Retain or not to retain: Automatic promotion and student outcomes

Madhuri Agarwal*

Job Market Paper

December 7, 2020

Abstract

A large scale education reform in India introduced automatic promotion in all elementary grades. This paper estimates the impact of automatic promotion on education outcomes. I use quasi exogenous variation in exposure to the policy due to initial differences in repetition rates across districts. I find that automatic promotion reduces dropout rates by 0.1 percentage points for children in the lower secondary age. However, the policy had a negative effect on learning outcomes. The probability that a primary age student could solve a basic reading and arithmetic task falls by 0.3 and 0.8 percentage points respectively. The negative effect was larger for children with a poor socio-economic background. I explore probable mechanisms for the decline in learning levels. I find that districts with congested government schools suffered more due to the policy.

Keywords: Retention, elementary education, developing country
JEL Codes: I2, I24, I28

*madhuri.agarwal.2015@novasbe.pt Nova School of Business and Economics Universidade Nova de Lisboa Carcavelos Campus, Rua da Holanda, no. 1, 2775-405 Carcavelos, Portugal

I want to thank Bilal Barakat and Anna Cristina D'addio for their constant support and guidance. I also want to thank Ana Balcão Reis for her valuable suggestions. I am grateful to ASER Center for sharing their data. This paper is funded as part of the UNESCO fellowship for Global Education Monitoring report 2019.

1 Introduction

Many countries use retention as a tool to motivate students to work hard. In 2010, 32.2 million pupils repeated a grade in primary education globally (UNESCO, 2012). Retention is an expensive policy[1] and can even harm job market prospects in the long run (Eren, Lovenheim, et al., 2018). As opposed to retention some countries practice automatic promotion. Automatic promotion is a policy wherein students are promoted to the next grade without regard to achievement. Often termed as social promotion, this policy aims to keep students with their peer group.

This study uses quasi exogenous variation in exposure to a large scale education reform in India to estimate the effect of automatic promotion on access and quality of education. In 2009, India passed the Right to Education Act (RTE) making elementary education free and compulsory for all[2] . The RTE Act has a no-detention policy clause that introduced automotic promotion in all elementary grades. The aim is to answer the following questions: *(a)* What is the effect automatic promotion on dropout rates? *(b)* What is the effect of automatic promotion on learning outcomes? Its not clear ex-ante how automatic promotion might affect student outcomes. It can decrease dropout rates by reducing the opportunity cost as well as physiological costs of retention. However, it might dis-incentivise students to work. Also, teachers might find it harder to work with more heterogeneous classes.

Evidence on the effect of retention on student outcomes is inconclusive [3]. Some studies find a positive effect of early grade retention on student achievement (Greene and Winters, 2007; Nunes et al., 2018; Roderick and Nagaoka, 2005; Schwerdt et al., 2017) while others show that retention is an ineffective tool to help weak students progress through school (Eren, Depew, et al., 2017; Greene and Winters, 2009; Jacob and Lefgren, 2009; Manacorda, 2012; Roderick, 1994). This study adds to the literature on retention by providing causal evidence

[1] According toUNESCO (2009) repetition is estimated to cost around 12% of the education budget in Mozambique and 16% in Burundi

[2] Elementary education in India comprises grades 1-8 or age group 6-14.

[3] Allen et al. (2009) and Allensworth (2005) provides an extensive review on this topic.

of automatic promotion. What happens when the threat to repeat a grade is removed? More specifically, this study estimates the effect of removing the incentive associated with grade retention. This paper is closely related to Koppensteiner (2014) who provide evidence for automatic promotion in primary schools in Brazil. This study looks at both primary (grade 1-5) and lower secondary grades (grades 6-8) in India. This is important as recent studies have shown that the effect of retention might vary by age.

The RTE Act (2009) introduced the policy of automatic promotion in almost all states across India at the same time. This makes the creation of treatment and control groups difficult. In order to causally estimate the effect of automatic promotion on student outcomes this paper exploits the variation in exposure to the policy due to initial differences in behaviour across distrits with respect to repetition rates. I show that before 2009 there was a huge variation in repetition rates across states (figure 1). However, the repetition rates fell significantly after 2009 in almost every state. I compare districts with high repetition rates to districts with low repetition rates before and after 2009. The districts with high repetition rates in 2008 form the treatment group. While districts with low repetition rates in 2008 form the control group. The identification relies on the assumption that before 2009 the difference in outcome variables between districts with high repetition rates and districts with low repetition rates was constant.

I present results for primary (age 6-11) and lower secondary (age 12-16) separately. I find that for children in the primary age group there is no difference in the dropout rates between the treatment and control districts. However, the dropout rates for children in the secondary age group fell by 0.1 percentage points more in treatment districts compared to districts in the control group. I next present results for learning outcomes. I find that the policy had a negative effect on learning outcomes both for primary and lower secondary age groups. The probability that a primary age student could solve a basic reading and arithmetic task falls by 0.3 and 0.8 percentage points respectively. For children in the secondary age group there was no difference in reading levels between districts which got more treatment and districts which got less treatment. However, the math levels fell by 0.4 percentage points more for treatment districts compared to districts in the control group.

I test for heterogeneous impact of the policy depending on the socio-economic background of the child. I find that the negative effect was larger for children with a poor socio-economic background. I further explore probable mechanisms for the decline in learning levels. I find that districts with congested government schools (high pupil teacher ratios) suffered a larger decline in learning outcomes compared to those with less congested schools (low pupil teacher ratios.)

This study contributes to the rich literature on retention in two important ways. *First*, most of the evidence on retention looks at the effect of repeating a grade on repeaters or those who are at the highest risk of repeating a grade. In this study, I look at the aggregate effect of automatic grade promotion, as opposed to retention, on all students in the age cohort affected by the policy and not just repeaters. Heilig and Darling-Hammond (2008) and Jacob (2005) show that performance-based accountability measures can encourage efforts to 'game the system' by changing teaching practices (for example teaching to the test or focusing only on subjects that are being evaluated). This can negatively affect not just repeaters but also high performing students who are not directly affected by the policy. Also, due to automatic promotion, the class composition can become more heterogeneous making it more difficult for teachers to teach students at varying levels. Thus, more evidence is needed to understand how the change in incentives due to automatic promotion might affect the behavior of teachers and students.

Second, most of the evidence on retention in from developed country context [4]. Especially from the US where retention is usually followed by remedial programs or other instructional support which can help low-performing students catch up with their peers (Greene and Winters, 2007; Schwerdt et al., 2017). Unfortunately, most developing countries do not have such support mechanisms in place. Therefore, the impact of retention on student outcomes

[4]Except for (Manacorda, 2012) which provides evidence for Uruguay and (Glick and Sahn, 2010) which provides evidence for Senegal

might be different in a developing country context.

The paper is divided into six sections. In the following section I provide a brief discussion on India's education system and the no-detention policy of the RTE Act 2009. Section three and four provide details of the data and empirical strategy respectively. In section five I discuss the results and probable mechanisms followed by conclusion in the last section.

2 Background

2.1 Elementary education in India

In India primary (grades 1 to 5) and lower secondary (grades 6 to 8) together constitute elementary education, corresponding to the age group 6-13 years. Table 1 outlines these levels along with the associated grades and ideal age range. The school system functions under a federal structure such that the control and management of schools is under the state governments. The central government is mainly responsible for laying down broad policy frameworks with a view to maintain uniform quality standards across the nation. The central government also provides funding to states through various centrally sponsored schemes to meet education development goals.

Table 1 Levels of education

	Grades	Age
Primary	I-V	6-10
Lower secondary/Upper- primary	VI-VIII	11-13
Secondary	IX-X	14-15
Higher Secondary	XI-XII	16-17

Since the 1990s India has witnessed continuous expansion in primary education through various centrally sponsored programs like the District Primary Education Programme (DPEP) in 1994 and the Education for All Campaign (Sarva Shiksha Abhiyan, SSA) in 2002. Although the country has made remarkable progress in increasing enrolments at primary level, many students are still unable to complete the elementary grade cycle. Also, various studies in recent years have highlighted the dismal state of student performance across the country [5]. The government has thereby shifted its focus towards policies to improve the quality of education in elementary schools (Muralidharan, 2013). Recently, in a bid to increase accountability in the education system the Indian parliament passed a bill that allows states in India to chose whether or not they want to continue with automatic grade promotion in elementary grades. Evidence from this study could help states in undestanding the impact of automatic promotion.

2.2 Right to Education Act 2009, and No detention policy

In 2009, the Right to Education Act (RTE) was passed, making elementary education free and compulsory for all children 6-14 years old. It was introduced in all states across India (except the state of Jammu and Kashmir). The RTE made various provisions related to access to schools, school infrastructure, teacher qualifications, and pupil-teacher ratios. Section 16 of the RTE Act stipulates that 'No child admitted in a school shall be held back in any class or expelled from school till the completion of elementary education'. The elementary stage of schooling covers grades 1 to 8. Coined as 'No-detention policy', this was considered an important feature of the act which was expected to remove the fear of failure and reduce drop out rates in elementary education. Also, instead of traditional exams the RTE aimed at using Comprehensive and Continuous Evaluation (CCE) to help children improve their learning.

Prior to the implementation of RTE in 2009, retention was a decision taken by the classroom teacher. The decision to pass or fail depends on a teachers analysis of academic performance, attendance and other behavioural traits of the students. Also, no provision for remedial help or additional instructional support was in place for those who fail. The students were required to repeat the same material again. This practice of retention is

[5] A nationwide study by ASER Centre reported that the proportion of children in rural India in grade 5 who can read a grade 2 level text is 47% and only 25.6% can solve a 3-digit by 1-digit division problem (ASER 2014) In 2009 the country ranked 73 out of the 74 nations that participated in the PISA study conducted by OECD.

very different from the one based on *high stakes tests* where the decision to retain depends on objective criterion like scores on a standardised test. Also, repeaters are provided with additional support or remedial help [6].

The subjective nature of repetion in India is also reflected in the differences in repetition rates across states before the implementation of RTE. Table 6 in appendix A gives a snapshot of repetion policies followed by each state before 2009 (Bhukkal, 2015). Each cell represents the average repetion rates in each grade for the years 2005-2008. The cells that are red in colour represent those grades where retention was allowed according to state mandate. For instance, in Himachal Pradesh retention started from grade 6 onwards whereas in Karnataka schools were not supposed to practice retention at all in any elementary grades. One would expect the repetition rate to be close to zero in grades where retention was not allowed. In table 6 I do not see a clear pattern. For instance, even though most states are not supposed to retain students until grade 3, one can see that repetition rates are quite high in some states even for those grades. This indicates that before RTE the decision to retain students was more subjective rather than based on state policy. However, I find that the repetition rates decreased significantly since RTE was implemented in almost every state (see figure 1.)

[6] Allensworth (2005) notes this difference between the two kinds of retention policies and how one is more subjective than the other.

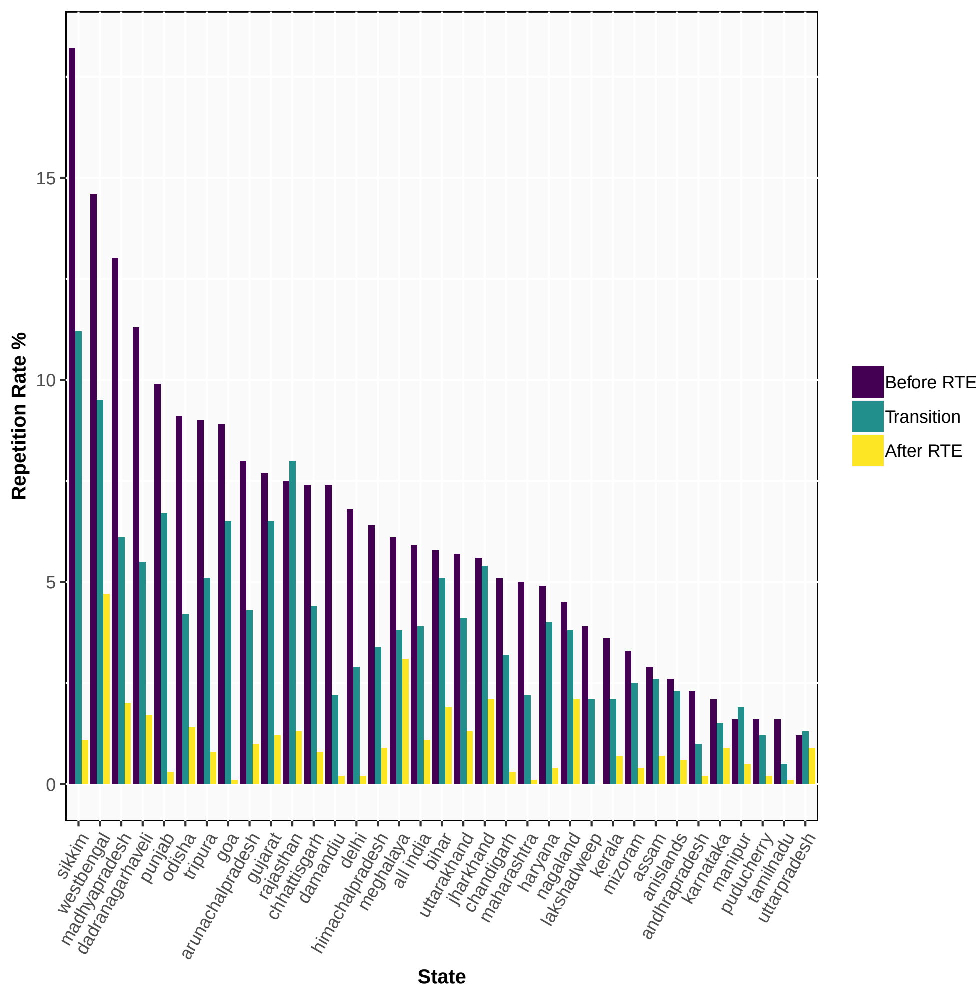

Figure 1 Trends in avergage repetition rates: The figure plots the average repetition rates by state and time category. The time category is before RTE (2005-2008), Transition (2009,2010) and after RTE (2011-2016). The dats is arranged in the descending order of average state repetion rates before RTE).

3 Data and Descriptives

The data for the analysis are drawn from two main sources. The District Information on Systems in Education (DISE 2005-2016) and Annual Status of Education Report (ASER, 2007-14). The DISE survey was initiated as part of the District Primary Education Programe 1994 (DPEP) by the Ministry of Human Resource Development (MHRD, India) and UNICEF, to collect school level information for successful implementation and monitoring of the program. This was later revised in 2001 to cover not just primary but all elementary grades for better monitoring of the SSA Program (Education for all Programe, 2001). The National University of Educational Planning and Administration is responsible for collecting and collating the data from all districts across the country. The schools (mostly head teachers) are responsible to supply information which is then aggregated at the district level. This annual survey has details on various indicators of elementary education (number of schools, enrolment, teachers ,infrastructure, school performance indicators and others). I use aggregate district level time-series data available from the DISE website for the years 2006-2016 [7].

ASER, on the other hand is a nation-wide household level annual survey conducted by the NGO Pratham since 2006. It collects information on schooling and basic learning status of children aged 5-16 from almost every rural district in the country. It is a citizen-led survey on education conducted in the household instead of schools.It therefore includes information on both enrolled and out of school children. Apart from basic reading and arithmetic tests, the survey also provides information on individual's education status (dropout, grade enrolled, school type etc.) and other household socio-economic indicators. As ASER does not follow the same individuals over time I use repeated cross section of individuals in the age group 6-16 years to create a pseudo-panel of individuals by age within each district. For my analysis I merge this data with the district level DISE data. Table 7 in Appendix A gives a brief description of the variables used in the analysis and table 2 shows the descriptive statistics. The target group is children in the age group 6-16. Children in the age group 6-10 constitute the primary age group and children in the age group 11-16 constitute the lower secondary age group. The outcome variables include *Droprate*: whether or not the child dropped out of school , *Years of education*: the grade in which the child is currently enrolled, *Reading level*: whether a child can read simple text or not, and *Math level*: whether a child can do simple math operation or not.

[7] http://schoolreportcards.in/SRC-New/Links/DISEPublication.aspx

Table 2 Descriptive statistics- Merged ASER and DISE data

	Mean	SD	Min	Max
ASER				
Outcome variables				
Dropout	0.04	0.19	0	1
Years of education	5.18	2.82	1	12
Reading level	0.47	0.50	0	1
Math level	0.54	0.50	0	1
Individual level covariates				
Lower secondary age group	0.53	0.50	0	1
Child Age	10.72	3.02	6	16
Gender=Female	0.47	0.50	0	1
Mother Schooling	0.49	0.50	0	1
Years	2010.28	2.28	2007	2014
DISE				
Intensity variables				
Rep. rate 2008 Primary	4.93	4.09	0.0	19.9
Rep. rate 2008 Lower secondary	4.65	4.26	0.0	25.3
District level covariates				
Repetition rate Primary	3.39	4.50	0.0	50.1
Repetition rate Lower secondary	2.96	4.48	0.0	80.2
Total teachers govt.	6703.47	4616.99	88.0	41044.0
Total rural govt. schools	1549.24	1051.63	0.0	8378.0
Total rural pvt. schools	288.63	297.75	0.0	2607.0
Total enr. govt.	182582.16	159885.83	0.0	1241336.0
One teacher schools	193.67	253.72	0.0	2951.0
Sch. enrol >50	603.24	575.95	0.0	5238.0
SDG grant	2830272.34	8128524.92	0.0	200702223.0
TLM grant	105762.14	495746.88	0.0	15799727.0
Years	2010.50	3.45	2005	2016

Notes: This table gives the summary statistics of ASER and DISE data. ASER is individual level repeated cross section data for children in the age group 6-16 from 2007-2014. DISE is district level panel data aggregated for all elementary grades 1 to 8 for years 2005-2016.

I use the average repetition rates in the year 2008 as a treatment intensity variable to create treatment categories. In figure 2 I plot the trends in repetition rates by arranging the data in ascending order of quartiles of the intensity variable. It shows that the fall in repetition rates was largest for the districts in the top 25th (i.e 75-100) quartile.

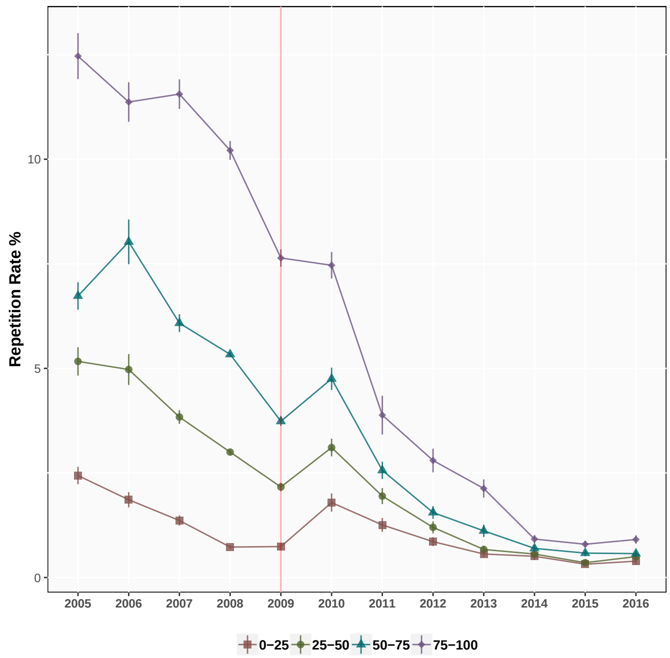

Figure 2 Trends in average repetition rates by arranging districts into quartiles categories derived from the intensity variable (Avg. repetition rate in 2008). This graph indicates how the repetition rate fell in each category specially for those districts in the highest quartile range (75-100)

4 Empirical strategy

The no-detention policy was rolled out across the whole country after the passage of the RTE Act in 2009. Prior to the implementation of the policy there was huge variation in repetion rates across districts. I use the average district level repetion rates in year 2008 to generate treatment and control groups. I call this the treatment intensity variable. Districts with high intensity (high average repetition rates) form the treatment group while districts with low intensity (low repetition rates) form the control group. After the introduction of automatic promotion there was a steep decline in repetition rates across the country, especially for those districts with pre-existing high repetition rates. In figure 3 I present a scatter plot of repetition rate over the repetition intensity variable with a regression line fitted for each subgroup: pre (2005-2008) and post RTE years (2009-2016). The graph indicates that in the post-RTE period there was a significant fall in repetition rates and that the repetition rates decreased more in high intensity districts compared to low intensity.

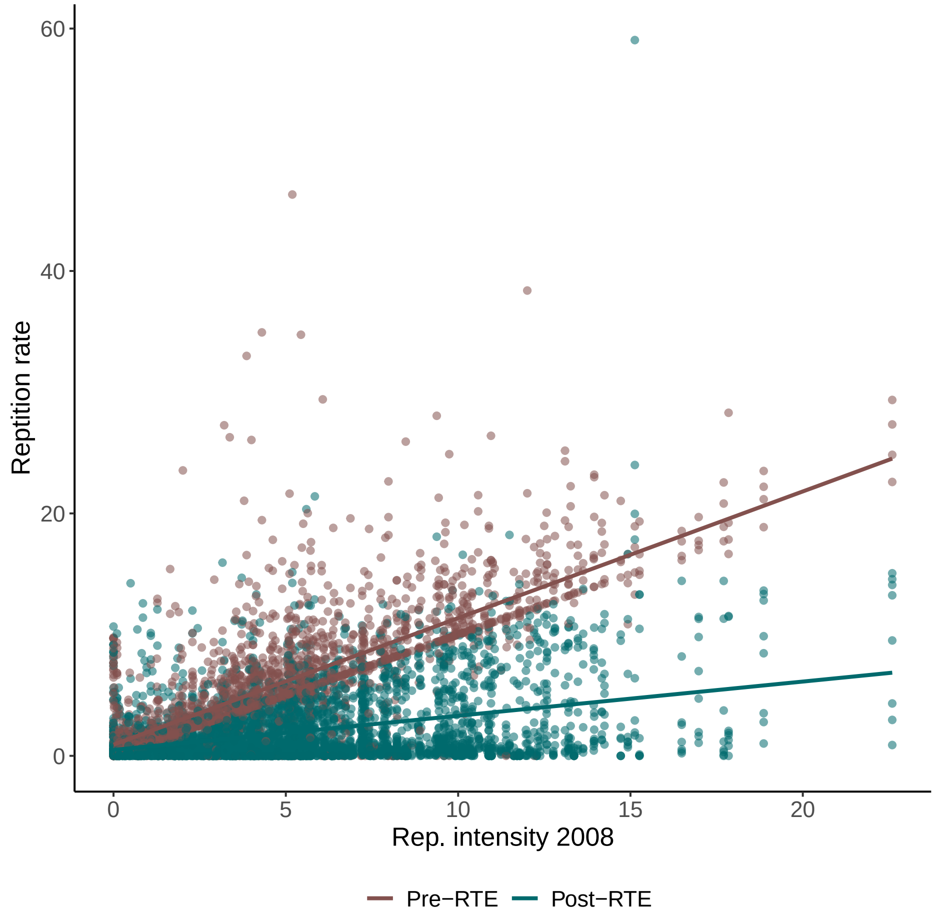

Figure 3 Scatter plot of repetition rate on intensity (Avg. repetition rate in 2008) by pre and post RTE category. The bold lines represent the fitted linear regression model. The graph shows how the change in repetition rates pre and post RTE varies by intensity (Avg. repetition rates in 2008). Post RTE, the repetition rates decreased more in high intensity districts compared to low intensity.

I exploit this difference in pre-existing behaviour across districts to employ a difference in difference framework wherein I compare districts with high repetition rates to districts with low repetition rates before and after the year 2009. The main idea is that the districts with high repetition rates will be affected more due to the sudden introduction of automatic promotion compared to those with low repetition rates. The identification strategy is to look at whether there is a break in any pre-existing differences in the trend of the outcome variables due to automatic promotion. In a regression framework in run the following specifications for each outcome variable:

$$y_{idt} = \alpha\ Post_t\ + \phi\ RR_d\ + \beta\ Post_t * RR_d\ + \gamma Dist_{dt}\ + \lambda X_i\ + \eta_d\ + \epsilon_{idt} \qquad (1)$$

where y_{idt} is the outcome variable for individual i in district d, and year t. Equation 1 is the standard difference in difference specification where I interact a time dummy variable $Post_t$ (2007-2008 takes vale 0, 2009-2014 takes value 1) with a continuous intensity variable, RR_d, (the average district level repetition rate in the year 2008). The coefficient of $Post_t * RR_d$ is the main variable of interest which gives the difference between high and low intensity districts before and after RTE 2009. $Dist_{dt}$ are time-varying district level school education variables (like total schools, enrolment, teachers etc.), η_d represent district fixed effects and X_i refers to individual/family level co-variates. ϵ_{idst} is the error term.

4.1 Robustness

In this section I discuss some of the issues which need to be considered in order to establish a causal link between automatic promotion and student outcomes. *First*, the choice of the year 2008 to create treatment and control districts. In figure 4 I show the density plot of the average repetion rates from 2005-2009. The figure shows how the distribution of repetition rates evolved over time prior to the implementation of the policy. One can notice a significant change in the distribution in the year 2009 when the RTE Act was passed. Therefore, the repetition rates in the year 2008 seemed a logical choice to create treatment categories.

Second, for establishing a casual link of automatic promotion it is important to test if prior to the implementation of RTE there was no change in the trends in behaviours regarding repetition rates in treatment and control districts. And that any divergence in behaviour occurred only after the year 2009.

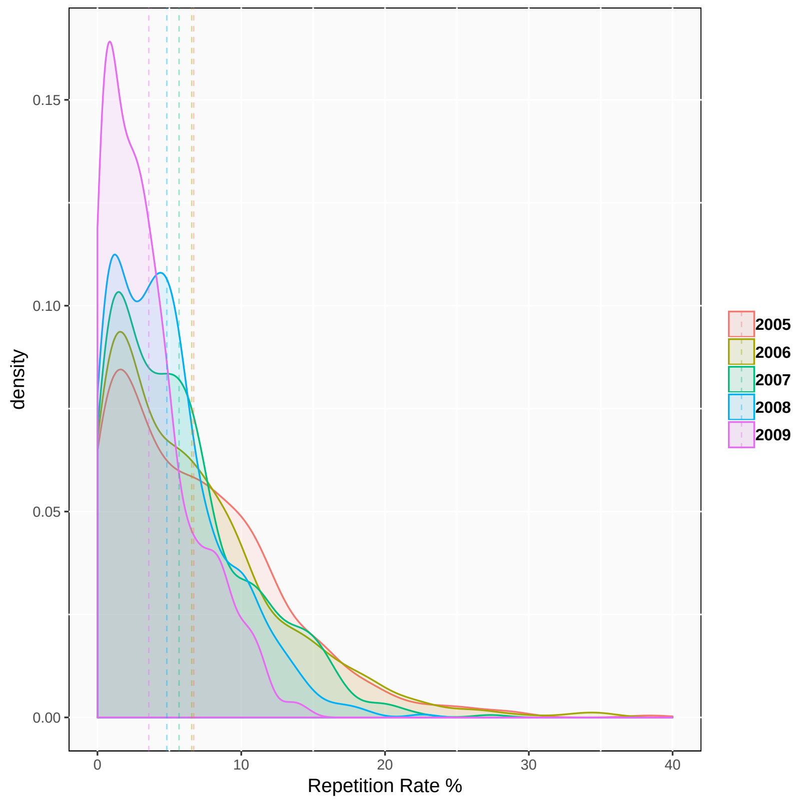

Figure 4 Density plot of repetition rates by year (2005-2009). The dotted line represents the mean. This figure shows how the distribution of repetition rates changed significantly in the year 2009.

I show that in this is in fact true. With the introduction of automatic promotion in 2009 there was a break in the pre-existing trends in the difference in repetition rates. In figure 5 I plots the coefficient of the interaction between repetition intensity and year, β_t using equation 2 below.

$$y_{idt} = \sum_{t=2007}^{t=2014} \alpha_t \, Year_t \; + \phi \; RR_d \; + \sum_{t=2007}^{t=2014} \beta_t \; Year_t * RR_d \; + \gamma Dist_{dt} \; + \lambda X_i \; + \eta_d \; + \epsilon_{idt} \quad (2)$$

This is similar to equation 1 with the only difference that I interact the intensity variable with year instead of a time dummy. This will generate a β_t coefficient for each year which estimates the trend in the outcome variable. More specifically, taking 2007 as base year, β_t

shows how the difference between high and low intensity districts changed over time without imposing any pre or post policy years. The results using equation 2 are presented graphically by plotting the β_t coefficient. As mentioned above, this interaction gives the change over time in the difference between high and low intensity district. Figure 5 plots the β_t coefficient using equation 2 with repetition rate as the outcome variable. The grey vertical line indicates the year when RTE was passed. It can be seen from the figure that before 2009 there was no change in the difference between repetition rates between high and low intensity groups but following the introduction of RTE in the year 2009 the coefficient of this interaction term becomes statistically significantly different from zero. The negative coefficient implies that the fall in repetition rates in high intensity regions was larger than the fall in repetition rates in low intensity regions, more so for lower secondary grades. This variation in behaviour can help me identify the impact of automatic promotion on education outcomes.

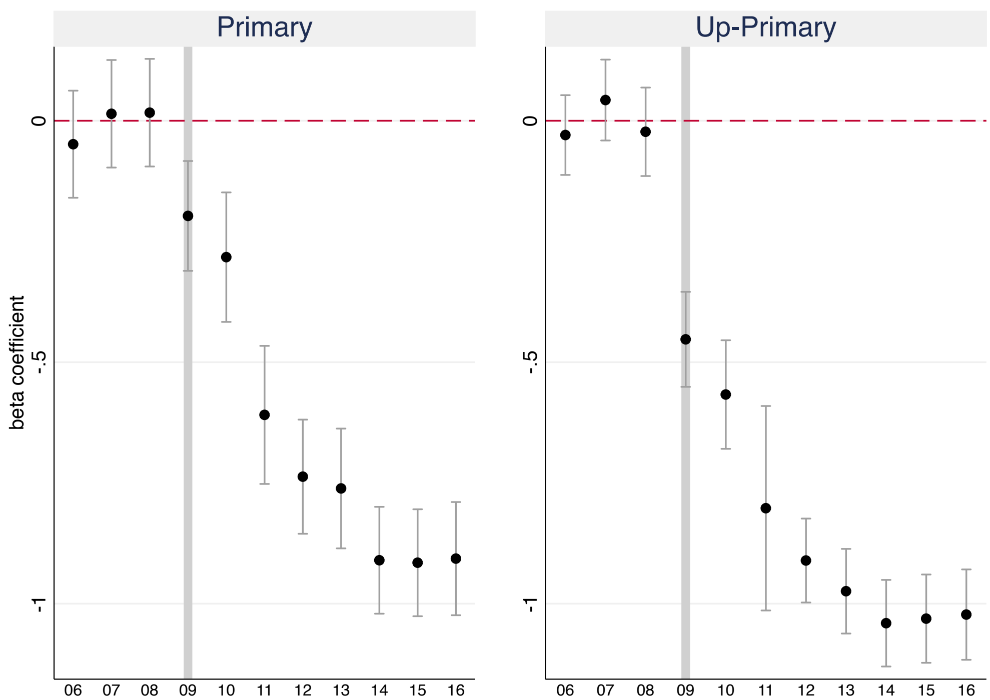

Figure 5 Trends in difference in repetition rates: This figure plots the β_t coefficient using equation 2 with repetition rate as the outcome variable. The grey vertical line indicates the year when RTE was passed.

Third, it is true that repetition rates prior to the implementation of the policy are not randomly assigned. Differences in repetition rates across districts might be associated with the quality of education, institutional capacity or other socio-economic factors which can bias my estimates. To address the endogenity of my intensity variable I control for time-varying district level indicators of education institutional capacity (like total schools, total teachers, enrolment etc.) $Dist_{dt}$. I also use district fixed effects to account for time-unvarying unobservable factors η_d.

Fourth, another important issue which needs to be addressed to estimate the is that the passage of RTE 2009 introduced other policy reforms along with automatic promotion. These reforms can simultaneously affect education outcomes thereby making it difficult to identify the effect of automatic promotion. For instance, some of the major reforms introduced by RTE include (i) free and compulsory government schools for all children ages 6–14, (ii) reservation of 25 percent of private school seats for disadvantaged students in the local area, and (iii) providing minimum infrastructure and quality standards (like libraries, and girls' toilets, teacher qualifications and pupil-teacher ratios). I argue that even if these reforms had any effect on educational outcomes it should not bias our estimates of automatic promotion as long as these reforms did not differentially impact students in our treatment (high intensity districts) and control groups (low intensity districts). I check for differences in other inputs which might have changed due to RTE in figures 10-17 in Appendix C .

5 Results and discussion

In table 3 I pressent the results for primary age group and in table 4 for lower secondary age group. Each column reports the results for different outcome variables using equation 1. In columns 1-2 the outcome variable is dummy for dropout status, in columns 3-4 the outcome variable is dummy for whether the child is able to read a simple standard two level text while in columns 5-6 the outcome variable is whether the child can perform simple math operations. All specifications include time-varying district level variables. I also plot the beta coefficients from the OLS regression using equation 2 for each outcome variable separately in figures 6 , 7, and 8 in Appendix B.

5.0.1 *Primary age group*

I find that the introduction of automatic promotion did not significantly affect the decision of primary age children to drop out of school or not (columns 1 and 2 of table 3).

Table 3 Diffrence in Difference: Primary age group

	Droprate		Read level		Math Level	
	(1)	(2)	(3)	(4)	(5)	(6)
Post	-0.001***	-0.002***	-0.017***	-0.016***	-0.024***	-0.011
	(0.000)	(0.000)	(0.006)	(0.005)	(0.008)	(0.006)
RepIntensity	-0.000		0.006***		0.010***	
	(0.000)		(0.001)		(0.001)	
Post*RepIntensity	-0.000	-0.000	-0.004***	-0.003***	-0.009***	-0.008***
	(0.000)	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)
Mother school	-0.006***	-0.006***	0.106***	0.095***	0.128***	0.110***
	(0.000)	(0.000)	(0.002)	(0.001)	(0.002)	(0.001)
Female	0.001***	0.001***	-0.002**	-0.001	-0.019***	-0.018***
	(0.000)	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)
District fixed effect	No	Yes	No	Yes	No	Yes
R^2	0.005	0.008	0.141	0.169	0.185	0.223
No. of Obs.	1742148	1742148	1610943	1610943	1603796	1603796
No. of clusters	4216	4216	4216	4216	4216	4216

Notes: Difference in Difference: Dropout, reading and math level. In columns 1-2 the outcome variable is dummy for dropout status, in columns 3-4 the outcome variable is dummy for whether the child is able to read a simple standard two level text while in columns 5-6 the outomce variable is whether the child can perform simple math operations. All specifications include time-varying distrct level variaables: *Total teachers govt,Total rural govt. schools, Total rural pvt. schools, Total Enr govt, One teacher schools,Sch. enrol, log SDG grant and log TLM grant.* I use cluster robust standard errors at district year level.

The left hand panel in figure 6 plots the results for primary age group. It can be seen that the beta coefficient for dropout remains insignificant and close to zero for all years from

2008-2014 (figure 6). Next, I present the results for the effect of automatic promotion on learning outcomes for primary age. I find that the introduction of automatic promotion lead to a significant decline in learning levels. The probability that a child can read a simple standard 2 level text decreases by around 0.3 to 0.4 percentage points (columns 3 and 4 of table 3) in a high intensity district relative to a low intensity district. The negative affect is even larger for arithmetic. The probability that a child in a high intensity district can solve a simple math problem decreases by around 1 percentage points more (columns 5 and 6 of table 3) compared to a low intensity district. I also plot the results in figures 7 and 8. The left hand panel in figure 7 shows that following the introduction of automatic promotion the fall in the reading levels for high intensity districts was higher than the low intensity districts. Similarly, for math levels (left panel figure 8) the difference between high and low intensity districts becomes large after the year 2009 and remains so until 2014.

5.0.2 *Lower secondary age group*

For children in lower secondary age I find that automatic promotion lead to a significant decline in the probability of dropout in high intensity districts of around 0.1 to 0.2 percentage points (table 4). The right hand panel in figures 6 plot the results for dropout rate in lower secondary age group. It can be seen that the beta coefficient for dropout becomes negative and significantly different from zero after the year 2009 (figure 6). These results indicate that the effect of automatic promotion on dropout rates is larger for older children compared to younger children.

Finally, I present the results for the effect of automatic promotion on learning outcomes for lower secondary age. I find that for this age group the decline in reading levels is not that significant (columns 3 and 4 of table 4). Although the probability that a child can solve a simple math problem decreases significantly by around 0.4 to 0.6 percentage points (columns 5 and 6 of table 4) in a high intensity district relative to a low intensity district.

Table 4 Diffrence in Difference: Lower Secondary age group

	Droprate		Read level		Math Level	
	(1)	(2)	(3)	(4)	(5)	(6)
Post	-0.001	-0.005***	-0.047***	-0.031***	-0.057***	-0.025***
	(0.002)	(0.001)	(0.006)	(0.005)	(0.007)	(0.005)
RepIntensity	0.001***		0.003***		0.005***	
	(0.000)		(0.001)		(0.001)	
Post*RepIntensity	-0.002***	-0.001***	-0.001	-0.001	-0.004***	-0.004***
	(0.000)	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)
Mother school	-0.055***	-0.051***	0.142***	0.129***	0.142***	0.126***
	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)
Female	0.009***	0.009***	-0.008***	-0.007***	-0.043***	-0.041***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
R^2	0.059	0.074	0.084	0.127	0.073	0.122
No. of Obs.	1973602	1973602	1788119	1788119	1784126	1784126
No. of clusters	4216	4216	4216	4216	4216	4216

Notes: Difference in Difference: Dropout, reading and math level. In columns 1-2 the outcome variable is dummy for dropout status, in columns 3-4 the outcome variable is dummy for whether the child is able to read a simple standard two level text while in columns 5-6 the outomce variable is whether the child can perform simple math operations. All specifications include time-varying distrct level variaables: *Total teachers govt,Total rural govt. schools, Total rural pvt. schools, Total Enr govt, One teacher schools,Sch. enrol, log SDG grant and log TLM grant.* I use cluster robust standard errors at district year level.

The results in figures 7 and 8 right hand panel also show that automatic promotion did not effect the reading levels of lower secondary age children however, for math the difference between high and low intensity districts becomes large after the year 2009 and keeps falling until the year 2014.

5.1 Mechanism

In table 5 I explore the probable mechanisms for the decline in learning levels after automatic promotion was introduced. I use the math level of primary age children as the dependant variable. In column 1 I use a triple interaction of time and intensity with the district level pupil-teacher ratio (or STR) and in column 2 I use a triple interaction of time and intensity with the dummy for the mother schooling. The triple interaction with STR is negative and significant which indicates that districts with a high student teacher ratio in government schools were more adversely affected by the policy.

Next, I show that students from disadvantaged backgrounds experience lower learning outcomes (math levels) compared to other students. I use mother's schooling variable as an indicator for child's socioeconomic background. The postive sign of the triple interaction with mother's schooling shows that student's whose mother went to school are better off compared to students whose mother never attended school.

Table 5 Diffrence in Difference: Heterogeneous effects

	(1)	(2)
Post*Intensity*STR	-0.010***	
	(0.002)	
Post*Intensity*Motherschool		0.003***
		(0.001)
R^2	0.222	0.220
No. of Obs.	1616378	1631276
No. of clusters	4256	4256

Notes: Heterogeneous effects: The dependent variable in both columns is math level for primary age group. In column 1 I use a triple interaction of time and intensity with the district level pupil teacher ratio. In column 2 I use a triple interaction of time and intensity with the dummy for mother schooling. I use district fixed effects and cluster robust standard errors at district year level.

There could be other reasons for the negative effect of automatic grade promotion on student outcomes. These include (a) less motivated students and teachers because of the removal of high stake exams or (b) inability to implement the new form of Continuous Comprehensive Evaluations (CCE) to assess student learning. More data on teachers and student assessments can help in understanding other mechanisms that lead to a decline in the quality of education after the policy.

6 Conclusion

The improvement in access to primary education across many developing countries has met with serious challenges to provide inclusive, quality education for all. Recent years have witnessed a shift in the focus of education policy towards improving the quality of education. For instance, the Indian parliament recently passed a bill that allows states to abolish social promotion in schools in a bid to improve declining quality of education. It is not yet clear though how this policy might affect educational opportunity and learning outcomes. This study thereby provides evidence on the effect of automatic promotion on educational outcomes.

In order to causally estimate the effect of automatic promotion on students' educational outcomes I use a large scale education reform in India, the Right to Education Act (2009) no-detention policy, that abolished the practice of retention for all elementary grades across the country. The difference in difference method allows me to estimate the effect of the policy on student drop-out rates, years of education and learning outcomes. I exploit variation in exposure to the no-detention policy due to differences in initial repetition rates across districts.

As intended the no-detention policy helped in reducing dropout rates in elementary education. I find that the policy helped in reducing the drop-out rates in post-primary education by 0.1 percentage points and increases the years of education by 0.07 years. However, the policy had a negative effect on learning outcomes. The probability that a primary age student could solve a basic reading and arithmetic task falls by 0.3 and 0.8 percentage points respectively. The negative effect was larger for children with a poor socio-economic background. I explore probable mechanisms for the decline in learning levels. The probable mechanisms for the negative effect of automatic promotion on learning outcomes are (a) less motivated students and teachers because of the removal of high stake exams (b) congestion or (c) inability to implement the new form of Continuous Comprehensive Evaluations (CCE) to assess student learning. I find that districts with congested government schools suffered more due to the policy. More data on teachers and student assessments can help in understanding other mechanisms that lead to a decline in the quality of education after the policy.

References

Allen, Chiharu S, Qi Chen, Victor L Willson, and Jan N Hughes (2009). "Quality of research design moderates effects of grade retention on achievement: A meta-analytic, multilevel analysis". In: *Educational Evaluation and Policy Analysis* 31.4, pp. 480–499.

Allensworth, Elaine M (2005). "Dropout rates after high-stakes testing in elementary school: A study of the contradictory effects of Chicago's efforts to end social promotion". In: *Educational Evaluation and Policy Analysis* 27.4, pp. 341–364.

Bhukkal, Geeta (2015). *Report of CABE Sub-Committee on Assessment and Implementation of CCE*. Ministry of Human Resource and Development.

Eren, Ozkan, Briggs Depew, and Stephen Barnes (2017). "Test-based promotion policies, dropping out, and juvenile crime". In: *Journal of Public Economics* 153, pp. 9–31.

Eren, Ozkan, Michael F Lovenheim, and Naci H Mocan (2018). *The effect of grade retention on adult crime: Evidence from a test-based promotion policy*. Tech. rep. National Bureau of Economic Research.

Glick, Peter and David E Sahn (2010). "Early academic performance, grade repetition, and school attainment in Senegal: A panel data analysis". In: *The World Bank Economic Review* 24.1, pp. 93–120.

Greene, Jay P and Marcus A Winters (2007). "Revisiting grade retention: An evaluation of Florida's test-based promotion policy". In: *Education Finance and Policy* 2.4, pp. 319–340.

— (2009). "The effects of exemptions to Florida's test-based promotion policy: Who is retained?: Who benefits academically?" In: *Economics of Education Review* 28.1, pp. 135–142.

Heilig, Julian Vasquez and Linda Darling-Hammond (2008). "Accountability Texas-style: The progress and learning of urban minority students in a high-stakes testing context". In: *Educational Evaluation and Policy Analysis* 30.2, pp. 75–110.

Jacob, Brian A (2005). "Accountability, incentives and behavior: The impact of high-stakes testing in the Chicago Public Schools". In: *Journal of public Economics* 89.5-6, pp. 761–796.

Jacob, Brian A and Lars Lefgren (2009). "The effect of grade retention on high school completion". In: *American Economic Journal: Applied Economics* 1.3, pp. 33–58.

Koppensteiner, Martin Foureaux (2014). "Automatic grade promotion and student performance: Evidence from Brazil". In: *Journal of Development Economics* 107, pp. 277–290.

Manacorda, Marco (2012). "The cost of grade retention". In: *Review of Economics and Statistics* 94.2, pp. 596–606.

Muralidharan, Karthik (2013). "Priorities for primary education policy in India's 12th five-year plan". In: *India Policy Forum*. Vol. 9. 1. National Council of Applied Economic Research, pp. 1–61.

Nunes, Luis Catela, Ana Balcão Reis, and Carmo Seabra (2018). "Is retention beneficial to low-achieving students? Evidence from Portugal". In: *Applied Economics*, pp. 1–12.

Roderick, Melissa (1994). "Grade retention and school dropout: Investigating the association". In: *American Educational Research Journal* 31.4, pp. 729–759.

Roderick, Melissa and Jenny Nagaoka (2005). "Retention under Chicago's high-stakes testing program: Helpful, harmful, or harmless?" In: *Educational evaluation and policy analysis* 27.4, pp. 309–340.

Schwerdt, Guido, Martin R West, and Marcus A Winters (2017). "The effects of test-based retention on student outcomes over time: Regression discontinuity evidence from Florida". In: *Journal of Public Economics* 152, pp. 154–169.

UNESCO (2009). *Global Monitoring Report 2009: Overcoming inequality: why governance matters*. UNESCO, Paris.

— (2012). *Opportunities lost: the impact of grade repetition and early school leaving.*

A Tables

Table 6 Grade repetition in states before RTE (2005-2008)

State	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	Grade 6	Grade 7	Grade 8
No grade repetion								
ANDHRA PRADESH	6.4	2.8	2.2	1.8	1.7	1.4	1.3	1.0
KARNATAKA †	2.1	2.0	2.0	2.0	2.5	2.5	1.9	1.9
ASSAM †	4.2	2.6	2.2	2.1	2.8	2.2	2.2	6.1
DELHI	5.1	5.6	5.3	5.7	2.6	14.3	8.9	7.3
MADHYA PRADESH	15.1	11.6	12.8	12.4	15.1	11.7	8.6	16.5
CHANDIGARH	3.3	3.2	2.8	2.8	4.7	6.7	6.7	10.7
HIMACHAL PRADESH	6.5	3.8	3.7	4.2	2.7	8.1	6.2	15.7
UTTARAKHAND	11.6	6.7	6.3	4.3	1.4	6.7	4.9	3.5
RAJASTHAN	14.7	9.2	6.6	3.9	3.3	8.2	5.4	8.3
BIHAR	16.1	7.5	6.0	4.8	3.9	3.1	2.7	2.3
ARUNACHAL PRADESH	10.0	9.6	9.3	7.5	6.9	6.9	5.8	8.3
JHARKHAND	16.5	7.2	5.3	4.1	3.4	3.2	2.8	2.6
ORISSA	20.8	8.7	7.5	6.2	5.9	6.4	8.4	8.7
TAMIL NADU	1.1	0.9	0.8	0.8	0.9	3.4	2.7	2.3
ANDAMAN& NICOBAR	3.5	2.0	1.5	1.8	1.5	3.9	3.1	3.3
WEST BENGAL†	18.0	8.0	6.6	6.6	22.2	18.5	18.7	18.4
PUNJAB	8.9	8.6	8.8	7.9	3.5	10.0	8.1	23.1
PONDICHERRY	0.5	0.3	0.3	0.3	1.7	3.9	2.5	3.1
TRIPURA	11.8	6.3	8.3	6.7	5.7	13.2	10.8	8.7
CHHATTISGARH	11.6	7.6	8.1	6.9	4.9	7.0	5.3	7.4
GOA†	4.1	2.5	2.3	5.7	13.0	11.6	10.8	21.0
HARYANA	3.9	4.4	6.4	6.0	3.4	4.0	3.9	7.2
UTTAR PRADESH	1.9	1.4	1.5	1.2	1.2	0.9	0.8	0.8
GUJARAT†	12.3	8.8	8.9	7.0	7.5	5.9	4.4	1.3
MAHARASHTRA†	7.6	5.1	4.7	3.4	5.2	4.5	3.9	5.9
LAKSHADWEEP †	3.0	3.6	2.9	2.4	3.0	3.1	5.1	8.3
KERALA†	0.5	3.5	3.3	3.4	3.6	3.6	5.3	5.8
SIKKIM	17.8	17.8	20.1	20.5	17.0	18.9	15.0	18.7
NAGALAND	4.8	4.3	4.4	4.0	4.6	4.4	4.4	5.5
MANIPUR	3.7	1.2	1.3	1.2	1.2	1.4	1.3	1.4
MIZORAM †	6.4	3.2	3.0	2.7	2.6	1.9	3.7	0.0
MEGHALYA †	7.6	5.8	5.4	4.9	7.3	5.8	5.9	5.6
DAMAN&DIU †	8.5	6.7	6.5	7.5	9.9	6.2	3.3	11.2
DADAR&NAGAR †	17.5	13.2	12.9	9.7	14.5	8.5	5.8	5.6

Note: India has total 36 states and union territory. I do not include the state of Jammu and Kashmir as it is not yet covered by RTE Act 2009. I include data for undivided Andhra Pradesh.

† Most states in India have grade 1 to 5 as primary and 6 to 8 as lower secondary. While some states which have 1 to 4 as primary and 5-7 as lower secondary include: Assam, DamanD̂iu, Dadar and Nagar, Lakshadweep, Meghalaya, Mizoram, West Bengal, Goa, Gujarat, Karnataka, Maharashtra and Kerala.

Table 7 Description of variables

ASER	
Outcome variables	
Dropout	Dummy for whether the child dropped out of school or not
Years of education	Presently enrolled in which grade in school
Reading level	Whether the child can read a grade 2 level text or not
Math level	Whether the child can solve a grade 2 level math problem
Individual level covariates	
Lower secondary age	Dummy for whether the child is in primary (6-10 years) or lower secondary (11-16) age group
Child Age	The age of child
Gender=Female	Dummy for whether the child is female or male
Mother Schooling	Dummy indicating whether the child's mother went to school or not
DISE	
Intensity variables	
Repetition rate 2008 primary	The average of repetition rate in primary grades for the year 2008
Repetition rate 2008 lower secondary	The average of repetition rate in lower secondary grades for the year 2008
District level covariates	
Repetition rate Primary %	The average of repetition rate (total repeaters/total enrolment) in primary grades (grade 1-5 or 1-4)
Repetition rate lower secondary %	The average of repetition rate (total repeaters/total enrolment) in lower secondary grades (grade 6-8 or 5-7)
Total teachers	Total number of teachers in government schools
Total schools govt.	Total government schools in rural areas
Total schools pvt.	Total private schools in rural areas
Total Enrolment govt. schools	Total enrolment in govt. schools
One teacher schools	Total single teacher schools
Sch. enrol >50	Total schools with enrolment greater than 50
SDG grant	Grants for SDG
TLM grant	Teacher learning material grant
Years	ASER 2007-2014,DISE 2005-2016
States	31
Districts	574
Observations	3,913,378

B Figures

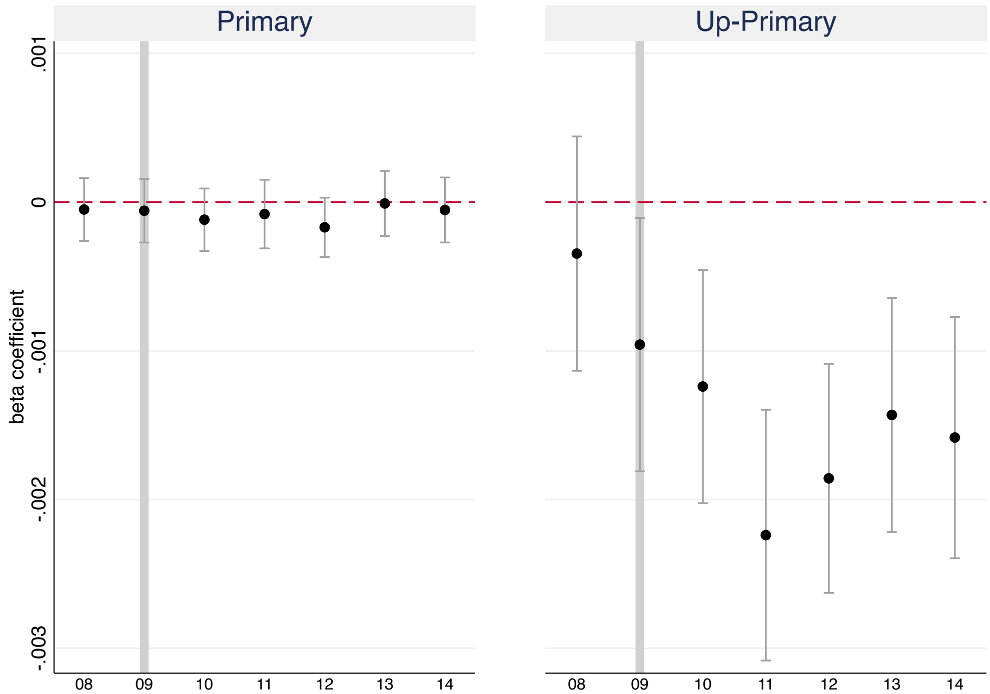

Figure 6 Difference in difference Dropout: This figure plots the β_t coefficient using equation 2 with drop out as the outcome variable. The grey vertical line indicates the year when RTE was passed.

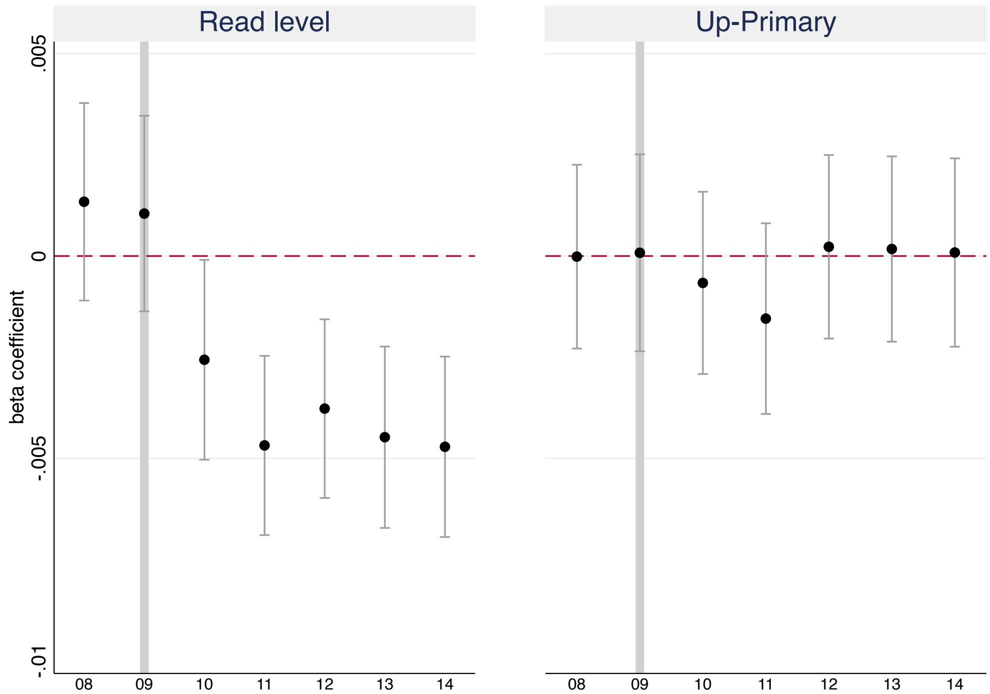

Figure 7 Difference in difference in Reading level: This figure plots the β_t coefficient) using equation 2 with reading level as the outcome variable. The grey vertical line indicates the year when RTE was passed.

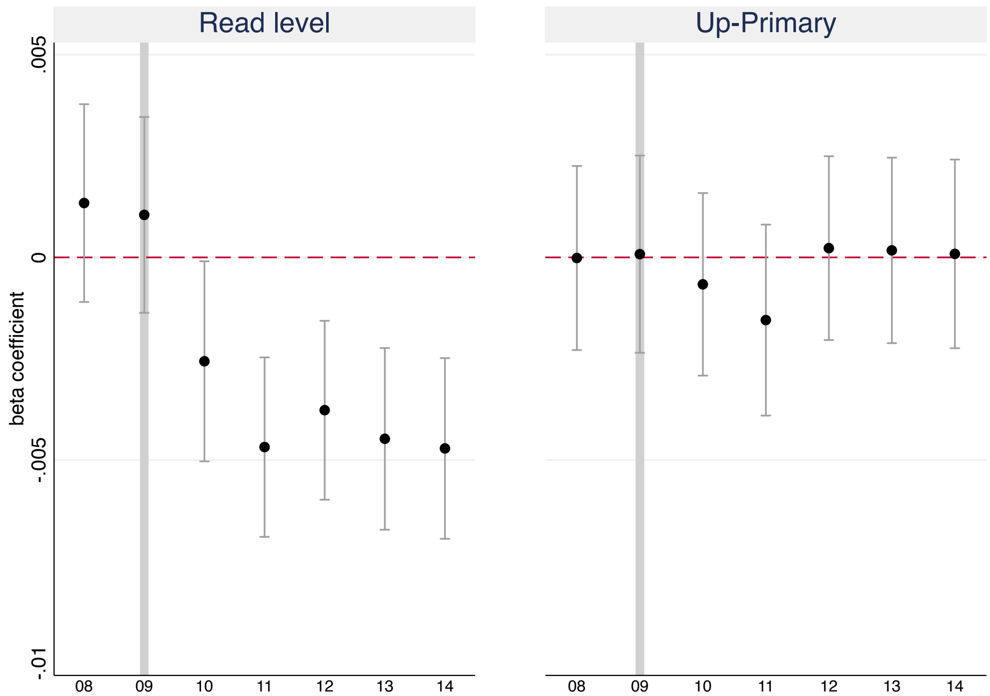

Figure 8 Difference in difference Arithmetic level: This figure plots the β_t coefficient) using equation 2 with arithmetic level as the outcome variable. The grey vertical line indicates the year when RTE was passed.

C

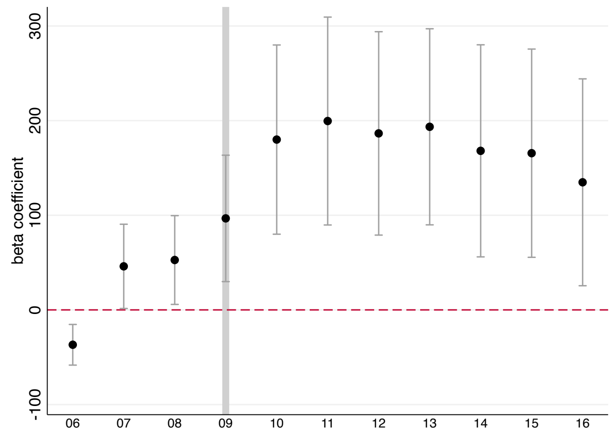

Figure 9 Trend in difference Total number of teachers in government schools.

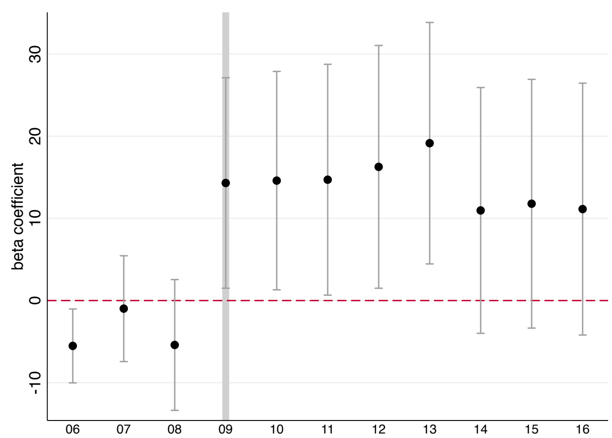

Figure 10 Trend in difference in Total government schools in rural areas.

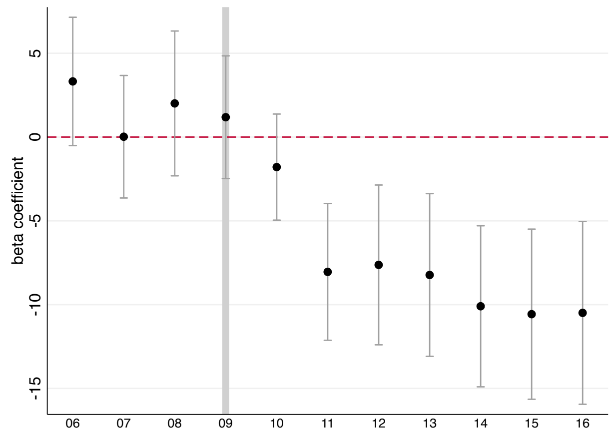

Figure 11 Trend in Total private schools in rural areas.

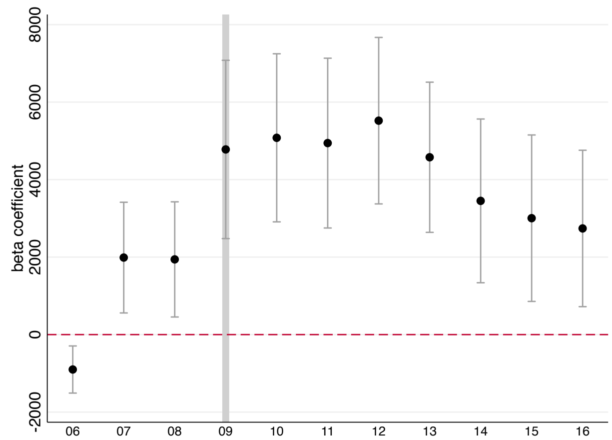

Figure 12 Trend in difference in Enrolment in government schools.

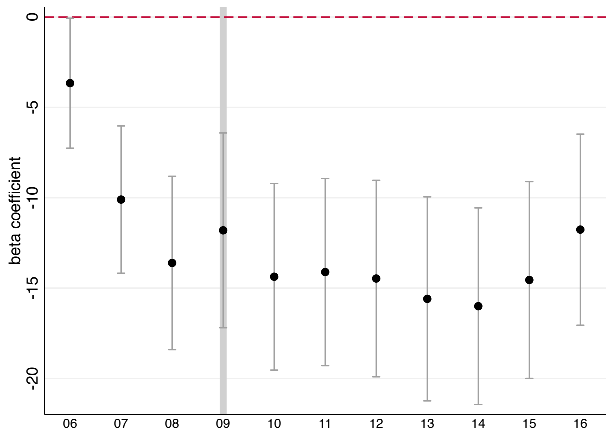

Figure 13 Trend in difference in Total single teacher schools

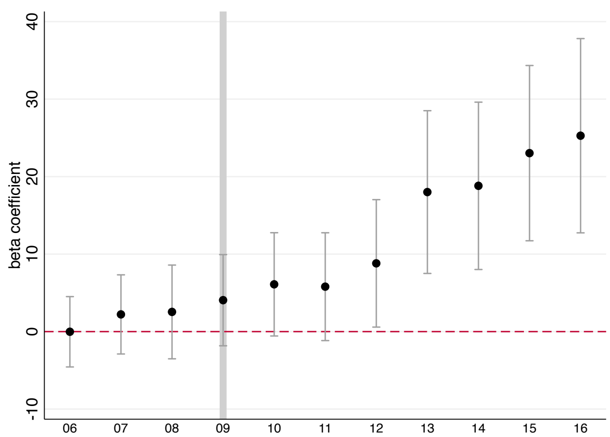

Figure 14 Trend in difference in Total schools with enrolment greater than 50.

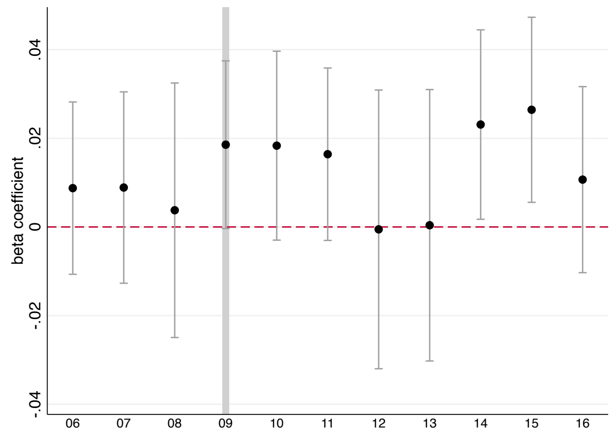

Figure 15 Trend in difference in Grants for SDG

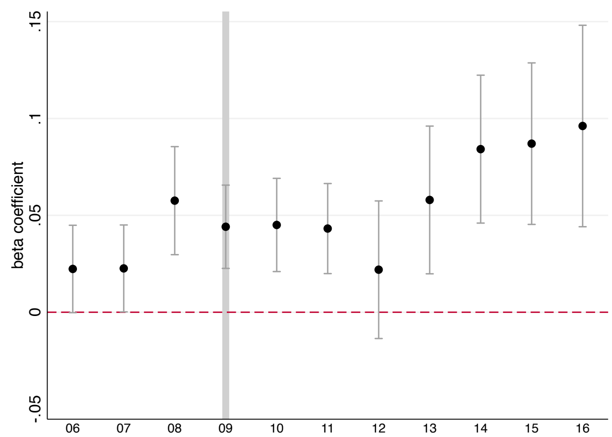

Figure 16 Trend in difference in Grants for TLM.