

## Determinants of Schooling in Rural Areas of Pakistan

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### Abstract

*The twin problems of low school enrolment and high gender disparity have widely been addressed in the literature. In this paper we investigate the determinants of schooling of children overall and separately for boys and girls using primary data of rural households. The contribution of this paper lies in integrating the child schooling decisions of the households by rigorous econometric analysis.*

*The empirical estimates based on the model point to certain findings. The first enrolment of children in schools is delayed and it is more severe for girls. There exists gender disparity in children's schooling. The head of the household education significantly increases the probability of overall children's schooling. It has a greater effect on boy's schooling and does not matter in girl's schooling. The head of household income has a slight impact on overall children's enrolment but for girls it is significantly higher than boys. Parental education also significantly increases the probability of child's schooling. Mother's education exerts a much stronger effect of increasing school enrolment. The estimates of the gender specific determinants suggest that maternal education increases the likelihood of girl's schooling enrolment than of boys. Higher per capita income of households and ownership of assets by households increases the probability of school attendance. Family size and household composition also plays a significant role. Children from large families are more likely to go to school but children from households with a large number of children (up to 15 years) are less likely to go to school. Similarly, children from households with larger number of children (in the age group of 5-15) are less likely to go to school. It is sibling size (in both age groups) which hinders the schooling of children, not the family size.*

### Introduction

In the economic literature, human capital is considered as the engine of growth [see, Romer 1990; Becker *et. al.* 1990]. Barro [1991]

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found that human capital indicated by primary and secondary school enrolment had a positive impact on economic growth. Abbas [2000] provided evidence for Pakistan to support Romer's [1990] model of endogenous growth that larger stock of human capital proxied by primary school enrolment rate may enable an economy to make greater investment in physical capital, which in turn leads to greater growth.

Easterly [2001] indicated that Pakistan's lagging economic performance is primarily due to the poor quality of its human resources. A study on agricultural productivity in Pakistan shows that four years of schooling on average increases the output of farmers by about 8 percent. A 10 percent increase in male literacy in Pakistan causes the greatest increase (2.7 percent) in agricultural productivity. On the other hand schooling is presumed to be a powerful weapon in the immediate battle against child labour [UNICEF 1997]. It is widely seen as critical to poverty alleviation. It is particularly important when complex new technologies and market options become available [Rosenzweig 1995].

Pakistan remains a country where most education plans and policies have failed to make any significant contribution to increasing literacy. The largest donor funded programme-Social Action Program (SAP), which was focused particularly on schooling in rural areas, specifically female schooling, failed to achieve its objectives with poor records of disbursement and implementation [CRPRID 2002]. That is why, of about 20 million population in the 5-9 years cohort, 6 million are out of school. In Punjab 50 percent of the children in the same age cohort are out of school, of which 54 percent are girls and 46 percent are boys. Similarly, of 20 million children in the cohort of 10-14 years, which covers middle and secondary level of education, 120 million children are out of school.

The net enrolment rate at school level is shown in Table 1.

**Table 1: Net Primary and Secondary Enrolment Rates in Pakistan**

	Net Primary Enrolment Rates (Percent)			Net Secondary Enrolment Rates (Percent)		
	Male	Female	Overall	Male	Female	Overall
Urban	68.5	64.6	66.5	46.7	47.4	47.0
Rural	53.6	36.4	45.2	34.9	15.8	25.0
Overall	57.2	43.6	50.5	38.3	25.1	31.9

The state has contributed to a high rate of illiteracy. Currently, the literacy rate is estimated to be 45 percent. That is 55 percent or 80 million

young people and adults (10+ years) are illiterate, despite the fact that the estimate of literacy is based on the definition of “one who can read a newspaper and write a simple letter”. Moreover, literacy is not based on testing while it is a recorded response to a set of questions, so an upward bias in the estimation is expected [CRPRID 2002].

The low enrolment rate at primary and secondary level has resulted in an extremely low level of participation at the university level, i.e. only 3 percent, which is a matter of great concern. For the East Asian Countries the university level participation rate is more than 30 percent, which is considered as the base for research and advance technology.

The schooling enrolment in rural areas as compared to urban areas is much lower in Pakistan. The net enrolment rate in rural areas is 23 percentage points less at the primary level of education and 22 percentage points at the secondary level of education.

The determinants of schooling in the context of developing countries have been examined in several studies [see, Behrman and Wolfe 1984; Deolalikar 1995; Lavy 1996; Behrman and Knowles 1999]. Some studies analysed the same for the rural areas of Pakistan [see, for instance, Gazdar 1999; Sathar and Lloyd 1993; Sawada and Lokshin 2000]. On the supply side, the non-availability of public sector schools and teachers, poor physical infrastructure of schools, non-accessibility of schools, ghost schools, low social and financial status of school teachers, gender disparity in the provision of schooling facilities, regional disparity, comparatively less availability of private schools, are prominent. For example, in the rural areas of Pakistan 27 percent of the schools are more than a kilometer away from student's residence; a rural child in Pakistan is poorer than an urban child [Ray 2001]; the annual budget allocation for education at the national level is very low [Abbas 2000], and there is inefficient use of public educational expenditures [Alderman *et. al.* 1996].

On the demand side of schooling, that is parents/head of household perspective, there are a number of reasons, i.e. low quality of education, irrelevant curriculum, high cost of education and the perception of education, etc.

The demand for schooling by households depends upon their perception about education, which is determined by the characteristics of children and household. To analyse the demand side determinants of schooling concerned with households is the focus of the present study.

## **Objectives**

The objectives of the study are to analyse the demand side determinants of child's schooling in rural areas using primary data from two districts of Pakistan. The study probes the question of whether and to what extent child characteristics (birth-order, gender, and age), head of household and parent characteristics (gender, age, education, employment and income), and household characteristics (ownership of assets, per capita income of household, family size, number of children, number of infants and gender of older siblings) affect the school participation of children. Another concern of this paper is to estimate the gender specific determinants of the participation of children in schooling, so as to shed light on the causes of observed low school participation of girls. Based on the results, the study makes policy recommendations.

## **Collection of Data and Methodology**

We use the primary data collected for the study. Cluster sample technique is adopted for the study. The sample of the study, i.e. District Pakpattan and Faisalabad are selected purposely, as a combination of these districts represents the average condition of the country owing to two reasons:

1. Pakpattan stands in the region of low literacy (with 30.2-45 percent literacy rate) in the age cohort of 10+ years while Faisalabad stands in the region of high literacy with 45-59.8 percent literacy rate [CRPRID 2002].
2. Ghaus *et. al.* [1996] ranked Pakpattan at number 50 and Faisalabad at number 8 of the 94 districts of Pakistan in terms of social indicators in Weighted Factor Score and at 76 and 6 in terms of Z-Score ranking respectively, while eleven indicators relating to education, health, and water supply were included.

The cluster of the sample represents the average conditions of the area of the sample. The households in the cluster consist of all income groups. The household survey was the basis of the collection of data on the currently school attending particulars of children. One thousand households from each district were surveyed.

To analyse the decision of the parents regarding child's schooling (in the cohort of 5-15 years) the probit model is used, on the assumption that:

$$P = f(bX)$$

Where P is the probability of the child going to school and included in the model as a dichotomous variable, i.e. whether the child goes to school or not, b is the vector of model parameter and contains the explanatory variables.

Three groups of explanatory variables are selected as determinants of schooling, i.e. child characteristics, head of household and parents characteristics, and household characteristics. The variables have been selected on the basis of previous relevant literature.

First the probit model for the full sample is estimated and then to highlight the possible gender effect, the sub sample for boys and girls separately follows.

The definition of dependent and explanatory variables used in the probit model are represented in Table 2.

## **Results and Discussion**

The mean and standard deviation of explanatory variables are shown in Table 3. In parenthesis the standard deviation is shown. The probit results are shown in Table 4. The Table reports the probability derivative of the parameter estimates, computed at the mean of the explanatory variables. The derivatives show the percentage point change in probability for one unit increase at the mean of a given explanatory variable holding all other variables constant at the mean. In the parenthesis the t-statistics are shown. The second column shows the probability of going to school for all children. In the third column the probability of going to school for boys and in the last column that for girls is given.

**Table 2: Definitions of Variables Used in The Probit Model**

VARIABLES	DEFINITION
<b>Dependent Variables</b>	
P [Child goes to school]	•1 if child goes to school, 0 otherwise
<b>Independent Variables</b>	
<b>Child Characteristics</b>	
Bord [Birth order of child]	• Birth order of child in his/her brothers and sisters
Cgen [Child's gender]	• 1 if child is male, 0 otherwise
Cage [Child's age]	• Child's age in completed years
Cagesq [Child's age squared]	• Child's age squared
<b>Head of household and Parent Characteristics</b>	
Hgen [Gender of Head of household]	• 1 if Head of household is male, 0 otherwise
Hage [Head of household's age]	• Head of household's age in completed years
Hagesq [Head of household's age squared]	• Head of household's age squared
Hedu [Head of the household's education]	• Head of the household's completed years of education
Hemp [Head of household's employment]	• 1 If Head of household is employed, 0 otherwise
Hy [Head of household's income]	• Head of household's income per month in Rupees
Fedu [Father's education]	• Father's education in completed years of education
Fy [Father's income]	• Father's income per month in Rupees
Medu [Mother's education]	• Mother's completed years of education
My [Mother's income]	• Mother's income per month in Rupees

Household Characteristics	
Asst [Household's ownership of assets]	• 1 if the household owns assets, 0 otherwise
Py [Per capita Income of Household]	• Household's per month per capita income in Rupees
Fmsiz [Household family size]	• Number of household members
Child 015	• Number of children ages 15 or less than 15 years in the household
Child 04	• Number of children ages 4 or less than 4 years in the household
Child515	• Number of children ages 5-15 years in the household
Sib 16	• Number of siblings ages 16 years or above in the household

Table 3: Summary Statistics of Variables (Mean and Standard Deviation)

Variables	Overall Children	Boys	Girls
<b>Child Characteristics</b>			
Bord	2.1718 [1.2660]	2.0254 [1.1858]	2.3421 [1.3341]
Cgen	0.5877 [0.4987]	- -	- -
Cage	9.9935 [3.1015]	10.29 [3.1308]	9.6469 [3.03276]
Cagesq	109.48 [62.5196]	115.70 [63.3891]	102.24 [60.7686]
<b>Head of Household and Parent Characteristics</b>			
Hgen	0.9749 [0.0707]	0.9746 [0.0729]	0.9753 [0.06819]
Hage	42.5219 [8.3274]	42.5334 [8.4257]	42.5085 [8.2180]
Hagesq	1877.41 [748.13]	1879.99 [759.14]	1874.40 [735.69]
Hedu	5.7275 [5.3031]	5.8181 [5.2591]	5.62208 [5.3560]

Hemp	0.9317 [0.2523]	0.9278 [0.2589]	0.9362 [0.2445]
Hy	5219.75 [6612.40]	5092.77 [6301.86]	5368.23 [6958.25]
Fedu	5.78 [5.3167]	5.8302 [5.2591]	5.7247 [5.3771]
Fy	5219.75 [6612.40]	5092.10 [6302.20]	5358.05 [6961.33]
Medu	3.0388 [4.8879]	3.0842 [4.8767]	2.98 [4.9042]
My	502.48 [1996.01]	447.06 [1462.17]	566.95 [2475.99]

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**Household Characteristics**

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Asst	0.82099 [0.3835]	0.8355 [0.3709]	0.8040 [0.3972]
Py	972.96 [1517.68]	935.66 [1228.79]	1016.36 [1796.28]
Fmsiz	7.3206 [2.1539]	7.3101 [2.2007]	7.3328 [2.0998]
Child015	3.9130 [1.7732]	3.8435 [1.7610]	3.9937 [1.7851]
Child04	0.5420 [0.7889]	0.5361 [0.7813]	0.5489 [0.7983]
Child515	3.3759 [1.5334]	3.3181 [1.5148]	3.4432 [1.5531]
Sib16	1.03595 [1.5310]	1.0735 [1.5553]	0.9922 [1.5023]

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**Table 4: Probit Estimation of Schooling for Rural Children**

Variables	Probability of Overall Children Going to School	Probability of Boys Going to School	Probability of Girls Going to School
Constant	-1.5014 [-4.9144]	-2.9690 [-1.1058]	0.0001 [0.0121]
<b>Child Characteristics</b>			
Bord	-0.0039 [-1.2291]**	0.0197 [1.5657]**	0.1251 [1.4613]**
Cgen	0.1635 [5.53119]*	- -	- -
Cage	0.2305 [7.4911]*	0.5926 [2.5309]*	0.7184 [1.3115]**
Cagesq	-0.0126 [-8.1699]*	-0.0399 [-2.5650]*	-0.0438 [-2.0178]*
<b>Head of Household and Parent Characteristics</b>			
Hgen	-0.0598 [-1.5196]**	-0.0072 [-0.0211]	-0.2101 [-0.2817]
Hage	-0.0398 [-1.2938]**	-0.0033 [-1.3371]**	-0.6043 [-1.5105]**
Hagesq	0.0004 [1.3362]**	0.0004 [1.3611]**	9.3066 [1.3109]**
Hedu	0.0817 [-1.3443]**	0.5114 [2.1767]*	0.0000 [1.3136]*
Hemp	0.0272 [1.3512]**	-0.6028 [-2.4020]*	-6.5401 [-0.4690]
Hy	0.0009 [1.3350]**	0.0004 [1.3819]**	0.1609 [2.3170]**
Fedu	0.1065 [1.7554]*	0.6464 [0.2233]	-0.0000 [-0.0118]
Fy	0.0020 [-0.1406]	-0.0044 [-0.3680]	-0.0012 [-0.2924]
Medu	0.1197 [1.3848]**	0.0913 [1.4010]**	-0.3020 [-1.4714]**
My	-0.0001	0.0010	2.1019

	[-2.3641]*	[0.4786]	[0.2531]
<b>Household Characteristics</b>			
Asst	0.0452 [1.4172]*	0.5369 [1.5763]*	5.4214 [0.0164]
Py	0.0664 [1.6521]*	0.0913 [1.4894]**	-0.0081 [-1.3241]**
Fmsiz	0.0186 [1.2882]**	-0.2770 [-0.9004]	2.3604 [0.9481]
Child015	-0.0402 [-1.2916]**	0.1305 [0.2446]	-0.0439 [-1.4247]**
Child04	0.0221 [0.6193]	0.3951 [1.3407]*	-0.1789 [-2.2308]*
Child515	-0.0238 [-1.6209]*	-0.0213 [-1.7251]*	-0.0439 [-1.6632]*
Sib6	-0.0023 [-0.1803]	0.02195 [1.3702]**	-0.0469 [-2.0694]*
Log of Likelihood Function	-891.99	-451.18	-414.40
No of Observations	1891	1016	875
R-Squared Percent	0.2943	0.3121	0.2770
Correct Predictions	0.8609	0.7727	0.7651

\* Indicates significant at 5 percent level and \*\* indicates significant at 10 percent level

Regarding school participation of children, it is generally perceived that children within the same household are treated differently according to their birth-order. But in the economic literature there is no consensus about whether birth order effects on school participation of children really exist, and if it exists, whether it is positive, negative or non-linear in form [Parish and Willis 1993]. There are two possible cases [Behrman and Taubman 1986]. The first probability is a negative birth order effect. As more children are born, the household resource constraint becomes severe and fewer resources are available per child. If the per child resource

shrinkage effect is dominant, the younger (high birth order) siblings will receive less education than other siblings. Alternatively, the resource competition effect might decline over time, since the household can accumulate assets and increase income over time. Moreover, the older children may enter the labour market, contributing to household resources. Therefore young children (high birth order) siblings could spend more years at school, that is the case of positive birth order effect. An economy of scale due to household-level public goods might be important as well, since young children can learn easily from the experience of their older siblings through home teaching. Having older siblings might promote the education of a younger child, rather than impede the education of that child, if the resource extension effect, scale economies, and externalities are greater than the competition effect. There is another explanation of positive birth order effect, that is children may be required to perform household chores and related tasks and older children are more likely to have to forgo some years of education instead of younger children in the family [see also, Sathar 1993; Kim *et. al.* 1998]. Kanbargi and Kulkarni [1991] found that in Karnataka (India) the older children are frequently withdrawn from school so that they can look after and pay for the schooling of younger siblings. This suggests that younger siblings have more probability of going to school. Similarly, when an adult in the family falls ill or dies, an older child may have to drop out from school and take the adult's place in the labour market [Kishnakumari 1985]. Our research suggests that birth order exists and more importantly it is negative for school decisions. The birth-order among his/her brothers and sisters shows that the younger brothers and sisters have lower probability of going to school. This may be due to a resource constraint but another more likely explanation may be the delayed enrolment of children in schools.

The likelihood boys going to school increases with their birth order among brothers, i.e. the younger the boys among his brothers, the more likely for him to go to school. Similarly, the likelihood of girls going to school increases their birth order among sisters. It is concluded that birth order is important for boys but only among brothers and it is important for girls but only among sisters. It is more important for girls as the probability derivative for the girls is many times more than that of boys. This explains the phenomenon of household level public goods, scale economies and externalities, that is the girls learn from the experience of elder sisters and boys learn from the experience of brothers. The elder female siblings give instructions and education material to younger sisters, or alternatively, younger girls take educational aid from their elder sisters. In the case of boys, i.e. younger boys take educational aid from elder brothers.

In the context of Pakistan, the gender of children is one of the most important characteristics affecting child schooling [Sathar 1993]. The present household survey supports the view that boys are 16 percent more likely to go to school as compared to girls [see Duraisamy 2000 for India]. This provides supports for the results by Durrant [1998], Sawada and Lokshin [2000] and Ray [2001]. In the summary statistics of the present study, out of total school-going children in rural areas, 58.77 percent are boys [see Table No.3]. There are several possible explanations for the distinct gender gap. The lack of female schools in rural areas possibly explains this result. Moreover, strict Islamic laws that keep women at home and in comparatively conservative rural communities explains the lower school probability for girls. Opportunity cost in terms of lost home or market production is likely to differ between boys and girls. In particular, it is widely believed that girls are more likely than boys to help their mothers in household and child-care and may therefore have a higher opportunity cost of schooling. Sawada and Lokshin [2000] have described that high opportunity cost of daughter's education in Pakistan may lead to apparent intra-household discrimination against women in terms of education.

On the other hand, there may be more market opportunities for boys, especially since boys are more likely to be allowed to venture alone outside the home. Because of the custom of seclusion of women, parents might have a strong negative perception of female education. The low probability for girls schooling also reflects the low female teacher availability and quality in schools [Sathar 1993; Saquib 1998]. The socio-cultural forces in Pakistani rural households particularly create the need for women teachers to teach girls, require single sex schools and lack of school availability all of which affects female education more seriously than male education [Shah 1986]. In the rural areas the low attendance among girls is also an outcome of strict restrictions on their movements outside the home after they reach puberty [see also, Duraisamy 2000 for India]. Dropout rates at various grades and levels are higher for rural areas and girls [Khan *et. al.* 1987; Kim *et. al.* 1998]. There may be a case of selective allocation of resources where girls might enter school but are not able to remain there for a long duration, presumably because their brothers get preferential treatment [Rosenzweig and Schultz 1982; Schultz 1995]. Gender has a strong influence in the rural areas of Pakistan. Being a girl in rural Pakistan reduces the chances of attending school [Sathar 1993]. The parents, particularly of rural girls perceive less economic returns to girls' education than boys, which influences the decision of schooling for children. Gender bias in inheritance and marriage practices and in the labour market is a decisive factor in the low participation of girls in education. According to custom, men frequently inherit from, and work and care for their parents,

whereas women marry out of their household and go to their husband's family. Since sending girls to school entails immediate costs with no economic return in the long run, there is little incentive for households to invest in their daughters' education. Early marriages further limits girl's school opportunities. Sawada and Lokshin [2000] found that in the rural areas of Pakistan, 2.9 percent of the children terminate schooling because of marriage. The earlier the marriage age, the less the parents enjoy the benefits of their daughter's education.

Some recent studies [Alderman, *et. al.* 1997; Glewwe and Jacoby 1995; Glewwe *et. al.* 1998] have emphasised the importance of the age when children start school. The lower the age at which a child attends school, the more quickly that child completes his or her schooling, the lower is the private cost of schooling in both direct monetary cost and opportunity costs, the sooner are post-schooling returns reaped, and the longer is the period in which to earn these returns. Age of child is an important variable in determining child's schooling [Durrant 1998]. We find that the probability derivative of age is positive and age-square is negative. More specifically, it implies that the probability of going to school increases by 23 percent by one more year of age of child but it increases at a decreasing rate. The result is contradictory to the general perception that school participation decreases by increase in age [See, Burki and Fasih 1998]. We have taken the minimum age of a child to be in school as 5 years. At this age the children are not sent to school, that is the explanation for the probability derivative being positive. The results again explain the fact that the school enrolment of children is delayed in rural areas. Khan, *et. al.* [2003] found that child enrolment is also delayed in urban areas, so regardless of the rural or urban areas the school enrolment of children is delayed at the national level. For girls the age parameter is more severe regarding delayed school enrolment. This reflects the phenomenon of gender disparity in rural areas.

The parameters of head of the household are critical in determining the child schooling decision. We find that children from the male head of households are 5.9 percent less likely to go to school though 97.5 percent of the households sending their children to school are male-headed. But Maitra and Ray [2000] found for Pakistan that gender of the head of the household does not matter in the schooling decision of children. Ali and Khan [2003] found that in the rural areas of Pakistan children from male head of household are less likely to go to school. This makes the impact of the gender of the head of household on the schooling decision ambiguous in economic literature. The result such as the greater probability for the child to go to school from female-headed households needs consideration.

The female-headed or female-managed households are identified as indicators of family disintegration, child neglect and abandonment, and child exploitation. Life is difficult for female-heads, not least because of prejudice and social stigma. The sheer physical and emotional fatigue of child-raising alone and trying to be the main source of both affection and authority at the same time drain the morale. They are more likely to head a household by necessity rather than by choice. They have far more difficulty maintaining their families because they have less access to the market economy. When they do earn, their wages are generally far lower. The households led by women are among the poorest. In a society such as Pakistan where a system of purdah is predicated on women's dependence on men and separation from the world of work, can result in extreme destitution for women and children. Female participation in economic activity is less due to generally low education level as compared to males, lack of income-earning skills, less employment opportunities and various socio-cultural factors. The probability of children from female-headed households going to school should remain low. But the present study revealed that the economic effect behind the gender of the head of household is not involved. This means that despite the low level of education and comparatively low income, women are good decision makers regarding children's education.

The stage in the life cycle of the head of the household has a negative effect on children overall as well as separately for boys and girls. Anyhow the effect is much stronger on girls' schooling. The older is the head of the household, the less likely it is that the child goes to school. The possible explanation may be that the older head of household has comparatively more siblings as compared to the younger head of household. There may exist a resource competition effect among children. Moreover, the older head of households may have relatively older siblings, which require more educational cost and have a high opportunity cost of schooling.

It is generally perceived that a head of the household's education plays a positive role in the child's decision to go to school. We find that in rural areas the probability of a child going to school increases by 8 percent by increase of one year of schooling of the head of household on average. This indicates important complementarity between the education of the head of the household and child's schooling. This complementarity is generated possibly by the educated head of household's positive incentives for educating children, improved technical or allocative efficiency, and/or superior home teaching environments as pointed out by Behrman *et. al.* [2000]. The educational status of head of household underlines the transgenerational effect of education.

As concerns the impact of head of household's education on boys and girls separately, it is stronger for boys than the overall impact, but for girls it is nil. No impact on girl's schooling and positive impact on boy's schooling represents the gender discrimination in the education of children.

It is found that in the rural areas of Pakistan the employment status of head of household affects schooling positively. Children from the head of the household who are employed are more likely to go to school. The result highlights the fact that an employed head of household does not face income fluctuations, which ensures the schooling of the child. The employment effect is more intensive for boys as compared to children overall.

Similarly, the income level of head of the household affects schooling positively though the effect is slight. Income of the head of the household is a proxy for the poverty level. That is how current income of the families keeps poor children out of school and thus perpetuates poverty in the next generation. The schooling cost has two aspects, i.e. one of the kind of fees, books and uniform cost and second is the absence of school in the village of residence, distance or travel time to the nearest school or average out-of-pocket expenditures on schooling in the area of residence [Rosenzweig 1982]. Saquib [1998] narrated that it is the opportunity cost that constitutes a huge part of the total cost of education and is most likely to affect the decision to attend a school. That is particularly true for the rural areas where schools are often far away from the home village of students. We find that, for the boys and girls separately, the income effect for boys is almost negligible while for girls it is positive and many times stronger than the overall affect. So it is evident that the poverty level affects girls more, as the income of the head of household increases, it is more likely for girls to be in school.

Education of parents emerges as an important determinant of child's enrolment in school [Sather and Lloyd 1993; Khan 1993]. In the economic literature there exists a strong link between parental education and likelihood of schooling [Behrman *et. al.* 19984; Ravallion and Wodon 2000]. Parents who have themselves been to school are presumably more likely to invest in the education of their children [Alderman *et. al.* 1996]. We find that father's education has a significant positive effect on child's schooling. One additional year of education of the father increases the school participation of children by 10 percent. This result supports the finding of a number of studies [see, for instance Kim *et. al.* 1998]. Mother's education also has a positive effect and one additional year of education of the mother increases the school participation by 12 percent. Parental education is likely

to be complementary with schooling in human capital production. As a consequence, the level of parental education can influence school input choices for their children [see, also Alderman *et. al.* 1996]. The impact of mother's education on the schooling of children seems to be stronger than that of father's education [see also, Sathar 1993; Ravallion and Wodon 2000; Sathar and Lloyd 1993] though the average years of schooling of mothers in the sample is 3.03 years as compared to 5.78 years of fathers. Parental education influences child's schooling mainly through the more favourable attitude towards children's education. Moreover, the cost of helping with homework may be less for more educated parents than for less-educated parents [see, also Behrman and Knowles 1999]. The mother's education on the girl's schooling has more impact than on boy's schooling [see also Duraisamy 2000 for India]. The present study has shown a surprising result regarding the income parameter of the mother, i.e. it has a mildly negative effect on child's schooling.

If the household has assets, the children overall have 4.5 percent more probability of going to school. The ownership of assets also has a positive impact on boys separately, and the impact is more than ten times stronger than for children on the whole. The lower impact on overall children's schooling may be due to the fact that children from some asset holding households have to complement the productive assets. The ownership of assets such as household enterprises, cattle, house, agricultural land, agricultural implements, and shop etc. are an obvious measure of a household's wealth. Hence our results suggest that the probability of child's schooling is systematically higher for households with wealth. Moreover, ownership of assets makes the household stable against the fluctuations in income through credit procurement or sale of the assets. Furthermore, the households with wealth may be more able to afford to hire wage labour instead of drawing children out of school [see also, Sathar 1993]. If the ownership of assets is assumed to stand as a proxy of poverty, then again it is concluded that poverty makes the parents take their children out of school.

Household economic status has been demonstrated in many studies [Duraisamy 2000; Behrman *et. al.* 1984; Lavy 1996] as an important factor contributing to child school participation. We find the per-capita income of the sample as Rs.972.96 per month, which denotes that the whole sample is living above the poverty line<sup>1</sup>, and the children from higher per-capita

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<sup>1</sup> Planning and Development Division of Government of Pakistan has adjusted official poverty line at Rs.673.54 per-capita per month for overall areas of the country [CRPRID 2002:297], though the line slides downwards slightly for rural areas.



income brackets are 6.64 percent more likely to go to school. The explanation may be that the higher-per capita income households have lower risk aversion. Hence they have incentives to invest more in schooling than lower-per capita income households. Higher-per capita income households may have better information (in part because of the better family enterprise option and better connections). Therefore they have higher expected marginal private benefits than poorer households. As a result they face less uncertainty about schooling investment. Higher-per capita income households may be better able to deal with stochastic events. For example, through their connections (perhaps facilitated by income transfer, including bribes), they may be better able to offset their children's bad performance on admission examinations than can poorer households. They therefore have private incentives to invest more in schooling than otherwise identical lower-per capita households [see, also Behrman and Knowles 1999 for Vietnam; Bhatta 1998 for India and Dreze and Kingman 1999 also for India]. There are several reasons, higher-per capita income households offer higher-quality (or more accessible) schooling in response to their greater economic and political power. These households may invest in children's education at home directly through tutoring and indirectly through improvement in their health and nutrition. Higher-per capita income households may have better quality of staff and quality of current inputs.

However, it is surprising that per capita income has a negative impact on girl's schooling, but not so surprising is the fact that in rural areas comparatively high-income group households are more prone to socio-cultural factors. Moreover, Kim *et. al.* [1998] have found that in rural Balochistan, the household income is highly inelastic for girls enrolment.

The present survey expresses the average family size of 7.32 persons in the sample. Regarding the impact of household size on child schooling two alternative hypotheses are postulated. One is that in larger households, parents make less investment on schooling of their children because their income per head may be very low owing to higher dependency ratio. In such households the likelihood of schooling becomes low. The other equally compelling argument explaining the mechanism of large households is that they have more earning hands, therefore they have more tendency to admit their children in school [see Durrant 1998]. Ravallion and Wodon [2000] found that children from larger households are neither more nor less likely to be at school. We find that household size plays a major role in the decision making of child's schooling by parents. Household size has a positive influence on child schooling. The finding tends to suggest that larger households, probably due to the joint family system in rural areas,

may in fact be a way of pooling resources to educate a larger number of children.

In rural areas of Pakistan we find that the household composition exerts an impact on child's schooling. The impact is through the number of children. The number of children (up to the age of 15 years) in the household has a negative effect. The presence of an additional child in the household decreases the likelihood of schooling of children by 4 percent. The explanation as given by Ray [2001:10] is that a child living in a household with a large number of children is more likely to be living in poverty than a child residing in a household with few children. Sawada and Lokshin [2000:15] had similar results for rural areas that students who could have higher education are from households with a small number of children. This is a reflection of intra-household resource competition. Sathar [1993] narrated that children from households with a large number of siblings are more likely to be drop outs.

The number of children up to age 15 has a stronger negative impact on girl's schooling, as compared to its impact on children overall. So the competition effect is stronger for girls.

There is another surprising result that the presence of children (up to age 4 years) tends to increase the likelihood of schooling of boys. The result is counter to what one would expect that presence of infants makes the competition for household resources tough and enhances the home-care responsibility. But the presence of children influences the schooling propensity negatively for girls, which makes clear that girls are engaged in child-care.

The presence of children in the ages of 5-15 years decreases the propensity of schooling by 2.38 percent for children overall, and for boys and girls separately by 2.13 and 4.39 percent respectively, so the impact is more severe for girls. As the presence of children (in both age groups of age up to 15 years and 5-15 years) has a negative impact on child's schooling and family size has a positive impact on schooling. So it is the number of children, not the household size which hinders the child's schooling while it may be concluded that the presence of adults in the household may enhance child schooling. The presence of prime-age siblings, i.e. in the age group of 16 or above in the household increases the likelihood of schooling of boys by 22 percent while it decreases the likelihood of schooling of girls by 4.6 percent.

## Policy Recommendations

The study has identified a number of factors responsible for lower schooling in the rural areas and some are significant from the policy point of view. It is found that parents do not send their children to school owing to lower perceived benefits specifically for girls. Any successful strategy of raising parental demand for schooling will increase schooling and improve the school environment to a level where children are actually attracted to spend more and more time in schooling.

Pre-schooling education is required for early enrolment of children in schools so as to avoid the delayed enrolment and in order to enhance school participation. The public sector should also concentrate on pre-school facilities.

Poor parents do not demand schooling due to the unbearable cost of schooling, so the cost should be minimised. Collateral credit availability to poor households, especially for asset-less families, may play a pivotal role in sending children to school.

Subsidising education for the poor can induce the parents to send their children to school. The Government may try subsidising instructional materials, uniforms, school meals, etc [see, also, Behrman and Knowles 1999].

The *mohallah* schools projects in Pakistan, for instance, reduced the cost of education by holding classes in homes and doing away with uniforms. As a result, the enrolment of girls rose dramatically. So the project should be expanded.

In India midday meal programmes and attendance scholarships have created a demand for school attendance. This may be replicated in Pakistan. Bangladesh has also introduced such a programme for poor families. This has led to an increase in enrolment of 2.4 percent and a fall in the dropout rate of 7.6 percent. Food for education stipend is a pure discount on the price of schooling for parents.

By virtue of conducting the analysis separately for boys and girls, we highlight the gender differential in school participation. Our analysis identified some important differences in the determinants of schooling of boys and girls. In rural Pakistan, where the gender gap is enormous, closing the gap will substantially increase school participation. For this purpose the

education of adults needs to be enhanced where again gender disparity exists. So gender equality is equally significant for children and adults.

Raising educational levels of the adult members in the household and increasing public awareness can have a significant positive impact on child schooling. Employment generation of adults can also enhance the school participation of children by boosting incomes and reducing fluctuations in incomes of households.

Fertility and population control policies are significant for school participation. It acts on two fronts, i.e. on the household level by decreasing the intra-household resource competition among children for schooling and at the national level for providing good quality and low-cost schooling to the nation.

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