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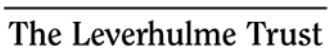

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Primary Education in India: Prospects of meeting the MDG Target

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Abstract
This paper uses two large repeated cross-sections, one for the early 1990's, and one for the late 1990's, to describe growth in school enrolment and completion rates for boys and girls in India, and to explore the extent to which enrolment and completion rates have grown over time. It decomposes this growth into components due to change in the characteristics that determine schooling, and another associated with changes in the responsiveness of schooling to given characteristics. Our results caution against the common practice of using current data to make future projections on the assumption that the model parameters are stable. The analysis nevertheless performs illustrative simulations relevant to the question of whether India will be able to achieve the Millennium Development Goal of realising universal primary education by the year 2015. The simulations suggest that India will achieve universal attendance, but that primary school completion rates will not exhibit much progress.

Keywords: Millennium Development Goals, primary schooling, attendance, completion rates, gender, India, decomposition

JEL Classification: I21, I28, O12, J18

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1. Introduction

Education is now widely valued not only for its intrinsic value in enriching the lives of individuals but also for its functional value in the development of the human capital of a nation. Educational investments in children have been shown to have high private and social returns. The private returns are associated with increased productivity and earnings in adulthood, and with further non-pecuniary gains arising from the greater efficiency with which educated individuals are able to acquire and process information (e.g. Rosenzweig 1995). The social premium to education over and above the private value includes further productivity increases arising from knowledge spillovers, gains in health for one generation that flow from gains in education for the previous, and the improved functioning of civic society and democracy. These examples illustrate that widespread education not only helps growth through productivity effects, but is also crucial to distribution of the gains from growth. Growth in a society in which most people have a basic education is most likely more pro-poor than growth in a society in which the educated are the elite few. Also, there is widespread evidence of an inter-generational correlation in educational attainment (e.g. Becker and Tomes 1986), at least some of which is thought to be causal (e.g. Lleras-Muney 2001, Chevalier 2004). To the extent that the impact of parental education on child education is causal, there are significant knock-on effects of public investment in education. In other words, they payoff to policy immediately goes up because investments in education at any one time have a multiplier effect, yielding additional benefits in the future. In summary, education is a powerful tool for reducing poverty, unemployment and inequality, improving health and nutrition and promoting sustained human development led growth (World Bank (2004), p.69).

One of the Millenium Development Goals (MDGs) agreed in September 2000 at a UN summit of world leaders is the achievement of universal primary school attendance for boys and girls. This, of course, implies a complete closing of the

gender gap. It also requires a 100% primary school completion rate, that is, that all students entering grade 1 are retained until grade 5. The MDG couched in these terms reflects recognition of the importance of basic (primary) education. This is particularly pertinent in India where primary education has historically been neglected by the state, with educational expenditures being concentrated on the tertiary sector (e.g. Dreze and Sen 1995). As a result, there are vast inequalities in educational attainment in India, a remarkable degree of illiteracy coexisting with frontier research in science and technology. India is also marked for being one of the group of countries in South Asia and Northern Africa where outcomes tend systematically to be better for boys than for girls, suggesting gender discrimination or at least undesirable gender differentiation. A further reason that India offers an interesting case study is that it exhibits striking diversity in educational indicators across its states that, in further work, we will exploit to consider more carefully the sorts of policy interventions that are likely to be effective.[1] With India being such a large country, sample sizes available for statistical analysis are large, allowing more general pursuit of heterogeneity in the data- for example by religion (Muslims have lower educational attainment than Hindus) or by caste (scheduled castes and tribes exhibit lower educational attainment than the higher-castes).

The NFHS data that we describe below show that, in India in 1998/9, the school attendance rate was 82.5% and the primary school completion rate was 61.7%. We argue in this paper that it is challenging, *a priori*, to expect both of these rates to rise to 100% by 2015.

2. Data and Definitions

The data used in the analysis are from the two rounds of the National Family Health Survey of India (NFHS), conducted in 1992/3 and in 1998/9, respectively. Although this survey was primarily concerned with reproductive and child health, the household questionnaire of the survey contains information on schooling for every individual in the surveyed household. The survey covered the 26 main states of India,

[1] For instance, nearly half of all children aged 6-11 who were not in school in 1999/2000, according to the NSS data, were in Uttar Pradesh and Bihar, with a further 11% being in Madhya Pradesh. There is further geographic concentration at the village level. Just 10% of villages in India account for nearly 50% of all out-of-school children aged 6-11 while 20% of all villages account for 75% of all out-of-school children (World Bank 2004; p.77).

interviewing 88563 households in 1992 and 92486 in 1998. In 1992/3, 69% and, in 1998/9, 66% of households reported living in rural areas. For rural households, we have merged in information on relevant infrastructure indicators that is available from a village questionnaire. In 1992, 485 villages were surveyed and, in 1998, 622. An advantage of household survey data over administrative data is that the latter often exaggerate school enrolment, possibly because this reflects well on school administrators and district officials, and because public expenditure allocations to schools and districts are often based upon the number of enrolled students (e.g. World Bank 2004).

As education is on the concurrent list of the constitution, it is partially a state subject. As a result, there are some differences in school structure and in definitions of progression across states. We will not concern ourselves with these here as we are interested in applying a uniform scale across all states, with a view to assessing the likelihood of India as a whole attaining the MDG for education.

In this paper, we look at two indicators, primary school attendance and the primary school completion rate. For each of these, the analysis is conducted first for all children and then for boys and girls separately. Primary school age is defined as 6-11 years. This corresponds to grades 1-5, and is sometimes referred to as lower-primary.[2] The primary school attendance or enrollment rate is the ratio of the number of children aged 6-11 attending school to the total number of children aged 6-11. We are further interested in the completion rate since, in many developing countries, including India, it is common that children enroll in school but then fail to progress, or dropout. This may reflect the quality of schools but it may alternatively reflect the volatility of parental incomes, children being taken out of school in response to unanticipated income shocks (e.g. Jacoby and Skoufias 1997). The completion rate is defined as the ratio of the number of children aged 12 at the time of the survey who report having completed primary school to the number of children aged 12 who report having enrolled in primary school. Ideally, we would use longitudinal data that allow us to follow a child through school, to completion. In the absence of such data, retrospective information such as available in the NFHS for level of schooling completed at the time of interview, is a second-best alternative.

[2] The next three years (age 12-14) are then referred to as upper primary (e.g. World Bank 2004, Chapter IV). Upper primary may alternatively be referred to as middle school. And lower and upper primary together are sometimes referred to as elementary education.

There are approximately 70,000 children aged 6-11 in each year and approximately 11,000 aged 12 (exact sample sizes are in the Tables). Construction of the estimation samples is described in Table 1. Comparing (weighted) averages from the two rounds of the survey shows that attendance amongst 6-11 year-olds increased from 69.5% in 1992/3 to 82.5% in 1998/9, and that growth in attendance was more rapid for girls than for boys (see bottom of Table 4). In contrast, the primary school completion rate *declined*, from 65.3% to 61.7%. The decline was larger for girls than for boys, suggesting that the gender gap in completion widened even as the gap in attendance shrunk (see bottom of Table 5).

Means and standard deviations of all microdata variables used in the analysis are in Table 2, where we also present a t-test of the significance of the difference of the means in the two years (this is defined in the Notes to the Table). Summary statistics for the state-level data used in the analysis are in Table 3.

3. Related Literature and Contributions

Closely related to the current paper is a recent analysis of education and health conducted for the World Bank by Anil Deolalikar (World Bank (2004); also see Deolalikar 2005). Motivated in the same spirit as the current analysis, to assess the likelihood of India attaining the MDG in education, this study provides a comprehensive analysis of primary schooling is India. It uses the 55^{th} round of the National Sample Survey (NSS), conducted in 1999/2000. Multivariate probits are estimated for primary school attendance, school attendance and primary completion rates. The study finds that the largest marginal effects are associated with household living standards, access to electricity and expenditure on elementary schooling.

The parameter estimates obtained for 1999/2000 are used to simulate indicators of school achievement in 2015 under three alternative scenarios. All of these involves an assumed change in each of nine predictor variables that were significant in the estimated model. Consider the attendance equation. Here, these are adult schooling amongst men and women, household consumption, annual public expenditure on elementary education per 6-14 year-old child, and the following indicators of district-level conditions: village access to pucca roads and electricity, the number of primary schools per 1000 children, the pupil-teacher ratio at the primary level, and crimes against (kidnappings of) women and girls. Since the education

deficit is concentrated in the poor states (see footnote 1), the simulations group the Indian states as poor and non-poor. In the first scenario, the specified characteristics in the poor states are brought up to the national average. In the second scenario, they are brought up to the average for the non-poor states. In the third scenario, they are increased at a specified rate per annum between 1999/2000 and 2015. The specified rate is set for each of the nine variables in an *ad hoc* way, to illustrate the possibilities. The predicted outcomes for 2015 get progressively more encouraging as one moves from the first to the third scenario. The overall conclusion in this study is that attaining the MDG for education is extremely unlikely in the poor states and, as a result, in India as a whole.

The current study employs definitions of school outcomes similar to those used by World Bank (2004) and it estimates multivariate probits that are similarly specified. However, we use the NFHS data rather than the NSS, which is useful in that it provides an opportunity to cross-check the results of one study against the other. A contribution of the current study is that it uses repeated cross-sectional data (two rounds of the NFHS) to investigate the growth in schooling indictors. It then assesses the extent to which (a) the predictor variables actually change and (b) the parameters are stable over time. We find that the predictor variables change much less than hypothesized in the illustrative simulations conducted in World Bank (2004).[3] For example, in scenario-3, the assumed annual change in male and female years of schooling is 0.25 and 0.3 respectively. Between 1992/3 and 1998/9, these variables increased (for the sample of 6-11 year olds) by only 0.055 and 0.066 years per year respectively. We also find that the parameters are not stable over time, which makes it very difficult to extrapolate to the future. Indeed, we find that almost all of the growth in schooling can be attributed to changes in the elasticities. We caution against the common practice of making predictions on the assumption of stable parameters, while recognizing that there may be no better alternative. We conclude that the prospect of India attaining universal primary attendance is good, but that the prospect of attaining universal completion rates in primary school is bleak unless a major intervention is undertaken.

[3] Anil Deolalikar clarifies that the figures he uses in Deolalikar (2005) and World Bank (2004) are only illustrative. Also, despite more optimistic assumptions on the rate of growth of variables that improve schooling probabilities, his conclusions are, like ours, pessimistic.

4. Analytical Approach

Educational enrolment at any time will depend upon supply and demand factors. In a competitive markets framework, education is an investment in human capital and the extent of this investment will depend only upon its relative rate of return. When credit markets are imperfect, or when parents value education of their children as a consumption or a status good (e.g. Banerjee 2004) then parental wealth also affects the level of education demanded. A role for religion, gender and ethnicity in further determining the demand for education may be argued to arise from differences in tastes, opportunity costs (wages) or perceived returns along these dimensions. Empirically, the demand for education can be modeled like the demand for any other good, as a function of total resources (parental wealth), relative prices (rates of return), demographics and taste-shifters. Supply-variables like access to school are included in the model to allow for disequilibria: not everyone who demands education can have it; see Ham (1986) for similar reasoning for the inclusion of the regional unemployment rate in models of labour demand. The estimated equations are similar to those in numerous previous studies of educational enrollment and progression (e.g. Behrman and Knowles 1999).

Our approach to developing projections to 2015 is as follows. We estimate equations for selected educational indicators for each of the years, 1992/3 and 1998/9, for all children and also separately for boys and girls. We analyse changes in schooling outcomes between 1992/3 and 1998/9, decomposing them into changes in characteristics (regressors, X) and changes in model parameters (β's). We then assume that the contribution of the evolution of variables over time is the same between 1998/9 and 2015, as between 1992/3 and 1998/9.

5. Empirical Model

As the outcomes analysed in this paper are binary indicator variables (0/1), they are modeled as probits and the parameters estimated by maximum likelihood. We estimate separate equations for each year, rather than pool the data. The data are, however, pooled across the states, state fixed effects being included to allow for all state-level unobservables. This will include political-economic variables, historically determined attitudes to education and initial conditions. The socio-economic status of the household is captured by wealth indicators, adult education and demographics.

For rural areas, we include indicators of the supply of schooling at the village level. Since no similar information is available for urban regions, these variables appear in interaction with a dummy for whether the household lives in a rural area. If a variable has a sufficiently large number of missing values then, rather than discard all observations with any missing data, we create a dummy to indicate missing values and include this in the model as an additional regressor; this is the case for caste and religion.

Estimates of the attendance equations for each year and each gender are in Table 4, while estimates of the completion equations are in Table 5. The independent variables in the attendance and completion models are the same, with one exception. Since the attendance equation is for 6-11 year-olds, it includes a set of age dummies and, in the sample that pools genders, this is interacted with a dummy for whether the child is a girl (1) or a boy (0). The completion equation, which is for 12 year-olds, simply includes a gender dummy.

To take account of the survey design, all estimates are weighted using weights available in the datafile. Reported standard errors are robust to arbitrary forms of heteroskedasticity that we expect are likely given clustering in the data structure. Tests of the joint significance of subsets of variables (e.g. village infrastructure, state fixed effects) are reported in the Tables. The contribution of the state fixed-effects to the total explained variation as measured by the Pseudo R-squared is also reported in the Tables.

Explaining The State Fixed Effects

In a second stage of the analysis, we investigate what state-level variables might explain the observed state fixed effects in the estimated micro-level equations. The state dummy coefficients are saved for each year and then pooled to generate a panel with T=2. The panel of state fixed effects coefficients is merged with a panel of data on state-level GNP, inequality, education expenditure and other relevant predictors. We have time series data on these predictor variables (refer Besley and Burgess 2002, 2004; we are grateful to these authors for allowing us to use the data they have compiled). We have constructed five-year averages of the predictors, over the five years preceding the data of the NFHS survey (ie. 1987/8-1992/3 for NFHS1 and 1993/4-1998/9 for NFHS2).

6. Results

The probit results are reported in Tables 4 and 5. Discussion of the individual, household and village-level effects is detailed in Bhalotra and Zamora (2006) and summarized in section 8 below. The state dummies are jointly highly significant in both years and most are individually significant. They explain around 2 to 4 (2 to 6) percent of the total variance in attendance (completion) after controlling by the remaining variables. The second-stage results which take the state fixed effects from the probits for each year, pool them and regress them on state-level variables are in Table 6. The state-level variables displayed in Table 6 explain 89% (71%) of the state variation in attendance (completion) that remains after conditioning on household wealth, education and demographics and, for rural households, on some infrastructure indicators. The rest of this section describes the state-level effects in some detail as these are particularly relevant to the design of interventions aimed at improving schooling outcomes.

The female illiteracy rate significantly reduces attendance and completion for both genders. For attendance, this effect is four times as large for girls as for boys but, for completion, it is only marginally larger for girls. The male illiteracy rate has no effect (not shown), nor does the ratio of the female to the male illiteracy rate (shown).

Real p.c. GNP (net state domestic product) has a significantly positive effect on attendance, and no effect on completion. The attendance effect is larger for girls than for boys. At a given level of GNP, the share of education expenditure in GNP has a positive effect on attendance, although no effect on completion. We also included the fraction of education expenditure that goes towards primary education but this was insignificant in every specification. The ratio of development expenditure to state GNP has a significant effect on both attendance and completion (although significance is marginal for girls' completion), even after controlling for education expenditure. Development expenditure includes, in addition to expenditure on education, expenditure on health, famine relief and food subsidies. It would, of course, be relevant to policy to know which elements of state development expenditure impact on educational outcomes. We included the share of health expenditure in the equation, expecting that it may have a positive impact, especially on completion, given that there is considerable evidence that children with poor health

join school late or drop out early (e.g. Alderman et al 2003). However this variable had no effect in any of the equations, and so it was not retained.

The ratio of rural to urban consumption (mean real consumption per capita) has a positive effect on attendance for both genders, the effect being almost twice as large for girls as for boys. We also see a hint of a positive effect on girls' completion rates. The higher is the rural-urban consumption ratio, the lower is between-sector inequality. Since schooling outcomes are worse in rural areas, this result is plausible. We included the Gini coefficient to capture within-sector inequality for each of the rural and urban sectors. As both coefficients were insignificant, they were dropped. Poverty within each of these sectors is measured by the poverty gap index. We find that higher rural poverty is associated with lower attendance, but there is no effect on completion. Urban poverty is insignificant in every specification.

The number of elementary schools (i.e. lower and upper primary; see footnote 2) has a positive effect on attendance but no effect on completion. The ratio of female to male teachers in primary schools encourages attendance though, unexpectedly, this effect is not larger for girls than for boys. Also possibly unexpected is the result that the feminization of the teacher workforce adversely affects completion, this effect being greater for girls than for boys!. This variable deserves further investigation. The year dummy indicates that, other things equal, unobservables specific to the year 1998/9 pushed attendance rates down and completion rates up.

7. Decomposition and Simulation

This section reports estimates of the extent to which the change in school attendance and completion rates between 1992/3 and 1998/9 can be attributed to changes in characteristics. It then simulates the change from 1998/9 to 2015, applying alternative weighting schemes corresponding to the estimated elasticities for 1992/3 and 1998/9 respectively.

For the purpose of developing projections of the school indicators to 2015, based on the evolution of predictor variables between 1992/3-1998/9, it is convenient to have a one-step model that shows the impact of state and household level variables on mortality all at once. We therefore replace the state fixed effects with the state-level variables that appeared as regressors in stage-2 above. Having confirmed that the linear probability model gives results similar to the probit, we use the linear

estimator for this one-step model. The estimates are reported in Appendix Tables 1 and 2. These are the equations that the decomposition described below is based upon. Note that the effective sample is reduced from 26 to 15 states, these being the states for which the state-level data are available. This means that the results cannot be directly compared with those reported earlier. Further differences between the results reported in Tables 4-6 and those in the Appendix Tables may be explained by correlations between the state-level variables and other regressors in the Appendix Tables.

A standard if *ad hoc* and questionable way of making extrapolations or predictions is to assume that the parameters of a model are stable and to predict changes in the outcome from changes in the predictor variables. When only a single cross-section of data is available, there may be no choice but to assume parameter stability. However, there is no *a priori* reason to believe that the relation of interest is time-invariant. The probability of attending or completing school is bounded between zero and one, and we may expect the marginal effect of "inputs" to get smaller as educational outcomes improve. Alternatively, it may be argued that there are diminishing returns to some inputs. For instance, the positive effect of access to television on schooling outcomes may decline as TV sets become common enough that the relevant information has diffused through the community. This may explain our finding that the effect of the number of TV sets per capita in a village raises attendance and completion probabilities in 1992/3, but not in 1998/9 (see Tables 4, 5).

In the current study, we estimate the same model on each of two rounds of data. As a result, we can investigate the assumption that the elasticities are constant over time (i.e the same in the 1998/9 survey as in the 1992/3 survey). In particular, we assess the extent to which the observed change in schooling between the two periods can be attributed to changes in the predictor variables over that period *versus* changes in the parameters.

Decomposition of differences in outcomes has a long history following the pioneering work of Oaxaca (1973) and Blinder (1973). Most applications perform decompositions in order to compare two groups of people, such as men and women (as in Oaxaca and Blinder), or Hindus and Muslims (as in Bhalotra and van Soest 2004). In this case, the change attributable to differences in sample characteristics is regarded as "explained" while that attributable to differences in parameters between the two groups is thought of as "unexplained" and, therefore, potentially related to

discrimination. Discrimination aside, the same ideas apply to the decomposition of changes over time that we undertake in this paper. To the extent that the average values of predictors change over time, we would expect the outcome to change over time. For example, we may find that the increase in school attendance observed can be attributed, in part, to an increase in the fraction of villages with a primary school. But if attendance in 1998/9 were to respond less to an increase in the supply of schooling than it did six years before, then we would find a smaller increase in attendance than if the elasticity were constant over time.

Most applications of the decomposition methodology have been to linear models. The procedure can be extended in a fairly straightforward manner to nonlinear models such as the probit (see Yun 2004). However, the detailed decomposition (i.e. decomposition by individual variable or by specified sub-groups of the regressor set) is harder to interpret in the non-linear model. For this reason, we report decompositions based upon the linear probability model. The coefficients used to weight changes in the predictor variables are those obtained from a pooled model.[4]

Refer Table 7. Consider attendance first. The increase in attendance rates of boys and girls over the six-year period, 1992/3-1998/9, is predicted to be 9.8 and 16.7 %-points respectively, close to the actual increases of 9.5 and 16.3 %-points. Most of this is explained by the regressors: 78% in the case of boys and 67% in the case of girls. Decomposition by sub-group shows that most of the explained variation, in turn, is on account of the state-level variables. Assuming that the per annum change in attendance rates that is attributable to the regressors remains the same between 1998/9 and 2015 as it was between 1992/3 and 1998/9, and weighting by the coefficients estimated on a model that pools the 1992/3 and 1998/9 data, we predict primary school attendance rates to be 100% in 2015 for both boys and girls.

Now consider completion rates, for which the predicted change between 1992/3 and 1998/9 is 3.4% for boys and 5% for girls. These predicted changes are much more positive than the actual changes which were –3.1% for boys and –4.3% for girls. As in the case of attendance, most of the predicted change is accounted for by growth in the regressors: 65% in the case of boys and 90% in the case of girls. Our predictions for the year 2015 are that completion rates will rise from 61.6% in 1998/9 to 65.2% for boys and from 61.8% in 1998/9 to 70% for girls. A positive feature of

[4] Stata provides an excellent summary in the help-file for the command "Oaxaca".

these results is that the gender gap appears set to reverse. However, for neither boys nor girls are completion rates set to rise to anywhere near 100%.

8. Conclusions

Comparing educational data for children in the 1992/3 and 1998/9 surveys, we find that primary school attendance grew for both boys and girls in the age range 6-11, indeed, more rapidly for girls. However reported completion rates for 12 year old children deteriorated in this time-frame.

We find that the elasticities of models for these schooling outcomes do change between 1992/3 and 1998/9, as a consequence of which any projections we make are sensitive to which elasticities we use to weight the contribution of the change of variables over time. We use elasticities from a model that pools the 1992/3 and 1998/9 data. Assuming that the predicted change due to the regressors is the same between 1998/9-2015 as it was between 1992/3-1998/9, we project that all girls and boys aged 6-11 will be attending primary school by the year 2015, but that, conditional upon enrolling, only 65% of boys and 70% of girls at age 12 will have completed primary school.

Putting the fairly positive results for attendance together with the worrying results for completion rates serves to highlight the importance of late entry and dropout. It suggests that the causes of late entry and dropout are not to be found amongst variables conventionally analysed- such as household wealth, distance to school or maternal education. This is an area that merits further exploration.

The policy-amenable variables "macro" (state-level) variables that have contributed to changes in attendance and completion between 1992/3-1998/9 and that therefore need to be monitored now include female literacy, GNP p.c., the share of education and development expenditure in GNP, poverty rates within the rural and urban sectors, and the disparity in living standards between rural and urban areas (ie the difference in average consumption expenditure between the two sectors).

Other significant predictors of attendance rates, observed at the microlevel in our data, include the presence of primary and middle schools in the village (in the case of rural India) and, at least in the first survey-year, the prevalence of TV sets. Wealth and living conditions at the household level are also relevant, significant indicators being an index of household possessions, whether the household has access

to electricity, and whether it has a separate room for cooking. The higher the educational level of the most educated adult in the household, the greater is the likelihood that a child in that household is attending school. It does not seem to matter to attendance rates whether this person is a man or a woman. However, where the head of the household is a woman, children are more likely to be in school. Children are less likely to attend school when the principal-female (head or head's wife) in the household is working. As the proportion of women in work is expected to rise, this factor will constrain increases in attendance unless the parameters of the model change to nullify this effect (the latter is a real possibility since increases in women's labour force participation have, historically, been associated with wider structural change in the organization of both markets and households). Children in larger households are less likely to attend school and, for a given household size, children of primary school age are less likely to attend if children under the age of five are present in the household. These results suggest that, if India experiences further reductions in fertility, it will see further rises in school attendance. There are some significant compositional effects on attendance, indicating that scheduled castes, scheduled tribes and Muslims are less likely to have children attend school. Age dummies in the model are consistent with late entry, especially amongst boys. At every age, girls are less likely than boys to be attending school, the gender gap tending to increase with age.

Looking at the regressions for completion rates, we find there was little positive change growth between 1992/3 and 1998/9. Consider what we have learnt about the variation in completion rates in a given year. Amongst state-level or macro-variables, the two-step analysis indicates that only the female literacy rate is a significant predictor of completion rates, although the one-step analysis reported in Appendix Table 2 suggests a wider range of influences. Amongst variables in the micro-data, the presence of a middle or a secondary school in the village (in rural India) has a positive impact on completion probabilities, consistent with the notion that children will be less likely to complete primary if there is nowhere to go after. Wealthier households, as indicated by a durables index, are more likely to have children complete primary school. The educational level of the most educated adult in the household is significant and, in contrast to the attendance results, completion rates are further favoured by the most educated adult being a woman. Completion is also more likely when the household head is a woman and, as in the case of attendance,

less likely when the principal female is working. Large families and, further, families with small children appear to find it harder to support their children through primary school. Although scheduled tribe children are less likely to complete, in contrast to the attendance results, children from scheduled castes and from Muslim families are no less likely to complete. An important finding is that, holding constant a rich set of household and state level covariates, girls are less likely than boys to complete primary school, the probability differential being 0.05 in 1992/3 and rising to 0.07 in 1998/9. Overall, the results suggest that a first step towards improving completion rates would be to close the gender-gap in completion. The results also suggest that the improvements in the overall female literacy rate in the state will contribute to improving primay completion rates for boys and girls.

As discussed, further research is required into the determinants of completion rates. We suggest that factors such as poor health may delay enrollment and weaken cognitive ability and therefore progression. At the same time, school curricula that are uninteresting to the children or irrelevant to their future earnings prospects, or timetables that conflict with peak agricultural seasons may be important constraints on completion. A further possibility is that children enroll but then fail to complete because the household is subject to an income or health shock that makes the opportunity cost of schooling too high for the family to afford at the time. Once a child has dropped out, she or he may not enroll again.

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TABLES

Table 1. Selection of the Samples for Analysis
1.1. Sample selection for school attendance

	NFHS92/93		NFHS98/99	
	# obs.	%	# obs.	%
Children aged 6-11 of the facto population*	74510	100	71479	100
Dropped observations				
(1) missing answer whether attending school	367	0.49	283	0.40
(2) missing value in years of education of highest adult	69	0.09	31	0.04
(3) missing answer in distance to nearest town	166	0.22	236	0.33
(4) missing answer in distance to pucca road	1148	1.54	658	0.92
Attendance Sample	72841	100	70392	100
Boys attending school	30322	41.63	31958	45.40
Boys not attending school	7613	10.45	4549	6.46
Girls attending school	23876	32.78	27335	38.83
Girls not attending school	11030	15.14	6550	9.31

* de facto population estimated with population who slept the night previous to the survey in the household

1.2. Sample selection for primary school completion

	NFHS92/93		NFHS98/99	
	# obs.	%	# obs.	%
Children aged 12 of the facto population	14204	100	14086	100
Dropped observations				
(1) no education or unknown education level	3212	22.61	2108	14.97
(2) missing value in years of education of highest adult	21	0.15	12	0.09
(3) missing answer in distance to nearest town	36	0.25	42	0.30
(4) missing answer in distance to pucca road	207	1.46	130	0.92
Primary Completion Sample	10834	100	11659	100
Boys who have completed primary	3984	36.77	4050	34.74
Boys who have not completed primary	2191	20.22	2473	21.21
Girls who have completed primary	3118	28.78	3270	28.05
Girls who have not completed primary	1541	14.22	1946	16.69

* de facto population estimated with population who slept the night previous to the survey in the household

Table 2. Microdata Sample Statistics (weighted by all India sample weight[1])

	Attendance Sample			Completion Sample		
	Mean(92/93)	Mean(98/99)	t ratio[3]	Mean(92/93)	Mean(98/99)	t ratio[3]
Age 7	0,167	0,163	1.63	---	---	---
Age 8	0,189	0,191	-0.77	---	---	---
Age 9	0,144	0,141	0.69	---	---	---
Age 10	0,197	0,201	-1.16	---	---	---
Age 11	0,126	0,127	0,000	---	---	---
Female	0,479	0,482	-0.78	0,410	0,438	-2.19*
Pucca house	0,212	0,277	-23.8**	0,270	0,315	-6.8**
Own flush toilet	0,141	0,153	-4.73**	0,192	0,178	1.26
Electricity	0,476	0,551	-19.5**	0,573	0,613	-2.53*
Potable water into the house	0,392	0,385	4.64**	0,455	0,400	7.0**
Separate room for cooking	0,530	0,468	24.1**	0,609	0,526	12.9**

Land owner	0,558	0,536	-0.12	0,567	0,550	0.34
Livestock owner	0,603	0,546	11.8**	0,578	0,555	2.12*
Durables index	-0,332	-0,321	6.4**	0,084	-0,069	8.4**
Rural* pucca house	0,080	0,128	-25.5**	0,094	0,143	-8.7**
Rural* own flush toilet	0,038	0,049	-7.2**	0,052	0,057	0.09
Rural* electricity	0,276	0,338	-16.7**	0,320	0,369	-2.9**
Rural* potable water into the house	0,239	0,238	0.14	0,260	0,237	3.3**
Rural* separate room for cooking	0,378	0,327	16.1**	0,409	0,358	7.6**
Rural* land owner	0,510	0,488	1.92	0,508	0,494	0.87
Rural* livestock owner	0,557	0,506	9.7**	0,525	0,509	0.92
Rural*Durables index	-0,256	-0,431	31.8**	-0,104	-0,276	13.7**
Schooling years of highest educ. Adult	5,948	6,316	-13.8**	7,369	6,983	2.51*
Highest educated adult is female	0,448	0,446	3.4**	0,371	0,398	-1.62
Household size	7,639	7,514	6.4**	7,495	7,260	4.9**
Proportion of females under five	0,066	0,062	4.8**	0,042	0,037	2.7**
Proportion of males under five	0,073	0,068	4.0**	0,044	0,041	1.36
Proportion of females aged 6 to 16	0,194	0,199	-5.3**	0,193	0,201	-2.30*
Proportion of males aged 6 to 16	0,208	0,210	2.19*	0,233	0,236	0.16
Proportion of females aged 17 to 30	0,106	0,110	-4.5**	0,085	0,088	-1.64
Proportion of males aged 17 to 30	0,070	0,065	8.6**	0,075	0,068	5.5**
Proportion of females aged +50	0,040	0,039	-0.24	0,040	0,039	-0.61
Proportion of males aged +50	0,037	0,034	4.1**	0,041	0,038	2.6**
Household head female	0,063	0,072	-0.15	0,079	0,080	2.22*
Child of head	0,746	0,742	5.6**	0,783	0,789	1.1
Principal female working [2]	0,260	0,314	-13.9**	0,254	0,300	-4.1**
Rural resident	0,754	0,765	-5.7**	0,707	0,736	-3.3**
Scheduled caste	0,128	0,193	-28.6**	0,114	0,184	-11.6**
Scheduled tribe	0,094	0,096	-5.8**	0,072	0,084	-2.9**
Muslim	0,148	0,157	-12.4**	0,128	0,146	-7.0**
Christian	0,020	0,020	3.5**	0,026	0,025	3.6**
Other religion	0,032	0,029	3.5**	0,038	0,033	2.20*
Rural*Distance to nearest town	13,803	11,183	12.7**	12,541	10,571	2.55*
Rural*Distance pucca road	1,863	3,368	-45.7**	1,520	3,194	-20.8**
Distance to pucca road* primary School	1,665	3,012	-44.0**	1,392	2,846	-19.3**
Distance to pucca road* girl	0,896	1,641	-31.4**	0,533	1,385	-14.9**

Table 1 Continued

Rural* Village electrified	0,556	0,608	-20.8**	0,550	0,603	-8.7**
Rural* Primary School in village	0,666	0,685	-12.9**	0,635	0,665	-6.5**
Rural* Middle School in village	0,379	0,381	-9.0**	0,386	0,396	-4.0**
Rural* Secondary School in village	0,207	0,214	-1.92	0,213	0,221	-0.5
Rural* Bank in village	0,179	0,163	7.7**	0,188	0,171	3.8**
Rural* Post Office in village	0,344	0,354	-3.7**	0,347	0,350	-0.42
Rural*Number of tv sets per 1000 hab.	5.230	16,956	-10.1**	5,724	18,453	-3.6**
Rural* missing number of tv sets	0,007	0,031	-18.9**	0,007	0,030	-7.6**

Notes

1. Sample weight inversely proportional to the variance of an observation

2. Female head or spouse of head

3 t statistic test of the nul hyphotesis mean(92/93)-mean(98/99)=0

* significant at 5% ** signficant at 1%

Table 3: Annual Growth Rates of State Level Variables: (% p.a.) in 1982-1999

state	Real GDP p.c.	Devexp/ GDP	Eduexp/ GDP	Rural Poverty	Urban Poverty	Rural/Urb. Consumpt.	Female Illiteracy rate	Female/ Male Illiteracy	Female/ Male teachers primary
AndhraPradesh	5.00	1.43	0.98	-12.1	-8.19	1.90	-0.83	0.31	6.22
Assam	3.12	3.05	5.66	-8.63	16.8	-0.85	-1.28	-2.71	64.5
Bihar	4.10	2.68	4.18	-2.87	-10.7	-1.68	-0.64	0.41	0.11
Gujarat	6.39	1.66	2.45	-6.91	-7.46	0.23	-1.40	0.60	1.52
Haryana	-----	0.54	2.29	6.23	-12.5	-4.70	-1.36	1.18	12.5
Jammu	1.59	7.66	6.16	34.5	21.9	-9.22	-0.87	1.16	-0.12
Karnataka	5.39	0.80	1.40	-10.5	-11.7	0.99	-1.39	0.40	7.82
Kerala	5.63	0.93	-0.15	-7.99	-11.2	-2.10	-6.65	1.12	3.51
MadhyaPradesh	4.77	1.82	2.79	-6.29	-0.79	-0.57	-0.87	0.91	3.32
Maharashtra	5.14	-0.08	2.69	-11.7	-1.29	1.32	-1.84	0.58	2.49
Orissa	5.30	1.88	4.04	-1.93	-8.31	6.61	-1.19	0.32	-1.21
Punjab	5.12	3.03	1.43	3.41	-15.4	-4.02	-1.77	0.69	-0.79
Rajasthan	5.72	2.29	2.98	-4.45	-2.27	-1.34	-0.58	1.35	72.6
Tamil Nadu	6.09	0.37	1.25	-10.1	-4.72	5.64	-1.57	-0.28	0.68
WestBengal	4.71	1.63	3.28	-5.71	-14.5	0.45	-1.64	0.36	115.5
UttarPradesh	3.80	1.01	3.02	-5.12	-12.1	-1.96	-0.86	0.74	1.31
All India	4.79	1.92	2.78	-3.13	-5.14	-0.58	-1.55	0.45	18.1

Notes: These are the growth rates of the variables that are significant in the regression shown in Table 6 below. In Table 6, we use the average of the variable over the five years preceding the date of the survey. To describe the overall trend in these variables, we now present data for 1982-99, that is, starting 10 years before the date of the first survey (1992/3). GDP is state net domestic product, p.c. is per capita, devexp is development expenditure, eduexp is education expenditure, urb is urban, consumpt is consumption. Precise definitions of all variables are in Bhalotra and Zamora (2006).

Table 4. Probit Estimates of School Attendance among 6-11 year old Children.

	Marginal Effects Estimates (weighted by all India sample weight)					
	NFHS92/ 93			**NFHS98/ 99**		
	Total	**Boys**	**Girls**	**Total**	**Boys**	**Girls**
Child age and gender effects						
Age 7	0.1208	0.0939	0.1086	0.0640	0.0523	0.0614
	(15.70)**	(15.90)**	(10.70)**	(13.70)**	(13.77)**	(10.24)**
Age 8	0.1626	0.1271	0.1207	0.0734	0.0601	0.0602
	(23.23)**	(23.25)**	(12.22)**	(16.01)**	(15.91)**	(10.09)**
Age 9	0.1640	0.1279	0.1297	0.0758	0.0631	0.0637
	(21.03)**	(21.13)**	(11.90)**	(14.25)**	(14.64)**	(9.27)**
Age 10	0.1575	0.1236	0.0942	0.0621	0.0524	0.0251
	(18.42)**	(18.12)**	(8.39)**	(10.28)**	(10.33)**	(3.32)**
Age 11	0.1519	0.1212	0.0620	0.0544	0.0473	0.0055
	(15.19)**	(15.35)**	(4.60)**	(6.98)**	(7.45)**	(0.57)
female* Age 6	-0.1042	----	----	-0.0426	----	----
	(7.72)**	----	----	(3.98)**	----	----
female* Age 7	-0.1589	----	----	-0.0689	----	----
	(11.11)**	----	----	(5.61)**	----	----
female* Age 8	-0.2176	----	----	-0.0868	----	----
	(16.29)**	----	----	(7.50)**	----	----
female* Age 9	-0.2108	----	----	-0.0895	----	----
	(13.52)**	----	----	(6.30)**	----	----
female* Age 10	-0.2329	----	----	-0.1101	----	----
	(17.10)**	----	----	(9.74)**	----	----
female* Age 11	-0.2684	----	----	-0.1219	----	----
	(15.93)**	----	----	(7.89)**	----	----
Assest effects						
Pucca house	0.0365	0.0214	0.0607	0.0048	-0.0004	0.0118
	(2.34)*	(1.06)	(2.62)**	(0.44)	(0.03)	(0.74)
Own flush toilet	0.0116	0.0287	-0.0192	0.0112	0.0176	0.0013
	(0.65)	(1.31)	(0.68)	(0.96)	(1.19)	(0.07)
Electricity	0.0704	0.0557	0.0746	0.0437	0.0304	0.0592
	(4.04)**	(2.51)*	(2.94)**	(3.05)**	(1.52)	(2.79)**
Potable water into the house	0.0118	0.0004	0.0319	0.0114	0.0061	0.0188
	(0.72)	(0.02)	(1.34)	(0.98)	(0.40)	(1.09)
Separate room for cooking	0.0356	0.0328	0.0394	0.0298	0.0208	0.0408
	(2.32)*	(1.68)	(1.81)	(2.65)**	(1.41)	(2.38)*
Land owner	-0.0168	0.0141	-0.0626	0.0215	0.0296	0.0135
	(0.88)	(0.55)	(2.29)*	(1.31)	(1.31)	(0.57)
Livestock owner	-0.0009	0.0107	-0.0137	0.0127	0.0150	0.0099
	(0.05)	(0.45)	(0.54)	(0.75)	(0.63)	(0.42)
Durables index	0.0401	0.0295	0.0502	0.0204	0.0170	0.0239
	(9.56)**	(6.33)**	(7.63)**	(7.12)**	(5.08)**	(5.55)**
Rural* pucca house	0.0049	-0.0012	0.0095	0.0153	0.0010	0.0307
	(0.23)	(0.04)	(0.32)	(0.97)	(0.04)	(1.39)
Rural* own flush toilet	0.0228	0.0002	0.0423	0.0061	-0.0080	0.0204
	(0.75)	(0.00)	(0.97)	(0.27)	(0.24)	(0.64)
Rural* electricity	-0.0137	-0.0186	0.0092	-0.0250	-0.0198	-0.0294
	(0.69)	(0.70)	(0.34)	(1.30)	(0.74)	(1.07)

Rural* potable water into the house	0.0159	0.0243	0.0013	0.0015	0.0067	-0.0062
	(0.90)	(1.05)	(0.05)	(0.10)	(0.35)	(0.29)
Rural* separate room for cooking	0.0079	0.0033	0.0118	-0.0124	-0.0041	-0.0228
	(0.47)	(0.15)	(0.51)	(0.88)	(0.22)	(1.10)
Rural* land owner	0.0585	0.0332	0.0932	-0.0025	-0.0006	-0.0065
	(2.90)**	(1.19)	(3.22)**	(0.14)	(0.02)	(0.26)
Rural* livestock owner	-0.0098	-0.0144	-0.0074	-0.0077	-0.0144	0.0007
	(0.49)	(0.55)	(0.26)	(0.45)	(0.58)	(0.03)
Rural*Durables index	0.0080	0.0101	0.0084	0.0114	0.0103	0.0133
	(1.11)	(1.24)	(0.75)	(3.05)**	(2.37)*	(2.36)*
Education and Demographic effects						
Schooling years of highest educated adult	0.0260	0.0189	0.0344	0.0138	0.0105	0.0180
	(29.17)**	(19.40)**	(24.57)**	(24.27)**	(15.95)**	(20.76)**
Highest educated adult is female	0.0019	-0.0094	0.0139	0.0116	0.0040	0.0205
	(0.20)	(0.75)	(1.11)	(1.40)	(0.35)	(1.72)
Log Household size	-0.0465	-0.0400	-0.0633	-0.0403	-0.0393	-0.0450
	(8.08)**	(6.04)**	(7.07)**	(10.47)**	(8.75)**	(7.62)**
Proportion of female members under five	-0.2296	-0.1424	-0.3435	-0.1850	-0.1016	-0.2856
	(6.64)**	(3.64)**	(6.21)**	(8.16)**	(3.78)**	(8.04)**
Proportion of male members under five	-0.2236	-0.1328	-0.3421	-0.1842	-0.1356	-0.2413
	(6.42)**	(3.38)**	(6.16)**	(7.98)**	(4.99)**	(6.68)**
Proportion of female members aged 6 to 16	-0.0750	-0.0164	-0.1773	-0.0728	-0.0405	-0.1153
	(2.23)*	(0.45)	(3.15)**	(3.29)**	(1.64)	(3.19)**
Proportion of male members aged 6 to 16	-0.1324	-0.1458	-0.0944	-0.1385	-0.1318	-0.1471
	(3.90)**	(3.78)**	(1.76)	(6.18)**	(4.95)**	(4.26)**
Proportion of female members aged 17 to 30	0.1076	0.0877	0.1288	0.1135	0.1010	0.1275
	(3.67)**	(2.71)**	(2.74)**	(5.85)**	(4.63)**	(4.13)**
Proportion of male members aged 17 to 30	-0.2666	-0.2100	-0.3428	-0.1744	-0.1165	-0.2522
	(8.61)**	(6.16)**	(6.82)**	(8.36)**	(4.87)**	(7.64)**
Proportion of female members aged more than 50	0.0793	0.0302	0.1587	0.0134	0.0057	0.0140
	(1.86)	(0.64)	(2.30)*	(0.45)	(0.16)	(0.29)
Proportion of male members aged more than 50	0.0191	0.0165	0.0189	-0.0372	-0.0445	-0.0240
	(0.42)	(0.33)	(0.26)	(1.19)	(1.24)	(0.48)
Household head female	0.0416	0.0284	0.0624	0.0196	0.0047	0.0414
	(3.20)**	(1.69)	(3.34)**	(2.69)**	(0.46)	(4.38)**
Child of head	0.0306	0.0269	0.0354	0.0182	0.0238	0.0126
	(3.42)**	(2.22)*	(2.77)**	(2.99)**	(3.31)**	(1.32)
Principal female working	-0.0489	-0.0504	-0.0437	-0.0421	-0.0316	-0.0555
	(6.78)**	(5.49)**	(4.34)**	(32.85)**	(10.47)**	(16.68)**
Scheduled caste	-0.0247	-0.0130	-0.0409	-0.0206	-0.0101	-0.0346
	(2.81)**	(1.10)	(3.25)**	(3.10)**	(1.05)	(3.78)**
scheduled tribe	-0.0814	-0.0769	-0.0835	-0.0707	-0.0636	-0.0801
	(7.60)**	(5.61)**	(5.44)**	(16.05)**	(12.16)**	(8.85)**
Muslim	-0.0936	-0.0991	-0.0815	-0.0507	-0.0586	-0.0429
	(10.07)**	(8.64)**	(5.95)**	(11.92)**	(8.19)**	(4.72)**
Christian	-0.0170	-0.0224	-0.0130	0.0404	0.0372	0.0433
	(0.73)	(0.76)	(0.37)	(3.04)**	(2.11)*	(2.07)*
Other religión	-0.0013	-0.0025	0.0024	-0.0011	-0.0144	0.0189
	(0.07)	(0.10)	(0.09)	(0.07)	(0.63)	(0.93)
Rural infrastructure effects						
Rural resident	-0.0732	-0.0403	-0.1182	0.0140	0.0193	0.0059

	(3.49)**	(1.46)	(3.99)**	(0.76)	(0.78)	(0.22)
Rural*Distance to nearest town	-0.0002	-0.0001	-0.0004	-0.0003	-0.0003	-0.0003
	(1.27)	(0.47)	(1.49)	(2.49)*	(2.21)*	(1.49)
Rural*Distance pucca road	-0.0013	-0.0024	-0.0007	0.0016	0.0007	0.0025
	(0.97)	(1.79)	(0.37)	(2.41)*	(1.04)	(2.47)*
Rural*Distance to pucca road* primary School	-0.0004	0.0004	-0.0010	-0.0012	-0.0006	-0.0019
	(0.29)	(0.26)	(0.50)	(1.73)	(0.88)	(1.80)
Rural*Distance to pucca road* girl	-0.0008	----	----	-0.0003	----	----
	(0.94)	----	----	(0.73)	----	----
Rural* Village electrified	0.0037	0.0096	0.0014	0.0098	0.0058	0.0132
	(0.43)	(0.84)	(0.11)	(1.63)	(0.70)	(1.50)
Rural* Primary School in village	0.0314	0.0373	0.0200	0.0244	0.0209	0.0305
	(2.79)**	(2.50)*	(1.21)	(2.93)**	(1.95)	(2.47)*
Rural* Middle School in village	0.0204	0.0045	0.0374	-0.0010	0.0009	-0.0029
	(2.42)*	(0.39)	(3.19)**	(0.16)	(0.10)	(0.32)
Rural* Secondary School in village	0.0053	-0.0030	0.0158	0.0097	0.0040	0.0167
	(0.55)	(0.23)	(1.18)	(1.40)	(0.40)	(1.70)
Rural* Bank in village	0.0050	0.0025	0.0088	-0.0010	0.0011	-0.0037
	(0.51)	(0.19)	(0.61)	(0.13)	(0.11)	(0.31)
Rural* Post Office in village	-0.0147	-0.0139	-0.0111	-0.0039	-0.0034	-0.0044
	(1.71)	(1.20)	(0.91)	(0.62)	(0.40)	(0.49)
Rural*Number of tv sets in village per 1000 habitants	0.0007	0.0002	0.0012	0.0000	-0.0000	0.0001
	(3.06)**	(1.17)	(3.13)**	(0.52)	(0.83)	(1.36)
Rural* missing number of tv sets	0.0553	0.0322	0.1021	-0.0191	-0.0008	-0.0366
	(1.73)	(0.69)	(2.50)*	(1.16)	(0.04)	(1.52)
State fixed effects	yes	yes	yes	yes	yes	yes
Variables available only for 1998/99						
Other Backward Caste	----	----	----	-0.0076	0.0029	-0.0213
	----	----	----	(1.07)	(0.31)	(2.11)*
Missing Caste	----	----	----	-0.0232	-0.0210	-0.0238
	----	----	----	(1.76)	(1.26)	(1.27)
Missing religion	----	----	----	-0.0092	0.0512	-0.0905
	----	----	----	(0.15)	(1.05)	(0.80)
Mean dependent variable	**0.6971**	**0.7646**	**0.6242**	**0.8252**	**0.8603**	**0.7872**
Observations	72841	37935	34906	69456	36027	33429
Pseudo R-squared	0.2787	0.2343	0.3079	0.2285	0.2071	0.2457
Pseudo R-squared due to state fixed effects	0.0280	0.0195	0.0426	0.0201	0.0146	0.0298
Log Pseudolikelihood	-32221	-15850	-15991	-24828	-11554	-13051
Wald Chi2	8634	3862	5372	5634	2641	36429
F Age effects	593**	606**	197**	290**	306**	186**
F gender*age effects	1028**	----	----	420**	----	----
F assets effects	309**	153**	191**	188**	91**	122**
F rural*assets effects	79*	43**	68**	42**	22*	34**
F Village vars. Effects	71**	42**	55**	31**	15	28**
F Household demographics	2108**	1110**	1355**	1595**	827**	1051**
F state effects	1571**	622**	1325**	753**	286**	705**

Notes to Table 3:

1 Head or spouse of head

Interaction of rural residence with assets variables is included to capture the difference of the impact of

assets variables in rural as opposed to urban households.

·Interaction of rural residence with infrastructure variables is necessary as there is no corresponding urban information.

The F tests at the end of the Table are tests of joint significance of the named groups of variables.

Absolute value of Robust z-statistics in parentheses

* significant at 5% level; ** significant at 1% level

Table 5. Probit Estimates of School Completion among 12 year old Children.

Marginal Effects Estimates (weighted by all India sample weights)

	NFHS92/93			NFHS98/99		
	Total	**Boys**	**Girls**	**Total**	**Boys**	**Girls**
Gender						
Female	-0.0484	----	----	-0.0620	----	----
	(2.98)**	----	----	(4.19)**	----	----
Assets effects						
Pucca house	0.0373	0.0501	0.0128	0.0371	0.0654	0.0089
	(1.37)	(1.36)	(0.29)	(1.43)	(1.91)	(0.21)
Own flush toilet	-0.0152	-0.0370	0.0086	0.0842	0.0846	0.0825
	(0.54)	(0.92)	(0.21)	(3.43)**	(2.46)*	(2.23)*
Electricity	0.0827	0.1080	0.0475	0.1113	0.0777	0.1594
	(2.20)*	(2.19)*	(0.78)	(2.44)*	(1.36)	(2.10)*
Potable water into the house	0.0190	0.0346	0.0007	0.0324	0.0374	0.0185
	(0.65)	(0.84)	(0.02)	(1.18)	(1.00)	(0.45)
Separate room for cooking	0.0482	0.0570	0.0438	0.0384	0.0540	0.0108
	(1.76)	(1.48)	(1.10)	(1.48)	(1.53)	(0.28)
Land owner	0.0125	0.0025	0.0314	-0.0430	-0.0301	-0.0707
	(0.36)	(0.05)	(0.63)	(1.29)	(0.65)	(1.48)
Livestock owner	-0.0088	0.0006	-0.0250	0.0125	0.0513	-0.0231
	(0.27)	(0.01)	(0.53)	(0.39)	(1.17)	(0.48)
Durables index	0.0523	0.0431	0.0623	0.0190	0.0083	0.0343
	(6.25)**	(3.79)**	(5.07)**	(2.27)*	(0.76)	(2.69)**
Rural* pucca house	0.0013	-0.0056	0.0266	-0.0206	-0.0298	-0.0200
	(0.03)	(0.11)	(0.47)	(0.59)	(0.64)	(0.36)
Rural* own flush toilet	0.0101	0.0081	0.0047	-0.0408	-0.1000	0.0302
	(0.22)	(0.12)	(0.07)	(0.96)	(1.75)	(0.49)
Rural* electricity	-0.0153	-0.0458	0.0349	-0.0769	-0.0671	-0.0961
	(0.36)	(0.81)	(0.52)	(1.55)	(1.07)	(1.19)
Rural* potable water into the house	-0.0022	0.0003	-0.0153	-0.0314	-0.0393	-0.0133
	(0.06)	(0.01)	(0.30)	(1.00)	(0.91)	(0.28)
Rural* separate room for cooking	-0.0221	-0.0437	0.0115	-0.0199	-0.0335	0.0037
	(0.70)	(1.01)	(0.24)	(0.68)	(0.83)	(0.09)
Rural* land owner	0.0617	0.0724	0.0411	0.0406	0.0421	0.0630
	(1.57)	(1.36)	(0.70)	(1.13)	(0.84)	(1.22)
Rural* livestock owner	-0.0212	-0.0004	-0.0451	0.0046	-0.0312	0.0380
	(0.55)	(0.01)	(0.78)	(0.13)	(0.63)	(0.70)
Rural*Durables index	-0.0207	-0.0123	-0.0298	0.0227	0.0362	0.0047
	(1.59)	(0.70)	(1.52)	(1.96)	(2.37)*	(0.27)
Education and demographics effects						
Schooling years of highest educated adult	0.0200	0.0186	0.0233	0.0239	0.0235	0.0253
	(10.33)**	(7.23)**	(8.02)**	(13.52)**	(9.81)**	(9.69)**

Highest educated adult is female	0.0676	0.0634	0.0671	0.0538	0.0497	0.0600
	(3.79)**	(2.76)**	(2.33)*	(3.40)**	(2.34)*	(2.52)*
Log Household size	-0.0251	-0.0131	-0.0466	-0.0315	-0.0279	-0.0495
	(1.72)	(0.67)	(2.08)*	(2.29)*	(1.48)	(2.45)*
Proportion of female members under five	-0.1230	-0.0646	-0.1974	-0.5574	-0.3909	-0.7775
	(1.26)	(0.49)	(1.35)	(5.81)**	(3.03)**	(5.37)**
Proportion of male members under five	-0.3802	-0.3242	-0.4255	-0.5408	-0.3345	-0.7959
	(3.85)**	(2.52)*	(2.70)**	(5.72)**	(2.65)**	(5.50)**
Proportion of female members aged 6 to 16	-0.0499	-0.0246	-0.1183	-0.0825	0.0690	-0.3000
	(0.61)	(0.23)	(0.94)	(1.10)	(0.70)	(2.53)*
Proportion of male members aged 6 to 16	-0.1037	-0.0623	-0.1218	-0.3571	-0.2642	-0.4625
	(1.27)	(0.58)	(0.96)	(4.60)**	(2.58)**	(3.75)**
Proportion of female members aged 17 to 30	-0.0730	-0.0564	-0.0743	-0.1412	-0.0911	-0.2175
	(0.99)	(0.59)	(0.66)	(2.07)*	(1.02)	(2.04)*
Proportion of male members aged 17 to 30	-0.3890	-0.4216	-0.3795	-0.5598	-0.5110	-0.6471
	(4.84)**	(4.05)**	(2.99)**	(7.13)**	(5.03)**	(5.19)**
Proportion of female members aged more than 50	0.0141	-0.0148	0.0556	-0.1187	0.0543	-0.3655
	(0.14)	(0.11)	(0.34)	(1.19)	(0.41)	(2.42)*
Proportion of male members aged more than 50	0.1561	0.1715	0.1551	0.0105	0.1805	-0.2043
	(1.54)	(1.30)	(0.98)	(0.11)	(1.42)	(1.35)
Household head female	-0.0003	0.0005	0.0068	0.0726	0.0421	0.1170
	(0.01)	(0.01)	(0.17)	(3.43)**	(1.31)	(5.71)**
Child of head	-0.0167	-0.0444	0.0218	0.0337	0.0521	0.0105
	(0.88)	(1.78)	(0.73)	(1.96)	(2.16)*	(0.44)
Principal female working	-0.0177	-0.0409	0.0163	-0.0536	-0.0346	-0.0776
Scheduled caste	0.0057	0.0139	-0.0097	-0.0087	-0.0130	-0.0003
	(0.29)	(0.54)	(0.29)	(0.47)	(0.52)	(0.01)
scheduled tribe	-0.0937	-0.0621	-0.1412	-0.0595	-0.0905	-0.0309
	(3.34)**	(1.74)	(3.09)**	(2.44)*	(2.82)**	(0.86)
Muslim	-0.0847	-0.1068	-0.0530	-0.1273	-0.1627	-0.0926
	(3.89)**	(3.70)**	(1.53)	(6.06)**	(5.82)**	(3.20)**
Christian	-0.0386	0.0603	-0.1471	-0.0893	-0.1805	0.0276
	(0.85)	(0.99)	(2.24)*	(1.72)	(2.95)**	(0.36)
Other religion	-0.0098	-0.0500	0.0303	-0.0866	-0.1043	-0.0666
	(0.28)	(1.04)	(0.59)	(2.21)*	(2.14)*	(1.06)
Rural infrastructure effects						
Rural resident	-0.0151	-0.0183	-0.0316	0.1007	0.0716	0.1019
	(0.30)	(0.28)	(0.38)	(1.76)	(0.96)	(1.17)
Rural*Distance to nearest town	-0.0006	-0.0007	-0.0004	-0.0004	0.0006	-0.0018
	(1.40)	(1.37)	(0.53)	(0.79)	(0.79)	(2.23)*
Rural*Distance pucca road	-0.0111	-0.0140	-0.0075	0.0003	0.0014	-0.0004
	(2.06)*	(2.07)*	(0.96)	(0.12)	(0.52)	(0.12)
Rural*Distance to pucca road* primary School	0.0127	0.0144	0.0091	0.0005	-0.0014	0.0019
	(2.32)*	(2.07)*	(1.11)	(0.23)	(0.48)	(0.54)
Rural*Distance to pucca road* girl	-0.0030	----	----	-0.0004	----	----
	(0.95)	----	----	(0.32)	----	----
Rural* Village electrified	0.0120	0.0069	0.0253	0.0199	0.0272	0.0083
	(0.55)	(0.25)	(0.68)	(0.98)	(1.00)	(0.27)
Rural* Primary School in village	0.0094	0.0402	-0.0404	-0.0332	-0.0198	-0.0376
	(0.32)	(1.07)	(0.80)	(1.23)	(0.54)	(0.97)

Rural* Middle School in village	0.0014	0.0131	-0.0084	-0.0028	-0.0250	0.0289
	(0.07)	(0.51)	(0.27)	(0.16)	(1.08)	(1.24)
Rural* Secondary School in village	0.0525	0.0629	0.0315	0.0321	0.0333	0.0288
	(2.58)**	(2.30)*	(0.97)	(1.70)	(1.27)	(1.10)
Rural* Bank in village	0.0251	0.0132	0.0463	-0.0216	-0.0412	-0.0063
	(1.16)	(0.44)	(1.45)	(1.02)	(1.39)	(0.22)
Rural* Post Office in village	-0.0442	-0.0611	-0.0179	0.0284	0.0290	0.0282
	(2.21)*	(2.31)*	(0.57)	(1.68)	(1.25)	(1.18)
Rural*Number of tv sets in village per 1000 habitants	0.0011	0.0009	0.0016	0.0000	0.0006	0.0000
	(2.82)**	(1.83)	(2.18)*	(0.33)	(1.90)	(0.11)
Rural* missing number of tv sets	-0.0799	-0.0488	-0.1264	-0.0336	0.0069	-0.0739
	(1.04)	(0.49)	(1.03)	(0.82)	(0.13)	(1.15)
State fixed effects	yes	yes	yes	yes	yes	yes
Variables available only for 1998/99						
Other Backward Caste	----	----	----	-0.0086	-0.0135	-0.0059
	----	----	----	(0.52)	(0.61)	(0.24)
Missing Caste	----	----	----	-0.0751	-0.0700	-0.0815
	----	----	----	(2.32)*	(1.67)	(1.64)
Missing religion	----	----	----	-0.0711	0.2358	-0.0742
	----	----	----	(0.42)	(0.89)	(0.42)
Mean dependent variable	**0.6530**	**0.6473**	**0.6612**	**0.6167**	**0.6156**	**0.6181**
Observations	10834	6175	4659	11659	6476	5183
Pseudo R-squared	0.1608	0.1468	0.2000	0.2093	0.1951	0.2465
Pseudo R-squared due to state fixed effects	0.0273	0.0243	0.0346	0.0519	0.0473	0.0628
Log Pseudolikelihood	-5868	-3419	-2386	-6136	-3472	-2596
Wald Chi2	1363**	765**	653**	1914**	1102**	921**
F assets effects	107**	58**	53**	75**	40**	41**
F rural*assets effects	37**	28**	14	17	14	16
F Village vars. Effects	37**	28**	13	13	12	15
F Household demographics	218**	131**	123**	435**	255**	221**
F state effects	365**	200**	186**	647**	363**	326**

Notes to Table 4: see Notes to Table 3.

Table 6: Stage-2 Results
Regression of the State Fixed Effects on State-Level Variables

	Attendance			Completion		
	All	**Boys**	**Girls**	**All**	**Boys**	**Girls**
log real GNP p.c.	1.448**	1.240**	1.637**	-0.457	-0.659	-0.249
	[4.70]	[3.65]	[5.21]	[0.64]	[0.93]	[0.33]
log (development expenditure/GNP)	0.667*	0.677*	0.694*	1.274	1.445*	1.141
	[2.32]	[2.27]	[2.21]	[1.89]	[2.14]	[1.63]
log (education expend/GNP)	1.450*	1.257	1.598**	-1.038	-1.376	-0.733
	[2.71]	[2.12]	[3.11]	[1.07]	[1.45]	[0.71]
rural poverty gap index	-0.009**	-0.010**	-0.008	-0.004	-0.004	-0.004
	[2.99]	[3.55]	[1.82]	[0.54]	[0.49]	[0.50]
urban poverty gap index	0.014	0.016*	0.012	0.001	-0.005	0.006
	[1.69]	[2.27]	[0.97]	[0.07]	[0.29]	[0.32]
rural/urban mean p.c. consumption	0.346**	0.231*	0.433**	0.251	0.178	0.332
	[3.50]	[2.19]	[4.59]	[1.09]	[0.75]	[1.57]
female illiteracy rate	-1.245**	-0.495	-1.969**	-2.368**	-2.303**	-2.701**
	[4.33]	[1.38]	[6.31]	[3.36]	[3.02]	[4.11]
female/male illiteracy rate	0.084	0.285	-0.091	-0.232	-0.164	-0.399
	[0.44]	[1.40]	[0.42]	[0.68]	[0.47]	[1.15]
female/male teachers in prim school	0.004**	0.005**	0.004*	-0.010**	-0.009*	-0.012**
	[3.69]	[3.97]	[2.38]	[3.03]	[2.69]	[3.56]
number of elementary schools	0.000**	0.000*	0.000**	-0.000	-0.000	0.000
	[3.82]	[2.39]	[4.44]	[0.20]	[0.43]	[0.11]
dummy for year-98/99	-0.590**	-0.455**	-0.705**	0.345	0.457*	0.205
	[5.00]	[3.67]	[5.74]	[1.68]	[2.36]	[0.89]
Constant	2.475**	1.774**	3.137**	2.486*	2.219*	3.053**
	[4.37]	[3.46]	[4.26]	[2.56]	[2.12]	[3.13]
Observations	28	28	28	28	28	28
R-squared	0.89	0.84	0.91	0.71	0.72	0.71

Notes: The state fixed effects are estimates from Tables 4 and 5. All reported standard errors are robust to heteroskedasticity. Year-1 is 1992/3 and year-2 is 1998/9; these refer to the two rounds of the NFHS survey. The regressors are, in each round, averages over the six years preceding the date of the survey.

Table 7: Decomposition & Prediction Based on the Linear Probability Model

	Attendance			Completion		
	Total	Boys	Girls	Total	Boys	Girls
Predicted Change between 1992/93 and 1998/99	**13.10%**	**9.79%**	**16.66%**	**4.05%**	**3.40%**	**4.98%**
	(0.0036)	(0.0042)	(0.0051)	(0.0084)	(0.0111)	(0.0129)
1. Predicted Change due to variables	**9.32%**	**7.56%**	**11.17%**	**3.06%**	**2.16%**	**4.45%**
	(0.0030)	(0.0034)	(0.0042)	(0.0067)	(0.0423)	(0.0104)
Decomposition of the change due to variables						
1.1. Child demographics (age and gender)	-0.004%	0.011%	-0.048%	0.132%	----	----
	(0.0005)	(0.0004)	(0.0003)	(0.0005)	----	----
1.2. Assets	0.285%	0.041%	0.556%	0.540%	0.279%	1.177%
	(0.0009)	(0.0011)	(0.0013)	(0.0024)	(0.0030)	(0.0042)
1.3. Household adult education	0.682%	0.560%	0.805%	0.732%	0.146%	1.764%
	(0.0011)	(0.0010)	(0.0016)	(0.0017)	(0.0020)	(0.0029)
1.4. Household demographics	0.424%	0.317%	0.536%	-0.481%	-0.356%	-0.326%
	(0.0005)	(0.0005)	(0.0007)	(0.0011)	(0.0014)	(0.0019)
1.5. Principal female working	-0.186%	-0.181%	-0.185%	0.069%	0.065%	0.063%
	(0.0003)	(0.0003)	(0.0004)	(0.0005)	(0.0006)	(0.0008)
1.6. Ethnicity	-0.143%	-0.084%	-0.202%	0.179%	0.128%	0.247%
	(0.0004)	(0.0005)	(0.0005)	(0.0010)	(0.0013)	(0.0015)
1.7 Religion	-0.043%	-0.060%	-0.024%	0.120%	0.183%	0.051%
	(0.0002)	(0.0003)	(0.0002)	(0.0007)	(0.0010)	(0.0008)
1.8. Rural villages supply	0.467%	0.384%	0.580%	-0.195%	-0.396%	-0.225%
	(0.0007)	(0.0009)	(0.0011)	(0.0020)	(0.0029)	(0.0036)
1.9. State variables	7.840%	6.573%	9.147%	1.961%	2.108%	1.701%
	(0.0023)	(0.0029)	(0.0033)	(0.0057)	(0.0075)	(0.0086)
2. Predicted Change due to coefficients	**3.77%**	**2.23%**	**5.49%**	**0.99%**	**1.24%**	**0.53%**
	(0.0017)	(0.0021)	(0.0024)	(0.0044)	(0.0423)	(0.0066)
Predicted Annual change due to variables	**1.55%**	**1.26%**	**1.86%**	**0.51%**	**0.36%**	**0.74%**
Schooling level in 1998/99	*82.52%*	*86.03%*	*78.72%*	*61.67%*	*61.56%*	*61.81%*
	Linear Prediction					
Predicted schooling level to 2015	**100%**	**100%**	**100%**	**69.82%**	**67.31%**	**73.68%**
	Compound rate prediction					
Predicted schooling level to 2015	**100%**	**100%**	**100%**	**66.89%**	**65.20%**	**69.57%**

Notes: The changes are in percentages and the standard deviation in parenthesis. The linear probability models upon which the decomposition is based are reported in Appendix Tables 1 and 2. Row 1 shows the predicted total change. This total change is decomposed into the change attributable to included regressors or variables (1) and the change associated with changes in coefficients (2). The change due to variables is estimated as $\left(\sum_k X_{98,k} b_k^*\right) - \left(\sum_k X_{92,k} b_k^*\right)$, where β^*_k are the coefficients estimated by pooling the data for the two NFHS rounds, 1992/3 and 1998/99. This is further decomposed into the contribution of nine groups of variables. The "predicted annual change due to variables" is simply the "predicted change due to variables" divided by 6, this being the number of years between 1992/3 and 1998/9. Linear predictions to the year 2015 (strictly, to 2014/2015) are made by adding to the 1998/99 schooling level the predicted change to 2015, which is the result of multiplying the annual changes by 16, the number of years between 1998/9 and

2014/2015. Compound rate predictions to 2015 are made by multiplying the 1998/99 schooling level by (1+annual change)[16].

Appendix Table 1. Linear Probability Model of School Attendance for Children aged 6-11

	NFHS1992/93			NFHS1998/99		
	Total	Boys	Girls	Total	Boys	Girls
Age 7	0.1193	0.1201	0.0878	0.0889	0.0904	0.0724
	(12.54)**	(12.60)**	(9.12)**	(11.40)**	(11.64)**	(8.50)**
Age 8	0.1660	0.1672	0.0922	0.0946	0.0959	0.0681
	(18.92)**	(19.04)**	(10.15)**	(13.14)**	(13.36)**	(8.48)**
Age 9	0.1664	0.1717	0.1048	0.1010	0.1074	0.0724
	(17.80)**	(18.37)**	(10.67)**	(13.03)**	(13.89)**	(8.26)**
Age 10	0.1598	0.1618	0.0729	0.0830	0.0865	0.0251
	(17.82)**	(18.01)**	(7.82)**	(11.02)**	(11.42)**	(2.95)**
Age 11	0.1537	0.1656	0.0494	0.0725	0.0823	0.0094
	(15.98)**	(17.17)**	(4.66)**	(8.70)**	(9.84)**	(0.97)
female* Age 6	-0.0874	----	----	-0.0509	----	----
	(8.49)**	----	----	(5.61)**	----	----
female* Age 7	-0.1195	----	----	-0.0671	----	----
	(12.01)**	----	----	(8.41)**	----	----
female* Age 8	-0.1617	----	----	-0.0771	----	----
	(18.05)**	----	----	(10.40)**	----	----
female* Age 9	-0.1410	----	----	-0.0743	----	----
	(14.28)**	----	----	(9.05)**	----	----
female* Age 10	-0.1696	----	----	-0.1073	----	----
	(18.71)**	----	----	(13.76)**	----	----
female* Age 11	-0.1788	----	----	-0.1048	----	----
	(16.89)**	----	----	(11.03)**	----	----
Pucca house	0.0152	0.0053	0.0307	0.0071	0.0051	0.0076
	(1.65)	(0.48)	(2.34)*	(0.90)	(0.53)	(0.69)
Own flush toilet	-0.0196	-0.0055	-0.0359	-0.0110	-0.0021	-0.0226
	(2.24)*	(0.54)	(2.80)**	(1.59)	(0.26)	(2.27)*
Electricity	0.0834	0.0776	0.0874	0.0849	0.0705	0.1007
	(5.84)**	(4.46)**	(4.40)**	(5.09)**	(3.38)**	(4.37)**
Potable water into the house	0.0008	-0.0054	0.0072	0.0098	0.0040	0.0177
	(0.08)	(0.47)	(0.53)	(1.29)	(0.43)	(1.67)
Separate room for cooking	0.0052	0.0118	0.0001	0.0190	0.0181	0.0205
	(0.54)	(1.03)	(0.01)	(2.59)**	(2.12)*	(1.92)
Land owner	-0.0213	-0.0013	-0.0455	0.0105	0.0142	0.0096
	(2.29)*	(0.11)	(3.28)**	(1.39)	(1.58)	(0.89)
Livestock owner	0.0041	0.0095	-0.0008	0.0214	0.0238	0.0184
	(0.35)	(0.70)	(0.05)	(2.20)*	(2.09)*	(1.35)
Durables index	0.0173	0.0134	0.0217	0.0030	0.0035	0.0026
	(6.44)**	(4.16)**	(5.60)**	(1.31)	(1.18)	(0.81)
Rural* pucca house	0.0084	0.0014	0.0110	0.0044	-0.0079	0.0194
	(0.69)	(0.10)	(0.64)	(0.46)	(0.69)	(1.45)
Rural* own flush toilet	-0.0038	-0.0112	-0.0039	-0.0111	-0.0194	0.0017
	(0.29)	(0.77)	(0.20)	(1.13)	(1.74)	(0.12)
Rural* electricity	-0.0211	-0.0336	-0.0024	-0.0622	-0.0593	-0.0634
	(1.38)	(1.79)	(0.11)	(3.58)**	(2.74)**	(2.63)**
Rural* potable water into the house	0.0248	0.0311	0.0210	-0.0006	0.0048	-0.0090
	(2.18)*	(2.25)*	(1.31)	(0.07)	(0.43)	(0.69)
Rural* separate room for cooking	0.0478	0.0375	0.0567	0.0110	0.0099	0.0113

	(4.33)**	(2.79)**	(3.65)**	(1.25)	(0.96)	(0.88)
Rural* land owner	0.0687	0.0662	0.0722	0.0267	0.0382	0.0113
	(6.00)**	(4.72)**	(4.38)**	(2.82)**	(3.37)**	(0.84)
Rural* livestock owner	-0.0191	-0.0198	-0.0216	-0.0114	-0.0201	-0.0018
	(1.43)	(1.22)	(1.14)	(1.02)	(1.52)	(0.12)
Rural*Durables index	0.0119	0.0078	0.0161	0.0263	0.0224	0.0302
	(2.85)**	(1.58)	(2.61)**	(7.73)**	(5.28)**	(6.37)**
Schooling years of highest educated adult	0.0215	0.0172	0.0262	0.0139	0.0111	0.0172
	(31.26)**	(21.49)**	(26.20)**	(25.37)**	(16.86)**	(21.83)**
Highest educated adult is female	-0.0440	-0.0522	-0.0339	-0.0237	-0.0236	-0.0232
	(7.98)**	(7.78)**	(4.38)**	(5.39)**	(4.48)**	(3.62)**
Log Household size	-0.0352	-0.0322	-0.0454	-0.0428	-0.0455	-0.0431
	(6.63)**	(4.62)**	(6.35)**	(8.79)**	(7.37)**	(6.38)**
Proportion of female members under five	-0.1611	-0.1186	-0.2115	-0.1779	-0.0978	-0.2572
	(4.92)**	(2.75)**	(4.72)**	(6.26)**	(2.70)**	(6.36)**
Proportion of male members under five	-0.1540	-0.1093	-0.2164	-0.1845	-0.1410	-0.2332
	(4.68)**	(2.54)*	(4.81)**	(6.50)**	(3.92)**	(5.77)**
Proportion of female members aged 6 to 16	-0.0088	0.0188	-0.0596	-0.0283	-0.0158	-0.0419
	(0.29)	(0.50)	(1.35)	(1.12)	(0.52)	(1.07)
Proportion of male members aged 6 to 16	-0.0502	-0.1070	0.0204	-0.1088	-0.1335	-0.0864
	(1.62)	(2.62)**	(0.48)	(4.11)**	(3.88)**	(2.32)*
Proportion of female members aged 17 to 30	0.1595	0.1446	0.1721	0.1902	0.1703	0.2138
	(6.22)**	(4.47)**	(4.78)**	(8.93)**	(6.65)**	(6.80)**
Proportion of male members aged 17 to 30	-0.1734	-0.1628	-0.1963	-0.1425	-0.0952	-0.2088
	(6.11)**	(4.51)**	(4.91)**	(5.87)**	(3.21)**	(5.88)**
Proportion of female members aged more than 50	0.0798	0.0296	0.1422	0.0193	0.0105	0.0127
	(2.13)*	(0.63)	(2.63)**	(0.61)	(0.26)	(0.27)
Proportion of male members aged more than 50	0.0407	0.0159	0.0527	-0.0488	-0.0704	-0.0257
	(0.99)	(0.30)	(0.91)	(1.33)	(1.54)	(0.48)
Household head female	0.0416	0.0351	0.0491	0.0301	0.0108	0.0528
	(4.12)**	(2.76)**	(3.57)**	(3.69)**	(1.04)	(4.57)**
Child of head	0.0155	0.0153	0.0161	0.0104	0.0208	0.0009
	(2.47)*	(1.89)	(1.82)	(1.81)	(2.89)**	(0.11)
Principal female working	-0.0400	-0.0462	-0.0336	-0.0517	-0.0427	-0.0609
	(7.61)**	(6.90)**	(4.72)**	(10.60)**	(7.13)**	(8.80)**
Rural resident	-0.1132	-0.0904	-0.1370	-0.0030	0.0077	-0.0165
	(6.45)**	(4.04)**	(5.71)**	(0.15)	(0.30)	(0.59)
Scheduled caste	-0.0252	-0.0176	-0.0337	-0.0153	-0.0106	-0.0196
	(3.41)**	(1.85)	(3.33)**	(2.80)**	(1.58)	(2.50)*
scheduled tribe	-0.0878	-0.0950	-0.0779	-0.0863	-0.0933	-0.0777
	(9.47)**	(7.97)**	(6.35)**	(10.37)**	(8.91)**	(6.60)**
Muslim	-0.0668	-0.0851	-0.0479	-0.0425	-0.0625	-0.0226
	(8.81)**	(8.72)**	(4.75)**	(6.36)**	(7.51)**	(2.51)*
Christian	-0.0181	-0.0222	-0.0255	0.0306	0.0430	0.0177
	(1.36)	(1.35)	(1.33)	(2.28)*	(2.80)**	(0.85)
Other religion	-0.0280	-0.0293	-0.0219	-0.0418	-0.0508	-0.0244
	(2.50)*	(2.10)*	(1.37)	(3.91)**	(3.80)**	(1.68)
Rural*Distance to nearest town	-0.0002	-0.0001	-0.0004	-0.0006	-0.0007	-0.0005
	(1.35)	(0.48)	(1.66)	(3.29)**	(3.02)**	(1.79)
Rural*Distance pucca road	-0.0012	-0.0047	-0.0014	0.0032	0.0016	0.0041
	(0.61)	(1.86)	(0.60)	(3.27)**	(1.29)	(3.21)**
Rural*Distance to pucca road* primary School	0.0008	0.0021	0.0001	-0.0023	-0.0013	-0.0034
	(0.39)	(0.81)	(0.03)	(2.32)*	(1.07)	(2.56)*
Rural*Distance to pucca road* girl	-0.0036	----	----	-0.0008	----	----

	(3.94)**	----	----	(1.91)	----	----
Rural* Village electrified	0.0154	0.0208	0.0128	0.0397	0.0323	0.0454
	(1.96)	(2.07)*	(1.22)	(5.23)**	(3.47)**	(4.28)**
Rural* Primary School in village	0.0292	0.0422	0.0140	0.0246	0.0226	0.0301
	(2.77)**	(3.10)**	(0.99)	(2.51)*	(1.89)	(2.20)*
Rural* Middle School in village	0.0234	0.0082	0.0365	-0.0012	-0.0014	0.0007
	(3.21)**	(0.88)	(3.68)**	(0.19)	(0.19)	(0.08)
Rural* Secondary School in village	0.0070	0.0010	0.0142	0.0081	0.0055	0.0092
	(0.91)	(0.10)	(1.32)	(1.23)	(0.68)	(0.95)
Rural* Bank in village	0.0064	0.0045	0.0087	-0.0013	0.0035	-0.0061
	(0.82)	(0.47)	(0.77)	(0.19)	(0.43)	(0.61)
Rural* Post Office in village	-0.0110	-0.0130	-0.0058	-0.0106	-0.0084	-0.0121
	(1.56)	(1.45)	(0.61)	(1.78)	(1.14)	(1.43)
Rural*Number of tv sets in village per 1000 habitants	0.0002	-0.0000	0.0005	0.0000	-0.0000	0.0000
	(2.47)*	(0.29)	(3.41)**	(1.72)	(0.13)	(7.72)**
Rural* missing number of tv sets	0.0445	0.0231	0.0837	-0.0012	0.0201	-0.0231
	(1.53)	(0.61)	(2.09)*	(0.09)	(1.34)	(1.15)
State-level variables						
log real GNP p.c.	0.3546	0.3739	0.3321	0.0162	0.0841	-0.0578
	(13.88)**	(11.81)**	(9.29)**	(1.11)	(4.84)**	(2.72)**
log(development expenditure/GNP)	0.0460	0.0528	0.0357	0.0032	0.0497	-0.0482
	(1.78)	(1.65)	(0.99)	(0.15)	(1.93)	(1.57)
log(education expenditure/GNP)	0.3416	0.3837	0.2984	-0.0916	-0.0223	-0.1684
	(9.01)**	(8.20)**	(5.65)**	(4.85)**	(0.98)	(6.17)**
rural poverty gap index	-0.0080	-0.0051	-0.0112	0.0003	-0.0004	0.0011
	(8.99)**	(4.49)**	(9.05)**	(1.14)	(1.14)	(2.80)**
urban poverty gap index	0.0049	0.0039	0.0063	0.0032	0.0014	0.0051
	(2.89)**	(1.87)	(2.65)**	(5.44)**	(1.96)*	(5.94)**
rural/urban mean p.c. consumption	-0.2004	-0.0035	-0.4175	0.0596	0.0288	0.0925
	(4.64)**	(0.06)	(6.84)**	(9.77)**	(3.78)**	(10.53)**
female illiteracy rate	0.1214	0.2566	-0.0367	-0.2342	-0.0231	-0.4667
	(2.08)*	(3.53)**	(0.46)	(9.13)**	(0.77)	(12.27)**
female/male illiteracy rate	0.2040	0.2022	0.1964	-0.0512	0.0164	-0.1229
	(5.61)**	(4.45)**	(3.93)**	(4.22)**	(1.12)	(7.00)**
female/male teachers in prim school	-0.0161	-0.0070	-0.0269	0.0004	0.0004	0.0005
	(4.61)**	(1.61)	(5.50)**	(3.01)**	(2.01)*	(2.30)*
Constant	0.6754	0.5345	0.8010	0.6001	0.5327	0.6231
	(8.80)**	(5.57)**	(7.50)**	(11.31)**	(8.16)**	(8.38)**
Observations	57740	30159	27581	56201	29212	26989
R-squared	0.28	0.22	0.33	0.18	0.15	0.21

Robust t statistics in parentheses
* significant at 5%; ** significant at 1%

Appendix Table 2. Linear Probability Model of School Completion for children aged 12 years

	NFHS1992/93			NFHS1998/99		
	Total	Boys	Girls	Total	Boys	Girls
Female	-0.0388	---	---	-0.0514	---	---
	(2.62)**	---	---	(4.07)**	---	---
Pucca house	0.0266	0.0385	0.0031	0.0231	0.0418	0.0067
	(1.16)	(1.25)	(0.09)	(1.08)	(1.45)	(0.21)
Own flush toilet	-0.0271	-0.0442	-0.0116	0.0475	0.0517	0.0382

	(1.27)	(1.51)	(0.36)	(2.37)*	(1.88)	(1.32)
Electricity	0.1061	0.1299	0.0697	0.1214	0.0868	0.1674
	(2.80)**	(2.64)**	(1.17)	(2.90)**	(1.64)	(2.53)*
Potable water into the house	0.0030	0.0139	-0.0074	0.0144	0.0143	0.0113
	(0.13)	(0.42)	(0.22)	(0.70)	(0.49)	(0.38)
Separate room for cooking	0.0425	0.0369	0.0535	0.0399	0.0485	0.0265
	(1.77)	(1.11)	(1.53)	(1.89)	(1.64)	(0.89)
Land owner	0.0125	0.0115	0.0184	-0.0150	-0.0097	-0.0248
	(0.52)	(0.34)	(0.55)	(0.64)	(0.29)	(0.77)
Livestock owner	-0.0127	-0.0116	-0.0172	0.0087	0.0381	-0.0248
	(0.47)	(0.32)	(0.44)	(0.34)	(1.12)	(0.66)
Durables index	0.0306	0.0265	0.0355	0.0061	0.0007	0.0139
	(4.64)**	(2.91)**	(3.72)**	(0.94)	(0.08)	(1.42)
Rural* pucca house	-0.0067	-0.0107	0.0115	-0.0007	-0.0027	-0.0077
	(0.22)	(0.26)	(0.25)	(0.03)	(0.08)	(0.19)
Rural* own flush toilet	0.0162	0.0157	0.0173	-0.0231	-0.0662	0.0291
	(0.50)	(0.35)	(0.37)	(0.77)	(1.61)	(0.66)
Rural* electricity	-0.0305	-0.0550	0.0136	-0.0692	-0.0634	-0.0845
	(0.76)	(1.05)	(0.21)	(1.58)	(1.13)	(1.22)
Rural* potable water into the house	0.0088	0.0140	-0.0057	-0.0273	-0.0322	-0.0136
	(0.31)	(0.36)	(0.14)	(1.13)	(0.96)	(0.39)
Rural* separate room for cooking	-0.0084	-0.0179	0.0144	-0.0201	-0.0278	-0.0080
	(0.30)	(0.47)	(0.34)	(0.82)	(0.82)	(0.23)
Rural* land owner	0.0543	0.0596	0.0397	0.0271	0.0370	0.0304
	(1.84)	(1.47)	(0.93)	(1.00)	(0.97)	(0.79)
Rural* livestock owner	-0.0356	-0.0096	-0.0700	-0.0068	-0.0361	0.0253
	(1.11)	(0.22)	(1.47)	(0.23)	(0.92)	(0.59)
Rural*Durables index	-0.0108	-0.0099	-0.0138	0.0239	0.0331	0.0117
	(1.05)	(0.70)	(0.90)	(2.59)**	(2.68)**	(0.85)
Schooling years of highest educated adult	0.0175	0.0166	0.0199	0.0201	0.0202	0.0202
	(10.28)**	(7.33)**	(7.72)**	(13.58)**	(9.99)**	(9.35)**
Highest educated adult is female	0.0462	0.0412	0.0493	0.0347	0.0337	0.0336
	(3.43)**	(2.35)*	(2.35)*	(2.92)**	(2.09)*	(1.92)
Log Household size	-0.0220	-0.0122	-0.0363	-0.0220	-0.0178	-0.0357
	(1.60)	(0.65)	(1.73)	(1.80)	(1.08)	(1.97)*
Proportion of female members under five	-0.0907	-0.0178	-0.1776	-0.4848	-0.3181	-0.6738
	(0.95)	(0.14)	(1.28)	(5.59)**	(2.68)**	(5.36)**
Proportion of male members under five	-0.3044	-0.2244	-0.4076	-0.4751	-0.2775	-0.6948
	(3.12)**	(1.75)	(2.68)**	(5.60)**	(2.41)*	(5.54)**
Proportion of female members aged 6 to 16	-0.0063	0.0185	-0.0738	-0.0569	0.0903	-0.2514
	(0.08)	(0.18)	(0.65)	(0.90)	(1.06)	(2.64)**
Proportion of male members aged 6 to 16	-0.0573	-0.0105	-0.0882	-0.2664	-0.1686	-0.3546
	(0.76)	(0.10)	(0.77)	(4.03)**	(1.87)	(3.63)**
Proportion of female members aged 17 to 30	-0.0178	-0.0099	-0.0140	-0.0646	-0.0318	-0.1040
	(0.26)	(0.11)	(0.14)	(1.12)	(0.41)	(1.19)
Proportion of male members aged 17 to 30	-0.2906	-0.3358	-0.2570	-0.4379	-0.3885	-0.4980
	(3.85)**	(3.39)**	(2.22)*	(6.57)**	(4.39)**	(4.94)**
Proportion of female members aged more than 50	0.0389	0.0279	0.0613	-0.0751	0.0801	-0.2744
	(0.41)	(0.23)	(0.41)	(0.89)	(0.71)	(2.21)*
Proportion of male members aged more than 50	0.1568	0.1938	0.1225	0.0049	0.1637	-0.1763
	(1.68)	(1.60)	(0.84)	(0.06)	(1.51)	(1.41)
Household head female	-0.0051	0.0046	-0.0117	0.0565	0.0290	0.0913
	(0.22)	(0.14)	(0.35)	(2.79)**	(1.04)	(3.05)**
Child of head	-0.0196	-0.0445	0.0161	0.0184	0.0355	0.0002

	(1.22)	(2.13)*	(0.65)	(1.25)	(1.81)	(0.01)
Principal female working	-0.0104	-0.0309	0.0180	-0.0196	-0.0008	-0.0429
	(0.80)	(1.81)	(0.90)	(1.62)	(0.05)	(2.38)*
Rural resident	-0.0106	-0.0256	-0.0174	0.0690	0.0308	0.0853
	(0.23)	(0.42)	(0.23)	(1.37)	(0.48)	(1.08)
Scheduled caste	-0.0010	0.0121	-0.0250	-0.0078	-0.0064	-0.0051
	(0.06)	(0.50)	(0.80)	(0.56)	(0.34)	(0.24)
scheduled tribe	-0.1090	-0.0701	-0.1631	-0.0674	-0.0891	-0.0420
	(4.26)**	(2.13)*	(4.08)**	(3.43)**	(3.41)**	(1.40)
Muslim	-0.0714	-0.0883	-0.0478	-0.1054	-0.1338	-0.0760
	(3.81)**	(3.49)**	(1.71)	(6.72)**	(6.25)**	(3.36)**
Christian	-0.0158	0.0606	-0.1023	-0.0794	-0.1255	-0.0186
	(0.49)	(1.47)	(2.23)*	(2.23)*	(2.67)**	(0.34)
Other religion	-0.0679	-0.1046	-0.0257	-0.1075	-0.1225	-0.0968
	(2.50)*	(2.78)**	(0.66)	(3.46)**	(2.97)**	(2.11)*
Rural*Distance to nearest town	-0.0007	-0.0010	-0.0002	-0.0005	0.0005	-0.0017
	(1.45)	(1.67)	(0.32)	(0.97)	(0.81)	(2.43)*
Rural*Distance pucca road	-0.0155	-0.0150	-0.0158	-0.0002	0.0006	-0.0003
	(2.64)**	(2.37)*	(1.24)	(0.09)	(0.18)	(0.09)
Distance to pucca road* primary School	0.0166	0.0150	0.0169	0.0007	-0.0006	0.0012
	(2.77)**	(2.27)*	(1.30)	(0.29)	(0.19)	(0.34)
Distance to pucca road* girl	-0.0035	---	---	-0.0004	---	---
	(1.04)	---	---	(0.31)	---	---
Rural* Village electrified	0.0183	0.0091	0.0378	0.0295	0.0317	0.0251
	(0.87)	(0.34)	(1.08)	(1.63)	(1.33)	(0.89)
Rural* Primary School in village	0.0020	0.0390	-0.0538	-0.0405	-0.0245	-0.0475
	(0.07)	(1.08)	(1.08)	(1.66)	(0.76)	(1.29)
Rural* Middle School in village	0.0062	0.0120	0.0035	0.0114	-0.0096	0.0410
	(0.33)	(0.50)	(0.12)	(0.75)	(0.48)	(1.80)
Rural* Secondary School in village	0.0611	0.0704	0.0410	0.0346	0.0309	0.0369
	(3.09)**	(2.73)**	(1.36)	(2.05)*	(1.36)	(1.47)
Rural* Bank in village	0.0193	0.0092	0.0399	-0.0126	-0.0278	-0.0004
	(0.96)	(0.34)	(1.31)	(0.69)	(1.12)	(0.02)
Rural* Post Office in village	-0.0313	-0.0403	-0.0174	0.0194	0.0235	0.0143
	(1.70)	(1.68)	(0.61)	(1.27)	(1.16)	(0.63)
Rural*Number of tv sets in village per 1000 hab.	0.0002	0.0002	0.0002	0.0000	0.0007	-0.0000
	(1.29)	(0.62)	(1.61)	(0.11)	(2.05)*	(0.07)
Rural* missing number of tv sets	-0.1020	-0.0861	-0.1158	-0.0393	-0.0063	-0.0659
	(1.23)	(0.85)	(0.78)	(1.21)	(0.15)	(1.29)
State-level variables						
log real GNP p.c.	0.1825	0.1719	0.1873	0.1314	0.1246	0.1172
	(2.82)**	(2.05)*	(1.87)	(3.41)**	(2.45)*	(1.98)*
log(development expenditure/GNP)	0.2734	0.3044	0.2428	0.2648	0.3724	0.1564
	(4.13)**	(3.45)**	(2.44)*	(4.60)**	(4.76)**	(1.83)
log(education expenditure/GNP)	-0.0001	-0.0460	0.0303	-0.0225	-0.0393	-0.0402
	(0.00)	(0.37)	(0.21)	(0.46)	(0.60)	(0.54)
rural poverty gap index	0.0083	0.0088	0.0071	-0.0012	-0.0023	0.0000
	(3.50)**	(2.81)**	(1.98)*	(1.71)	(2.36)*	(0.04)
urban poverty gap index	0.0111	0.0081	0.0139	-0.0013	-0.0021	-0.0010
	(2.64)**	(1.44)	(2.19)*	(0.85)	(0.98)	(0.41)
rural/urban mean p.c. consumption	0.2741	0.3766	0.1207	0.0974	0.0782	0.1159
	(2.48)*	(2.52)*	(0.73)	(5.92)**	(3.53)**	(4.66)**
female illiteracy rate	-0.5735	-0.4999	-0.6729	-0.3691	-0.3380	-0.4780
	(4.03)**	(2.65)**	(3.09)**	(5.50)**	(3.84)**	(4.60)**

female/male illiteracy rate	-0.2981	-0.2611	-0.3436	-0.0046	0.0357	-0.0663
	(3.40)**	(2.24)*	(2.56)*	(0.15)	(0.86)	(1.43)
female/male teachers in prim school	0.0027	0.0004	0.0017	-0.0035	-0.0029	-0.0043
	(0.31)	(0.03)	(0.13)	(9.64)**	(5.97)**	(7.98)**
Constant	1.1718	0.9254	1.4308	0.9031	0.9425	0.8795
	(6.13)**	(3.60)**	(5.01)**	(6.77)**	(5.19)**	(4.43)**
Observations	8225	4807	3418	9240	5262	3978
R-squared	0.17	0.16	0.21	0.23	0.22	0.27

Robust t statistics in parentheses
* significant at 5%; ** significant at 1%