Consortium for Research on Educational Access, Transitions and Equity

Can Families in Rural India Bear the Additional Burden of Secondary Education? Investigating the Determinants of Transition

Gaurav Siddhu

CREATE PATHWAYS TO ACCESS
Research Monograph No. 50

November 2010



University of Sussex
Centre for International Education

Consortium for Research on
Educational Access, Transitions & Equity

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Address for correspondence:
CREATE,
Centre for International Education, Department of Education
School of Education & Social Work
Essex House, University of Sussex, Falmer BN1 9QQ
United Kingdom
Tel: + 44 (0) 1273 877984
Fax: + 44 (0) 1273 877534
Author email: g.siddhu@sussex.ac.uk
Website: http://www.create-rpc.org
Email create@sussex.ac.uk

Please contact CREATE using the details above if you require a hard copy of this publication.

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List of Acronyms

BMI	Body Mass Index
CFA	Confirmatory Factor Analysis
CREATE	Consortium for Research on Educational Access, Transitions and Equity
DHS	Demographic and Health Survey
DISE	District Information System for Education
EFA	Exploratory Factor Analysis
GOI	Government of India
RMSA	Rashtriya Madhyamik Shiksha Abhiyan
SSA	Sarva Shiksha Abhiyan
UP	Uttar Pradesh
GER	Gross Enrolment Rate

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Preface

This research monograph explores an under researched set of issues that surround the transition to secondary school on which surprisingly little work has been undertaken. It therefore breaks new ground in identifying the characteristics of who goes to secondary school and why in a district of Uttar Pradesh in India. If issues surrounding transition to secondary are not resolved it is clear that India will fail to reach the Millennium Development Goals and will also fall short of the targets it has set for itself in the 11th Five Year Plan. Universal levels of access to secondary are unattainable with current outputs from Grade 8, especially as these relate to socially excluded groups. Transition rates will also be diminished unless there are fewer over age children are and the costs of secondary schooling are low enough to be affordable by the poorest households.

Uniquely this study selects a cohort of children and tracks their progress over two years to establish patterns of transition and school choice. Costs and distance remain substantial obstacles to enrolment at secondary level for poor households. Costs in particular are exclusionary with even the cheapest option (from public primary school to private aided secondary) more than doubling costs to households. Girls are often less likely to transit than boys, and other groups remain under represented e.g. Muslims. The possible solution of improving access by building more secondary schools begs questions of costs and sustainable financing, and might not necessarily be the most efficient solution since small secondary schools can have high unit costs.

This study provides much to reflect on in relation to Rashtriya Madhyamik Shiksha Abhiyan which aims to achieve universal retention of children in secondary education by 2015. It is a very welcome contribution to what will be a central debate under the 12th Five Year Plan – how to ensure that India educates most of its children to secondary level as China already does. It complements work on the transition to secondary school that CREATE has supported in East and West Africa which is also becoming an African educational dilemma.

Keith Lewin
Director of CREATE
Centre for International Education
University of Sussex

Summary

India has witnessed a major expansion in participation in basic education in recent years, in the context of a major programme for its promotion: Sarva Shiksha Abhiyan (SSA). Despite a significantly improved picture at the basic level, a considerable proportion of children continue to drop out before reaching the secondary level. Over half of children who enrol in grade one do not make it to grade eight, and of those who do complete their basic education (grades one through eight), only 88 percent go on to participate in secondary schooling. Problems surrounding retention are more acute in rural areas of India, and as the country is a predominantly rural society, this study focuses on a farming district of Uttar Pradesh. It is in this dual context of drop out and rural villages that the present study investigates the factors influencing parents' decision whether or not to send their children to secondary schooling.

The study draws upon an expanded vision of access to education, embodied in zone 4 of CREATE's framework for considering access and transition in education: looking at those children who complete the primary cycle but who do not make the transition to secondary education. The study focuses on four key aspects in parental school decision making: incentives leading parents to view investment in education as worthwhile; the cost of secondary education; distance to secondary schools; and the impact of health-related factors. The study is based on survey data collected by the author over the first two school years of a four-year longitudinal study: 2008-09 and 2009-10; and the data is analysed using multivariate analysis to identify factors in transition and drop out. Overall the effect of additional cost and distance to secondary schooling proves significant, with cost being the most consistent factor, while distance is found to have a more nuanced effect. The study is particularly relevant in the context of the Government of India's latest major initiative, Rashtriya Madhyamik Shiksha Abhiyan which aims to achieve universal retention of children in secondary education by 2015, and has implications for the direction that interventions under this programme should take.

Can Families in Rural India Bear the Additional Burden of Secondary Education? Investigating the Determinants of Transition

1. Introduction

India's sustained economic growth has strengthened the case for investment in secondary schooling; and while there is a strong economic justification for such investment, the case for the attendant social returns may be even stronger. Expansion in secondary education may improve beneficiaries' lives through increasing marriage age, reducing fertility rates and improved birth practices, amongst other reasons (Wolfe and Zovekas, 1995). India has witnessed considerable expansion in participation in basic education in recent years, in the context of a major programme for its promotion: Sarva Shiksha Abhiyan (SSA, started in 2001). While participation has improved, almost half of children who enrol in grade one do not make it to grade eight, and of those who do complete the cycle, only around 88 percent go on to participate in secondary schooling (GOI, 2007c).

Despite market demand for secondary education, the country's gross enrolment rate (GER) of 40 percent at secondary level is far below those of its competitors in East Asia and Latin America with average GERs of 70 percent and 82 percent respectively (World Bank, 2009). Also, the participation at the secondary levels is highly unequal, with the enrolment rate for children in the highest expenditure quintile being 70 percent, while it is only 30 percent for children from the lowest expenditure quintile. In addition, the participation rate in rural areas is 20 percentage points lower than that of urban areas (ibid). Additionally, the problem of poor participation at the secondary level is much more severe for girls and children from 'backward' castes (Borooah and Iyer, 2005). In spite of evidence illustrating this problem, very little is known about what causes these children to be excluded from the secondary schooling system.

This paper attempts to fill a wide gap in the abundant literature on Indian education: there is at present virtually no reported research on the determinants of transition to secondary schooling. Additionally there are no longitudinal studies focusing on this topic, despite an acceptance in the methodological literature that following children over a course of years leads to a deeper understanding of educational paths chosen, and allows judgments as to causality to be made (Cohen et al., 2007). In addition to this more robust method of investigating transition, the study focuses on a rural district of Uttar Pradesh (UP) since problems surrounding retention are more acute in rural areas, and as the country is still predominantly agrarian.

The study draws upon a broader conceptualisation of access to education, as depicted in CREATE's framework of exclusion which outlines six different situations in which children become excluded from education at different levels, or are at risk of becoming so (see Appendix 2). Zone 4 is defined as a child's ceasing his or her education having completed primary education (in this case upper primary schooling, or grade 8) but having failed to enter secondary schooling (Lewin, 2007). The focus of the study is to identify the factors that prevent such children from transitioning to secondary level. It is hypothesised that additional cost and distance (meaning the difference between the cost of and distance to the secondary school and the upper-primary school the child was attending) may lead to children dropping out of education, and that these factors may prove more influential in the case of girls and traditionally disadvantaged groups. The effect of cost and distance has been studied under

two different scenarios: scenario 1 analyses the effect of additional cost and distance to the secondary schools nearest the child's home, while scenario 2 analyses the effect of additional distance and cost to the secondary school of the same type (as the child was attending at upper-primary level), nearest the child's home. The study is based on survey data collected by the author over the first two school years of a four-year longitudinal study: 2008-09 and 2009-10, coinciding with the launch of a major new initiative of the Government of India to ensure universal transition to lower secondary school by 2015: Rashtriya Madhyamik Shiksha Abhiyan (RMSA).

Section 2 will review the literature on school participation, while section 3 explains the situation of secondary education in India. The paper then moves on to explaining the methodology and the context in which the study was carried out. Section 5 presents qualitative and descriptive bivariate analysis, while section 6 presents the main results from the multivariate analysis. The seventh and last section outlines conclusions and policy implications of the research.

2. What motivates families and makes children want to study?

While there is a large body of research available investigating factors influencing school participation in general, there is hardly any research available with transition as its core focus (Hunt, 2008). A substantial number of research papers are available, mostly done using non-experimental data, to identifying factors influencing school participation and achievement. The research papers have identified school participation as a function of demand and supply factors as well as government policies (for example Glewwe and Jacoby, 1994 & 1995; Dreze and Kingdon, 2001).

A large volume of available literature which is discussed in the following two sections looks at the impact of demand side factors: school participation being determined by the perceived costs and benefits of staying in school. These costs include direct costs, opportunity costs of wage income and/or home production forgone. On the benefit side are economic gains resulting from the higher wages available from jobs attainable with more education, as well as non-income benefits though better health and through families' increased participation in community and public life. Another stream of literature in this area examines aspects of family background characteristics namely family income, parental education and children's characteristics. Besides these demand-side factors studies also analysed the impact of supply factors such as schools availability and quality of education on school participation. This section briefly attempts to present the key studies on this area.

2.1 Factors related to school supply and quality

The cost of schooling is discussed in the literature as being a significant factor in participation, with many studies illustrating the boom effect that fee abolition has had on enrolments in several countries (Rose, 2002). However most of these studies have focused on the primary level, while there is a lack of complimentary evidence for secondary education. The research has moved on significantly in recent decades, with an early study that examined the effect of charging school fees citing evidence that suggested that 'price elasticity of demand is low' (Jimenez and Lockheed 1995, cited in Glewwe and Kremer, 2005:23).

More recent studies, having utilised both survey data (Arunatilake, 2006; Deininger, 2003; Ohba, 2009) as well as data obtained through randomised trial studies (Kremer et al, 2007), have found participation to be more responsive to cost levels than suggested by Jimenez and Lockeed. Direct costs of schooling have been found to negatively affect the attendance of children: Chandrashekhar and Mukhopadhyay's research (2006) found that a very small increase of Rs. 190 per annum in the cost of primary schooling reduces the likelihood of a rural Indian child going to school by 3 percentage points, and this cost effect was much larger for children from scheduled caste families and from families in the lowest income quartile.

Deninger (2003) too found that reduction in the cost of primary schooling increases the likelihood of children and particularly girls from poor rural Ugandan families attending primary school. A similar affect was captured through randomised trial studies; Schultz (2004) in evaluating the effects of the PROGRESA programme in Mexico (through which a cash grant is given to mothers conditional on their children's attendance) found increased educational attainment amongst the poor (0.66 years) and increased transition to junior secondary school (20 percent increase for girls and 10 percent for boys).

Logically distance and travel times to schools might be considered significant factors, however the effects of these factors have been found to be ambiguous. One study from Ghana (Glewwe and Jacoby, 1995) found differing effects of travel time with regard to primary and middle school levels. The travel time to primary school was found to significantly affect delays in enrolment, but not the age of dropout. Conversely travel time to middle school was shown to significantly affect dropout age but does not affect delay in enrolment. Suryadarma et al (2006) and Connelly et al (2003) found significant effects of reducing distance on schooling participation in Indonesia and China. In contrast, Filmer (2004), in his analysis of 21 developing countries using DHS data, found that reducing distance to either primary school or secondary school increases school enrolment only slightly. The ambiguity of these results may stem from statistical issues as noted by Glewwe and Kremer (2005), who state that there may be issues with the reliability of the findings of most studies on school participation due to their reliance on retrospective survey data. Additionally these studies appear to assess distance simply on the basis of the nearest school to the household. However this study investigates whether parental preference for particular types of schools might outweigh distance: if the nearest school is not of the parents' preferred type, or if that school is inaccessible due to cost or some other factor, then distance to the absolute nearest school may not be so important.

The literature reports largely positive results from improvements in school quality indicators or proxies, for example Hanushek et al's study (2006) which found that children attending higher quality schools in Egypt are far more likely to continue their education. Dreze and Kingdon (2001) found that several school quality variables in India had significant effects on years of primary school attained. Quality of classrooms was shown to have strong positive effects for girls, while teacher absence due to non-teaching duties had a negative effect on boys only, and class size was shown to have a negative effect on both girls and boys. Glewwe and Jacoby's Ghana study (1994) found that years of completed schooling could increase by 2 to 2.5 years by raising teacher experience, repairing leaking roofs, providing blackboards to schools without them or reducing travel time, while in another paper Glewwe and Jacoby (1995) utilised the same dataset to find that quality of schooling significantly affects delay in enrolment.

2.2 Factors related to child and household characteristics

In the existing research, family characteristics are examined with regard to their impact on participation, including income, social status, parental education and child-specific characteristics such as age, gender and birth rank (Connelly et al, 2003; Dreze and Kingdon, 2001; Hanushek et al, 2006; Suryadarma et al, 2006). Of note is that certain household and parent characteristics have been found to be related more strongly with certain children within the family, for example there are some differences between boy and girl children. In many societies tradition is associated with families having differing views on priorities regarding sons and daughters.

Using survey data, Suryadarma et al (2006) tried to identify factors responsible for low enrolment at the secondary level. With transition to lower secondary school as the dependent variable, the authors found that consumption expenditure, used as a proxy for welfare, is significantly related to the probability of continuation, along with other variables such as the father's education, the child's gender, as well as his or her own innate ability.

Similar gender results were found by Connelly et al (2003) which used Chinese census data from 1990 to analyse educational enrolment and completion of 10 to 18 year olds in rural and urban China. They found that boys have a significantly higher rate of enrolment at both primary and middle levels as well as a higher completion rate at primary level in rural areas. Amongst other factors, higher levels of parents' educational attainment significantly increased the probability of enrolment and completion at all levels in both rural and urban areas.

In the case of India, Dreze and Kingdon (2001) found both parents' educational level to significantly affect the probability of ever being enrolled and current enrolment status, and also the level of education attained (the latter for girls only). For boys only the fathers' education was found to have a significant effect, while in Hanushek et al (2006) there was found to be no statistically significant effect of the years of mothers' or fathers' education on dropout. Lastly, the age of the child, where the child is not in the correct grade level, was found to lead children in South Africa to drop out due to difficulties with school work (Motala et al, 2009).

To summarise the existing research in this area, the gender of the child has been found to be strongly related with children's educational outcomes, with boys often being most favoured. Other issues that often tend to be related with children's educational outcome include the wealth of the family, the educational attainment of parents, and also the age of the child.

2.3 Factors related to the child's health status

The previous section has shown that a large number of family-related factors have been found to affect children's participation and achievement; but additionally an extensive body of research shows that both acute and chronic hunger also affect children's participation in schooling. For those children attending school it is found to negatively affect their attention span, behaviour in class and educational outcomes such as enrolment age, grade repetition, attendance rate, number of grades completed and test score performance (Grantham-McGregor 2005).

In Ghana, Glewwe and Jacoby (1995) found strong evidence that delayed primary school enrolment is caused by nutritional deficiencies in early childhood (measured using the height to age ratio), and that other factors such as family income or the school fee do not delay enrolment. Another study conducted on data from Pakistan found similar results. Alderman et al (2001) used data from more than 800 households in 45 villages in rural Pakistan, to estimate the impact of pre-school aged child health (measured using height for age) on subsequent school enrolment. The investigators found significantly positive effects of preschool nutrition on the probability of school enrolment and found that children's health and nutrition is three times more important for enrolment than is suggested by 'naïve' estimates that assume that children's health and nutrition is predetermined rather that determined by household choices. They also found that not only does improved nutrition increase enrolment in general, but that it does so even more for girls, thus closing a portion of the gender gap.

Using longitudinal data from the Philippines, Glewwe et al (1999), found that under-nourished children enter school later, probably because they are deemed unready for school at the minimum age of enrolment, and perform more poorly on cognitive achievement tests than their better-nourished counterparts. They found one standard deviation increase in height

raises the achievement score by 5 points which they assert to be equivalent to spending four additional months in school. Cueto (2005), on the contrary, found no association between any anthropometric variables and achievement or advancement to higher grades without repetition. The author suggests that this could be because the research was carried out at an altitude of 3000-3500 metres above sea level (in the mountains of Peru) and the pattern of height and weight for children and adolescents at that altitude are different than at sea level. In short, the health of the child has been found to have significant associations with a child's education, however it should be born in mind that context may have a bearing on the findings.

2.4 Conclusion

This section has discussed the various factors that have been found to affect children's participation in schooling. Most of these factors are taken account of in the analysis to follow. Of note is the lack of studies examining factors in transition, a gap in the literature that this study seeks to fill. The next section provides a macro-level picture of access to secondary education in India, providing a larger context in which to situate the current study.

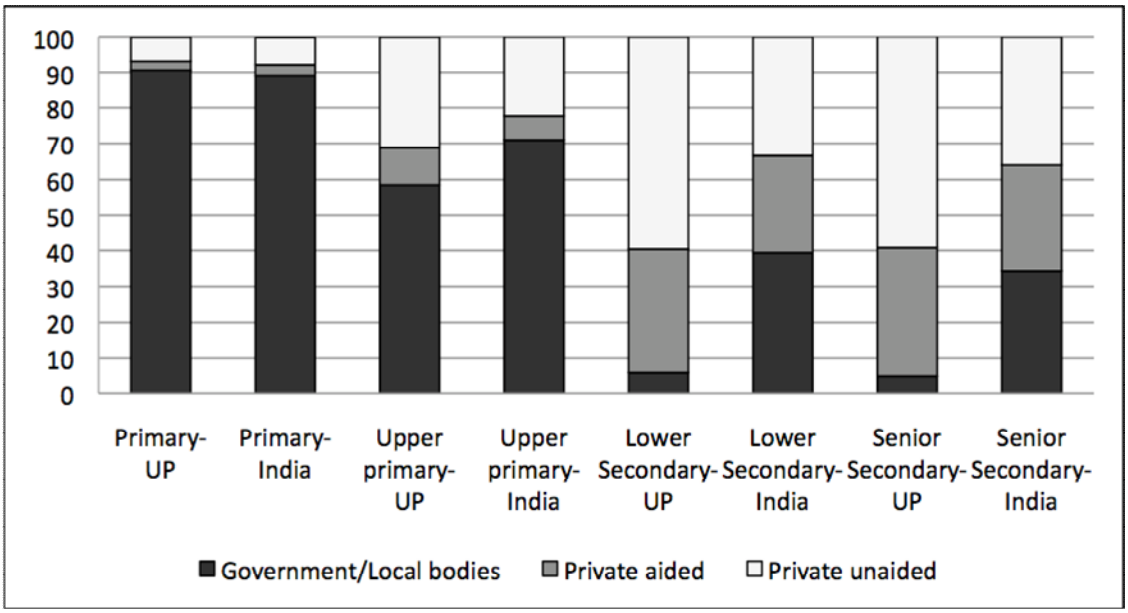
3. Access to secondary education in India

This section presents a general picture of secondary education in India and UP. It provides information on the distribution of schools available by the sector or type, and then discusses enrolments in these schools disaggregated by gender. This provides the background to the problem: that many children do not make it to secondary school, the reasons for which need to be better understood.

In the majority of Indian states secondary schooling is comprised of two years of lower secondary and two years of senior secondary education and is generally delivered in three types of schools: government and local body schools, private schools that receive government grants-in aid and private unaided schools receiving no government support. The majority of schools at the primary level are government schools, funded and managed entirely by the government, while by contrast the majority of schools at both lower and senior secondary levels are private unaided schools, fully funded and managed by private operators. Despite attempts at government regulation of the unaided sector, these schools have considerable autonomy in setting fee levels, class sizes and in selection of teachers. The third category of private-aided schools are privately owned and managed but receive government grants-in-aid and have less autonomy as a result (Kingdon, 2007). Unlike private unaided school, the private-aided schools have less autonomy and are subject to state regulations regarding selection of teachers, admissions and fee levels.

Figure 1 presents the share of these three types of schools at each level of education in UP and in India. In the country as a whole, the share of government and local body schools as a percentage of total schools declines from 89 percent at the primary level to 71 percent at the upper primary level, 39 percent at the lower secondary level and 34 percent at the senior secondary level (Government of India 2007c). The share of government and local body schools at the secondary level in Uttar Pradesh is even lower: only 6 percent of lower secondary schools and 5 percent of senior secondary schools belong to this category whereas the share of private unaided schools at the lower and the senior secondary levels is 60 percent and 59 percent, respectively (ibid.).

Figure 1: Distribution of schools in UP and India by type of school and level of education



Source: Selected Educational Statistics 2006-07

While India has successfully managed to reduce the gap in primary school participation in comparison with other fast-growing economies, secondary education is characterised by an overall low participation rate and wide gender disparity. Table 1 presents the gross enrolment rate for the year 2006-07; for India at the elementary level (primary and upper primary) in 2006-07 this was 97 percent with the girls' enrolment rate being 7 percentage points lower than that of boys, whereas the total enrolment rate at the lower secondary and upper secondary level was only 53 percent and 29 percent, respectively, with an even wider gap between girls' and boys' enrolment rates. In UP, the gross enrolment rate for elementary, lower secondary and senior secondary levels were 91 percent, 49 percent and 22 percent, respectively. Significantly, girls' enrolment in Uttar Pradesh at the lower secondary level was 23 percentage points lower than that of boys. The data source which provided data for this table also unfortunately shows that the enrolment rate for scheduled caste children in Uttar Pradesh at the lower and senior secondary level was only 33 percent and 13 percent respectively, with girls' participation being 37 percentage points lower than that of boys. This is much lower compared to the national average of 52 percent at the lower secondary level and 26 percent at the senior secondary level for children from this socially disadvantaged group. The gender disparity in participation reduces however at the senior secondary level indicating that a significantly smaller proportion of boys studying in grade 10 continue with their senior secondary schooling as compared to the proportion of girls studying at the same level.

Table 1: Gross enrolment rate 2006-07 by gender and level of education

	UP			India		
	Boys	Girls	Total	Boys	Girls	Total
Primary	118	109	114	115	108	111
Upper primary	60	47	54	78	70	74
Lower secondary	59	36	49	59	47	53
Senior secondary	24	19	22	32	26	29

Source: Selected Educational Statistics 2006-07

In terms of availability of secondary schools, UP lags far behind the national average. While there are around ten secondary schools per 100,000 head of population at the national level, *there are only three secondary schools per 100,000 people in Uttar Pradesh*. In terms of geographical coverage, for every 100 square kilometers there are less than two schools in UP while the national average is more than three. Additionally the availability of secondary schools is much lower in the rural areas as compared to urban areas. In 2002, *there were roughly 46,000 secondary schools* in urban areas to accept students from around 87,000 upper primary schools and there were just 84,000 secondary schools in rural areas *for 250,000 upper primary schools*. The problem of poor participation at the secondary level is not only related to the physical availability and cost of secondary schools but also to efficiency at the primary and upper primary levels. Between grade 1 and grade 8 more than 44 percent of children in Uttar Pradesh drop out of school, which is slightly better than the national average of 46 percent. But the dropout rate is much higher for children from scheduled caste families, at almost 60 percent in Uttar Pradesh with the girls' dropout rate being 71 percent (18 percentage points more than for boys). This situation is further worsened by the poor transition rate from upper primary to lower secondary level with girls' transition being significantly lower than that of boys. According to Jha and Subrahmanian (2005), the transition rate to lower secondary level in Uttar Pradesh was almost 92 percent for boys but only 70 percent for girls.

In conclusion, there is ample public provision of primary education in India and UP more specifically, however this provision significantly drops off after the primary level, and reduces sharply at the secondary level. Into this void left by government provision the private schools have stepped in, with this phenomenon being particularly marked in UP, with approximately 60 percent of all secondary schools being private unaided. With ability to access private schooling being conditional on ability to pay, and with so many children dropping out during their primary education cycle, this educational landscape indicates serious obstacles to equitable access to education.

4. The context and the research design

While the previous section outlined the national and local contexts of participation and transition, the current section describes the setting in which the study was carried out, including the geographical area, the people and their social make-up, their livelihoods, and the schools that are available for their children in the selected survey area. The type of school selected for sample children at the upper primary level is then discussed in relation to the characteristics of the child, in section 4.3. Section 4.4 describes the characteristics of the families of sample children, while section 4.5 shows the economic status of these families. Section 4.6 explains the methodology employed for discovering the determinants of transition to the secondary level. Section 4.7 briefly concludes.

4.1 Geographical area of the study

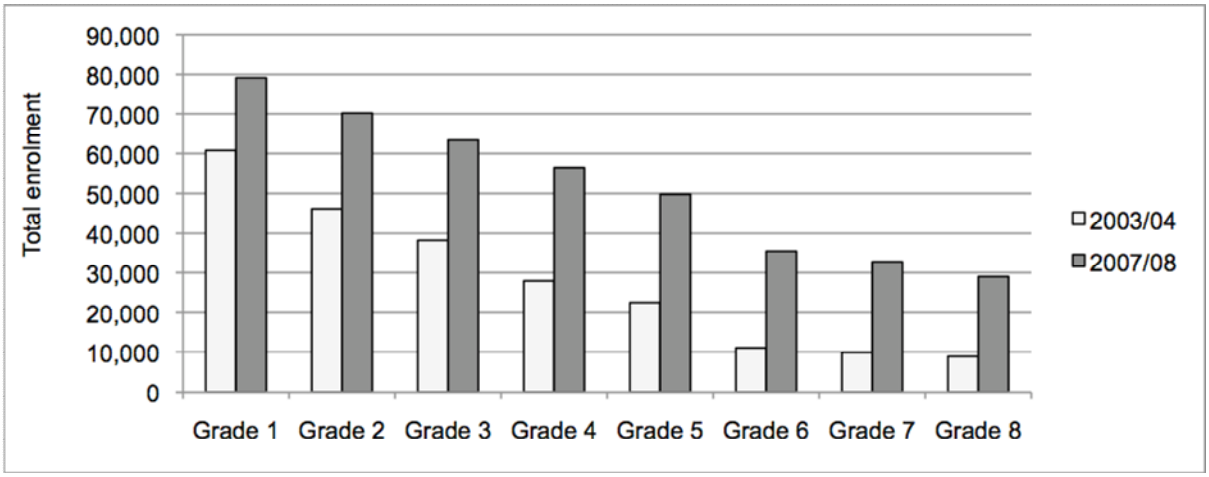
The geographical setting for this study comprises seven administrative blocks in District JP Nagar in western UP, an area dependent primarily on agriculture and related industries with almost 75 percent of the population of JP Nagar living in rural areas. All seven administrative blocks are officially considered 'educationally backward' which is evident in the overall literacy rate of only 49.5 percent, with that for women being even lower at only 34.6 percent. While significant progress has been made in terms of improving participation at the primary level, access to upper primary and secondary level education is still very poor. According to the District Information System for Education (DISE) data for 2007-08, the gross enrolment rate at the primary level was 155 percent but only 85 percent at the upper primary level. However the transition rate of nearly 72 percent from grade 5 to the upper primary level (grade 6) indicates issues relating to access to post-primary education.

4.2 Access to upper primary and secondary schooling in the survey area

In terms of the educational landscape of the study area specifically, the three types of schools discussed above are available to varying degrees, with government primary schools present in nearly every village, while there is only one government secondary school in the entire district. In the last decade private schooling has expanded greatly; however the market in primary education is far from stable, with schools opening and closing at a rapid pace[1]. Private (unaided) secondary schools are far fewer in number than private primary schools, however they tend to be more well-established and enduring than the latter. The UP government has largely relied on private aided schools for the provision of secondary education up to the present time, and so many of these schools are found in the study area.

[1] I was involved in the primary data collection for another related study, see Härmä (2010). Within 18 months of completion of the fieldwork, one quarter of the 16 private primary schools visited across 10 villages had closed down.

Figure 2: Enrolment trend for JP Nagar



Source: DISE data 2007/08

There are 783 upper primary schools in JP Nagar with 54 percent belonging to the private sector (aided and unaided) which enrols almost 59 percent of all children at this level. Figure 2 presents the enrolment pattern at the elementary level for the years 2003-04 and 2007-08, indicating that a great many children drop out between primary grade 1 and grade 8, suggesting that considerable efforts are required to improve retention and achievement even at this level. Only one third of children, a very select group, make it to grade 8. The figure shows a slow improvement during the four years between data points, indicating that the positive effects on future generations of having educated parents and a broadly more highly educated society will be very slow to build.

Table 2: Average distance to primary and secondary schools by school type attended at the upper primary level (kilometres)

	Distance to upper primary school attended	Distance to nearest private secondary school	Distance to nearest aided[2] secondary school
Private	1.9	2.0	7.3
Government	1.3	2.7	5.7
Aided	2.1	1.8	6.9
Total	1.7	2.2	6.5

The average distance to any upper primary school in the sample area is two kilometres, with government schools being the closest to households at 1.3 kilometres. Table 2 presents average distances to upper primary schools alongside the average distances to the two types of secondary schools that children must choose from. While physical access to upper primary school is not a problem, at the lower secondary level there are far fewer schools, with the average distance to the nearest aided secondary school being over 6 kilometres.

[2] Due to the near absence of public secondary schools, aided schools are essentially treated as public schools as this is the mechanism through which the government provides secondary education.

Table 3: Average annual cost of attending primary and secondary schools by type and fee classification

	Upper Primary (Grade 8)			Lower Secondary (Grade 9)	
	Private	Government	Aided	Private	Aided
Registration and Development	148	48	119	402	90
Tuition Fee	966	123	105	1,440	180
Exam Fee	67	38	42	84	60
Books	401	0	0	660	775
Stationary	423	209	225	450	275
School Dress	303	246	271	400	300
Total	2,307	664	761	3,326	1,680

45 Rupees = $1 at the time of the research

Table 3 presents the cost of attending upper primary and lower secondary schools. The direct costs (paid to schools) as a percentage of total cost of attending schools is 51 percent, 31 percent and 35 percent for private, government and aided upper primary schools respectively. While the direct cost increases to 58 percent in the case of private lower secondary schools, it reduces to 20 percent in the case of aided lower secondary schools with the single biggest expenditure in this category being on textbooks which accounts for 46 percent of the total expenditure.

4.3 Children's characteristics and the choice of schools

In terms of the children sampled for this study and the relationship between school sector and gender, in total there were 701 attending grade 8 in 17 sampled schools of which 49 percent were girls. More than 50 percent of girls attended government schools and 24 percent attended private unaided schools as compared to 43 percent and 30 percent for boys respectively (the balance of children attend private-aided schools). This indicates preference for sending boys to private unaided schools. With regard to the birth rank of the child and the school selected for that child there is no significant relationship at the upper primary level.

With regard to the preference for sending boys to private schools, this bias is much stronger in the case of Muslim families. There is 5 percentage point difference between the share of boys and girls attending private schools for both scheduled caste and non-scheduled caste Hindu families while the difference is 13 percentage points in the case of Muslim families (table 4).

Table 4: Distribution of children between three school types by caste and religion

	Girls				Boys			
	Private	Government	Aided	Total	Private	Government	Aided	Total
Scheduled Caste	13.8	45.7	40.4	100.0	18.6	40.7	40.7	100.0
Muslim	15.2	72.8	12.0	100.0	28.0	50.0	22.0	100.0
Non scheduled caste Hindu	54.8	22.6	22.6	100.0	59.6	15.8	24.6	100.0

4.4 Household characteristics

The sample children belong to families drawn from 51 villages in the district. The caste makeup of these families is 26 percent scheduled caste while in terms of religion there are 25 percent Muslim families. In terms of the educational levels attained by parents, 31 percent of fathers have no qualification, 37 percent have up to upper primary schooling while 32 percent have secondary schooling or above. More mothers were entirely uneducated, at 67 percent. The average sized household includes almost three adults and over three school aged children (aged 6-17 years). Disaggregated by economic status, families in the poorest income quintile tend to have an average of four school aged children as opposed to those in the richest quintile which have an average of three children.

Most families rely on agricultural employment (40 percent of sample families were found to be landless), while others have smallholdings in addition to their daily wage labour on the land of others. There are very few larger farms due to past land redistribution and traditional inheritance practices (of the 60 percent of sample families with land, the average holding is 1.7 acres). For 25 percent of families farming is the main source of income, while 34 percent of families rely mainly on unskilled manual labour, 22 percent on subsistence farming along with unskilled labour and the remaining 19 percent are engaged in semi-skilled and skilled activities. For nearly 46 percent of scheduled caste families unskilled manual labour is the main source of income while another 27 percent rely on subsistence farming along with unskilled manual labour.

4.5 The economic status of sample families

One of the key areas of interest for this study is how the economic status of the family affects transition for individual children; therefore it is necessary to robustly measure the wealth (or poverty) status of each family. In order to ascertain economic status of sample families, an asset index has been derived using factor analysis methods. A large number of studies have utilised such indices to examine inequality in household income as they are considered to be better proxies of family's economic status than consumption expenditure (Filmer and Pritchett, 2001; Härmä, 2010).

There are two main types of common factor modelling techniques: exploratory factor analysis (EFA) and confirmatory factor analysis (CFA). Both methods aim to represent the observed relationships among groups of indicators with a smaller set of latent variables (or factors). A common factor model postulates that each indicator in a set of observed measures is a linear function of one or more common factors, meaning in this case the indices that result from the analysis which will be used as the measure of economic status in the further analysis. Using information on 17 assets (listed in table 5) owned by rural households, confirmatory factor analysis was carried out using MPlus. Factor scores were then calculated for each household and families were then equally divided in five categories (or quintiles). Table 5 also presents the incidence of ownership of each of these assets by families in different asset quintiles in order to demonstrate reliability of these economic categories. For example, average land holding for families in quintile 1 (poorest) is 0.1 bigha[3] as compared to 3 bighas for families in quintile 5 (the richest).

[3] Regional unit of measuring land: 1 acre = 6.25 bigha

Table 5: Possession of assets by families in each asset quintile

	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5	All
Chair	0.0	0.0	0.7	29.3	90.7	24.1
Table	0.0	0.0	0.0	32.1	92.9	25.0
Wardrobe	0.0	0.0	0.0	13.6	57.9	14.3
Radio	0.7	2.1	17.9	28.6	47.1	19.3
Working bicycle	39.7	65.0	85.7	82.9	93.6	73.3
Bike/Scooter	0.0	0.0	0.0	9.3	60.0	13.8
Working television	0.0	2.1	15.0	28.6	62.1	21.5
Tractor	0.0	0.0	0.7	9.3	36.4	9.3
Mobile	0.7	25.0	40.7	70.0	90.7	45.4
Gas stove	0.0	0.0	0.7	7.9	50.7	11.8
Cow	4.3	12.1	10.0	23.6	39.3	17.8
Goat	32.6	21.4	17.9	10.7	7.9	18.1
Chicken	5.7	5.0	7.9	5.7	4.3	5.7
Engine	1.4	20.0	52.9	62.1	87.9	44.8
Ox	0.7	15.7	30.7	35.7	58.6	28.2
Fodder machine	60.3	88.6	92.1	86.4	95.7	84.6
Sewing machine	18.4	35.7	43.6	52.1	67.9	43.5
Average number of buffalos	0.5	0.9	1.1	1.2	1.6	1.1
Average land holding (in bigha)	0.1	0.3	0.8	1.1	3.0	1.1

The percent distribution of the sample families by asset index score quintiles and according to the religion and the caste of the family is shown in table 6. Hindu families are almost evenly distributed across the asset quintiles whereas almost 78 percent Muslim families and all Christian families are in the three poorest quintiles. Disaggregation of Hindu families by caste reveals that nearly 60 percent of non-scheduled caste Hindu families are in the top two quintiles as compared to only 13 percent of scheduled caste families; however the distribution of scheduled caste families is fairly even across the quintiles.

Table 6: Distribution of families by religion/caste category and wealth quintiles

		Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5	Total
Religion of family							
	Christian	33.3	33.3	33.3	0.0	0.0	100.0
	Hindu	15.6	18.3	20.0	22.3	23.7	100.0
	Muslim	32.7	25.0	20.2	12.5	9.5	100.0
Caste of family							
	Scheduled caste	24.7	18.5	23.0	20.8	12.9	100.0
	Non Scheduled caste Hindus	0.0	8.4	8.4	23.5	59.7	100.0
Total		20.0	20.0	20.0	20.0	20.0	100.0

4.6 The methodology for exploring factors influencing transition to the secondary levels

In terms of the methodology for the study two 'educationally backward'[4] administrative blocks were purposively selected due to the author's familiarity and personal interest in the area. As the study is school-based, a sampling frame of all available upper-primary schools (grades 6 to 8) was drawn up as the first step. A sample of 17 schools from across the three school types (nine government, two private-aided, five private-unaided (government recognised) and one private-unaided (unrecognised) was selected through stratified random sampling. Due to the small sample size, for the purpose of analysis recognised and unrecognised private-unaided schools were combined. All children in grade 8 of the sample schools were included in the study, resulting in 701 cases; and it must be borne in mind that many of the most 'vulnerable' children have already dropped out long before reaching grade 8 and therefore this sample may already be considered high-achieving. Informed verbal consent was gained at three levels: the school, the family and the child, and after the purpose of the study was explained, no prospective participant declined to be included.

As the aim of the study was to determine what factors might influence a child's transition, data was collected from a variety of sources. The first step, during academic year 2008-09 was to capture a range of students' characteristics. Achievement tests in mathematics and Hindi were administered (at the schools), designed by the National Council for Educational Research and Training for grade 8 pupils. An IQ test (Raven's Test[5]) was also administered, children's body-mass index scores were captured, and lastly the pupils were interviewed. Certain school-level characteristics were also recorded, such as teacher and infrastructure related indicators. Structured interviews were then carried out in the household with at least one parent to establish relevant household characteristics including socioeconomic status, and parents' views and aspirations regarding their children's education were also recorded. Over the course of the school year three additional unannounced visits were made to schools in order to record attendance. During the subsequent academic year the households were re-visited in order to establish and record the transition status of the sampled children, and structured interviews were again carried out with parents of all 701 sampled children. In the 130 cases where children were found to have dropped out, qualitative semi-structured interviews were conducted in order to gain an understanding of why this occurred.

In order to calculate the effect of cost and distance on transition status, distance to the secondary schools in the catchment area of sample villages and cost of attending those schools was calculated in the second round of the survey. In the analysis two different scenarios were used to calculate this affect: in scenario 1 additional cost and distance to the nearest secondary school is used; this was calculated by subtracting expenditure on upper primary school that the child was attending and the distance to that school from cost of attending the nearest secondary school and the distance to that secondary school. In scenario 2 additional cost and distance to the same type of secondary school is used; this is calculated by subtracting expenditure at the upper primary school that the child was attending and the distance to that school from the cost of attending the same type of secondary school and the distance to that same school. For example, if the child was attending private school at the upper primary level, the additional cost of attending nearest private secondary school and the distance to that school is used. There is only one government secondary school in the entire district hence in order to calculate additional distance and cost to the same type of school for

[4] Interview with Basic Education Officer, J.P. Nagar, 3rd September 2008.
[5] The Raven's Test is a widely-used test of innate ability, as used by Kingdon, 1996.

children attending government upper primary schools, private aided schools are used as proxies as these schools by law have the same fee structure and admission criteria as the government schools.

4.7 Conclusions

In conclusion, this section has covered much ground with regard to all contextual issues related to the study. In addition, the methodology employed in the study has been described, meaning that the reader should feel well-situated to explore the heart of the study, starting with bivariate (section 5) and then moving on to the multivariate analysis (section 6).

5. What makes a child progress to secondary school? The determinants of transition

Based on a review of the literature, the central hypothesis of the research is that additional cost and distance are the key factors in the decision to stop a child's education after the upper primary level, with other factors such as the gender of the child also playing a role. The scale of drop out found during the field research was considerable. Out of the total of 701 child cases, 6 children failed to pass grade 8 and were therefore dropped from the analysis. Out of the remaining 695 children, 130 dropped out, meaning a transition rate of 81 percent, and of the 130 dropouts, 89 were girls. These girls represent 26 percent of sample girls, while only 11.5 percent of sample boys dropped out. Poverty seems to increase the likelihood of dropping out, with nearly 44 percent of girls and 20 percent of boys in the poorest quintile doing so, while the proportion for both genders in the richest quintile is only three percent, indicating that gender bias manifests in conjunction with poverty.

Against this backdrop section 5.1 explores the qualitative reasoning given by parents for why their child has dropped out. In section 5.2 variables drawn from this reasoning, as well as variables drawn from the literature, are explored using bivariate analysis before the results of the multivariate analysis are presented in the following chapter.

5.1 Parents' reasons why children did not make it to secondary school level

During interviews with parents, one of the key questions asked regarding a child who had left school was 'what was the main reason for the child dropping out?' (Table 7). As expected, the most cited reason for all children was cost. For boys the largest single reason was lack of interest in studies, with many boys preferring to join the world of work, as one father stated:

> I used to try taking him there [the school] every day, but he would just disappear. I couldn't keep trying, he just wants to enter some trade so he is joining his uncle to learn his work.

This tallies with results of Demographic and Health Survey data presenting a high incidence of the same reason (Government of India, 2007b).

Table 7: Reasons for not transiting to secondary level by gender and social groups (in percentage)

	All			Scheduled Caste			Muslim	
	Female	Male		Female	Male		Female	Male
Cost of education	25.8	26.8		28.6	33.3		28.6	31.3
Not interested in studying	6.7	56.1		14.3	50.0		5.7	62.5
Got paid employment	0.0	2.4		0.0	0.0		0.0	0.0
Social reasons	15.7	0.0		4.8	0.0		11.4	0.0
To help with house work	6.7	9.8		4.8	8.3		8.6	0.0
School too far	39.3	2.4		42.9	0.0		40.0	6.3
Ill health	5.6	0.0		4.8	0.0		5.7	0.0
Too old	0.0	2.4		0.0	8.3		0.0	0.0
Total number dropped out	89	41		21	12		35	16

For girls the most common reason was the distance to school, while the second was social pressures, with these reasons being related. There is a general fear for the security of girls when they leave the confines of the home for schooling, which is exacerbated where distances are greater. Socially it is considered undesirable for girls, particularly as they reach puberty, to travel unaccompanied, and other 'social reasons' include the general attitude to girls' education, as one father said:

> 'she will belong to her husband's house. It is good for her to learn some things which can help her in life, but she's not going to become a doctor, is she?'

Indeed some girls dropped out because they were to be married that year. Current rural attitudes to girls' schooling dictate that girls should have some education, but that they should be kept close to the home, as far as possible, and that *higher* levels of education are not necessary when marriage is the ultimate goal. However the 'marriage market' has had some positive influence, as one parent stated (with many others expressing the same view in similar words):

> 'It's the demand in the area nowadays, everyone is looking for an educated wife - who will marry an uneducated ignoramus?'

Table 8: Distribution of children who dropped out by activity of engagement (in percentage)

	Female	Male
Not doing anything	2.3	19.5
Helping with house work	79.3	26.8
Helping with commercial work	13.8	19.5
Learning trade	2.3	34.1
Got married	2.3	0.0

In order to examine whether or not the reasons advanced for dropping out matched what the child was doing in their first year out of school, the child's current occupation was asked during the second round of field work, and these reasons and occupations were found to match in most cases. By far the main occupation during the following academic year for a girl who had left school was domestic labour, with only a very small percentage (2.3%) having married immediately after (Table 8). The most common current occupation for boys was the learning of a trade, followed by helping with the commercial/farming and domestic work of the household.

By way of contrast and comparison with the sample children, questions were asked of parents in the first round of data collection with regard to non-sample, school aged children found in the household who were out of school. Parents were asked the reasons for the children's absence from school, and where boys were concerned these were broadly similar to the reasons supplied for a sample boy's dropping out, while for girls the answers were quite different. For non-sample girls, cost was advanced as the reason in 51 percent of cases, and lack of interest in their studies was given as the second most common reason (32 percent of cases). These reasons contrast with those supplied with regard to sampled children who left school *at the point of transition to secondary*, while these other children within the household may have left school in the middle of either primary or upper primary school. It appears that the reasons for boys to leave school are relatively stable, clear and few irrespective of the

boy's age, while for girls the reasons may depend more on the individual child and the stage of education at which the girl's continuation becomes in doubt. The case of girls appears more complex and nuanced than that of boys.

5.2 Factors affecting transition status

This section presents finding from the descriptive analysis done using cross tabulation between the status of transition and variables which came out of the literature and the interviews with the parents of dropouts. It also presents the degree of correlation between the transition status and the various explanatory variables. Tetrachoric and polychoric correlation have been used in the case of binary and ordinal variables. These correlations are presented in appendix 1.2.

5.2.1 Access to secondary schooling

Cost of and distance to secondary schooling which is *additional* to those applying to the chosen upper primary school are considered in the main analysis (as described in section 4.6), and all direct costs of schooling are quantified, rather than relying on the monthly fee only. It should be borne in mind throughout that in most cases, the closest secondary school was in fact a private unaided school. The additional cost of attending secondary schools under both scenarios is presented in Table 9, illustrating that the costs of attending secondary school rise far more steeply for children attending government and private aided upper primary schools. Under scenario 1, the cost increase (i.e. to access the closest secondary school: usually a private unaided school) for children attending government and aided school was more than twice the cost increase of that for children who already attended private schools. This highlights the greater additional burden of reaching secondary level education on the poorest families. The additional cost under scenario 2 remains nearly the same for children attending any type of school at the upper primary level, although approximately Rs1,000 (the difference in cost) will represent a vastly more significant proportion of family income/expenditure for those in the poorest quintile than for the richest families.

Table 9: Average additional cost for attending secondary schools (Rupees)

Type of upper primary school child was attending	Scenario 1: Additional cost to nearest secondary school	Scenario 2: Additional cost to nearest secondary school of the same type
Private	1,065	1,118
Government	2,370	1,042
Aided	2,329	911
Total	2,008	1027

45 Rupees = $1 at the time of the research

Table 10 illustrates that additional distance under both scenarios for children attending private schools at the upper primary level is almost zero whereas for children attending either government or private aided schools the average additional distance can be as high as 4.8 kilometres. It again highlights that children from the weakest communities face the largest challenge when hoping to access secondary schools.

Once again bearing in mind that in most cases the closest secondary school is a private unaided school, for those who can afford to pay, supply of schools is not an issue. However for those who are less well-off, the existence close by of these higher fee-paying schools is

essentially of no help; these less advantaged children must travel longer distances to access a more affordable option, meaning that the current context has negative equity effects.

Table 10: Average additional distances to secondary schools (kilometres)

Type of upper primary school child was attending	Scenario 1: Additional distance to nearest secondary school	Scenario 2: Additional distance to nearest secondary school of the same type
Private	0.0	0.1
Government	1.3	4.5
Aided	-0.3	4.8
Total	0.6	3.4

In support of parents' assertions in the previous section and the *prima facie* evidence, there proves to be a statistically significant and negative correlation between additional cost and distance to schools and transition status in both scenarios, with the effect being stronger for girls, further highlighting the difference in attitudes to girls' and boys' schooling. However, the disaggregated analysis shows an insignificant relationship between cost and distance and transitions status for boys under scenario 2 only.

5.2.2 Parental perception of the child's performance at the primary level

The reasons for drop out outlined in section 5.1 point to the importance of motivations of parents and children regarding education. Proxies indicating how well the child's education is going are used as explanatory variable, and are measured by each child's scores on the Raven's (IQ), mathematics and Hindi tests, presented in Table 11. The average score for girls in all three tests is lower than that of boys and for both genders the average scores for children who dropped out were lower than those for children who transitioned to the secondary level. There is a significant correlation between IQ test scores and the transition status of children, however when disaggregated by gender, it is no longer significant for boys but remains so for girls. The correlation between scores on mathematics and Hindi tests and transition status is significantly positive for both genders, with the effect being stronger once again for girls.

Parents tended to express a lack of motivation with regard to their child's education when no results could be observed. As one parent expressed the problem,

> 'What is the point in spending so much money when she is not learning anything? She is a little thick. Even after so many years she barely knows anything.'

The situation of girls is once again found to be more complex than that for boys – the level of a boy's learning appears to impact on parental dedication to education much less than where a girl is concerned.

Table 11: Average test score of children by transition status and gender

	Female			Male			Total		
	No	Yes	All	No	Yes	All	No	Yes	All
Raven score	13	20	18	18	23	22	14	21	20
Math score	8	11	10	11	15	15	8	13	13
Hindi score	17	21	20	20	23	23	18	22	22

(Yes=transition and No=dropout)

Another proxy for the level of motivation of parents and child is the child's attendance record over a year, with the average attendance of those children who transitioned to secondary school being 27 percentage points higher than for those who dropped out. Table 12 presents the average attendance using school records as well as attendance measured as part of the research during the survey period. Boys' attendance using both school and survey records is lower than that of girls and the difference in average attendance between those who transitioned and those of dropped out is 24 percentage points for girls and 36 percentage points for boys. The correlation between the attendance record of a child and the transition status is statistically significant across the board, with the relationship between boys' attendance and their transition status being stronger than the same relationship for girls.

Table 12: Average attendance of children by transition status and gender

	Female			Male			Total		
	No	Yes	All	No	Yes	All	No	Yes	All
School record	70.1	87.4	82.9	65.5	84.1	81.9	68.7	85.6	82.4
Survey record	56.6	80.7	74.5	41.2	77.6	73.3	51.7	79.0	73.9

(Yes=transition and No=dropout)

5.2.3 Child characteristics

Certain characteristics of the individual child are highlighted in the literature as being important to the child's education, such as the age, gender, birth rank, work and body mass index (BMI – a proxy for health and general fitness). It is widely recognised that the gender of the child is significant, with this factor playing a significant role throughout this study. In terms of age, those children who were 'over age' for grade 8 by one or more years were found to be much more likely not to transition than their counterparts of the official age for the grade; Table 14 shows that over 47 percent of children who were 'over age' dropped out as compared to 15 percent of other children. It is likely that there is an element of social discomfort in being significantly older than one's classmates, which may erode the child's motivation.

For girls the relationship between age and dropping out may be related to puberty and their approach to marriageable age, and the fact that parental fears regarding their daughters' safety and reputation increase as a girl gets older. There may also be some opportunity costs involved where daughters would otherwise be helping with domestic work or with the main economic work of the family. Indeed, 56 percent of over-age girls were found to have dropped out, with some parents expressing the view that a girl in particular can simply become 'too old to remain in school', reinforcing the well-documented societal bias against

girls. Many parents expressed similar concerns regarding the reputation of their families linked to an older girl remaining unmarried and having to commute to school:

> 'She is almost of the age [for marriage]. We have to consider the society also. If something happens [to her], what would happen to our family?'

For a boy, dropping out as an older child may be even more strongly related to increasing opportunity costs as their potential for wage earning increases along with their age, with 36 percent of over-age boys having dropped out (Table 13). Of those children who dropped out, over 50 percent of boys were found to be engaged in economic activity, while almost 80 percent of female dropouts were found to be at home, helping with domestic work.

Table 13: Percentage distribution of children by transition status, age category and gender

	Female			Male			Total		
	No	Yes	**Total Children**	No	Yes	**Total Children**	No	Yes	**Total Children**
Under age	18.8	81.3	**16**	14.3	85.7	**14**	16.7	83.3	**30**
Right age	22.1	77.9	**285**	9.1	90.9	**308**	15.3	84.7	**593**
Over age	56.1	43.9	**41**	35.5	64.5	**31**	47.2	52.8	**72**
Total	26.0	74.0	**342**	11.6	88.4	**353**	18.7	81.3	**695**

(Yes=transition and No=dropout)

The correlation between the transition status and the birth order or rank of the child in the family is nearly zero and insignificant for both genders, being either oldest or youngest in the family does not increase or decrease a child's chances of making the transition to secondary school. Also, a child's engagement in the work of the family does not affect their transition status; the correlation for both boys and girls is nearly zero and insignificant. Counter-intuitively, the relationship between a child's BMI and transition is negative and significant, meaning that *underweight* children are more likely to make the transition compared to children who are fitter. However, when the analysis was done only for children who are in the right age group the correlation between BMI and the transition status becomes weak and insignificant. This indicates that there may be other attendant complications connected with a child's being outside of the official age range.

5.2.4 Household characteristics

The final group of factors centre around household characteristics which may also impact on the child's chance of transition. Caste is widely recognised as having an impact on people's lives in India, and surprisingly it was found that being a member of a scheduled caste appears to have virtually no relationship with transition, with 18 percent of scheduled caste children having dropped out which is in line with the trend across the entire sample. However this finding may be explained by the fact that in India only around 50 percent of children ever make it to grade 8, meaning that a large proportion of the disadvantaged will have already exited the system, leaving only the more motivated and/or privileged to consider whether or not to continue into secondary schooling. Table 14 illustrates that the picture of caste changes when considering girls: 22 percent of scheduled caste girls dropped out while the proportion is 14 percent of scheduled caste boys. However over all the correlation between caste and the transition status for both boys and girls is extremely weak and insignificant. This may be

partly because the 'non-scheduled caste' category includes minority religion families who tend to have poorer outcomes, as illustrated below.

Table 14: Percentage distribution of children by transition status, religion and gender

	Female			Male			Total		
	No	Yes	**Total Children**	No	Yes	**Total Children**	No	Yes	**Total Children**
Non scheduled caste	27.3	72.7	**249**	10.8	89.2	**268**	18.8	81.2	**517**
Scheduled caste	22.6	77.4	**93**	14.1	85.9	**85**	18.5	81.5	**178**
Total	26.0	74.0	**342**	11.6	88.4	**353**	18.7	81.3	**695**

(Yes=transition and No=dropout)

Being a member of a minority religion may also impact on transition, which is borne out by the dropout rate for Muslim children of 29 percent being a significant 10 percentage points higher than for the sample as a whole. Additionally, the case of Muslim girls is worse yet, with 38 percent dropping out as opposed to 20 percent of Muslim boys. However, the magnitude of correlation for both boys and girls is almost same and significant. When disaggregated by the asset index quintile it is found that almost 46 percent of poorest Muslim children dropped out as compared to 24 percent of children in the non-Muslim category (Table 15).

Table 15: Percentage distribution of children by transition status, religion and gender

	Female			Male			Total		
	No	Yes	**Total Children**	No	Yes	**Total Children**	No	Yes	**Total Children**
Non Muslim	21.5	78.5	**251**	9.2	90.8	**273**	15.1	84.9	**524**
Muslim	38.5	61.5	**91**	20.0	80.0	**80**	29.8	70.2	**171**
Total	26.0	74.0	**342**	11.6	88.4	**353**	18.7	81.3	**695**

(Yes=transition and No=dropout)

It was also found that the children of older parents are less likely to transition with the affect being significantly negative and almost equal for both girls and boys. The effect of father's qualification is mixed when the level attained is below secondary school but the effect is strongly significant and positive when father's qualification is secondary or above, with the effect being stronger yet for a girl child. Conversely a mother's having any education at all, a characteristic often associated with better educational outcomes for children, significantly increases the likelihood of the child's transition. As expected, the total number of adults in the household is insignificant, while the number of school aged children has a significant and negative effect, with families in the lowest asset index quintile having one child more on average than other families.

5.2.5 Economic status of the household

The effect of the family's main livelihood proves statistically significant across the board, with the direction of this relationship being positive for the children of farmers and skilled labourers, while it is negative for the children of unskilled workers, 25 percent of whom drop out:

> 'If they [children] don't work, what will they eat? And whatever we are spending [on education] is coming out of our food basket.'

Such concerns were expressed by many unskilled labourers and marginal farming families. Distribution of children by family's main economic activity is presented in Table 16, it shows that more than twice as many girls dropout of school in families where the main source of income is unskilled manual labour as compared to families whose main source of income is either skilled work or farming.

Table 16: Percentage distribution of children by transition status, religion and gender

	Female			Male			Total		
Main income source	No	Yes	**Total Children**	No	Yes	**Total Children**	No	Yes	**Total Children**
Farming	10.5	89.5	**86**	6.9	93.2	**87**	8.7	91.3	**173**
Skilled labour	16.9	83.1	**59**	8.7	91.3	**69**	12.5	87.5	**128**
Unskilled labour	35.5	64.5	**197**	14.7	85.3	**197**	25.1	74.9	**394**

(Yes=transition and No=dropout)

Related to this, it is important to capture the economic status of the family as accurately as possible, with rural households presenting particular difficulties in terms of quantifying income or expenditure, often having multiple and irregular sources of income. Table 17 illustrates that the economic status of the household, derived using asset index scores has a linear relationship with transition, with the numbers dropping out in each quintile increasing as wealth decreases. Thirty-three percent of children in the lowest wealth quintile dropped out, while the proportion is only 3 percent for those in the highest quintile.

Table 17: Percentage distribution of children by transition status, asset index category and gender

	Female			Male			Total		
	No	Yes	**Total Children**	No	Yes	**Total Children**	No	Yes	**Total Children**
Quintile 1	44.0	56.0	**75**	20.6	79.4	**63**	33.3	66.7	**138**
Quintile 2	39.7	60.3	**73**	21.2	78.8	**66**	30.9	69.1	**139**
Quintile 3	23.1	76.9	**65**	9.3	90.7	**75**	15.7	84.3	**140**
Quintile 4	15.4	84.6	**65**	6.8	93.2	**73**	10.9	89.1	**138**
Quintile 5	3.1	96.9	**64**	2.6	97.4	**76**	2.9	97.1	**140**
Total	26.0	74.0	**342**	11.6	88.4	**353**	18.7	81.3	**695**

(Yes=transition and No=dropout)

5.3 Conclusion

The bivariate analysis outlined here supports the hypothesis that additional cost and distance play a role in a child's transition. This section has also discussed other factors that appear to play a role and that must therefore be controlled for in the multivariate analysis, the results of which are presented below.

6. The multivariate analysis of transition

Taking the above description of the various issues related to transition as a foundation, this section focuses on the multivariate analysis carried out using forward stepwise logistic regression to determine the factors which are most strongly and closely associated with transition. The dependent variable is the transition status of the child after one year: whether or not the child has enrolled in secondary school, with this status recorded at the *end* of the admissions period for that academic year. Five different models were constructed to assess the robustness of the effect of additional cost and additional distance on the transition status of children. Section 6.1 presents findings from multivariate analysis using scenario 1, and section 6.2 presents finding from analysis using scenario 2.

6.1 Scenario 1: Additional cost and distance to the nearest secondary school

Taking our variables of most interest first, additional cost is shown to be significantly related to transition in the direction expected: additional cost is associated with a significantly reduced chance that the child will make the transition to secondary school (Table 18). This relationship remains constant throughout the modelling process, but in order to further investigate the effect, a disaggregated analysis was carried out for each wealth quintile. Coefficients could not be generated for the top two quintiles due to the small numbers of dropouts, however taking the middle quintile additional cost was found to be insignificantly related to transition, whereas this association was strong and significant for the lowest two quintiles.

This relationship was also examined through the lens of gender and social groups: additional distance is insignificant with regard to boys, but is strongly and negatively significant for girls. This indicates that it is not solely the cost that is most important but it becomes so when intersecting with gender bias: the reason most commonly advanced by parents of girl dropouts was cost, while for boys this was the child's lack of interest in school. Also with regard to Muslim children, the additional costs involved significantly reduce the odds of transition, whereas in the case of scheduled caste families the effect of additional cost was found to be insignificant for this group (Appendix 1.3). An investigation of the combined effect of gender and caste was not possible due to an insufficient number of observations.

As expected, additional distance is negatively and significantly related to transition, thus highlighting that any increase in distance that a child must travel in order to access secondary schooling is associated with a decreased chance of transition; this association remains constant across models, and even across economic levels. The association is stronger for girls however it is also negatively significant for boys, in contrast to the results for costs. Also with regard to scheduled caste and Muslim children, additional distance is significantly related to transition.

The relationship of scores on the three tests (Raven's, mathematics and Hindi) with transition is positive but insignificant across models, however when disaggregated, it is found that the innate ability of girls (Raven's test score) is significantly positive. The overall finding with regard to achievement tests indicates a weak carry-forward effect of the quality of schooling on families' decisions regarding transition. However, attendance at the upper primary level is significantly and positively related to transition, including for scheduled castes and Muslims. The disaggregated analysis shows that the association is stronger for boys than for girls, which arguably is linked to boys dropping out due to lack of interest in school.

Counter intuitively, BMI has a weak (insignificant) but negative association with transition, and this is same for both boys and girls, however this requires further investigation and will be considered in future work from the study. On the other hand, the child's age is significantly and negatively related to transition, with a much stronger association for girls than for boys. Those children who are already over age for their class are much less likely to make the transition to secondary school. However, when disaggregated, age is insignificant for Muslim and scheduled caste children. The child's birth rank in the family was also found to be insignificant, however again with regard to girls it proves to be significantly negative. The child's work status is insignificant for all effects.

Having an older father is shown to be negatively and significantly associated with transition, however this relationship is fairly weak, only becoming significant with regard to Muslim children. Compared to fathers and mothers with no education, having primary or post-primary education (or any education for mothers) has no significant effect. Surprisingly, caste and religion, in the pooled analysis, are also insignificantly related to transition; however when disaggregated we see that the odds of transition are significantly lower for Muslim boys. Consistent with many studies examining factors in school participation, the economic status is positively and significantly related to transition, meaning that compared to children in the lowest two quintiles, children from the top three quintiles are significantly more likely to transition to secondary school.

Table 18: Odd ratio for the likelihood of transition (pooled data) – Scenario 1

	Model 1		Model 2		Model 3		Model 4		Model 5	
Variables	Odd ratio	Z-score	Odd ratio	Z-score	Odd ratio	Z-score	Odd ratio	Z-score	Odd ratio	Z-score
Supply factors										
additional distance	0.71	-4.41*	0.68	-3.89*	0.67	-3.82*	0.67	-3.67*	0.67	-3.72*
additional cost /100	0.92	-5.98*	0.95	-3.03*	0.96	-2.73*	0.96	-2.60*	0.95	-2.69*
Parental Incentives										
raven			1.03	1.76	1.03	1.70	1.03	1.65	1.03	1.63
math			1.06	1.76	1.06	1.72	1.06	1.60	1.05	1.36
hindi			1.01	0.50	1.01	0.27	0.99	-0.22	0.98	-0.81
attendance			1.03	6.67*	1.03	5.25*	1.03	4.62*	1.03	4.60*
attendance*gender			1.02	3.24*	1.02	1.78	1.02	2.09**	1.02	2.02**
Children Characteristics										
age					0.66	-3.48*	0.67	-2.89*	0.68	-2.81*
gender					0.79	-0.36	0.61	-0.74	0.59	-0.71
birth rank					0.97	-0.31	1.20	1.21	1.17	1.03
work					1.06	0.25	1.07	0.25	0.97	-0.12
body mass index					0.93	-1.06	0.91	-1.31	0.88	-1.63
Household Characteristics										
father age							0.95	-2.28**	0.96	-2.00**
father qual-up to upper							0.65	-1.41	0.65	-1.38
father qual-secondary and above							1.50	1.17	1.33	0.84
mother qualification							0.67	-0.99	0.64	-1.04
total adult							0.91	-0.61	0.88	-0.80
total school age children							0.89	-1.14	0.91	-0.82
skilled labour							0.57	-1.16	0.92	-0.16
unskilled labour							0.35	-2.86*	0.63	-1.06
scheduled caste							1.06	0.20	1.00	0.00
muslim							0.59	-1.62	0.64	-1.41
Asset Index										
asset2									0.86	-0.43
asset3									2.53	2.53**
asset4									2.53	2.15**
asset5									4.76	2.29**
Pseudo R-square	0.09		0.30		0.32		0.36		0.39	
Sample size	695		695		695		695		695	

Note: Z score are calculated using robust standard error.
Significance at the 1% and 5%level is indicated with * and **, respectively.

6.2 Scenario 2: Additional cost and distance to the same type of secondary school

In the second scenario additional distance to and cost of the same type of school that the child attended at the upper primary level has been used as the key explanatory variable to study transition to the secondary level. The association of additional cost and transition remains significant and negative across all models but the association of additional distance and transition, in contrast to scenario 1, becomes insignificant after controlling for the economic status of families (Table 19).

The disaggregated examination of the data illustrates that the additional distance is significant for girls but insignificant for boys. However additional cost is significantly and negatively related to transition for both boys and girls in the pooled model. For Muslim children neither additional distance nor additional cost was significant but for scheduled caste children both variables were significantly related to transition with the coefficient of additional distance being stronger than that of additional cost (Appendix 1.4).

Achievement scores is significantly related to transition in model 2 but the association becomes insignificant when controlled for child and household characteristics. The Raven's test score is significantly positive for girls and children from the Muslim community but not for boys and children from scheduled caste families. Attendance as well as the interaction term of attendance and child's gender remains significant in the pooled analysis indicating a significantly stronger association of attendance with the continuation status of boys. Attendance remained significant for both genders and social and religious groups in the disaggregated analysis, but for scheduled caste and Muslim children the coefficient of interaction (even though positive) was insignificant, indicating an insignificantly different effect of attendance for boys.

The effects of children's characteristics are similar to those in scenario 1 with the only exception being the child's birth rank in the disaggregated analysis. Unlike in scenario 1, birth rank is insignificantly related to transition status for girls. Also, the effect of household characteristics was similar as in the case of scenario 1 with the only difference being with regard to the total number of adults in the case of girls and father's age in the case of scheduled caste children. The total number of adults in the household is insignificant for girls and father's age is significant for scheduled caste children.

Being in asset quintile 4 (second richest) significantly increases the chance of transition for boys and being in (middle) quintile 3 significantly increases the chance of transition for girls. This is in contrast to the finding from the disaggregated analysis in scenario 1 where the effect of being in any wealth quintile was insignificant for both genders.

Table 19: Odd ratio for the likelihood of transition (pooled data) – Scenario 2

	Model 1		Model 2		Model 3		Model 4		Model 5	
Variables	Odd ratio	Z-score	Odd ratio	Z-score	Odd ratio	Z-score	Odd ratio	Z-score	Odd ratio	Z-score
Supply factors										
additional distance	0.84	-4.62*	0.89	-2.17**	0.90	-1.96**	0.89	-1.96**	0.90	-1.80
additional cost /100	0.79	-4.36*	0.82	-3.27*	0.83	-3.02*	0.81	-2.95*	0.78	-3.23*
Parental Incentives										
raven			1.03	2.09**	1.03	1.93	1.03	1.91	1.04	1.90
math			1.07	2.08**	1.07	1.99**	1.07	1.81	1.06	1.57
hindi			1.02	0.72	1.01	0.54	1.00	0.00	0.98	-0.66
attendance			1.03	6.92*	1.03	5.59*	1.03	4.77*	1.03	4.86*
attendance*gender			1.02	3.28*	1.02	1.71	1.02	2.03**	1.02	1.97**
Children Characteristics										
age					0.67	-3.42*	0.69	-2.70*	0.69	-2.62*
gender					0.84	-0.28	0.65	-0.63	0.68	-0.55
birth rank					0.95	-0.52	1.15	0.96	1.14	0.85
work					1.13	0.51	1.19	0.68	1.09	0.33
body mass index					0.93	-1.09	0.91	-1.39	0.86	-1.91
Household Characteristics										
father age							0.95	-2.47**	0.95	-2.26**
father qual-up to upper [illegible]							0.66	-1.36	0.64	-1.43
father qual-secondary and [illegible]							1.55	1.28	1.39	0.94
mother qualification							0.73	-0.81	0.70	-0.84
total adult							0.95	-0.35	0.90	-0.61
total school age children							0.89	-1.17	0.92	-0.75
skilled labour							0.64	-0.93	1.09	0.17
unskilled labour							0.36	-2.87*	0.68	-0.91
scheduled caste							1.09	0.28	1.02	0.05
muslim							0.57	-1.76	0.63	-1.48
Asset Index										
asset2									0.85	-0.49
asset3									2.64	2.57*
asset4									2.38	2.16**
asset5									6.17	2.31**
Pseudo R-square	0.04		0.28		0.30		0.35		0.37	
Sample size	695		695		695		695		695	

Note: Z-score are calculated using robust standard error.
Significance at the 1% and 5%level is indicated with * and **, respectively.

7. Conclusion and policy implications

7.1 The key findings

This paper attempts to fill a significant gap in the literature on education in India: establishing the determinants of transition. As expected from the qualitative data and from the descriptive analysis undertaken, the two factors that were expected to be most significant proved to be so: the additional cost and additional distance required to access secondary school. Cost appears to be the most consistently significant factor in transition, while the effect of distance is much more nuanced. While under scenario 1 both additional cost and distance significantly reduce the probability of transition to the secondary levels, in scenario 2, only the relationship between the additional cost and the transition status remains significant. Of note is that, in effect, *cost outweighs distance*: for poorer families *the fact that an unaffordable school is close by is immaterial*. Bowing to the financial constraints under which they live, their children must travel longer distances in order to access the cheaper option if they are to make the transition, meaning that distance comes to appear insignificant.

With regard to the increase in cost involved in transition, even when considering the cheapest option available (transitioning from government primary school to private aided secondary school) the cost increases by 2.5 times, meaning a swift and substantial increase in the education cost burden of the family. This can be seen to affect poor families the most, as the increase in cost from private unaided primary to the same type of secondary (while this sector is more expensive to begin with) is only 1.5 times. This relationship is compounded by the fact that poorer families tend to have larger family sizes thus leaving them with no option but to prioritise the education of some children within the family, often boys. Those families sufficiently well off to access private education at the primary level fairly comfortably will be less severely affected by the rise in cost between levels than the poorest families accessing the cheapest option; a highly inequitable situation.

However the disaggregated analysis leads to further insights. Disaggregation along gender lines suggests that increased distance and cost are most detrimental for girls. With regard to boys under scenario 1, the association of cost and transition proves insignificant, while that of distance and transition is significant. In terms of social status, for both boys and girls there is no significant relationship between being scheduled caste and transition status. However being a Muslim boy is associated with a lesser chance of transition, with no such relationship for Muslim girls. With regard to the age of the child, the relationship with transition for both boys and girls is significant, however the relationship is more robust in the cast of girls.

When the analysis is disaggregated by caste, the relationship between transition and additional distance is significant under both scenarios, while cost is only significant under scenario 2. When disaggregated by religious status, the relationship between gender and transition is insignificant, however with regard to the asset index scores, being in the top two quintiles significantly increases the chance of transition.

In both the pooled and also all disaggregated analyses the relationship between attendance at the upper-primary level and transition is very strongly significant. Those children of both genders and all socio-economic groups and levels who do not participate strongly and consistently at this level are much less likely to transition.

7.2 The policy implications

Under the new policy of RMSA the Government of India is planning to construct many more secondary schools throughout the country (within 5 kilometres of any habitation), either in entirely new sites or by upgrading of existing upper-primary schools. An increase in the number of public secondary schools will have the combined effect of reducing both cost and distance to secondary schools. The analysis in this paper indicates that an increased supply of secondary schools of the lowest possible cost may well have an impact on transition overall. However the magnitude of affect may be lower for boys and children from minority group as indicated by the mixed effect of additional distance and cost under two scenarios.

Apart from possible policy interventions at the secondary level designed to affect transition, attention needs to be paid to policies at the primary level, as experiences of participation at this level may have long-term effects on the child's chances of transitioning to secondary school. This is indicated by the significant relationship between attendance at the upper-primary level in both pooled and disaggregated analysis, with transition. Where children do not attend regularly, and where the child enters schooling at the wrong age (i.e. older than he or she should be), or is delayed by repetition and interrupted attendance the child is much more likely to drop out. It may be that the relevance and quality of education they receive at lower levels (which therefore colours children's and parents' views on education) may prove to have a great impact. It should be remembered that approximately half of all pupils drop out of school during the primary cycle, meaning that significant improvements are required at this level to achieve high participation at the upper-primary and secondary level. Those children reaching grade 8 today can already be considered a relatively select group.

7.3 Areas for future research

More research into related areas would go some way to clarifying how best to improve transition. Any method of cost subsidisation to aid those for whom cost is a major barrier, requires careful consideration: should the government offer free secondary education, or would a targeted stipend or voucher yield more efficient and cost-effective results? This must be considered in the context of the expanding private sector which in many areas is providing a large supply of schools which are, however, unaffordable to many, and certainly those below the third quintile of wealth. One option for significantly reducing the costs at private aided school would be to offer free text books, thus cutting the costs of schooling by 45 percent. Another significant area for research would be to examine how effective policies to improve participation and attendance at the primary level have been, and whether these could be better designed. There is much work yet to be done, to fully understand the problem of low transition to secondary education, and to make it more equitable.

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Appendices

Appendix 1.1: Descriptive statistics for all study variables

Variables	Description	Range	Mean	SD
Supply factors				
additional distance	Additional distance to nearest secondary school	-2.0 - 4.0	0.55	1.21
additional cost	Additional cost to nearest secondary school	0 - 3690	2009	848
Parental Incentives				
raven	Score in raven test (maximum = 60)	0 - 52	19.99	11.70
math	Score in mathematics test (maximum = 40)	0 - 35	12.56	6.41
hindi	Score in Hindi test (maximum = 40)	0 - 38	21.41	6.44
attendance	Average attendance in four rounds	0 - 100	73.68	25.25
body mass index	Body mass index	12.2 – 23	16.23	1.72
Children Characteristics				
age	Age of child in years	10 - 17	13.61	0.90
gender	Gender of child (0* = female 1 = male)	0 - 1	0.51	0.50
birth rank	Rank of child among children in the family	1 - 7	2.59	1.31
work	Is child helping with family's economic activities (0*=no 1=yes)	0 - 1	0.49	0.50
Household Characteristics				
father age	Father age in years	30 - 65	40.90	6.87
father qual-no	Father qualification (1= No education)*	0 - 1	0.31	0.46
father qual- up to upper primary	Father qualification (2= Up to upper primary)	0 - 1	0.32	0.47
father qual-secondary and above	Father qualification (3= Secondary and above)	0 - 1	0.37	0.48
mother age	Mother age in years	28 - 62	38.49	6.88
mother qualification	Mother qualification (0*=no education 1=some education)	0 - 1	0.23	0.42
total adults	Total number of adults in the family	2 - 7	2.90	1.08
total school age children	Total number of school age children in the family	1 - 7	3.37	1.25
farming	Family's main economic activity (1=farming)*	0 - 1	0.25	0.43
skilled labour	Family's main economic activity (2=skilled labour)	0 - 1	0.19	0.39
unskilled labour	Family's main economic activity (3=unskilled	0 - 1	0.56	0.49
scheduled caste	Is this a scheduled caste family (0*=no 1=yes)	0 - 1	0.26	0.44
muslim	Is this a Muslim family (0*=no 1=yes)	0 - 1	0.25	0.43
asset1	Asset index (1=poorest)*	0 - 1	0.20	0.40
asset2	Asset index (2=not so poor)	0 - 1	0.20	0.40
asset3	Asset index (3=neither rich nor poor)	0 - 1	0.20	0.40
asset4	Asset index (4=not so rich)	0 - 1	0.20	0.40
asset5	Asset index (5=richest)	0 - 1	0.20	0.40

* Refers to the reference category N=695

Appendix 1.2: Correlation with dependent variable (0=dropout 1=transition to secondary school)

	Pooled		Girls		Boys	
Supply factors	Correlation	SE	Correlation	SE	Correlation	SE
Scenario 1						
additional distance	-0.23*	0.05	-0.24*	0.07	-0.19*	0.07
additional cost	-0.35*	0.05	-0.40*	0.06	-0.28*	0.08
Scenario 2						
additional distance	-0.17*	0.06	-0.23*	0.08	-0.08	0.10
additional cost	-0.17*	0.06	-0.18*	0.07	-0.17	0.10
Parental Incentives						
raven score	0.36*	0.05	0.41*	0.06	0.18	0.11
math score	0.43*	0.04	0.37*	0.05	0.34*	0.11
hindi score	0.36*	0.05	0.38*	0.06	0.24*	0.09
attendance	0.49*	0.04	0.48*	0.05	0.57*	0.05
Children Characteristics						
age	-0.31*	0.04	-0.34*	0.06	-0.26*	0.07
gender	0.34*	0.06				
birth rank	0.03	0.06	0.02	0.07	0.00	0.09
work	0.03	0.07	-0.09	0.09	0.06	0.11
Household Characteristics						
father age	-0.18*	0.05	-0.20*	0.07	-0.17*	0.08
father qual- up to upper primary	-0.15*	0.07	-0.17	0.09	-0.19	0.11
father qual-secondary and above	0.40*	0.07	0.46*	0.08	0.37*	0.11
mother age	-0.18*	0.05	-0.20*	0.07	-0.17*	0.08
mother qualification	0.29*	0.08	0.35*	0.10	0.27*	0.13
total adults	-0.05	0.05	-0.10	0.07	0.02	0.09
total school age children	-0.10*	0.05	-0.03	0.07	-0.10	0.07
skilled labour	0.17*	0.08	0.21*	0.11	0.11	0.13
unskilled labour	-0.35*	0.06	-0.44*	0.08	-0.23*	0.11
scheduled caste	0.01	0.07	0.09	0.10	-0.10	0.12
muslim	-0.29*	0.07	-0.29*	0.09	-0.28*	0.11
asset2	-0.29*	0.07	-0.29*	0.09	-0.29*	0.11
asset3	0.08	0.08	0.06	0.11	0.08	0.13
asset4	0.23*	0.08	0.25*	0.11	0.20	0.13
asset5	0.54*	0.08	0.62*	0.09	0.43*	0.13

* Statistically significant

Appendix 1.3: Odd ratio of likelihood of transition by gender and social groups (Scenario 1)

	Boys		Girls		Muslim		Scheduled Caste	
Variables	Odd ratio	Z-score	Odd ratio	Z-score	Odd ratio	Z-score	Odd ratio	Z-score
Supply factors								
additional distance	0.66	-	0.61	-3.38*	0.52	-2.70*	0.49	-
additional cost /100	0.96	-1.50	0.95	-	0.95	-	0.92	-1.32
Parental Incentives								
raven	1.00	-0.04	1.05	2.01**	1.05	1.47	1.07	1.46
math	1.11	1.62	1.03	0.62	0.96	-0.52	1.13	1.19
hindi	0.99	-0.20	0.97	-0.85	0.96	-0.71	0.95	-0.66
attendance	1.05	5.33*	1.03	4.24*	1.03	3.42*	1.09	4.44*
attendance*gender								
Children Characteristics								
age	0.62	-	0.66	-	0.75	-1.21	0.50	-1.36
gender					2.94	1.91	2.84	1.88
birth rank	0.78	-0.92	1.53	2.23**	1.08	0.28	2.05	1.77
work	0.70	-0.66	1.09	0.24	1.22	0.45	1.07	0.11
body mass index	0.82	-1.29	0.87	-1.34	0.83	-1.34	1.10	0.54
Household Characteristics								
father age	0.94	-1.57	0.95	-1.80	0.91	-	0.89	-1.95
father qual-up to upper primary	0.27	-	0.81	-0.54	0.55	-1.08	0.63	-0.58
father qual-secondary and above	0.61	-0.73	1.70	1.20	1.19	0.23	1.86	0.73
mother qualification	0.43	-1.27	0.72	-0.58	5.65	1.79	0.19	-1.63
total adult	1.67	1.50	0.68	-	1.09	0.24	1.22	0.42
total school age children	0.92	-0.43	0.90	-0.71	0.82	-0.98	0.74	-1.03
skilled labour	1.25	0.23	0.73	-0.45	1.83	0.58	0.27	-0.91
unskilled labour	1.20	0.21	0.38	-1.74	1.88	0.69	0.17	-1.48
scheduled caste	0.49	-1.35	1.62	1.06				
muslim	0.29	-	0.87	-0.33				
Asset Index								
asset2	0.97	-0.05	0.81	-0.45	1.17	0.27	1.38	0.26
asset3	2.83	1.64	2.45	1.76	3.25	1.61	2.82	1.13
asset4	2.23	1.29	2.57	1.57	6.89	2.44**	1.29	0.24
asset5	5.54	1.55	5.50	1.64			0.32	-1.40
Pseudo R-square	0.42		0.37		0.35		0.54	
Sample size	354		341		158		180	

Note: Z-score are calculated using robust standard error.

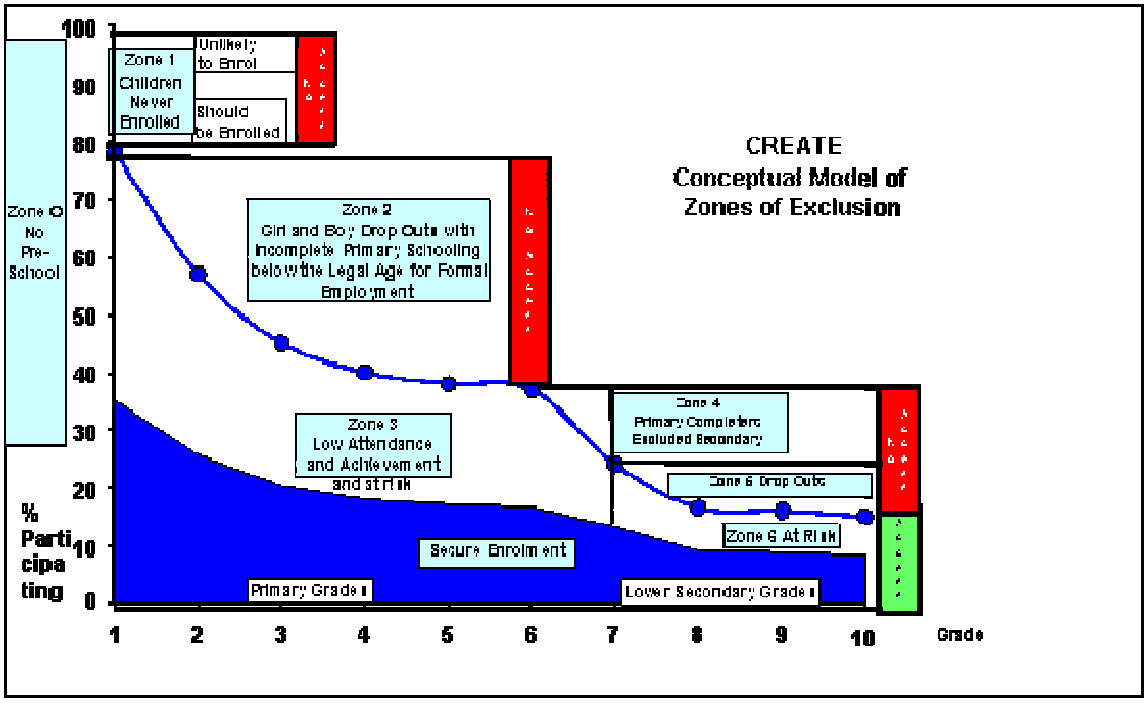
Significance at the 1% and 5%level is indicated with * and **, respectively.

Appendix 1.4: Odd ratio of likelihood of transition by gender and social groups (Scenario 2)

	Boys		Girls		Muslim		Scheduled Caste	
Variables	Odd ratio	Z-score	Odd ratio	Z-score	Odd ratio	Z-score	Odd ratio	Z-score
Supply factors								
additional distance	1.04	0.43	0.81	-	1.06	0.43	0.71	-
additional cost /100	1.00	-2.61*	1.00	-	1.00	-1.47	0.99	-3.22*
Parental Incentives								
raven	0.99	-0.19	1.05	2.20**	1.04	1.32	1.12	2.23**
math	1.13	1.82	1.04	0.80	1.00	-0.01	1.16	1.42
hindi	0.99	-0.08	0.98	-0.63	0.98	-0.34	0.94	-0.75
attendance	1.06	6.07*	1.03	4.59*	1.03	2.83*	1.08	3.64*
attendance*gender					1.01	0.75	1.01	0.28
Children Characteristics								
age	0.60	-	0.68	-	0.78	-1.08	0.47	-1.27
gender					1.00	0.00	1.93	0.32
birth rank	0.78	-0.93	1.43	1.94	1.06	0.24	2.14	1.39
work	0.81	-0.44	1.20	0.53	1.48	0.83	1.17	0.23
body mass index	0.77	-1.54	0.87	-1.50	0.84	-1.40	1.20	0.86
Household Characteristics								
father age	0.94	-1.76	0.95	-1.90	0.91	-	0.88	-
father qual-up to upper primary	0.29	-	0.82	-0.53	0.52	-1.12	0.49	-0.83
father qual-secondary and above	0.57	-0.83	1.86	1.34	1.32	0.37	2.23	0.85
mother qualification	0.39	-1.42	0.77	-0.49	7.47	1.79	0.20	-1.69
total adult	1.58	1.27	0.71	-1.74	1.02	0.06	1.03	0.05
total school age children	0.98	-0.13	0.88	-0.97	0.85	-0.77	0.74	-1.20
skilled labour	1.15	0.14	1.19	0.26	2.87	1.03	1.30	0.21
unskilled labour	0.89	-0.13	0.58	-1.07	2.18	0.87	0.57	-0.59
scheduled caste	0.51	-1.32	1.65	1.13				
muslim	0.28	-	0.84	-0.42				
Asset Index								
asset2	0.99	-0.01	0.82	-0.43	1.01	0.01	0.86	-0.11
asset3	3.02	1.79	2.87	1.98**	3.66	1.73	2.53	1.04
asset4	3.74	2.10**	2.14	1.37	9.12	2.88*	0.96	-0.04
asset5	16.68	1.69	6.35	1.73			0.14	-1.55
Pseudo R-square	0.43		0.35		0.31		0.57	
Sample size	354		341		158		180	

Note: Z-score are calculated using robust standard error.
Significance at the 1% and 5%level is indicated with * and **, respectively.

Appendix 2: CREATE's zones of exclusion model



- Zone 0 – children who are excluded from pre-school;
- Zone 1 -children who have never been to school, and are unlikely to attend school;
- Zone 2 - children who enter primary schooling, but who drop out before completing the primary cycle;
- Zone 3 - children who enter primary schooling and are enrolled but are "at risk" of dropping out before completion as a result of irregular attendance, low achievement, and silent exclusion from worthwhile learning;
- Zone 4 – children who fail to make the transition to secondary school grades;
- Zone 5 children who enter secondary schooling but who drop out before completing the cycle;
- Zone 6 children who enter secondary schooling and are enrolled but are "at risk" of dropping out before completion as a result of irregular attendance, low achievement and silent exclusion from worthwhile learning.

Consortium for Research on
Educational Access, Transitions & Equity

Funded by DFID

Report summary:

India has witnessed a major expansion in participation in basic education in recent years, in the context of a major programme for its promotion: Sarva Shiksha Abhiyan (SSA). Despite a significantly improved picture at the basic level, a considerable proportion of children continue to drop out before reaching the secondary level. Over half of children who enrol in grade one do not make it to grade eight, and of those who do complete their basic education (grades one through eight), only 88 percent go on to participate in secondary schooling. Problems surrounding retention are more acute in rural areas of India, and as the country is a predominantly rural society, this study focuses on a farming district of Uttar Pradesh. It is in this dual context of drop out and rural villages that the present study investigates the factors influencing parents' decision whether or not to send their children to secondary schooling. The study draws upon an expanded vision of access to education, embodied in zone 4 of CREATE's framework for considering access and transition in education: looking at those children who complete the primary cycle but who do not make the transition to secondary education. The study focuses on four key aspects in parental school decision making: incentives leading parents to view investment in education as worthwhile; the cost of secondary education; distance to secondary schools; and the impact of health-related factors. The study is based on survey data collected by the author over the first two school years of a four-year longitudinal study: 2008-09 and 2009-10; and the data is analysed using multivariate analysis to identify factors in transition and drop out. Overall the effect of additional cost and distance to secondary schooling proves significant, with cost being the most consistent factor, while distance is found to have a more nuanced effect. The study is particularly relevant in the context of the Government of India's latest major initiative, Rashtriya Madhyamik Shiksha Abhiyan which aims to achieve universal retention of children in secondary education by 2015, and has implications for the direction that interventions under this programme should take.

Author notes:

Gaurav Siddhu is a development economist who has focussed primarily on basic education, having worked with The World Bank, UNESCO and several NGOs. He is currently a doctoral candidate at the Centre for International Education, University of Sussex, examining factors influencing transition to secondary education in rural Uttar Pradesh, India. He is also currently a consultant working on monitoring and evaluation of education sector plans for a major DFID-funded education project in Nigeria, Education Sector Support Programme in Nigeria (ESSPIN).

Address for Correspondence:
CREATE, Centre for International Education
Department of Education, School of Education & Social Work
Essex House, University of Sussex, Falmer, BN1 9QQ, UK.
Website: http://www.create-rpc.org
Email: create@sussex.ac.uk