# Does Exposure Matter? Parent's Early Childhood Exposure to Public Schools and Choice of Private Schools: Evidence from India Working Paper

Nitin Kumar Bharti, Pradeep Kumar Choudhury, and Pabitra Chowdhury

ABSTRACT. The increasing level of privatization has been a predominant feature observed in the post-liberalization period in India. We do two things in the paper. First, using nationally representative NSS datasets from 1985 to 2018, we highlight insights into privatization trends by stages of education. For example, privatization in recent years is strongest at the primary level, undeterred by 12 times more expensive private schools on average. The share of enrollment at the primary stage jumped by 20pp (20% in 1985 to 40% in 2018). Second, we causally estimate the impact of the quasi-exogenous variation in the change of the share of public primary schools during the father's first 9 years of age on the decision to send his kid to private school. We find that a 1sd increase (decrease) in the share of public primary school translates into a reduction (increment) of 8.14% probability of sending his own kid to private primary school. We conjecture that it is due to distrust among parents towards the public primary schools due to decades of neglect of primary schooling by the government.

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Bharti: Postdoctoral Associate New York University-Abu Dhabi; nkb2039@nyu.edu

Choudhury: Assistant Professor, Zakir Husain Centre for Educational Studies, JNU, Delhi & Research Fellow, South Asia Institute, Harvard University

Chowdhury: Independent Researcher; pabitrachowdhury.ju@gmail.com

### 1. INTRODUCTION

The Indian education system is rapidly moving from government-led to private-led. In 2017-18, the total enrollment in private institutions was 41%. The rapid expansion of private schools in India caters to the increasing demand for quality education, where private schools are perceived as better. In contrast, the state of learning outcomes of Indian students hasn't picked up at the same pace. India ranks second after Malawi in a list of 12 countries where a grade two student could not read a single word of a short text in 2018 (Bank 2018).<sup>1</sup> These two facts, prima facie, suggest that not all private schools perform as they are assumed to do. Privatization also poses challenges to equity and stratification by skimming away the cream of students. Hence, understanding the intricate dynamics of privatization in the education sector is essential as India navigates through the crucial phase of the demographic dividend.<sup>2</sup>

We analyze the evolution of privatization in the education sector from 1986 to 2017, drawing on the comparison at different levels of education. Next, focussing on the primary level, we study whether a father's exposure to the share of public primary schools in his own school-going age (0-9 years of age) matters in choosing private schools for his kid(s).<sup>3</sup> An enlarging causal early childhood research in economics shows that early life exposure to a sociopolitical environment engenders the development of fundamental parameters, such as later-life social preferences (Cappelen et al. 2020), preferences for honesty (Abeler et al. 2021), political identity (Billings et al. 2020), and intergroup behavior during adulthood (Fisman et al. 2020; Couttenier et al. 2019; Bharti and Roy 2023).

Over the years, private schools have grown in popularity in India (Karopady 2014; Kaur 2017; Lahoti and Mukhopadhyay 2019). Poor quality state schooling has often been cited as the primary reason for the increased demand for fee-charging private schools (Drèze and Kingdon 2001; Karopady 2014). Poor parents shift children from cost-free government schools to fee-paying private schools to ensure better education for their wards (Kaur 2017), as parental dissatisfaction with the performance of government schools is considerable in India (Karopady 2014).<sup>4</sup> Despite their high cost, private schools exist in the market because they provide (or are believed to provide) a better quality of education than government schools. Households across the country have developed faith in private schools and, therefore, send their children to these schools by paying the fee, despite the presence of government schools in their locality (Kaur 2017; Choudhury 2020). Previous research finds the breakdown in the quality of government schools as an important reason for the growth

<sup>&</sup>lt;sup>1</sup>ASER 2018 report covering rural elementary schools in India finds that 60% of class VIII students in public schools and 46% of private school students could not do simple division.

 $<sup>^{2}</sup>$ Further, as enshrined in the Indian Constitution, educating all up to 14 years of age is the state's duty and everyone's fundamental right.

<sup>&</sup>lt;sup>3</sup>Our focus on the father and not the mother in this study is contextual. First, a majority of women move to their husband's place and second, the available surveys do not capture the district of origin. This makes it impossible to know the exposure during the mother's early age.

<sup>&</sup>lt;sup>4</sup>Further, with increasing awareness and greater demand of education, parents understand the importance of choosing a school that provides a good education that serves as a reliable input for higher education and positive labor market outcomes for their children.

of private schools in India (Karopady 2014; Sahoo 2017; Desai and Dubey 2009; Rangaraju et al. 2009).  $^5$ 

The decline in the quality of education, especially at the primary (and upper primary level), is partly due to the rapid expansion of government primary schooling in post-1990s India. The expansion of the primary education system from 1950-90 was government-led and much slower compared to post-1990 expansion. Further, the adopted educational policies gave higher education more weight than primary education (Bharti and Yang 2023), which might have led to mistrust about government primary schools and preference towards private schools. The 75th National Sample Survey (NSS) round data on education (2017-18) reveals that 42% of parents prefer to send their children to private primary schools as they believe that the quality of education is unsatisfactory in government schools.<sup>6</sup>. Only 2% say they tried but couldn't get the government schools (Table 2). It contrasts with more than a quarter share of parents tried for public colleges but couldn't get one at the tertiary level.

This led us to hypothesize that a father's own positive exposure to public primary education in his early childhood will generate a lesser negative perception of public schools (conditional on parameters impacting the quality of schools) than when the father's experience was less positive. We create this exposure (continuous) variable as a change in the share of public primary schools during the father's first 9 years. The 0-9 years is because any change in the share during this age will directly impact the father as the primary school-going age is from 5-10 years. The assumption is that any change after this age will not directly impact the father. The prevalent level of the share of public schools is controlled directly capturing the district-specific characteristics.

Our econometric approach follows the recent studies on the impact of early childhood exposure as the research setting is similar.<sup>7</sup> We identify the effect using two key variations. The first variation is based on the variations in early childhood share of public schools exposure to fathers who were born in the same districts but belonged to different birth cohorts as well as on across districts' early childhood variation in the share of public schools within the same birth cohorts. The second variation relates to the quasi-exogenous variation in the changing school characteristics (during recent years) due to the rapid expansion of both public and private primary schools. It allows to control for the unobserved time-varying differences in the district (as in the Equation 2).

<sup>&</sup>lt;sup>5</sup>Parents also find public schools to be inflexible and non-responsive towards their needs and believe that private schools can provide a better future for their children, which motivates them to make the necessary expenditure (Desai et al., 2009; Galab et al., 2013; Bhattacharya et al., 2015; Santhakumar, Gupta, and Sripada, 2016).

 $<sup>^{6}\</sup>mathrm{Around}$  one quarter mentions reasons such as better infrastructure (13%) and better peer group (11%) to be the reason

<sup>&</sup>lt;sup>7</sup>The main difference with these papers (Couttenier et al. 2019; Fisman et al. 2020; Bharti and Roy 2023) is that they identify the impact of exposure to violence in early childhood, whereas our interest is on the exposure to the changing share of public schools.

We find that exposure to 1 sd unit change in the share of public primary schools when aged 0-9 years (of the father) causes a decline of 8.14% probability of sending his kid to private primary school at 1% significance level. The effect is robust to including and excluding controls such as fathers' level covariates (education level, religion, caste, monthly consumption) and child-level covariates (gender and birth order). Our result survives after controlling for the school-level time-varying observables (when deciding to send the kid to private school), which are known to impact parental choice. More importantly, our results survive the addition of district-level time trends, effectively controlling for district-level observable and non-observables.

The paper makes several contributions. The first contribution is providing causal evidence of a novel determinant of private schools by parents- channeling through the preference developed in early childhood exposure. We expand the literature on the determinants of parental choice by providing evidence on long-term determinants of parental choices. Our focus on linking interventions during the formative years of the father on choices for his offspring relates to the early childhood literature, which has highlighted the impact of early childhood intervention on long-term social preferences such as those found in (Billings et al. 2020; Cappelen et al. 2020; Couttenier et al. 2019).

The paper's second contribution is highlighting that policies may have long-term repercussions by changing the preferences among the population. It shows that parental decisions may reflect their own experiences in their childhood rather than the existing reality. We add a new dimension highlighting that the explanation behind increasing privatization at the primary level in India (and other developing countries) has a historical origin of lopsided policies.

Our third contribution is adding a nuanced result on parental choices, contributing to the existing trends of privatization. Others have highlighted the observed differences in public and private schools driving the privatization. Comparing public and private schools on the input-based qualitative parameters, studies show private schools, on average, have more teaching days, lower teacher absenteeism, lower pupil-teacher ratio, and reduced multi-grade teaching (Goyal and Pandey 2009; H"arm" a 2009; Muralidharan and Kremer 2006; Mehrotra and Panchamukhi 2006; Muralidharan and Sundararaman 2013). On the other hand, government schools perform better in teachers' qualifications, professional development training, and salary (Goyal and Pandey 2009; Muralidharan and Kremer 2006; Singh 2015). In terms of learning outcomes, on average, students of private schools perform better than their public school counterparts (Goyal and Pandey 2009; Kumar and Choudhury 2021).

The rest of the paper is organized as follows. Section 2 presents the context and data in detail. Section 3 provides the details of privatization trend from 1986-2017. Section 4 explains the empirical strategy. Section presents the 5 and Section 6 concludes.

## 2. Context and Data

2.1. **Context.** The landscape of education in India is undergoing a significant transformation, marked by the increasing influence of privatization. The debate surrounding the privatization of primary education has also taken center stage.<sup>8</sup> The rise of private institutions in India's education landscape is undeniable. They have gained prominence by catering to the surging demand for quality education, a demand often perceived as lacking in government institutions - especially at the primary level. This trend has led individuals and organizations to establish private schools, further contributing to the increasing privatization of primary education. Nevertheless, privatization brings its share of challenges, notably equity. Additionally, financial constraints have been a significant concern in private education (Lhungdim & Hangsing, 2021).

The new trend of privatization is no longer confined to the upper middle/ middle class in urban regions. Rather, much of the expansion (particularly in the last two decades) has been driven by the mushrooming of low-fee private (LFP) schools in India to fulfill the educational aspirations of poor and lower-middle-class parents (Mehendale and Mukhopadhyay 2018). The LFP schools (referred to as budget schools in the literature) are a new 'avatar' of the private school education market. These schools are quite popular among the parents of marginalized sections of society living in less developed urban settlements and villages. Between 2006 and 2018, the share of private school student enrolment went up from 18.8% to 30.9% (ASER 2020).<sup>9</sup>

A key feature of the expansion of private schools in rural India is the emergence of low-fee private schools (LFPS) (Lahoti and Mukhopadhyay 2019; Mehendale and Mukhopadhyay 2018). These less expensive private schools in rural India are getting popular among lower and lower-middle-income households living in villages (Nambissan 2012; Nambissan and Ball 2010; Tooley and Dixon 2007; Srivastava 2008; H"arm" a 2009; Choudhury 2020). Even poor rural parents shift their children from cost-free government schools to fee-paid private schools (Kaur 2017).

2.2. Survey Data. We harmonize five rounds of National Sample Survey (NSS) education surveys: 42nd round (Jul'86-Jun'87), 52nd round (Jul'95-Jun'96), 64th round (Jul'07-Jun'08), 71st round (Jan'04-Jun'04) and 75th round (Jul'17-Jun'18) to understand national-level patterns of increasing

<sup>&</sup>lt;sup>8</sup>NITI Aayog proposed potential reforms in its three-year action plan in 2017, including the exploration of publicprivate partnerships (PPP) to address the deficiencies in government schools. Under this model, private entities would take over underperforming government schools, funded on a per-child basis. This suggestion aimed to tackle issues plaguing government schools, such as high teacher absenteeism, limited instructional hours, and lower educational quality compared to private counterparts. However, it is important to note that while the discussion on privatization is ongoing, the government has clarified that there are no immediate plans to privatize primary education.

 $<sup>^{9}</sup>$ Muralidharan and Kremer 2009 show that 28% of the rural population has access to private schools in their village, which increases to more than 60% in states like Punjab and Haryana.

privatization at all the stage of education. <sup>10</sup> All the rounds capture detailed expenditure information on education. To understand the pattern of privatization, we used information on enrollment and breakout of different types of expenditure like tuition fees, books, uniform and transport costs, and expenditure on private coaching, the reason for private school choice for the same enrolled children at the age of 3 - 35 years of old. We create a dummy for the private enrollment of the kid, combining two categories - private aided and private unaided.<sup>11</sup>. The last two survey rounds also capture parents' reasons for opting for private school (over public school). In both rounds, the question is asked for the students aged 3 to 35 years old and currently enrolled in educational institutions.

We pool the last two rounds (NSS 71st and 75th) and form a novel father-child pair dataset using the relationship information captured with respect to the household head. From the pooled dataset, we keep the households where at least one kid is currently attending primary-level schooling. To create the child-father pair, we match the relationship with the household head and with the kid currently attending a primary school. We create birth orders based on a child's age and level of enrollment in primary school. The district names are harmonized with the census 2001 district names by keeping the original (parents) districts.

2.3. District Information System for Education (DISE) Data. We rely on the DISE-2017 data to get the expansion of public and private schools over time. DISE is an annual data set that covers the universe of schools all over India, with school-level information, such as the year of opening of schools, levels of schools (primary, secondary, higher secondary), school management structures, and school's highest and lowest grade levels. Our analysis focuses on primary school expansion, i.e., schools with primary classes (Class I-V).<sup>12</sup>

In the data, public schools are with school management categories (in 2017)- Department of Education, Tribal Welfare Department, Local body, Other Government Managed, Social Welfare Department, Ministry of Labour, Kendriya Vidyalayas, Navodaya Vidyalaya, Sainik School, Railway School, Central Tibetian School, Recognized Madarasas. Privately managed are school management with definition as - Government Aided, Private unaided, and all Unrecognized schools. Also, it incorporates geographical details about the school, including district names, which we used to link this data with the NSS survey districts. In order to do that, we harmonized district name for the year 2001. The dataset is at school level, hence we create a balanced panel with the information

<sup>&</sup>lt;sup>10</sup>The surveys are designed to assess the benefits derived by various sections of society from public expenditure such as health services, educational services, public distribution systems, and social consumption. (Key Indicators of Household Social Consumption on Education in India - 75th round)

<sup>&</sup>lt;sup>11</sup>Private-aided institutions receive some funding from the government (especially for teachers' salaries); however, they are independent in managing themselves. Private unaided schools do not receive any funding from the government. There is an ongoing debate about whether to consider private-aided schools as public or private. We have decided to keep private aided schools under private, following a large amount of literature doing so. Further, the fee pattern in the private aided schools is closer to private unaided schools.

<sup>&</sup>lt;sup>12</sup>In the DISE data, schools are classified based on the highest standard/class. A secondary school can or can't have primary classes. Hence, we use the highest and lowest grades in the school to identify primary schools.

of type of school managment and number of public and primary school collapsed at the district level. We used the main variable year of establishment of a school and calculate number of public and private primary schools were established in that year with in a district. This balanced panel is created from the establishment school establishment year of 1950-2017.

We also harmonize other DISE year reports from 2005 to 2017. We created district level panel for school characteristics from 2005 to 2017. To define school characteristics we used number of parameters at district level like number of working days, infrastructure facilities index (boundary wall, toilets, playground, classrooms, library etc), pupil-teacher ratio, medium of instruction is English or not etc. We have harmonized and collapsed the data at the level of 2001 district names.

# 3. Descriptive Statistics: Evolution in 30 years from 1986-2017

The expansion of the education system, and predominantly the primary level graduates over the years, is now changing especially the student structure within the education system. Between 1986-87 and 2017-18, the share of students attending up to upper-primary level (Class I-VIII) declined with a corresponding increase in the share of post-secondary levels. The share of students attending primary education has dropped from 58% to 44% (refer appendix A.I), whereas the percentage of students in tertiary education rose from 2% to 11%, highlighting expanding secondary and higher education sectors in India.

3.1. **Privatisation.** Enrollment in private institutions is increasing in India, within private unaided institutions. In Table 1, between 1986 and 2017, students' enrollment in private schools and colleges increased from 28% to 41% (with a corresponding decreasing share of students in government/public schools). Notably, within private enrollment, the increment comes from private unaided institutions. In 1996, 20% of students attended private unaided schools, which increased to 28% in 2017. This shift in enrolment from government to private (unaided) is entirely driven from the primary level. The change in the share of private enrollment in other stages of education is marginal during this period. The share of private enrollment increased at the primary level by 16pp, compared to 3pp in upper primary, -3pp in secondary, -2pp in secondary, and 6pp at the tertiary level between 1986 and 2017. The noticeable dynamics in post-primary level education is change in the enrollment share from private aided to private unaided. For instance, the enrollment share in private aided schools at secondary and post-secondary levels declined by 13pp during this period, and a gain of 15pp and 21pp, respectively, in private unaided schools.

3.2. Expenditure per Student. There is an absolute increase in the expenditure per student (exp/student) of households in education. The Appendix Table B.I presents the ratio of exp/student in private to government institutions at all levels of education.<sup>13</sup> The ratio is more than 1 in all cells (except at the tertiary level before 2000), showing private schools are more expensive throughout. In 1986, sending a kid to a private institution was 2.27 times more expensive than a public one, on average, for a household, which increased to 5 times in 2017. Overall, the expense of education to households increased for sending one's kids to private institutions.

The increment is starker at the primary level, where the ratio has increased from 3.8 in 1986 to 11 in 2017.<sup>14</sup> During this period, the ratio increased to: 7.6 (from 1.9) at upper primary level; 3.9 (from 1.2) at secondary level; 2.9 (from .98) at senior secondary level; and 2.3 (from .7) at tertiary level. Irrespective of this tremendous increase in the cost of sending kids to private schools and colleges, the increasing share of enrollment shows that households are willing to absorb this cost.

<sup>&</sup>lt;sup>13</sup>Table B.II shows the exp/student for different levels in all years in government and private separately.

 $<sup>^{14}</sup>$  One had to spend INR 14,756 annually in 2017 for a primary going kid in private school, compared to only INR 1,297 in public school (Appendix Table B.II)

3.3. Components of Expenditure in Public and Private. In addition to the overall increase in the cost of education per child, there is a dramatic shift in the share of different components of expenditure. We divide the total expenses into tuition fees, private coaching, and others (including books, uniforms, travel, and miscellaneous). The share of tuition has mounted from 21% in 1986 to 55% in 2017 (Appendix Table B.III). The share of private coaching has remained stable at around 10% of the total cost.<sup>15</sup>. The decline is in the others category (from 68% to 35%). This pattern is prevalent at all levels of education.

Next, we look at the share of different components of cost into public and private separately (Appendix Figure 1). Within public institutions, the increase in the tuition share is from 15% to 39% between 1986 and 2017. The share of private coaching also increased from 11% to 15% during this period (also, the levels are higher than in private institutions in post-2000). In private institutions, the tuition share has also increased tremendously from 30% to 70%, whereas the marked difference is in the declining private coaching share. This shows that households, where kids go to public schools are topping up their education with private coaching.

If we take a step further and look at expenditure component X public/private X education level, we get more insights (Refer Appendix Table B.III). First, within public institutions, the increase in the tuition share is entirely driven by tertiary-level education. It is because of free education policies of central and several state governments up to age 14 and higher subsidies until senior secondary level. Second, the share of private coaching has increased up to one-third of the total cost at all school levels. For example, it increased to 27% (from 9%) at the primary level; 32% (from 11%) at the upper primary level; 34% (from 17%) at the secondary level; 30% (from 13%) at the senior secondary level. This indicates that the topping up through private coaching has increased tremendously for all school-going students in public schools, even at the early stage of primary.

In contrast, we notice that the increase in tuition share in private institutions cuts across all levels of education. For example, at the primary level, the tuition share is 61% (compared to 7% in government schools). The private coaching share has declined to single digits (except in secondary and senior secondary, where it is 12% and 16%, respectively). One reason behind this is private schools integrating private coaching within the school framework<sup>16</sup>.

3.4. **Privatisation and Caste-based stratification.** The increasing trend of privatization is also leading to caste-based stratification, where lower-caste groups are now over-represented in public schools, and correspondingly, upper-caste groups are over-represented in private institutions. In 1986, the share of SC and ST students was 17% and 7%, respectively (close to their population share), which increased to 24% and 14% in 2017; 8pp and 5pp higher than their population share

 $<sup>^{15}\</sup>mathrm{In}$  the secondary and senior secondary levels, the share of private coaching is the highest at 18-20%

<sup>&</sup>lt;sup>16</sup>In the 75th NSS round, about 3% of parents give this reason behind sending their kids to private schools.

(See Appendix Figure A.II).<sup>17</sup> This trend is at all educational levels at different degrees, except in tertiary education (where public institutions are in more demand and there is explicit reservation based on the population share). Correspondingly, in private institutions, the share of General and OBC students is consistently over-represented in all years. (Refer Appendix A.III). In 2018, General (marked as Others in the graph) and OBC students were 32% and 49%, respectively, in primary schools (2pp and 5pp more than their population share).

It highlights that the increasing private enrollment is more from the non-SC/ST students, which points towards the equity concern. Provided lower caste groups are, on average, poor, they possibly couldn't afford the more expensive private schools, driving the stratification in society, which may have several negative repercussions.

3.5. **Preference for choosing private schools:** The last two NSS education rounds, the 71st round (Jan'14-Jun'14) and the 75th round (Jul'17-Jun'18) asked about the reasons for attending a private school. A glimpse into the reasons provided by parents by education level shows 56% of households in the 71st round mention better learning environment in private schools to be the reason, whereas 21% finds the quality of government schools unsatisfactory at the primary level (Table 2). In the 75th round, 37% mentioned a better learning environment (sum of availability of specific facilities, social reasons, and availability of private coaching), and 42% mentioned the unsatisfactory quality of education in government institutions to be the reason behind choosing private primary schools. At the primary level, English being the medium of instruction is also an important reason behind households preferring private schools (15% in the 71st and 21% in the 75th round mention)

Interestingly, the reasons are very different in tertiary education, where only 10% mention unsatisfactory quality at government institutions to be the reason, and close to one-third (28% in the 71st round and 37% in the 75th round) of parents tried for the government school but couldn't get it. This contrast shows the differential preferences of parents towards public institutions at the primary level versus the tertiary level, in line with our hypothesis that the historically lesser focus on the primary level policies might have developed mistrust towards the government primary schools.

<sup>&</sup>lt;sup>17</sup>One could see the under-representation of SC and ST students in private schools. In 2017-18, SC students are 14% (2 pp less than their population share and ST students are just 4% (5pp less than their population share)

## 4. Empirical Strategy

To identify the effect of a father's exposure to the share of public school in his school-going age on the decision to send his kid to a private school, we need exogenous variation in father's exposure, such that fathers are assigned randomly to different shares of public primary schools. We use a combination of two exogenous variations to estimate the causal effect. We first exploit the variation in the share of public primary school expansion across different birth cohorts within the same district. Our second source of variation comes from fathers in the same birth cohort exposed to different school expansions in different districts. Our baseline specification is as follows:

$$y_{f_idb} = \alpha + \beta \Delta (ShPub_{db}) + \beta_1 SchQual_{d,b-1} + \delta_d + \rho_b + X_{f_i} + X_f + \epsilon_{f_idb}$$
(1)

where,  $y_{idb}$  is 1 for enrollment in private primary school for the child *i* of father *f*, born (and living) in district *d*, belonging to father's birth cohort *b*. Our main coefficient of interest is  $\beta$ , which captures the causal impact of the father's exposure to the increased (share of) public primary school on the probability of sending his child to private primary school. The covariate  $\Delta(ShPub_{db})$  is a continuous variable capturing the change in the share of public schools in the district during the first nine years (age 0-9 years) of father f.<sup>18</sup> We also control for the share of public schools  $SchQual_{d,b-1}$ one year before the fathers' birth, capturing the impact of the prevalence of the existing share of public primary schools.  $X_{f_i}$  includes child-level controls (gender and order of birth), and  $X_f$  includes father-level controls (completed education level, religion, caste, household consumption). To capture the impact of locational proximity of school, we control for the distance from the nearest primary school<sup>19</sup>

Our main identifying assumption is that change in the share of public primary schools in a district is exogenous conditional on the district and birth year fixed effect. We control for unobserved differences in fathers' birth year by including birth year fixed effect ( $\rho_t$ ). Districts with large changes in the share of public schools' school expansion may be different from districts that experienced less change in the number of schools. We take into account such unobserved differences in districts by controlling for district fixed effects captured by  $\delta_d$ .

The decision to send the kid to private school also depends on the existing quality of public and private institutions. Hence, we explicitly control the ratio of private to public school qualitative measures aggregated at the district level, such as pupil-teacher ratio, infrastructure index (electricity, playground, boundary wall, etc.), and the number of working days. These values are calculated at the age of entry of the kid to school. Even after controlling for these observable school-level

<sup>&</sup>lt;sup>18</sup>Primary school-going age in India is from 5/6 years to 10/11 years.

<sup>&</sup>lt;sup>19</sup>Also, studies show parents choose to send their children to private schools because these schools are located in close proximity (Mousumi and Kusakabe 2019). In our data, too, 26% (in the 75th round) parents give "located nearby" as a reason for choosing a private primary school (See Table 2).

qualities, one identification threat remains: leaving out unobservables (e.g., teacher absenteeism)<sup>20</sup>, which might be driving up the underlying privatization trend in a given district of fathers and their kids. It could bias the estimates.

To overcome this, we enrich our specification by district X year of entry of the kid into school fixed effects, explicitly controlling the trend at the district level when deciding whether to send the kid to private or public school.

$$y_{f_idb} = \alpha + \beta \Delta (ShPub_{db}) + \beta_1 SchQual_{d,b-1} + \delta_{dXy} + \rho_b + X_{f_i} + X_f + \epsilon_{f_idb}$$
(2)

where all the variables are the same as above; the only change is the addition of  $\delta_{dXy}$  fixed effect and removing  $\delta_d$  district fixed effect.

### 5. Results

We present our results in this section. Table 3, shows how the coefficient changes by adding different fixed effects and controls.

Column (1) shows a strong negative correlation between the decision to send the kid to private school and the change in the share of public school b.n 0-9 years of the father. Columns (2) and (3) add district and fathers' year of birth fixed effects, removing the unobserved differences at the district and fathers' birth year level. The coefficient reduces to -0.733 but still is significant at 1% significance level. Columns (4) and (5) further add household-level and child-level controls, which reduces the coefficient to -0.632 without changing the significance level. Finally, in Column (6), we add the school's qualitative characteristics aggregated at the district level in the year of deciding to send the kid to private schools. Our coefficient doesn't change much and remains at -0.690 at a 1% significance level. Considering the variation in our main regressor, we find that 1sd change translates into a reduction of 8.14% probability of sending kids to private primary school.<sup>21</sup>

In Column (7), we replace the district fixed effect with district X year (where year is the child's entry into the school year) fixed effect. It controls for district-level trends, in effect controlling for district-level school characteristics (both observables and unobservables), which could be biasing the estimates. The coefficient becomes stronger at -0.752 at a 1% significance level. In other words, 1sd change in the share of public primary schools translates into a reduction of 8.9% probability of

<sup>&</sup>lt;sup>20</sup>Parents choose private schools due to higher teacher absenteeism in public schools. They are dissatisfied that teachers in government schools do not pay attention to teaching, and in many instances, students leave the school premises during school hours (Chaudhury et al. 2006; Muralidharan and Kremer 2006; Goyal and Pandey 2009). Lahoti and Mukhopadhyay (2019) note that children's learning, discipline, and safety in schools often determine school choice among rural parents

<sup>&</sup>lt;sup>21</sup>The standard deviation of our main regressor is .0295; the impact for 1sd change is going to be -0.069\*0.295=-.0204; which is 8.15% of the mean (-.0204/.25)

sending kids to private primary school. This shows that our results are unbiased; hence, we stick with Equation 1 as the baseline specification.

5.1. **Robustness.** The first robustness check is to keep only one child per father, as there could be a concern that few fathers with high impact and more kids could be driving the results. The coefficient of interest is of the same order and significance level as shown in Appendix Table B.V. Column (1) follows equation 1, and the coefficient of interest is -0.613 at 1% significance level. Column (1) follows equation 2, and the coefficient of interest is -0.781 at 1% significance level.

## 5.2. Heterogeneity.

5.2.1. Heterogeneity by the intensity of changing share of public schools. The first heterogeneity we look at is by the intensity of our main regressor, i.e., we divide the continuous variable into four categorical variables: less than 25 % change in the share of public primary schools, between 25-50% change in the share of public primary schools, between 50-75% change in the share of public primary schools, and more than 75% change in the share of public primary schools. The results are presented in Table 4. Columns (1) to (6) are the same as before in our main table (Table 3), with the gradual addition of fixed effects and all the controls. The base category is the first where the change in public share is less than 25%. The coefficients are more pronounced as we increase the quartiles. In Column (6), the coefficient is -.0467 (for 4th quartile) and -.0367 (for 3rd quartile), both at 5% significance level. There is no differential impact between the 1st and 2nd quartiles.

5.2.2. Heterogeneity by the completed fathers' education level. The second heterogeneity we test is whether the impact differs from the completed education level of the father. We split the sample into six educational categories - no education, below primary, primary, middle, secondary, and bachelor (& above), and run our baseline specification Equation 1 for each separately. The results, as shown in Table 5, highlight that the coefficient is negative for illiterate, primary, middle, and secondary graduates; however, it is significant (at 5% level) for secondary graduates only.<sup>22</sup>

## 6. CONCLUSION

We present the changing patterns of privatization, highlighting the differences in the patterns at educational levels. Explaining the recent trends of privatization at the primary level in rural areas, we show that exposure to the changing share of public education during a father's early age is an important determinant of choosing private schools for his kid.

 $<sup>^{22}</sup>$ Interestingly, the coefficient is positive for bachelor-level graduates and above, with a very high standard error (resulting in no statistical significance even at 10% level).

# 7. FIGURE



FIGURE 1. Evolution of share of expenditure components by type of institution.

Notes: The figure plots the estimates of the share of expenditure components by education levels in public and private institutions separately from 1986 to 2017 using NSS surveys. The data for 1986 doesn't allow differentiating between private aided and unaided institutions. The statistics are computed from different NSS rounds, taking into account the sample survey weights. It highlights the increasing tuition and private coaching share in public institutions. In private institutions, the tuition share increases dramatically while the private coaching share declines.

# 8. TABLE

PANEL A		% of (	Governm	lent		%	of Privat	e Aided	+ Unaio	led
	1986-87	1995-96	2007-08	2014	2017-18	1986-87	1995-96	2007-08	2014	2017-18
Total	72%	62%	67%	59%	59%	28%	38%	33%	41%	41%
Primary	79%	77%	73%	62%	64%	20%	23%	27%	38%	36%
Upper Primary	69%	69%	70%	66%	66%	31%	31%	30%	34%	34%
Secondary	60%	66%	62%	60%	63%	40%	34%	38%	40%	37%
Senior Secondary	50%	59%	54%	47%	52%	50%	41%	46%	53%	48%
Tertiary	53%	63%	47%	42%	47%	47%	37%	53%	58%	53%
PANEL B					Withi	n Private	9			
		%	of Priva	te Aid	led	%	of Priva	te Unaid	led	-
		1995-96	2007-08	2014	2017-18	1995-96	2007-08	2014	2017-18	-
Total		17%	12%	13%	13%	20%	20%	28%	28%	-
Primary		11%	7%	8%	10%	12%	20%	30%	27%	
Upper Primary		22%	12%	11%	10%	9%	19%	23%	23%	
Secondary		28%	19%	16%	15%	7%	19%	23%	22%	
Senior Secondary		32%	25%	23%	19%	8%	21%	30%	29%	
Tertiary		31%	29%	25%	25%	6%	24%	32%	27%	

TABLE 1. Share of Students at Private by Level of Education

Notes: Panel A of the table reports the evolution of the share of students attending government and private institutions at different stages of education from 1986 to 2017. The highest increase in the private share is in the primary stage of education. Panel B reports within private institutions, the increase is driven by the increase in enrollment in the private unaided institutions, whereas the share in the private aided institutions has declined. The statistics are computed from different NSS rounds, taking into account the sample survey weights.

		Primary	Middle	Secondary	Sr Secondary	Graduate
	Government institution is not available	5%	10%	15%	16%	19%
71st Round	Better environment of learning	56%	54%	54%	38%	28%
	English is the medium of instruction	15%	13%	10%	4%	1%
	Quality of education unsatisfactory in govt institutions	21%	19%	17%	15%	9%
	Tried for govt institution but couldn't get	1%	1%	2%	5%	28%
	Located nearby	26%	24%	29%	26%	23%
	Avalibity of specific facilities	13%	11%	11%	12%	8%
	Social reasons	11%	9%	8%	7%	4%
75th Round	Due to availability of private coaching	3%	2%	2%	3%	1%
	Medium of instruction is English	21%	15%	10%	9%	2%
	Quality of education unsatisfactory in govt institutions	42%	35%	29%	24%	10%
	Tried for govet institution but couldn't get	2%	3%	3%	9%	37%

## TABLE 2. Reason for Attending Private School

Notes: The table reports the summary statistics of the reasons provided by the parents of the kids attending private institutions in the last two NSS rounds (i.e., 71st Round: 2014 and 75th Round: 2017-18). The statistics are computed taking into account the sample survey weights. In both rounds, 75% of the parents of kids in primary schools claim the reason to be the better relative quality of private schools over government schools.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
VARIABLES	priv	priv	priv	priv	priv	priv	priv
$\Delta$ in Share of Public Schools b.n. 0-9 age	$-2.696^{***}$ (0.413)	$-0.730^{***}$ (0.216)	$-0.733^{***}$ (0.261)	$-0.632^{**}$ (0.252)	$-0.622^{**}$ (0.251)	$-0.690^{***}$ (0.244)	$-0.752^{***}$ (0.248)
Observations	44,337	44,336	44,336	44,296	44,296	39,014	38,749
R-squared	0.028	0.194	0.199	0.288	0.290	0.291	0.399
MeanDepVar	0.25	0.25	0.25	0.25	0.25	0.25	0.25
District FE	no	yes	yes	yes	yes	yes	no
Fathers' cohort FE	no	no	yes	yes	yes	yes	yes
DistrictXyear FE	no	no	no	no	no	no	yes
HH control	no	no	no	yes	yes	yes	yes
Child control	no	no	no	no	yes	yes	yes
School control	no	no	no	no	no	yes	no
Cluster	$dist_name$	$dist_name$	$dist_name$	$dist_name$	$dist_name$	$dist_name$	$dist_name$
Num_clusters	569	568	568	568	568	563	563

TABLE 3. Impact of change in the exposure to share of public primary schools

Notes: The table reports ordinary least square estimations based on the father-child dataset created from the NSS 71st and 75th round surveys. Robust standard errors in parentheses are clustered at the district level. The dependent variable is a dummy of whether child is going to a private school. The main explanatory variable is the change in share of public schools in the first 9 years of age of father. All estimations include district and father's birth year fixed effects. We also control for the , household current wealth, and dummy for Hindu and Muslim religions. Column (1) has no controls. Column (2) adds district fixed effect. Column (3) further adds father's birth year fixed effect. Column (4) further adds household level controls - number of members in the household, log of monthly consumption, caste, religion, share of public primary schools one year before birth, and father education level. Column (5) further adds child control - gender and birth order. Column (6) adds school-level qualitative controls at the age of entry into the school of the child. Col (7) is by adding district X child's school entry year fixed effect, following Equation 2.

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	$\operatorname{priv}$	$\operatorname{priv}$	$\operatorname{priv}$	$\operatorname{priv}$	priv	priv
$\Delta$ in Share of Public Schools b.n. 0-9 age (2nd quartile)	-0.107***	-0.00987	-0.00656	-0.00302	-0.00357	-0.00499
	(0.0194)	(0.0136)	(0.0140)	(0.0143)	(0.0142)	(0.0147)
$\Delta$ in Share of Public Schools b.n. 0-9 age (3rd quartile)	$-0.196^{***}$	-0.0219	-0.0161	-0.0273	$-0.0281^{*}$	-0.0367**
	(0.0200)	(0.0143)	(0.0165)	(0.0167)	(0.0167)	(0.0174)
$\Delta$ in Share of Public Schools b.n. 0-9 age (4th quartile)	-0.216***	-0.0343**	-0.0351*	-0.0397*	-0.0397*	-0.0467**
	(0.0192)	(0.0151)	(0.0205)	(0.0218)	(0.0217)	(0.0213)
Observations	44,707	44,706	44,706	44,296	44,296	39,014
R-squared	0.037	0.196	0.202	0.288	0.290	0.290
MeanDepVar	0.25	0.25	0.25	0.25	0.25	0.25
District FE	no	yes	yes	yes	yes	yes
Fathers' cohort FE	no	no	yes	yes	yes	yes
HH control	no	no	no	yes	yes	yes
Child control	no	no	no	no	yes	yes
School control	no	no	no	no	no	yes
Cluster	$dist_name$	$dist_name$	$dist_name$	$dist_name$	$dist_name$	$dist_name$
Num_clusters	569	568	568	568	568	563

TABLE 4. Impact of change in the exposure to share of public primary schools: Intensity

Notes: The table reports ordinary least square estimations based on the father-child dataset created from the NSS 71st and 75th round surveys. Robust standard errors in parentheses are clustered at the district level. The dependent variable is a dummy of whether the child is going to a private school. The main explanatory variable is the change in the share of public schools in the father's first 9 years of age. All estimations include district and father's birth year fixed effects. We also control for the household's current wealth and dummy for Hindu and Muslim religions. Column (1) has no controls. Column (2) adds district fixed effect. Column (3) further adds the father's birth year fixed effect. Column (4) further adds household level controls - number of members in the household, log of monthly consumption, caste, religion, share of public primary schools one year before birth, and father education level. Column (5) further adds child control - gender and birth order. Column (6) adds school-level qualitative controls at the age of entry into the school of the child.

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	priv	priv	priv	priv	priv	priv
$\Delta$ in Share of Public Schools b.n. 0-9 age	-0.496	0.0438	-0.288	-0.233	$-1.427^{**}$	0.842
	(0.397)	(0.566)	(0.453)	(0.551)	(0.582)	(0.965)
Observations	8,386	$3,\!687$	6,775	8,550	9,241	2,151
R-squared	0.291	0.533	0.417	0.319	0.365	0.607
MeanDepVar	0.14	0.13	0.16	0.25	0.38	0.59
District FE	yes	yes	yes	yes	yes	yes
Fathers' cohort FE	yes	yes	yes	yes	yes	yes
HH control	yes	yes	yes	yes	yes	yes
Child control	yes	yes	yes	yes	yes	yes
School control	yes	yes	yes	yes	yes	yes
Cluster	dist_name	dist_name	dist_name	dist_name	dist_name	dist_name
Num_clusters	493	432	525	554	550	391
Educ_Categ	Illiterate	Below Primary	Primary	Middle	Secondary	Graduation

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TABLE 5.	Heterogeneity	bv	the comp	leted	levels	OT	tather	s ec	incation
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Notes: The table reports ordinary least square estimations based on the father-child dataset created from the NSS 71st and 75th round surveys. Robust standard errors in parentheses are clustered at the district level. The dependent variable is a dummy of whether the child is going to a private school. The main explanatory variable is the change in the share of public primary schools in the first 9 years of fathers' age. All estimations include district and father's birth year fixed effects. We also control all household levels (household's log of monthly consumption, caste, religion, completed years of father's education) and child-level covariates (gender and birth order). Column (1) is for the sample where the father has no education; Column (2) is for the father's education below the primary level; Column (3) for Primary graduate father; Column (4) for Middle-level graduate father; Column (5) for Secondary/post-secondary graduate; and Column (6) for graduation and above.

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# APPENDIX A. FIGURES



FIGURE A.I. Share of students at different levels of education

Notes: The figure plots the estimates of the share of students enrolled at different levels of education from 1986 to 2017 using NSS surveys. The statistics are computed from different NSS rounds, taking into account the sample survey weights. It highlights the increasing share of students in higher levels of education and a corresponding decline in the primary level.



FIGURE A.II. Share of students by caste groups in public institutions.

Notes: The figure plots the estimates of the share of students by caste groups by education levels in public institutions from 1986 to 2017 using NSS surveys. The data for 1986 and 1995 doesn't allow the creation of OBC and Others categories separately. The statistics are computed from different NSS rounds, taking into account the sample survey weights. It highlights the increasing stratification by caste groups (especially at the primary level), where lower caste groups, such as the share of SC and ST in public institutions, have increased much beyond their population share. For example, in 2017-18, the SC's share at the primary level was 24% (with their population share being 16%), whereas ST's share stands at 14% (5pp more than their population share).



FIGURE A.III. Share of students by caste groups in private institutions.

Notes: The figure plots the estimates of the share of students by caste groups by education levels in private institutions from 1986 to 2017 using NSS surveys. The data for 1986 and 1995 doesn't allow the creation of OBC and Others categories separately. The statistics are computed from different NSS rounds, taking into account the sample survey weights. It highlights the increasing stratification by caste groups (especially at the primary level), where lower caste groups, such as the share of SC and ST in private institutions, are lower than their population share. For example, in 2017-18, the SC's share at the primary level was 14% (2pp less than their population share), whereas ST's share stands at 4% (5pp less than their population share).

### APPENDIX B. TABLE

	1986-87	1995-96	2007-08	2014	2017-18
Total	2.27	3.03	5.78	6.31	5.02
Primary	3.81	5.42	7.09	11.03	11.12
Upper Primary	1.91	2.36	3.50	5.92	7.55
Secondary	1.16	1.55	2.63	3.17	3.88
Senior Secondary	0.98	1.36	2.39	2.48	2.85
Tertiary	0.73	0.83	3.56	2.76	2.26

TABLE B.I. Ratio of Expenditure per Student in Private to Government Schools

Notes: The table reports the evolution of the ratio of expenditure per student (incurred to households) in private to public institutions at different stages of education from 1986 to 2017. The statistics are computed from different NSS rounds, taking into account the sample survey weights. The highest increase in the ratio is at the primary stage of education - from 3.8 in 1986 to 11.1 in 2017.

		Go	overnmei	nt	Private						
	1986-87	1995-96	2007-08	2014	2017-18	1986-87	1995-96	2007-08	2014	2017-18	
Total	2,675	2,655	3,237	4,008	3,740	6,085	8,113	15,359	20,423	20,116	
Primary	$1,\!145$	1,283	1,121	$1,\!327$	1,297	4,361	6,208	9,097	$12,\!367$	14,756	
Upper Primary	2,963	$2,\!993$	2,438	2,231	2,287	5,654	$6,\!997$	10,486	14,442	$16,\!841$	
Secondary	5,528	4,955	4,976	$4,\!447$	4,284	6,429	8,548	13,046	15,749	$17,\!265$	
Senior Secondary	$9,\!691$	8,121	8,644	8,193	7,347	9,494	13,224	$19,\!417$	$21,\!461$	23,328	
Tertiary	17,846	11,545	16,001	14,990	13,070	12,961	14,867	41,143	44,178	33,936	

TABLE B.II. Total Private Real Expenditure Per Student (INR)

Notes: The table reports the evolution of the expenditure per student (incurred to households) in real 2018 INR value in private and public institutions separately at different stages of education from 1986 to 2017. The statistics are computed from different NSS rounds, taking into account the sample survey weights. The cost of education has increased throughout, and more so in private schools and colleges.

	% of Tuition					% of Others(Books, Travel etc.)					% of Private Coaching				
	1986-87	1995-96	2007-08	2014	2017-18	1986-87	1995-96	2007-08	2014	2017-18	1986-87	1995-96	2007-08	2014	2017-18
Total	21%	24%	47%	54%	55%	68%	64%	41%	34%	35%	11%	12%	11%	12%	10%
Primary	23%	28%	42%	49%	55%	67%	63%	50%	40%	38%	9%	9%	9%	10%	7%
Upper Primary	17%	22%	36%	46%	50%	72%	65%	51%	39%	38%	11%	13%	13%	14%	12%
Secondary	17%	20%	35%	41%	45%	65%	61%	46%	38%	37%	18%	19%	19%	21%	18%
Senior Secondary	24%	25%	38%	43%	47%	61%	58%	41%	35%	34%	15%	16%	21%	23%	20%
Graduate	24%	34%	58%	64%	64%	69%	59%	36%	30%	31%	7%	8%	7%	6%	5%
Post Grad	26%	38%	66%	69%	65%	70%	57%	31%	27%	29%	4%	5%	3%	4%	6%

TABLE B.III. Share of Expenditure - Type by level of education

Notes: The table reports the evolution of the share of three expenditure components - tuition, private coaching, and others (books, uniforms, transportation, etc.) by educational levels from 1986 to 2017. The statistics are computed from different NSS rounds, taking into account the sample survey weights. The tuition component has increased at all education levels. For example, at the primary level, the tuition share used to be 21% in 1986, which increased to 55% in 2017.

PANEL A. Tuition		Go	vernmen	t		Private					
	1986-87	1995-96	2007-08	2014	2017-18	1986-87	1995-96	2007-08	2014	2017-18	
Primary	10%	13%	14%	10%	7%	36%	40%	51%	56%	61%	
Upper Primary	13%	12%	14%	11%	8%	22%	33%	47%	57%	60%	
Secondary	14%	14%	18%	15%	13%	21%	28%	46%	52%	58%	
Senior Secondary	20%	21%	23%	21%	21%	28%	32%	46%	51%	56%	
Graduate	19%	31%	47%	43%	43%	31%	43%	62%	69%	71%	
Post Grad	23%	39%	57%	53%	53%	30%	49%	68%	75%	72%	
DANEL D. Drivete Coashing		Go	vernmen	t			I	Private			
PANEL D: Private Coaching	1986-87	1995-96	2007-08	2014	2017-18	1986-87	1995-96	2007-08	2014	2017-18	
Primary	9%	11%	16%	28%	27%	10%	9%	6%	7%	5%	
Upper Primary	11%	13%	19%	32%	32%	11%	14%	10%	9%	7%	
Secondary	17%	20%	26%	36%	34%	20%	22%	15%	15%	12%	
Senior Secondary	13%	20%	26%	34%	30%	16%	21%	19%	18%	16%	
Graduate	5%	12%	12%	15%	13%	10%	8%	5%	3%	3%	
Post Grad	4%	5%	6%	8%	9%	5%	10%	2%	3%	3%	
DANEL C. OIL		Go	vernmen	t		Private					
(books, uniform, transport etc.)	1986-87	1995-96	2007-08	2014	2017-18	1986-87	1995-96	2007-08	2014	2017-18	
Primary	81%	76%	70%	62%	66%	54%	51%	43%	37%	34%	
Upper Primary	76%	75%	66%	57%	60%	67%	53%	43%	34%	32%	
Secondary	70%	66%	56%	50%	53%	59%	50%	39%	32%	30%	
Senior Secondary	67%	59%	51%	46%	49%	56%	47%	36%	31%	28%	
Graduate	76%	57%	41%	42%	44%	59%	48%	34%	27%	27%	
Post Grad	74%	55%	37%	38%	37%	65%	41%	30%	23%	25%	

TABLE B.IV. Distribution of Education Expenditure Categories in Government and Private Schools

Notes: The table reports the evolution of the share of three expenditure components - tuition (Panel A), private coaching (Panel B), and others (comprising the cost incurred on books, uniforms, transportation, etc. in Panel C) in public and private institutions by educational levels from 1986 to 2017. The statistics are computed from different NSS rounds, taking into account the sample survey weights. The increase in the tuition share at the primary level, as noticed in Appendix Table B.III is entirely driven by private schools. Parents who send their kids to public schools at the primary level have started spending a high share on private coaching (in 2017, the share is 27% compared to 9% in 1986).

	(1)	(2)
VARIABLES	priv	priv
$\Delta$ in Share of Public Schools b.n. 0-9 age	-0.613***	-0.781***
	(0.229)	(0.252)
Observations	26,780	$26,\!396$
R-squared	0.291	0.441
MeanDepVar	0.25	0.25
District FE	yes	no
DistrictXyear FE	no	yes
Fathers' cohort FE	yes	yes
HH control	yes	yes
Child control	no	yes
School control	yes	yes
Cluster	$dist_name$	dist_name
Num_clusters	563	563
Criteria	One Child	per Father

TABLE B.V. Robustness: Keeping one child per father

Notes: The table reports ordinary least square estimations based on the father-child dataset created from the NSS 71st and 75th round surveys. Robust standard errors in parentheses are clustered at the district level. The dependent variable is a dummy of whether the child is going to a private school. The main explanatory variable is the change in the share of public primary schools in the first 9 years of fathers' age. All estimations include the father's birth year fixed effects. Column (1) is with district fixed effects following Equation 1, and Column (2) is with district X year fixed effects following Equation 2. We also control all household levels (household's log of monthly consumption, caste, religion, completed years of father's education, and distance from the nearest primary schools) and child-level covariates (gender and birth order).