

**Child Work and Schooling in rural north India : What do time use data say about tradeoffs and drivers of human capital investment?**

**Sudha Narayanan and Sowmya Dhanraj**



**Indira Gandhi Institute of Development Research, Mumbai  
November 2013**

<http://www.igidr.ac.in/pdf/publication/WP-2013-023.pdf>

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## **Abstract**

*This study examines time use data for 1244 children in the age-group 6-12 years in 274 villages in eight states in rural north India to understand the tradeoffs between time spent in school, time spent at work, time spent on home study and leisure. Using a Seemingly Unrelated Regression (SURE) Model, we find that only a few variables influence allocation of time to different activities across the board. Overall, there seems to be no tradeoff between time spent at school and at work, whereas leisure time and home study appear to be compromised for the sake of work.*

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**JEL Code:** I20, D19

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### **1. Introduction**

In many developing country contexts, human capital investment in children in the form of formal schooling is often thwarted by a wide range of constraints; these could represent supply side constraints pertaining to availability and accessibility of schooling facilities, for example, or demand side constraints relating to affordability and to the particular circumstance of the household that might prevent child enrollment and regular attendance.

Much research has focused on the tradeoffs between child work and schooling, where parents take decisions on whether to put a child through school or to keep the child home or send him or her to work elsewhere for a wage. This has received attention not only in the context of schooling or human capital investment but also to address the problem of child labour and its consequences (Rogers and Standing, 1981; Grootaert and Kanbur, 2002 and Basu 1999, for example). Theoretical explanations for these tradeoffs suggest that poor, credit-constrained households are more likely to allocate children's time to labour outside or within the household, often at the expense of schooling. Child leisure time, in these instances, is a luxury (Basu and Tzannatos, 2003; Basu and Van, 1998).

Existing evidence on the relationship between schooling status and child labour have however produced equivocal results (Dar, et.al, 2002; Bhalotra and Tzannatos, 2003). While several studies validate the link between poverty and child labour, empirical evidence also suggests, somewhat differently, that where labour market opportunities abound for adults and child market wage is high, where households have access to productive assets, land and livestock or own a family enterprise, the likelihood of child work participation also increases. Other socio-economic factors have also been shown to be

important components or determinants of child work and schooling.<sup>3</sup> Importantly, it is not always the case that child labour displaces schooling. Households often protect schooling of children by reallocating time to domestic work rather than paid work outside. In this spirit, one view is that making schooling more attractive (Grootaert and Kanbur, 2002) could remove children from the situations of paid labour. Further, some forms of work are not necessarily detrimental to investments in human capital of the child and can be regarded as a component of education when it does not displace formal schooling (Rogers and Standing, 1981; Grootaert and Kanbur, 2002).

The typical empirical approach to mapping the child work-schooling decisions presumes a dichotomous relationship based on whether or not a child is in school and whether or not a child works. This approach implicitly imposes a very specific kind of tradeoff between attending school and working (Akabayashi and Psacharopoulos, 1999; Burke and Beegle, 2004; Cockburn and Dostie, 2007). In reality, the tradeoffs between work and study could instead be in terms of time allocation between different activities (de Graaf 2003, Levison, Akabayashi and Psacharopoulos, 1999, Levison and Moe, 1998, Assad et al, 2010; Amin and Chandrashekar, 2011, Larson and Verma, 1999). In this case, tradeoffs can be said to operate on the intensive margin rather than the extensive margin. In this context, analysis of time use data can be a remunerative approach to analyze the interrelationship between human capital investment and child labour.

The usefulness of time use analysis is recognized widely enough, but empirical researchers invariably use categorical variables, likely owing to constraints imposed by data availability. Generating reliable time use data from primary surveys is complicated and the data collected could potentially vary substantially depending on the method used (Harding, 1997). These caveats notwithstanding, time use data offer useful insights into the relationship between child work and schooling or study and its drivers.

While there is a growing literature on this subject, there is still not much quantitative empirical work in the context of India, where the goal of universal primary education continues to be a huge challenge. In India, primary education has been an arena of public action in recent years and a number of specific initiatives aimed at addressing the challenges of schooling unenrolled children have contributed to increased enrollment.<sup>4</sup>

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<sup>3</sup> These issues are covered in Parikh and Sadoulet (2005), Ray (2000), Cockburn and Dostie (2007), Bhalotra and Heady (2001), Canagarajah and Coulombe (1997), De Tray (1983), Levison and Moe (1998), Mergos (1992), Mueller (1984) and Rosenzweig and Evenson (1977), Skoufias (1994) and Emerson and Souza (2007).

<sup>4</sup> The District Primary Education Programme (DPEP) was initiated in 1994 with the objective of providing universal access to school, reducing dropout rates and gaps in enrollment and improve learning achievement. The Sarva Shiksha Abhiyan (SSA) was introduced in 2001 to achieve universal primary enrolment by 2003. More recently, the Indian Parliament passed the Right of Children to Free and Compulsory Education Act on 4 August 2009 and it came into force on 1 April 2010. India is also signatory to the Millennium Declaration, 2000, which has the universalization of primary schooling by 2015 as one of eight Millennium Development Goals (MDG).

Despite these steps, India continues to face the dual challenge of universal primary education as well as tackling the persistence of child labour. Although primary school enrollment as reflected in the Net Enrollment Ratio (NER) stood 97% and 94% for males and females in 2007-10, net attendance ratio was 85% and 81% respectively and the proportion of children in the labour force is 12% (2005-10).<sup>5</sup> Mean schooling years was just 4.4 years in 2011, and expectancy of 10.3 years (Government of India, 2012) so that dropout is still a big problem.

In the context of India, there has been some work on the child schooling-work tradeoff (Ray, 2000, Rosenzweig and Evenson, 1977, Skoufias 1994, Cigno and Rossatti, 2002). However, there are few systematic inquiries into how children spend their time. (Motiram and Osberg, 2011). This study seeks to fill this gap using primary survey data from six states in rural North India to map these relationships. The analysis of children's time use is particularly pertinent in India because though school enrollment rates have increased rapidly in the past two decades (Sankar 2009), many are nominally enrolled and attendance tends to be highly variable. Since school attendance is more important for learning outcomes and human capital formation, capturing time spent at school is therefore important. Further, the growing literature on this subject suggests that child work and schooling coexist.

The primary goal of this work is to examine the tradeoffs between time spent at school and learning activities on the one hand and domestic and paid work on the other in order to contribute to ongoing debates on the relationship between child work and schooling. Specifically, this paper asks if a variable that has a positive influence on school time necessarily has a negative relationship with work time. How do individual, household village and school characteristics define the time spent in school, at work, home based learning activities and leisure? Across these questions, we also explore any systematic differences across gender. We are able to do this using unique data from the PROBE Revisited Survey of households in rural North India conducted in 2006 as part of an effort to understand the ecology of primary schooling in India ten years following a similar PROBE Survey (PROBE 1996).

The section following this introduction provides details of the survey data that forms the basis of this article. Section 4 offers an overview of time use patterns of sample children. Section 5 describes the model to be estimated and the variables used. Section 6 discusses the results and Section 7 concludes the paper.

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<sup>5</sup> [http://www.unicef.org/infobycountry/india\\_statistics.html#86](http://www.unicef.org/infobycountry/india_statistics.html#86). Accessed on 28 September, 2012

## **2. The PROBE Revisited survey**

The PROBE Revisited Survey in eight states in India offers a rich data set covering 1586 children in 274 randomly selected villages in Bihar, Madhya Pradesh, Rajasthan, Uttar Pradesh and Himachal Pradesh, Uttaranchal, Jharkhand and Chattisgarh. The five states originally covered under the PROBE survey, known as the PROBE states, include Bihar, Madhya Pradesh, Rajasthan and Uttar Pradesh, all of which traditionally fared poorly on social indicators. Himachal Pradesh, a state with an impressive record of primary schooling, was included to provide comparative perspective. Although PROBE Revisited was conducted in the same villages, the households sampled were different (De, et.al, 2011). In these randomly sampled villages all educational facilities for primary education were surveyed. In each sample village, twelve households were randomly selected, among those that had at least one child in the age group of six to twelve years. The survey constituted structured interviews with households and heads of educational facilities and collected unique data on the time use of sample children. These included time spent on schooling, care giving, domestic chores, agricultural work, grazing animals, home-based learning activities and tuitions, paid work outside and leisure on the most recent working day. A village questionnaire captured the demographic and socio-economic profile of sample villages. This dataset allows us to combine the characteristics of the individual child, relevant household characteristics, those of the school attended and school choices available as well as village level characteristics to map time allocation decisions.

For the analysis, we restrict our sample to 1244 children in the age-group 6-12 years in these 274 villages including children who were enrolled in primary school at the time of the survey, dropouts as well as those who had never enrolled. Children for whom time use data was incomplete are not included in the analysis. Since typically only one child was interviewed in each sample household, data for time use of siblings do not exist, that would have offered greater scope for understanding tradeoffs in time allocation.

## **3. How children spend their time**

In this study, we derive four categories of activities from the survey data - time spent at school, time spent at home on studies, domestic or paid work and other time including leisure. The time spent at school includes time in attendance as well as the time invested in traveling to school. Time spent on studies at home includes time spent attending private tuitions, non-formal education as well as other home based learning activities. Domestic work includes care giving to the young and old, grazing animals, agricultural work, and domestic chores as well as paid work outside. It is customary to treat paid work as distinct from domestic work. In the context of the survey, only a few

children were reported to engage in wage earning activities outside the house.<sup>6</sup> Leisure time includes waking hours spent on play, social visits and time spent at home that did not involve work or study. A residual category of hours spent on normal activities such as eating, sleeping, etc. are not recorded or modeled here. All of these variables were measured for the last day on which the school was open and the child attended. To the extent that this is only for one day, the implicit assumption is that it is a typical day for the child. The variable denoting time spent in school is computed as the average number of hours spent at school the previous week, adjusted for the number of days the school was supposed to have been open, in this case six.<sup>7</sup> In order to account for idiosyncratic absence of the child from school on the days it was open, the model factors in the reason for a child's absence on the last day before the survey when the child missed school.

The Survey indicates that a very small proportion of students of the age 6-12 years remained unenrolled (Table 1). Enrollment was high among the sample children, though it was higher among the boys relative to the girls. Only 3 per cent of the sample children had never enrolled with about 5 per cent having dropped out of primary school, the rates being higher for the girls.

There was very little reporting of wage labour; only five children in the age group 6-12 years were engaged in wage labour outside the house and they were dropouts. In other cases, children's work consisted mainly of unpaid work with family members (on the fields and looking after animals), and in household chores (looking after younger children, cooking, cleaning, bringing water, collecting fuel). Comparing hours spent by children in the 6-12 age group who are out of school with those enrolled reveals sharp differences (Figure 1). The average time spent in work activities for all out of school children was 5.5 hours/day compared to 1.2 hours/day for the enrolled. This association could mean either those children were pulled out of school to be able to work or it could be that these children dropped out of school for other reasons and therefore ended up working longer hours.

**Table 1: Schooling and Work Status of Sample Children**

| <b>Schooling Status</b> | <b>Female</b>      | <b>Male</b>        | <b>All</b>           |
|-------------------------|--------------------|--------------------|----------------------|
| Enrolled                | 502 (40.35)        | 678 (54.50)        | <b>1180 (94.86)</b>  |
| Dropout                 | 23 (1.85)          | 16 (1.29)          | <b>39 (3.14)</b>     |
| Never Enrolled          | 20 (1.61)          | 5 (0.40)           | <b>25 (2.01)</b>     |
| <b>Total</b>            | <b>545 (43.81)</b> | <b>699 (56.19)</b> | <b>1244 (100.00)</b> |

Source: Computed based on PROBE Revisited Survey data.

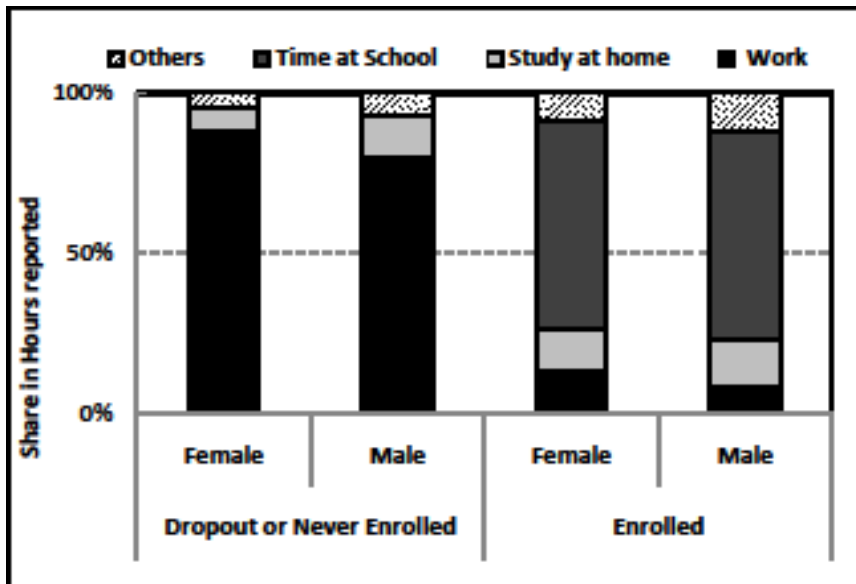
<sup>6</sup> There are several reasons for this. Work outside the house tends to be less common in the age group 6-12 years. Even when kids work for a wage it could be home-based.

<sup>7</sup>The average number of hours at school includes time to go to school and is computed as the number of hours per day multiplied by the proportion of days in the week that the child attended the school. This deals with the problem of non-attendance on account of the school being closed.



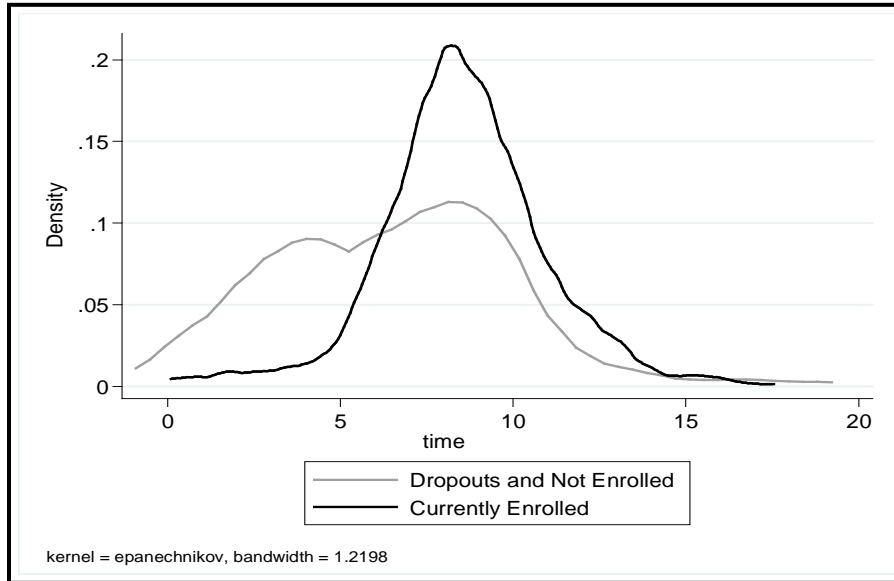
Among enrolled children, while the time at school is comparable for both boys and girls (5.5 hours/day), girls tend to work more on average (1.17 hours per day as against 0.73 hours for boys). Boys tend to have marginally higher hours for home based learning activities and more leisure time (1.02 hour per day versus 0.77 for girls). The pattern across activities and gender is similar for children who are either not enrolled and drop outs, other than the fact that their school time is channeled virtually entirely into work (Figure 1). De, et. al. (2010) observe that the evidence from the PROBE Revisited suggests that despite parental aspirations for their children to be educated, child work is a particular problem for older children and that there are significant differences across gender with girls being more likely to be engaged in domestic work. For about 55 per cent of the children in the sample, both schooling and domestic work were accommodated within the day. This is partly because of the rather short school days for children in the 6-12 years age group. This underscores the relevance of tradeoffs in the intensive margin in terms of time allocated rather than the notion that these tradeoffs manifest in work and schooling status. The total time accounted for in the survey varied quite starkly between those currently enrolled and those who are either never enrolled or dropouts (Figure 2). It suggests that children in the latter category perhaps have time, not falling into any of the categories in this study, that get reallocated to work, leisure or home based learning activities, as required.

**Figure 1: How children spend their time**



Source: Based on PROBE Revisited Survey (2006)

**Figure 2: Time accounted for by sample households**



Source: Based on PROBE Revisited Survey (2006)

#### 4. Model and variables

The empirical model for this paper is based on the household time allocation decision model proposed by Becker (1965) and applied by Rosenzweig and Evenson (1977) and thereafter by others such as Patrinos and Psacharopoulos (1995), Skoufias (1994) and Akabayashi and Psacharopoulos (1999), to name a few. Households are assumed to decide on allocations of children's time across different activities and children do not have agency. Given the interrelationship between the time allocations to various activities, we estimate a SURE (Seemingly Unrelated Regression Equation) system that models the time allocated to different activities as a function of individual, household, school and village characteristics to identify drivers and systematic patterns that might reflect tradeoffs (Appendix Table 1 and 2).

The individual position or profile of a child matters a great deal. Birth order and gender are especially important, as is age. It is well documented that older children are more likely to be assigned household work and the burden likely increases with age (De, et. al., 2010). While in the 6-12 years age category we do not capture this entire phenomenon, there are significant differences in what parents might expect a six year old to do vis-à-vis a twelve year old. These represent observable characteristics of the child. It is entirely possible that the ability of the individual child is systematically related to the nature of time allocation. Children who have high ability for academic achievement might spend less time on home study or it could be the case that parents allow them more time for home study, reinforcing investments in human capital. We are unable to account for this due to paucity

of data from the survey.<sup>8</sup> We however include parental aspiration for the sample child. This is captured by a question on the maximum grade they would want their child to study.

Key household level variables in this context are the level of parents' education, their occupation and the number of children, economic status, social and religious group. Due to the paucity of reliable and credible data on wealth and income status, occupational categories are used as proxies. Land ownership, the most important correlate of wealth in rural India is also included to control for economic status. The number of livestock, cows and bulls, are also included. While these represent the economic status of households in northern India, they also represent a burden on family time.

Village characteristics also matter. The age of the oldest school in the village is included to capture the social history of the village – those who have had a long history of primary education might value education more. A variable for infrastructure is included in this case whether the village has electricity or not. The proportion of population who are Scheduled Caste or Scheduled Tribe is included to capture the demographic pattern of the village.

School characteristics are matched with the student implying that where there are multiple schools we include the characteristics of the school that the sample child attends. While it could be the case that choice of school is driven by preferences of parents on time allocation, it is far more likely to impinge on enrollment decisions rather than time spent at school, which is the variable of interest in this work, especially when school timings are fairly similar across choices. Further, since the survey includes enrolled children who attend school within the village, there is not much variation across schools in terms of time spent on travel; the problem of endogeneity is therefore not a serious concern.

School functionality is more difficult to capture. An obvious aspect is the regularity of functioning, represented by the number of days that the school was open during the week of the survey, which was a typical week. Other variables include the proportion of teachers present at the time of the survey, proportion of enrolled students attending at the time of the survey. The proportion of enrolled students attending is a catch all measure of functionality. While this is a noisy measure since it reflects a single day's attendance, the assumption is that the survey happened on a typical day. Multigrade teaching is also included to capture school functionality.<sup>9</sup> We also include a binary variable for school management type (private or government). It is generally known that parents who enroll children in private schools spend more money on school fees and extra tuitions and children on average travel a longer distance than their cohort that attend government schools, implying that the time allocation could vary by school type. Further, for all the

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<sup>8</sup> Tests were administered to measure literary and numeracy achievements to a subsample of children. In this paper, which uses the full sample, we are unable to use these as metrics of ability.

<sup>9</sup> A number of other variables representing school quality were included and dropped because they did not have explanatory power, These include levels of infrastructure, parent teachers' associations and so on.

models, dummy variables are included to capture those observations for which critical variables are missing.

As described in the previous section, there are four dependent variables – average time spent in school, at work, on home based learning activities and leisure. In order to control for idiosyncrasies associated with the measure of time spent at school we use dummy variables for reasons for absence as controls. These account for a child missing school in the preceding week of survey due to various reasons, including ill-health hostile environment or lack of interest in what is taught at school, lack of parental pressure to attend school and pressure of domestic work.

## 5. Results

The SURE model was estimated with errors clustered at the village for 128 clusters (Appendix Table 3) and the F statistic indicates that the model is significant. A Breusch-Pagan test for cross equation correlation of errors is unable to reject the null of independent errors, so that the SURE model is appropriate and generates efficient estimates of parameters of the model. The R-squared figures indicated that the model explains most of the variation in time at school, but less so for the other categories of activities.

The estimated model was robust to several alternate specifications.<sup>10</sup> The number of children in the family can be regarded to be endogenous in the sense that fertility decisions might be linked to the need for family labour (Grootaert and Kanbur, 2002). Dropping children did not matter to the results. Interaction terms of birth order and sex of the child as well as of sex and age did not turn out to be significant. This is not unexpected since these might only matter for older children.

Three findings stand out. First, the drivers affecting each time use component tend to be different, reflecting no obvious set of statistically significant correlates that affect time allocation across the board. Only a few explanatory variables emerge statistically significant for multiple categories of activities. Second, the estimated model suggests that there might not be a direct correspondence between time allocated to school and time allocated to work in the sense that an explanatory variable that is associated positively with one is not necessarily associated negatively with the other. In other words, there might not be a tradeoff on the intensive margin between child work and school time (other than for enrolled children and dropouts). Third, it appears that leisure time and the residual time that is not modeled here, and to a lesser extent home study time are the reservoirs of time that are reallocated in response to specific drivers, so that any tradeoffs are likely across these variables.

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<sup>10</sup> These are not presented here but can be obtained from the authors.

Older children are more likely to work and study at home, thus having less time for leisure or residual activities. Whenever the birth order is larger than three (denoting that a child is a fourth born or higher and hence representing the younger children in larger families), these children spend more time in school and less time at work relative to children who are the older kids of their parents. Boys tend to work less than girls while having more leisure, controlling for age and birth order. Caste also matters in expected ways with children belonging to the Scheduled Tribes spending more time at work and less time at school, relative to those belonging to general social groups. Children belonging to families who are Muslim spend less time at school and study.

As discussed earlier, dropouts and never enrolled children (those who by definition spend no time at school) also spend longer hours at work and less time on home based learning activities. Dropouts also have fewer hours of leisure. While the direction of causation cannot be inferred from the above, evidence from the survey suggests that it is not unusual for a child to stop going to school in order to help the family with work, for example, grazing animals, etc. (De, et. al. 2011).

The mother' education level is associated with more time spent in school as well as on home based learning activities but only when the mother has studied at least past primary school and not past secondary school. Whenever the father has studied beyond secondary school, the hours at work are lower and home based learning activities is higher. This association points to possible intergenerational persistence of educational attainments, but it is informative that these impacts are not uniform across all levels of education. Parents' aspirations for their child, in terms of the highest grade they would like the sample child to complete, have clear and strong implications for time allocation of children. Parents who aspire for their children to complete higher grades allocate less work time to children, and more time to home based learning activities as well as leisure. It is not surprising that it is not associated with increase in school time since these are likely fixed. Ownership of livestock matters, a larger number of livestock increases the time spent at work. This is not surprising since in many of these settings, children are removed from school to undertake grazing activities. While there is no indication of school time or home study time being compromised, it does increase work hours of the child. Land owned by the household denoting household economic status has no impact on child work but is positively associated with time spent at school. It could imply that they can afford to send children to better schools or that fact that they are able to attend school regularly owing to the absence of competing demands on children's time. Relative to households whose main household occupation is regular salaried work; all other households have lower home study. In addition, households where the main occupation is self-employment children enjoy more leisure relative to those involved in casual labour and where the main income is from salaries. These are consistent with the demands that farming makes on family labour.

Interestingly, the regularity of functioning has a significant positive association with time spent at school. None of the other variables proxying school quality seems to be

significant. Multigrade teaching is associated with higher allocations of time at school. This is likely because students are retained for longer by a single teacher who takes turns to teach the different classes – this should not however be construed as a positive aspect. Lack of parental preferences in regular attendance decreases the time spent by the child at school. Similar is the case with hostile environment at school. Illness and work pressure also reduces the time spent at school significantly.

The state level fixed effects are revealing. Relative to Himachal Pradesh, a state with an exemplary record in the field of primary education (De et al, 2011), all other PROBE states are associated with children spending less time at school. This is partly because in Himachal Pradesh, primary education is a norm, but also reflects school functioning and quality. It is interesting however that in most of the PROBE states, including the newly formed Uttaranchal, another state known for advances in primary education, home study time is relatively higher indicating that perhaps parents are making compensatory investments that substitute for lower school time through home based learning activities. At the same time, Rajasthan, Madhya Pradesh and Uttar Pradesh, are associated with children spending less time at work perhaps reflecting the particular demands made by daily living in the mountainous state of Himachal Pradesh.

## **6. Concluding Remarks**

This paper sought to examine the tradeoffs and drivers of time allocation across multiple activities of children. The salient finding of the paper is the absence of evidence for tradeoffs between school time and work. Other activities such as leisure, home based learning activities and time unaccounted for appear to be the arena for action, acting as reservoirs from which time is reallocated to work. Parents appear to make complementary and sometimes compensatory investments at home by allocating time for home based learning activities to deepen human capital investment although we do not find parental occupational status or household economic status to be significant correlates to time allocated to work. Parental aspirations matter greatly for time at school. Where schooling is a norm and supply of schooling facilities is good, as in Himachal Pradesh, the time spent at school has a significant positive association, underlining the supply side constraints continue to be of relevance. There is perhaps a case to be made for improving the functioning of schools. The findings also suggest the persistence of gender based differences in these states. That these differences are apparent even at so young an age is instructive and disturbing. The finding also underscores well recognized concerns of the unintended consequences of development programmes for human capital investment – for example livestock development, that would displace home based learning activities with work.

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## APPENDIX

**Table 1: Description of Variables**

| Variables                         | Explanation   |
|-----------------------------------|---|
| <b>Time-use</b>                   |   |
| Time at school                    | (Average school time * number of days attended school in last week /6) + time taken to go to school |
| Study at home                     | Time spent in studies at home, attending private tuitions and non-formal education                  |
| Domestic work                     | Time spent in care-giving, grazing animals, domestic chores, agricultural and paid work             |
| Leisure + Others                  | Time spent in leisure and other activities  |
| <b>Individual characteristics</b> |   |
| Age (years)                       | Age of the child in years   |
| Male                              | Dummy for male child  |
| Birth order>3                     | Dummy for birth order of the child > 3  |
| Dropout                           | Dummy for dropout children  |
| Never enrolled                    | Dummy for never enrolled children   |
| <b>Household characteristics</b>  |   |
| Children                          | Number of children in the house   |
| SC                                | Dummy for SC  |
| ST                                | Dummy for ST  |
| Muslims                           | Dummy for Muslims   |
| Sikhs/others                      | Dummy for Sikhs/Budhists/other religion   |
| Mother edu -Primary               | Dummy for mother's education - primary or below   |
| Mother edu -Secondary             | Dummy for mother's education - above primary but secondary or below                                 |
| Mother edu- Above Sec             | Dummy for mother's education - above secondary  |
| Father edu-Primary                | Dummy for father's education - primary or below   |
| Father edu-Secondary              | Dummy for father's education - above primary but secondary or below                                 |
| Father edu - Above sec            | Dummy for father's education - above secondary  |
| Livestock                         | Number of cows+bullocks   |
| Land (Acres)                      | Land in acres   |
| Parental aspiration               | Upto what level the parents aspire to educate the children  |
| Casual labour                     | Dummy for main source of income for household - casual labour                                       |
| Self- employment                  | Dummy for main source of income for household - self-employment/ farming                            |
| Other occupation                  | Dummy for main source of income for household – other occupation                                    |
| <b>School characteristics</b>     |   |
| Multi-grade teaching              | Dummy for school having multi-grade teaching  |
| Proportion of teachers present    | Proportion of teachers present in the school at the time of survey                                  |
| Proportion of students attended   | Proportion of students present in the school at the time of survey                                  |
| Private school                    | Dummy for school management – private   |
| Mid-day meal                      | Dummy for school serving mid-day meal everyday  |
| <b>Village characteristics</b>    |   |
| Electricity                       | Dummy for village has electricity   |
| Primary schools                   | Number of primary schools in the village  |
| Proportion of SC                  | Proportion of SC population in the village  |
| Proportion of ST                  | Proportion of ST population in the village  |
| Age of oldest school              | Age of the oldest school in the village   |
| School open (days)                | Number of days school was open in the last week   |

| <b>Reasons for child's attendance in the week preceding survey</b> |  |
|--|--|
| School environment   | Dummy for child did not attend school due to hostile environment at school/ lack of interest in what is taught |
| Parental preference  | Dummy for child did not attend school due to absence of parental pressure/ visiting relatives                  |
| Illness  | Dummy for child did not attend school due to ill-health  |
| Work pressure  | Dummy for child did not attend school due to domestic work   |
| <b>State dummies</b>   |  |
| Bihar  | Dummy for state= Bihar   |
| Jharkhand  | Dummy for state= Jharkhand   |
| Madhya Pradesh   | Dummy for state= Madhya Pradesh  |
| Rajasthan  | Dummy for state= Rajasthan   |
| Uttarakhand  | Dummy for state= Uttarakhand   |
| Uttar Pradesh  | Dummy for state= Uttar Pradesh   |
| Land missing   | Dummy for missing values of land   |
| Aspiration missing   | Dummy for missing values of parental aspiration  |

**Table 2 - Summary Statistics**

| <b>Variables</b>                | <b>Mean</b> | <b>Standard deviation</b> | <b>Minimum</b> | <b>Maximum</b> |
|---------------------------------|-------------|---------------------------|----------------|----------------|
| Time at school                  | 4.695       | 1.849                     | 0              | 9.167          |
| Study at home                   | 1.153       | 1.075                     | 0              | 8              |
| Domestic work                   | 1.134       | 1.801                     | 0              | 18             |
| Leisure + Others                | 0.893       | 1.441                     | 0              | 9              |
| Age (years)                     | 8.375       | 1.818                     | 6              | 12             |
| Male                            | 0.562       | 0.496                     | 0              | 1              |
| Birth order>3                   | 0.150       | 0.357                     | 0              | 1              |
| Dropout                         | 0.031       | 0.174                     | 0              | 1              |
| Never enrolled                  | 0.020       | 0.140                     | 0              | 1              |
| Children                        | 3.554       | 1.522                     | 1              | 13             |
| SC                              | 0.241       | 0.428                     | 0              | 1              |
| ST                              | 0.077       | 0.267                     | 0              | 1              |
| Muslims                         | 0.096       | 0.295                     | 0              | 1              |
| Sikhs/others                    | 0.012       | 0.109                     | 0              | 1              |
| Mother edu -Primary             | 0.133       | 0.340                     | 0              | 1              |
| Mother edu -Secondary           | 0.166       | 0.373                     | 0              | 1              |
| Mother edu- Above Sec           | 0.027       | 0.161                     | 0              | 1              |
| Father -Primary                 | 0.121       | 0.327                     | 0              | 1              |
| Father -Secondary               | 0.370       | 0.483                     | 0              | 1              |
| Father - Above sec              | 0.090       | 0.286                     | 0              | 1              |
| Livestock                       | 1.983       | 2.315                     | 0              | 30             |
| Land (Acres)                    | 2.749       | 8.714                     | 0              | 250            |
| Parental aspiration             | 6.567       | 2.245                     | 0              | 9              |
| Casual labour                   | 0.271       | 0.445                     | 0              | 1              |
| Self- employment                | 0.499       | 0.500                     | 0              | 1              |
| Other occupation                | 0.116       | 0.320                     | 0              | 1              |
| Multi-grade teaching            | 0.494       | 0.500                     | 0              | 1              |
| Proportion of teachers present  | 63.501      | 37.056                    | 0              | 100            |
| Proportion of students attended | 54.519      | 34.300                    | 0              | 100            |
| Private school                  | 0.137       | 0.344                     | 0              | 1              |
| Mid-day meal                    | 0.680       | 0.467                     | 0              | 1              |
| Electricity                     | 0.812       | 0.391                     | 0              | 1              |

| Variables            | Mean   | Standard deviation | Minimum | Maximum |
|----------------------|--------|--------------------|---------|---------|
| Primary schools      | 1.809  | 1.321              | 1       | 7       |
| Proportion of SC     | 21.949 | 17.143             | 0       | 81.25   |
| Proportion of ST     | 6.217  | 16.736             | 0       | 100     |
| Age of oldest school | 46.318 | 25.620             | 0       | 161     |
| School open (days)   | 5.370  | 1.232              | 0       | 6       |
| School environment   | 0.012  | 0.116              | 0       | 2       |
| Parental preference  | 0.025  | 0.156              | 0       | 1       |
| Illness              | 0.041  | 0.198              | 0       | 1       |
| Work pressure        | 0.039  | 0.224              | 0       | 3       |
| Bihar                | 0.166  | 0.372              | 0       | 1       |
| Jharkhand            | 0.080  | 0.271              | 0       | 1       |
| Madhya Pradesh       | 0.186  | 0.389              | 0       | 1       |
| Rajasthan            | 0.198  | 0.398              | 0       | 1       |
| Uttarakhand          | 0.044  | 0.206              | 0       | 1       |
| Uttar Pradesh        | 0.228  | 0.420              | 0       | 1       |
| Land missing         | 0.165  | 0.371              | 0       | 1       |
| Aspiration missing   | 0.010  | 0.098              | 0       | 1       |

Source: Computed from the PROBE Revisited Survey.

Notes: The total number of observations is 1244.

**Table 3: Seemingly Unrelated Regressions for Child Time-use**

| Explanatory variables | Time at school | t-stat  | Study at home | t-stat | Domestic work | t-stat | Leisure + Others | t-stat |
|-----------------------|----------------|---------|---------------|--------|---------------|--------|------------------|--------|
| Age (years)           | -0.002         | -0.161  | 0.064***      | 4.087  | 0.171***      | 7.541  | -0.070***        | -3.289 |
| Male                  | 0.028          | 0.530   | 0.088         | 1.505  | -0.295***     | -3.480 | 0.149*           | 1.876  |
| Birth order>3         | 0.122          | 1.537   | 0.035         | 0.395  | -0.326**      | -2.540 | 0.050            | 0.418  |
| Dropout               | -5.481***      | -31.393 | -0.804***     | -4.436 | 3.036***      | 11.572 | 0.129            | 0.522  |
| Never enrolled        | -5.469***      | -26.930 | -0.909***     | -4.228 | 3.510***      | 11.279 | -0.532*          | -1.817 |
| Children              | 0.010          | 0.522   | -0.022        | -0.999 | 0.049         | 1.572  | -0.034           | -1.169 |
| SC                    | -0.002         | -0.038  | -0.104        | -1.429 | 0.104         | 0.988  | 0.113            | 1.148  |
| ST                    | -0.161         | -1.363  | -0.204        | -1.550 | 0.348*        | 1.823  | -0.583***        | -3.255 |
| Muslims               | -0.187**       | -2.142  | -0.149        | -1.520 | 0.084         | 0.594  | 0.440***         | 3.296  |
| Sikhs/others          | -0.083         | -0.346  | -0.219        | -0.819 | 0.063         | 0.163  | 0.269            | 0.739  |
| Mother -Primary       | 0.083          | 1.084   | 0.125         | 1.460  | -0.115        | -0.931 | 0.170            | 1.460  |
| Mother - Secondary    | 0.116          | 1.489   | 0.239***      | 2.761  | -0.088        | -0.699 | 0.051            | 0.429  |
| Mother -Above Sec     | 0.019          | 0.118   | 0.156         | 0.851  | 0.005         | 0.021  | -0.182           | -0.729 |
| Father -Primary       | -0.017         | -0.216  | -0.065        | -0.722 | -0.091        | -0.698 | 0.035            | 0.284  |
| Father -Secondary     | -0.045         | -0.744  | 0.104         | 1.538  | -0.047        | -0.476 | 0.008            | 0.087  |
| Father -Above sec     | 0.042          | 0.434   | 0.265**       | 2.424  | -0.309*       | -1.955 | 0.103            | 0.694  |
| Livestock             | 0.016          | 1.400   | -0.005        | -0.427 | 0.074***      | 4.021  | -0.016           | -0.924 |
| Land (Acres)          | 0.004          | 1.255   | 0.002         | 0.466  | -0.000        | -0.044 | -0.002           | -0.510 |
| Parental aspiration   | -0.002         | -0.161  | 0.052***      | 3.726  | -0.074***     | -3.698 | 0.051***         | 2.696  |
| Casual labour         | 0.059          | 0.631   | -0.549***     | -5.293 | 0.174         | 1.158  | 0.166            | 1.172  |
| Self- employment      | 0.106          | 1.275   | -0.250***     | -2.692 | -0.002        | -0.013 | 0.253**          | 1.995  |
| Other occupation      | 0.221**        | 2.101   | -0.408***     | -3.500 | 0.174         | 1.030  | 0.163            | 1.023  |
| Multi-grade teaching  | 0.251***       | 4.243   | -0.124*       | -1.868 | -0.068        | -0.712 | 0.155*           | 1.714  |
| Private school        | -0.119         | -1.070  | 0.166*        | 1.713  | -0.209        | -1.486 | -0.006           | -0.048 |
| Electricity           | 0.008          | 0.115   | 0.094         | 1.169  | -0.412***     | -3.537 | -0.019           | -0.176 |
| Proportion of SC      | 0.000          | 0.150   | 0.001         | 0.838  | -0.003        | -1.170 | -0.002           | -0.914 |

| <b>Explanatory variables</b>                                    | <b>Time at school</b> | <b>t-stat</b> | <b>Study at home</b> | <b>t-stat</b> | <b>Domestic work</b> | <b>t-stat</b> | <b>Leisure + Others</b> | <b>t-stat</b> |
|---|-----------------------|---------------|----------------------|---------------|----------------------|---------------|-------------------------|---------------|
| Proportion of ST  | 0.005***              | 2.610         | -0.002               | -0.751        | -0.003               | -0.850        | 0.006**                 | 2.144         |
| Age of oldest school  | 0.001                 | 0.821         | 0.001                | 1.103         | -0.002               | -1.210        | -0.004**                | -2.370        |
| School open (days)  | 0.890***              | 38.299        | -                    | -             | -                    | -             | -                       | -             |
| School environment  | -1.708***             | -8.000        | -                    | -             | -                    | -             | -                       | -             |
| Parental preference   | -2.620***             | -16.529       | -                    | -             | -                    | -             | -                       | -             |
| Illness   | -2.006***             | -16.241       | -                    | -             | -                    | -             | -                       | -             |
| Work pressure   | -1.171***             | -10.165       | -                    | -             | -                    | -             | -                       | -             |
| Bihar   | -0.678***             | -5.561        | 0.557***             | 4.421         | -0.222               | -1.219        | -0.442***               | -2.579        |
| Jharkhand   | -0.617***             | -4.430        | 0.580***             | 3.896         | 0.228                | 1.055         | -0.538***               | -2.654        |
| Madhya Pradesh  | -0.398***             | -3.596        | 0.366***             | 3.087         | -0.677***            | -3.939        | 0.378**                 | 2.340         |
| Rajasthan   | -0.579***             | -5.257        | -0.052               | -0.442        | -0.903***            | -5.316        | 0.781***                | 4.890         |
| Uttarakhand   | -0.128                | -0.858        | 0.445***             | 2.676         | 0.354                | 1.467         | -0.774***               | -3.418        |
| Uttar Pradesh   | -0.433***             | -4.121        | -0.115               | -0.978        | -0.442***            | -2.600        | -0.275*                 | -1.723        |
| Land missing  | -0.100                | -1.435        | 0.251***             | 3.227         | 0.006                | 0.051         | 0.094                   | 0.887         |
| Aspiration missing  | 0.179                 | 0.648         | 0.610**              | 1.971         | 1.278***             | 2.850         | -0.061                  | -0.144        |
| Constant  | 0.614**               | 2.467         | 0.355                | 1.431         | 0.868**              | 2.414         | 1.072***                | 3.173         |
| Observations  | 1,244                 |               | 1,244                |               | 1,244                |               | 1,244                   |               |
| R-squared   | 0.789                 |               | 0.211                |               | 0.410                |               | 0.185                   |               |
| chi2  | 4646.83               |               | 332.21               |               | 865.09               |               | 283.29                  |               |
| Prob>chi2   | 0.000                 |               | 0.000                |               | 0.000                |               | 0.000                   |               |
| Breusch-Pagan test of independence: chi2(6) = 17.344 Prob=0.008 |                       |               |                      |               |                      |               |                         |               |

\*\*\*, \*\*, \* denote significance levels at 10%, 5% and 1%

Only selected variables shown here. "-" means that the variables were not included in the regression.