0.0273)
Post2 2011	**0.0645****
	(0.0281)
Constant	0.769***
	(0.00568)
Number of Observations	35,924
R-squared	0.150

Notes: This is the event study results. I use a 5 years time window spanning from 3 years before the Right to Education act until 2 years after the Act. One year before the RTE Act, the year 2009 is the omitted base year. Hence I have not added in the above table 6 and but we can see in figure 2.

Figure 2. Event Study - Effect of Right to Education Act

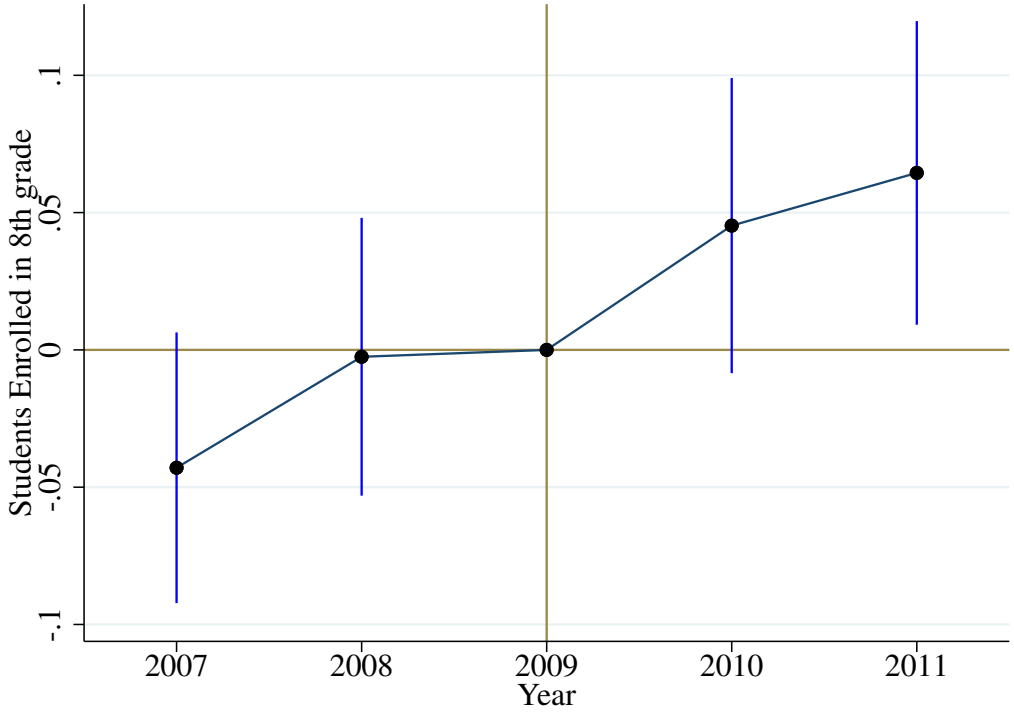

Table 7: Test Score - Effect of Right to Education Act

Dependent Variable	(1) Math Score	(2) Math Score	(3) Math Score	(4) Reading Score	(5) Reading Score	(6) Reading Score
Treat × Post	**0.168*** **	**0.168*** **	**0.146** **	**0.0934** **	**0.0929** **	**0.0819** **
	(0.0590)	(0.0596)	(0.0606)	(0.0408)	(0.0410)	(0.0389)
Treat	-0.188**	-0.188**		-0.155***	-0.155***	
	(0.0776)	(0.0776)		(0.0554)	(0.0554)	
Post1 2010		0.285***	0.259***		0.0524*	0.0385
		(0.0658)	(0.0678)		(0.0313)	(0.0300)
Post2 2011		0.159**	0.149**		0.0134	0.00851
		(0.0660)	(0.0666)		(0.0291)	(0.0274)
Constant	0.755***	0.746***	0.733***	0.834***	0.824***	0.807***
	(0.0160)	(0.0190)	(0.0127)	(0.0129)	(0.0163)	(0.0113)
No. Observations	35,924	35,924	35,924	35,924	35,924	35,924
R-squared	0.012	0.013	0.128	0.004	0.004	0.098
District Fixed-Effect	No	No	Yes	No	No	Yes
Year Fixed-Effect	No	Yes	Yes	No	Yes	Yes

Notes: In table 7, We can observe the learning outcome of students in 8^{th} grade. Column (1) and (4) are shown the Simple Difference-in-Difference results, and Column (3) and (6) are shows the district and year fixed effect results, respectively. The math score variable's construction is 1 if the child can subtract two-digit numbers or divide two-digit numbers; otherwise, it's 0, and the reading score variable is 1 if the child can read a paragraph or read a story; otherwise, it's 0.
Data source: ASER data from the year 2007 to 2011.

Table 8: Main Results Enrollment - Effect of Right to Education Act (DISE Data)

Dependent Variable	(1) Log Enrollment in 8th Grade	(2) Log Enrollment in 8th Grade	(3) Log Enrollment in 8th Grade	(4) Log Enrollment in 8th Grade
Treat × Post	**0.0771**	**0.0771**	**0.0771**	**0.0752**
	(0.139)	(0.141)	(0.157)	(0.166)
Treat	-2.370**	-2.370**		
	(0.879)	(0.892)		
Post1 2010		0.215*	0.215*	0.321
		(0.104)	(0.116)	(0.202)
Post2 2011		0.0299	0.0299	0.0984
		(0.0835)	(0.0930)	(0.160)
Log Number of Schools				0.933
				(0.595)
Log Number of Single Classroom Schools				-0.0614
				(0.0420)
Log Number of Single Teacher Schools				0.0616
				(0.0586)
Log Number of Schools with common toilets				-0.0581
				(0.0864)
Log Number of Schools with good Building				0.0334
				(0.0195)
Constant	14.75***	14.73***	13.49***	5.813
	(0.523)	(0.535)	(0.0361)	(4.750)
Number of Observations	105	105	105	105
R-squared	0.270	0.270	0.986	0.987
State Fixed-Effect	No	No	Yes	Yes
Year Fixed-Effect	No	Yes	Yes	Yes
School Control	No	No	No	Yes

Notes: In this table, we can observe the effect of the Right to Education Act on students' enrollment in 8th grade. I use DISE data, which provides information on the number of students enrolled in each state. Our dependent variable is the log of the number of students enrolled in the 8th grade. Column (1) shows simple DID, column (3) shows state and year fixed effect, and column (4) show with school control. Standard errors, clustered by state Code, are in parentheses, * 10% significance ** 5% significance *** 1% significance.

Table 9: Schools construction; Government vs Private - Effect of Right to Education Act (DISE Data)

Dependent Variables	(1) Log Government Schools	(2) Log Government Schools	(3) Log Government Schools	(4) Log Private Schools	(5) Log Private Schools	(6) Log Private Schools
Treat × Post	**-0.0202**	**-0.0202**	**-0.0274**	**0.139**	**0.139**	**0.156**
	(0.0301)	(0.0336)	(0.0396)	(0.0926)	(0.103)	(0.108)
Treat	-2.180**			-2.909**		
	(1.014)			(1.035)		
Post1 2010	0.0404	0.0404	0.0324	0.141*	0.141*	0.166
	(0.0294)	(0.0328)	(0.0365)	(0.0735)	(0.0819)	(0.126)
Post2 2011	0.0455	0.0455	0.0481	0.218**	0.218**	0.220
	(0.0308)	(0.0343)	(0.0468)	(0.0843)	(0.0939)	(0.140)
Log Number of Single Classroom Schools			0.00573			-0.0201
			(0.00875)			(0.0172)
Log Number of Single Teacher Schools			0.00363			0.0450
			(0.0116)			(0.0370)
Log Number of Schools with common toilets			0.0273			-0.101
			(0.0360)			(0.0756)
Log Number of Schools with good Building			-0.00293			0.0115
			(0.00296)			(0.0132)
Constant	9.401***	8.259***	8.011***	8.175***	6.652***	7.251***
	(0.557)	(0.0143)	(0.312)	(0.492)	(0.0453)	(0.575)
Number of Observations	105	105	105	105	105	105
R-squared	0.191	1.000	1.000	0.278	0.997	0.998
State Fixed-Effect	No	Yes	Yes	No	Yes	Yes
Year Fixed-Effect	Yes	Yes	Yes	Yes	Yes	Yes
School Control	No	No	Yes	No	No	Yes

Notes: In this table, we can observe the effect of the Right to Education Act on the Construction of Government and Private schools in India. I use DISE data, which provides information on the total number of Government and Private schools in each state. I use a natural log to normalize both variables. The results for government schools Column (1) shows simple DID, column (3) shows the state and year fixed effect with school control. Similarly, for Private schools, column (4) shows simple DID, column (6) shows state and year fixed effect with school control. Standard errors, clustered by state Code, are in parentheses, * 10% significance ** 5% significance *** 1% significance.