© *The Pakistan Development Review*
56:3 (Autumn 2017) pp. 249–264

Parental Effects on Primary School Enrolment under Different Types of Household Headship: Evidence from Pakistan

TARIQ MAHMOOD, NAJAM US SAQIB, and MUHAMMAD ALI QASIM

Previous studies in Pakistan have established the number of pupil, parents, household, and community characteristics as determinants of primary school enrolment. However, treatment of the role of the household power structure in these studies is limited to the inclusion of a single dummy variable for female headship. Present study estimates separate probit regressions for different types of headships, hence allowing for an analysis of the power structure of the household and its impact on other explanatory variables. In addition to confirming the findings of previous studies, this study concludes that mother's headship results in greater positive influence of her own education and the economic status of the household on child's primary school enrolment. Father's headship in this regard has only limited influence.

JEL Classification: C25, J16, I21
Keywords: Probit Models, School Enrolment, Gender Issues

1. INTRODUCTION

Education plays an important role in a society. Its function as an agent of economic growth is well established in economics literature [Mankiw, Romer, and Weil (1992)]. At micro level it is a potent force behind social and economic mobility. It transforms a raw human being into a valuable human resource. Benefits of education extend far beyond private returns reaped by the individual who gets education. A social rate of return is also associated with education in the form of positive externalities, hence making a classical case for government intervention. In view of the above, it is not surprising that all the member state of the United Nations committed themselves to achieving universal primary education as one of the eight Millennium Development Goals (MDG's) following the Millennium Summit of the United Nations held in 2000 [United Nations (2015)]. Quality education and gender equality are also included among Sustainable Development Goals (SDGs), passed by United Nations in 2015. Primary education, being the first and arguably very crucial rung of the educational ladder, has been a focus of all the education policies of Pakistan since the creation of this country.

Tariq Mahmood <tariqmahmood@pide.org.pk> is Senior Research Economist, Najam us Saqib is Senior Research Economist and Muhammad Ali Qasim <muhammad-aliqasim@hotmail.com> is Research Economist at the Pakistan Institute of Development Economics, Islamabad, Pakistan, respectively.

Authors' Note: The views expressed in this paper do not necessarily reflect the views and policies of the institute.

More recently, Pakistan's Vision 2025 has envisaged increasing the primary school enrolment and completion rate to 100 percent in 2025.[1]

Comment [T1]: 'by' 2025 rather than 'in' 2025

A study of the determinants of primary school enrolment is crucial for understanding the role of various factors that influence decision to enrol in a primary school and for devising policies necessary to achieve enrolment related goals set by the policy-makers. However, influence of these determinants may vary across types of households depending upon headship of the family. Female headed households usually have a widow or divorcee household head. This situation may create certain socio-economic conditions which are usually absent in other households. Joint family system makes the matter more complicated as an elder brother, uncle, or some other relative may become household head. In fact, it is household head who makes important family decisions including children's enrolment. So these decisions are very likely to influence the causal chain of almost all of the important explanatory variables in the model. Usually a single multiple regression equation is used with a dummy variable for female household head. Such analysis would give effect of female household headship on state of enrolment, whereas, we want to estimate the effects of all relevant variables e.g. income, education, region etc. on enrolment under three different types of household headship. For this purpose, we use three separate regressions for each type of household head, namely, (a) father as a household head, (b) mother as a household head, and (c) neither mother nor father as a household head. This would enable us to quantify effects of all determinants of primary school enrolment under different headships. Recent drive of gender empowerment makes the issue of headship more relevant to empirical research as well as policy actions.

The rest of the study is divided as follows. In the next section a brief overview of state of primary education in the country in the light of Millennium Development Goals is presented. A brief review of the relevant literature is presented in Section 3. Section 4 discusses methodology and data. Section 5 presents and discusses estimated results. Section 6 ends the paper with concluding remarks.

2. STATE OF PRIMARY EDUCATION IN THE COUNTRY IN THE LIGHT OF MILLENNIUM DEVELOPMENT GOALS

Millennium Development Goals (MGDs) were established in 2000 following the Millennium Summit of the United Nations, All the United Nations member states committed to achieve these goals by the year 2015. These are:

(1) To eradicate extreme poverty and hunger.
(2) To achieve universal primary education.
(3) To promote gender equality and empower women.
(4) To reduce child mortality.
(5) To improve maternal health.
(6) To combat HIV/AIDS, malaria, and other diseases.
(7) To ensure environmental sustainability.
(8) To develop a global partnership for development.

[1]Government of Pakistan, Planning Commission, Ministry of Planning, Development and Reform, "Pakistan 2025: One Nation-One Vision. Executive Summary". http://www.pc.gov.pk/wp-content/uploads/2015/05/Vision-2025-Executive-Summary.pdf (Accessed May 20, 2015)

The Second Millennium Development Goal promotes universal primary education. One hundred percent enrolment of children in primary education in the age group of 5-9, 100 percent completion of education from grade 1-5, and 88 percent overall literacy rate were decided to be the indicators to check the performance of a country in achieving this goal. The Third Millennium Development Goal aims to promote gender equality in education. It was committed that the gender disparity at all level of education will be eliminated by 2015.

Pakistan's National Education Policy (2009) gives great emphasis to the second and third MDGs. Increasing enrolment rates and improving retention and completion rates are main focus of the policy. The policy aims for strengthening education facilities, encouraging private sector participation, and removal of urban, rural and gender imbalances, developing social and human capital and empowering women. First pillar of the Vision 2025 aims at developing social and human capital and empowering women. So in essence it encompasses the Second Millennium Development Goal. Government took a number of initiatives to achieve the targets set by the MDGs. National Education Assessment System at a cost of Rs 319.4 million. Its aim was to improve the quality of education at all levels. A project for reform of Madaris was launched with a capital cost of Rs 5759.4 million. Its aim was to provide financial assistance to introduce formal subjects in the curricula of Deeni Madaris. Initiatives were launched at Federal and provincial levels to provide free textbooks. Funds were allocated in Public Sector Development Programmes to improve the capacity of teacher training institutions.

While these efforts are commendable, the fact remains that outcomes achieved in Pakistan lag much behind the objectives. Lack of funds, poor governance, corruption, inefficiency, and law and order situation in many parts of the country are some of the main reasons. Public expenditure on education has remained almost stagnant during first decade of the millennium (Table 1).

Table 1

Public Expenditure on Education

(Million Rupees)

Year	Current	Development	Total Expenditure	As % of GDP
2006-07	130,313	31,771	162,084	1.75
2007-08	155,622	32,034	187,656	1.76
2008-09	197,723	42,655	240,378	1.82
2009-10	219,933	39,592	259,525	1.75
2010-11	276,239	46,572	322,811	1.77
2011-12	330,228	63,295	393,523	1.96
2012-13	428,944	50,909	479,853	2.14
2013-14	453,735	83,863	537,598	2.14
2014-15 July - Dec	219,880	17,556	237,436	–

Source: Pakistan Economic Survey 2014-15.

Another reason for poor performance in this regard is the fact that higher education has been the top priority during the last two decades, which resulted in neglect of primary level education. In the year 2000-01 there were 147.7 thousand

primary schools in the whole country, whereas for the year 2014-15 the figure is estimated to be 158.7 thousand. This gives an annual growth rate of about 0.5 percent. Whereas during the same period, total number of universities increased from 59 to 161 (Table 2). The state of primary enrolment is also not very impressive. In the year 2000-01 14.105 million children were enrolled in primary schools, whereas for the year 2014-15 the figure is 19.935 million, an annual growth rate of about 2.75 percent (Table 2).

Table 2

State of Primary Education, 2000-01 to 2014-15

	Number of Primary Schools (In Thousands)		Enrolment in Primary Education(In Millions)		Number of Universities
Years	Total	Female	Total	Female	Total
2000-01	147.7	54.3	14,105	5,559	59
2001-02	149.1	55.3	14,560	5,871	74
2002-03	150.8	56.1	15,094	6,132	96
2003-04	155.0	57.6	16,207	6,606	106
2004-05	157.2	58.7	18,190	7,642	108
2005-06	157.5	59.8	17,757	7,710	111
2006-07	158.4	60.9	17,993	7,848	120
2007-08	157.4	64.9	18,360	8,032	124
2008-09	156.7	63.4	18,468	8,144	129
2009-10	157.5	60.6	18,772	8,320	132
2010-11	155.5	58.2	18,063	7,971	135
2011-12	154.6	57.0	18,667	7,905	139
2012-13	159.7	60.1	18,790	8,278	147
2013-14 (Estimated)	157.9	59.7	19,441	8,567	161
2014-15 (Provisional)	158.7	60.1	19,935	8,780	–

Source: Pakistan Economic Survey (2014-15).

Consequently, there appear huge gaps between the objectives and actual achievements. Net primary enrolment which was 46 percent in 1990-91 crept up to 57 percent in 2013-14 against the target of 100 percent for 2015. Completion/survival rate showed small improvement for some initial years, but for later years it remains almost stagnant against the target of 100 percent. Some improvement has been achieved in literacy rate as it increased from 1990-91 benchmark of 35 percent to 58 percent in 2013-14. However, it still misses the MDG target of 88 percent by a wide margin of 30 percent (Table 3).

Table 3

Progress towards Universal Primary Education

(Percentage)

Indicators	1990-91 (BenchMark)	2001-02	2004-05	2007-08	2010-11	2013-14	MDG Target 2015
Net Primary Enrolment Ratio (5-9 Years)	46	42	52	55	56	57	100
Completion/Survival Rate Grade 1 to 5	50	57	67	52	49	–	100
Literacy Rate (%) 10 Years and above	35	45	53	56	58	58	88

Source: Pakistan Social and Living Standards Measurement (PSLM) Survey 2013-14.

These facts indicate the severity of the problems faced by our education sector. There is an urgent need to recognise the root-cause of the problems, and take appropriate remedial measures.

In September 2015 United Nations passed a new set of goals with 169 targets to be achieved in 15 years. These are named as Sustainable Development Goals (SDGs). These goals are based upon broader concept of development, and include environment, sustainability, justice, and reduced income inequality. In addition, quality education and gender equality are explicitly included among these goals. Present study may provide an important insight regarding factors influencing primary enrolment under different family structures. This could be helpful in formulating strategies to fulfil the SDGs.

3. REVIEW OF LITERATURE

A number of studies have been conducted to analyse the determinants of primary school enrolment in Pakistan. A detailed review of the studies on this subject by Chishti and Lodhi (1988), Sathar and Lloyd (1994), Burney and Irfan (1991, 1995), and Alderman, *et al.* (1996, 2001) can be found in Saqib (2004). These studies are based on a variety of databases with diverse coverage. While coverage of the data used by Chishti and Lodhi (1988) and Alderman, *et al.* (2001) are limited to a single city, the other studies cited above use datasets like IFPRI's longitudinal survey of rural Pakistan, Pakistan Integrated Household Survey (PIHS) and Pakistan Labour Force and Migration Survey that cover much broader areas of Pakistan and therefore are more representative of the country as a whole.

More recent work on this subject, in addition to updating the previous one, adds variety to the contexts, methodologies, and datasets that have been used to study the determinants of the primary school enrolment. While exploring the question whether gender differences in school enrolment are due to underinvestment in female education or due to lower returns to female education, Qureshi (2012) reports maximum likelihood Logit estimates of the probability of being enroled in school using the Pakistan Social and Living Standards Measurement Survey (PSLMS), 2005-06. In another study, Qureshi, *et al.* (2014) look at the determinants of the probability of being enrolled in school in the context of the broader question of child enrolment/work decision of the household. Their school enrolment probit estimates are based on Pakistan Panel Household Survey, Round 2010. Though main focus of Sathar, *et al.* (2013) is the influence of poverty, gender, and

access to school on secondary schooling for girls in Pakistan, they also present an in-depth analysis of net primary school enrolment rates for girls based on PSLMS data from various rounds. In addition, they estimate logistic regression models to calculate odds ratios for school attendance of girls. Baluch and Shahid (2008) study determinants of gross and net enrolment rates in various localities in the district of Lahore employing primary data collected from 2520 urban and 800 rural households. The 1997 dataset used by Lloyd, *et al.* (2005), though limited in coverage to six rural communities in three districts each in Punjab and present day Khyber Pakhtunkhwa (KP), is supplemented by the data from all 26 public and 12 private primary schools located within 12 villages. This allows them to estimate nested multinomial logit models to study the decision to enrol in a school and making a choice between public and private schools. Rosati and Rossi (2003) look at the simultaneous decision of going to school and supplying work hours to the labour market. Their data came from a 1996 survey which was carried out under the Statistical Information and Monitoring Programme on Child Labour led by the International Labour Organisation (ILO) as part of its International Programme for the Elimination of Child Labour (IPEC). The probit estimates of Hazarika (2001) are based on PIHS 1991 data and include school access and school quality as measured by a number of proxy variables as the determinants of primary school enrolment.

Although the specific variables used as the factors that influence probability of primary school enrolment vary considerably from study to study depending on their scope, focus, and data availability, it is possible to group them in four broad categories namely pupil, parents, household, and in a few cases, community characteristics. Importance of parents' education as one of the most important determinant of primary school enrolment, along with household characteristics such as income and composition of the household as captured by the distribution of household members by age and/or by type of activities such as education and work is a common theme that resonates through almost all the studies mentioned above. However two important points that get little attention in this literature are the importance of the power structure of the household in addition to its composition, and interaction of this structure with parental characteristics, particularly education.

The studies that address the issue of household power structure, both in Pakistan and abroad, are mainly focused on the role of female headship, especially on its relationship with poverty.[2] A number of studies have also investigated the relationship between female headship and educational outcomes of the children. In the social context of the developed countries such as the United States, cause of concern is a possible negative effect of single-parenthood on children, and research on this topic has produced mixed results.[3] On the other hand, research on the developing countries has traditionally concentrated on the potentially positive role of female headed households in this regard

[2]See for example, Mohiuddin (1989), Buvinić and Gupta (1997), Ray (2000a), Chant (2004), Villarreal and Shin (2008) and Khalid and Akhtar (2011).

[3]Based on the analysis of data from four national surveys and more than a decade of research, McLanahan and Sandefur (1994) show that children living in s single-parent household suffer disadvantage at school even after controlling for income and race. Painter and Levine (2000), on the other hand, use data from the National Education Longitudinal Study of 1988 (NELS) to argue that much of the difference in the schooling outcomes of the fractured family children comes from the pre-existing disadvantages of these families.

and the results are mixed in this case too. Using data from seven African countries, Lloyd and Blanc (1996) find out that children in the female headed households are more likely to have attended school and completed grade 4 despite the fact that these households are economically disadvantaged as compared to male-headed households. Pong's (1996) research based on data from peninsular Malaysia discerns that Malaysian children of widowed mothers have similar school participation rates as children of two-parent families, when other demographic and socioeconomic factors are controlled, whereas divorce and separation have direct negative effect on their schooling. Johsi (2004) uses data from Matlab, Bangladesh to estimate the impact of female-headship on children's schooling and finds out that children residing in households headed by married women have stronger schooling attainments than children in other households. Evidence from four Latin American countries, Brazil, Ecuador, Nicaragua, and Panama suggests that the adolescents (age 14-16) who live in single mother households have lower school attendance and attainment as compared to those living with both parents [Arends-Kuenning and Duryea (2006)].

The role of female household headship on education of children has attracted considerable interest in Pakistan as well. This interest dates back at least to early 1990s when Hamid (1993) used a simple cross-tabulation analysis to find out that percentage of households sending their children to school was higher for those with a female head, as compared to other households. Maitra and Ray (2000) provide multinomial logit estimates for schooling and/or employment choices of Pakistani children based on data from PIHS 1991. Using a dummy for the gender of the head of the household, they conclude that it does not have a significant influence on these choices in Pakistan. Another study by Ray (2002) that recognises the joint endogeneity of child labour, child schooling and child poverty, and employs a three-stage estimation procedure to estimate years of schooling equation, confirms this finding. However, when data for male and female children is analysed separately, and the issue of sample selection bias has been taken care of, it turns out that though gender of the household head does not matter for boys, a female head exerts a positive and significant influence on school enrolment of girls, Ray (2000). If we believe the logit estimates of Toor and Parveen (2004) based on PIHS 2001-02 data for girls alone, this positive effect is limited to the female students living in the rural areas of the country and in the provinces of Punjab and Sindh only. While examining the impact of temporary economic migration of a member of a rural household in Pakistan on child schooling, Mansuri (2006) discovers no protective effect of migration-induced female headship on the schooling outcomes for girls. Contrary to that, such household heads seem to protect boys at the cost of girls. Their data comes from Pakistan Rural Household Survey (PRHS) 2001-02.

It is evident from the above review that the investigation of the role of the household power structure in the context of the primary school enrolment is essentially limited to the study of female headship alone and the efforts to capture this role are often limited to the introduction of a single dummy variable, hence ignoring the possibility of interaction of household headship with other explanatory variables. First of all, there are at least three possible headship scenarios that are of interest in the context of enrolment decisions, namely, when father is the head of the household, when mother heads the household, and when some other member of the household has this status. Therefore,

even if dummy variables are to be used, there should be at least two dummies. Moreover, if the influence of the head on school enrolment is reflected through his/her characteristics such as income and education, even dummy variables will not suffice. One possible way, used in this study, is to estimate separate regressions for different types of headships. The purpose of this study is to analyse the determinants of primary school enrolment in Pakistan keeping in mind the considerations discussed above. In particular, separate probit functions for school enrolment are estimated for different headship scenarios. This allows us to study the effects of household headship on the magnitude of influence that head's personal characteristics such as income and education exert on primary school enrolment.

4. METHODOLOGY AND DATA

Binomial probit regression model is the estimation procedure used in this paper. It is customary to motivate the probit model in the present context in terms of a continuous latent variable that measures unobservable propensity of parents to enrol their child in a school. Let us call it Y^*. It is assumed to depend on a vector X of explanatory variables, β a vector of parameters, and ε an independently and identically distributed random disturbance such that:

$$Y^*_i = \beta' X_i + \varepsilon_i \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (1)$$

While Y^* is unobservable, we observe Y, a dichotomous realisation of Y^*. It takes the value 1 if the parents enrol the student in a school and is equal to 0 otherwise. In Symbols, Y is defined as follows:

$$Y_i = 1 \text{ if } Y^*_i > 0$$
$$Y_i = 0 \text{ otherwise.} \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (2)$$

The probability of school enrolment, therefore, may be expressed as:

$$\text{Prob. (school enrolment)} = \text{Prob.}\ (Y_i = 1)$$
$$= \text{Prob.}\ (Y^*_i > 0)$$
$$= \text{Prob.}\ (\varepsilon_i > -\beta' X_i)$$
$$= 1 - F(-\beta' X_i) \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (3)$$
$$= F(\beta' X_i) \text{ (if the distribution of } \varepsilon_i \text{ is symmetric)} \quad \ldots \quad \ldots \quad \ldots \quad (4)$$

where F is the cumulative distribution function of ε_i. The probability of not enrolling in a school can be determined residually as $1\text{-}F(\beta' X_i)$. Assuming normal distribution for ε_i, the probability of school enrolment can be estimated by using probit model with the school enrolment dummy as the dependent variable.

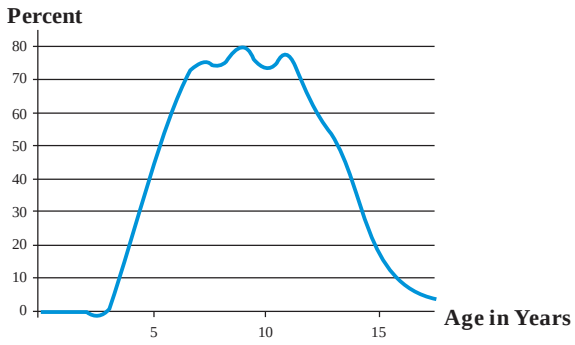
However, this conceptualisation of the probit model entails at least two problems. One, the idea of the propensity to enrol which cannot be empirically observed is not intuitively appealing. Two, any attempt to compare coefficients as implied by this interpretation of the model is complicated by the potential presence of the heterogeneity in the unknown variance of the residual variation among groups and subsamples [Mood (2010)]. Fortunately, there is a simple way out of these complications. Instead of postulating the dependent variable as an obscure propensity to enrol a child in school, we

may straightforwardly interpret the predicted values of the dummy dependent variable of probit model as measuring the predicted probability of school enrolment in the sample [Buis (2015)]. By assuming a normal distribution for ε_i we ensure that this probability lies between zero and one. Throughout this paper we follow this interpretation.

Pakistan Social and Living Standards Measurement Survey (PSLM) data for the year 2010-11 has been used in this study. This is a nationally representative survey based on stratified random sampling, which is carried out at irregular intervals. The survey is conducted by the Pakistan Bureau of Statistics, Pakistan's official data collecting organisation.

The probit estimates reported below are based on all the children covered in the survey who are between the ages of 4 and 14 years. Since our purpose is to analyse primary enrolment, we exclude children in the age group 4-14 who are enrolled in higher classes. In Figure 1 below percentage of children enrolled in primary schools is plotted against their age. It is clearly evident from the plotted curve that 4-14 is the age group in which most of the primary school attending students fall, except for 22 percent of the sample who are enrolled in higher classes. The dummy dependent variable of our probit regressions is equal to 1 for the children enrolled in primary schools while its value is zero for those who are not.

Fig. 1. Percentage of Students Enrolled in Primary Schools by Age



Source: Estimates based on the data from (PSLM) for the year 2010-11.

5. RESULTS

State of the sampled households in terms of the classification used in this paper is as follows. There are total 28511 children in the age group 4-15. These children are either enrolled in class 1-5 or not enrolled. Out of these, 21864 children have father as household head, 1516 children have mother as household head, and 5131 children have neither father nor mother as household head. The group of children with mother as household head turns out to be smallest among the three groups. Three separate probit regressions have been estimated for the three mutually exclusive and exhaustive groups of households, namely, the households headed by the father, those headed by the mother and the remaining households which are headed by someone other than child's father or mother. Estimation results are reported in Table 4 and Table 5.

Table 4

Probit Regression Results

	Father as HH Head		Mother as HH Head		Neither Mother nor Father as HH Head	
Independent Variables	Coefficients	Standard Errors	Coefficients	Standard Errors	Coefficients	Standard Errors
Age	1.3046***	0.0224	1.2939***	0.0874	1.4380***	0.0469
Age Square	–0.0722***	0.0013	–0.0732***	0.0049	–0.0794***	0.0027
Number of Children	–0.0604***	0.0065	–0.1016***	0.0289	–0.0438***	0.0093
Dummy for Male	0.3953***	0.0195	0.4086***	0.0770	0.3524***	0.0414
Dummy for Urban	0.2631***	0.0219	0.1631*	0.0951	0.2750***	0.0467
Sindh	–0.5470***	0.0255	–0.8208***	0.1487	–0.7340***	0.0592
Khyber Pakhtunkhwa	–0.0981***	0.0298	–0.2003**	0.0873	–0.2443***	0.0568
Balochistan	–0.4822***	0.0281	–0.8235***	0.2400	–0.7641***	0.0642
Quintile 2	0.2536***	0.0268	0.5326***	0.0999	0.0853	0.0902
Quintile 3	0.2834***	0.0287	0.7052***	0.1134	0.3048***	0.0861
Quintile 4	0.3395***	0.0322	0.4332***	0.1306	0.2844***	0.0838
Quintile 5	0.3835***	0.0406	0.5509***	0.2239	0.5138***	0.0844
Father's Education						
Education=Grade (1–5)	0.3312***	0.0273			0.3032***	0.0702
Education=Grade (6–10)	0.5698***	0.0266			0.3195***	0.0526
Education>=Grade 11	0.6846***	0.0369			0.5012***	0.0751
Mother's Education						
Education=Grade (1–5)	0.5706***	0.0409	0.9270***	0.1558	0.6054***	0.0754
Education=Grade (6–10)	0.6703***	0.0458	0.8493***	0.1427	0.6875***	0.0775
Education>=Grade 11	0.7777***	0.0763	0.6034**	0.2735	0.8657***	0.1143
Constant	–5.4443***	0.0969	–4.9281***	0.3768	–5.7754***	0.1970
	LL = –11087.4		LL = –720.6		LL = –2443.7	
	N = 21864		N = 1516		N = 5131	

'***', '**', and '*' indicate that the variable is significant at the level of 0.01, 0.05, and 0.10 respectively.

Table 5

Marginal Effects

	Father as HH Head		Mother as HH Head		Neither Mother nor Father as HH Head	
Independent Variables	Marginal Effects	Standard Errors	Marginal Effects	Standard Errors	Marginal Effects	Standard Errors
Age	0.3736***	0.0048	0.3455***	0.0179	0.3862***	0.0088
Age Square	–0.0207***	0.0003	–0.0195***	0.0010	–0.0213***	0.0005
Number of Children	–0.0173***	0.0018	–0.0271***	0.0076	–0.0118***	0.0025
Dummy for Male	0.1132***	0.0054	0.1091***	0.0201	0.0946***	0.0110
Dummy for Urban	0.0753***	0.0062	0.0436*	0.0253	0.0738***	0.0124
Sindh	–0.1566***	0.0071	–0.2192***	0.0386	–0.1971***	0.0153
Khyber Pakhtunkhwa	–0.0281***	0.0085	–0.0535**	0.0232	–0.0656***	0.0152
Balochistan	–0.1381***	0.0079	–0.2199***	0.0634	–0.2052***	0.0166
Quintile 2	0.0726***	0.0076	0.1422***	0.0259	0.0229	0.0242
Quintile 3	0.0812***	0.0082	0.1883***	0.0292	0.0818***	0.0230
Quintile 4	0.0972***	0.0092	0.1157***	0.0345	0.0764***	0.0224
Quintile 5	0.1098***	0.0116	0.1471***	0.0594	0.1380***	0.0224
Father's Education						
Education=Grade (1–5)	0.0948***	0.0077			0.0814***	0.0188
Education=Grade (6–10)	0.1632***	0.0074			0.0858***	0.0140
Education>=Grade 11	0.1961***	0.0103			0.1346***	0.0200
Mother's Education						
Education=Grade (1–5)	0.1634***	0.0116	0.2475***	0.0404	0.1626***	0.0199
Education=Grade (6–10)	0.1920***	0.0130	0.2268***	0.0371	0.1846***	0.0204
Education>=Grade 11	0.2228***	0.0217	0.1611**	0.0729	0.2325***	0.0303

'***', '**', and '*' indicate that the variable is significant at 0.01, 0.05, and 0.10 level of significance respectively.

Table 4 reports estimated coefficients of these models. Highly nonlinear nature of the probit model makes its coefficients impervious to ready interpretation. Therefore estimated marginal effects implied by these coefficients have also been reported in Table 5. All variable are statistically significant except Quintile 2 which turns out to be small and insignificant in case of either Mother or Father as Household Heads. This might be an indication of higher threshold level for income in joint families.

Estimation results for the three categories of household heads presented in this study lead to interesting insights about the role of household headship in the decision to enrol a child in primary school. The results indicate that the marginal effects of income and mother's education are much higher when mother is head of the household. The mother's headship effect seems more pronounced for lower quintiles as well as lower mother's education levels.

The most noticeable and consistent effect of the mother household head on child's school enrolment is observed to take shape through the channel of the economic status of the household. This impact is particularly pronounced in the 2nd and 3rd quintiles that are supposed to constitute the middle class of the society. The school enrolment probability of children belonging to the households in these two income quintiles is respectively 7 and 11 percentage points higher for the mother headed households, as compared to the father headed households. This advantage with reference to the households headed by someone other than the parents is respectively 12 and 11 percentage points. The role of father's headship of the household in this respect is much smaller and inconsistent across income quintiles.

Another important channel through which mother's household headship influences child's school enrolment is her education. Mother's primary education is the most important in this regard. When a primary school educated mother becomes head of the household, the probability of primary school enrolment of her children gets a boost of 9 percentage points as compared to other forms of household headship. In this respect, the father does not seem to have very substantial advantage over a non-parent head of the household.

When the mother's education is greater than or equal to grade 11, the marginal effect of mother headship case turns out to be lower than that of other two categories. One possible reason could be that highly educated mothers especially when they are also head of the household are more likely to be intensively involved in domestic, economic and social activities. This, so called "time poverty" is found to be more prevalent among females [Saqib and Arif (2012)]. Time poverty among females is also found to increase with the level of education [Lawson (2007)]. This time poverty may render the effect of mothers' education relatively less pronounced when they are the household head. However, the marginal effect is still positive and significant. Though headship of parents is not enough to reduce gender gap in school enrolment, the disadvantage of living in rural areas declines by 3 percentage points as mother of the potential student becomes head of the household.

Overall picture that emerges from these results is that of great conformity with the findings of the previous studies. Even a cursory look at the estimates points to the presence of substantial provincial and gender disparity in the country in terms of primary school enrolment. In this respect, provinces of Sindh and Balochistan are particularly

worse off as compared to the base province of Punjab. In these two provinces children are between 14 to 22 percent less likely to enrol in a primary school than those living in Punjab, depending on the nature of household headship. Khyber Pakhtunkhwa is also behind the base province in this regard, but if is still far ahead of Sindh and Balochistan. Female children in Pakistan are about 10 percent less likely to enrol in school when compared with boys. Rural-urban gap in primary school enrolment is also evident from these estimates. Children living in urban areas are 4 to 7 percent more likely to enrol in a primary school.

This study also confirms the key role played by mother's education in the school enrolment of the children, though father's role is also very important. The school enrolment probability of the children having an educated mother is between 16 and 25 percentage points higher as compared to the children of uneducated mothers, whereas the corresponding figures for father's education are 8 and 20 percentage points. The policy implication of these results is that increasing female enrolment in schools today will not only reduce the school enrolment gap between male and female children today, but it will also have substantial positive influence on future school enrolment trends when todays the girls will become tomorrow's mothers.

Well-off households are more likely to send their children to school as compared to the poorest 20 percent households. Depending upon the income quintile and the nature of household headship, this difference ranges between 7 and 19 percentage points.[4] This finding indicates that a possible beneficial side effect of the poverty reduction policies would be an increase in primary school enrolment rate. This provides another reason for increasing scope and coverage of the existing poverty alleviation programmes.

There is a quadratic relationship between age and school enrolment such that the probability of school enrolment increases with the child's age and, after reaching a maximum, starts declining. This is also evident from Figure 1 above. A possible reason for this enrolment behaviour could be availability of more attractive child labour opportunities for children beyond a certain age. This pattern highlights the importance of early childhood for educational outcomes of a child. Thus policies that incorporate steps for early intervention to get children enrolled in a primary school are more likely to bear fruit as compared to those which miss this opportunity.

Demographic composition of the household also plays a role in school enrolment of children. Present study confirms the finding of earlier studies that the households inhabited by more school age children are less likely to send them to school though this difference in terms of probability is relatively small—of the order of 1 to 3 percentage points. The reasons for this phenomenon may be diverse. Possible explanations often offered in the literature on this subject include more pressure on the given resources of the household due to an additional child or a trade-off between quality and number of children. Marginal effects of this variable may appear small, but these are comparable with those found in earlier studies, see for example, Rosati and Rossi (2003).

[4]Current income is not a good measure of the long-term purchasing power of a household as it fluctuates significantly from period to period. This is particularly true for the rural areas where such volatile factors as weather changes and outbreak of disease in crops and livestock can influence the level of income. Current consumption expenditure is considered a reasonable proxy for the permanent income of the household. Hence we use current consumption rather than nominal income to generate dummy variables for income quintiles.

This study seems to confirm the conventional wisdom that mother's lap is the nursery for raising educated children. Society can help mother in this invaluable effort by recognising significance of her role and enabling her to play a more active part in making decisions about allocation of household resources for education of children. Policy-makers can do their little bit by ensuring more education for women which better equips them to positively influence their children's educational future.

6. CONCLUSIONS

Study of the determinants of primary school enrolment is a popular theme among researchers in Pakistan and abroad. Such studies shed light on the nature and strength of various factors that influence the decision to enrol in a primary school and help devise policies to achieve universal primary education, a coveted goal of governments and other stake holders. Previous studies in Pakistan on this subject have established the number of pupil, parents, household, and community characteristics as significant influences on the primary school enrolment. However, two important points that get little attention in this literature are the importance of the power structure of the household in addition to its composition, and interaction of this structure with parental and household characteristics. The role of the household power structure in these studies is essentially limited to the study of female headship alone and the efforts to capture this role are often limited to introduction of a single dummy variable, hence ignoring the possibility of interaction of household headship with other explanatory variables.

There are at least three possible headship scenarios that are of interest in the context of school enrolment decisions, namely, when father is the head of the household, when mother heads the household, and when some other member of the household has this status. Moreover, the influence of the head on school enrolment may also reflect itself through explanatory variables such as household income and parent's education. This calls for estimating separate regressions for different types of headships. Present study analyses the determinants of primary school enrolment in Pakistan by estimating separate probit functions for the three headship scenarios.

Estimation results for the three categories of household heads presented in this study lead to important insights about the role of household headship in making decision to enrol a child in a primary school, which conventional studies do not offer. Though headship of parents is not enough to reduce gender gap in school enrolment, it leads to some decline in the disadvantage arising from living in the rural areas. The most noticeable and consistent effect of mother's household headship on child's school enrolment shows itself through the greater positive influence of the economic status of the household on the latter. This impact is particularly pronounced in the middle income groups. The role of father headed household in this respect is much smaller and inconsistent across income quintiles. Another important channel through which mother's household headship influences child's school enrolment is her education. Mother's primary education is the most important in this regard. Father's headship on the other hand, does not seem to have a very substantial advantage in this respect over the headship of a non-parent member of the household.

Results of this study generally conform well to the findings of previous studies. The study confirms presence of substantial provincial and gender, and some rural-

urban disparity in the country in terms of primary school enrolment. Mother's education plays a key role in the school enrolment of the children, though father's role is also important. Therefore increasing female enrolment in schools will not only reduce school enrolment gap between male and female children today, it will also have a substantial positive influence on future school enrolment trends when todays girls will become tomorrow's mothers. Well-off households are more likely to send their children to school as compared to the poorest 20 percent households. Thus a possible beneficial side effect of the poverty reduction policies would be an increase in primary school enrolment rate. Households with more school age children are less likely to send them to school, probably due to the pressure on limited household resources or due to a tradeoff between the number and quality of children. The probability of school enrolment increases with the child's age and after reaching a maximum, starts declining, perhaps due to availability of more attractive child labour opportunities in the later years. This highlights the importance of early intervention to get children enrolled in a primary school.

This study clearly demonstrates that mothers' role is of critical importance in raising educated children. Enabling them to play a more active role in making decisions about allocation of household resources for education can make crucial difference in the children's educational outcomes. Ensuring more education for women through policy intervention can better equip them to ensure the educational future of the next generation.

REFERENCES

Alderman, H., Behrman, R. Jere, Khan, S. Ross, R. David, and R. Sabot (1996) Decomposing the Regional Gap in Cognitive Skills in Rural Pakistan. *Journal of Asian Economics* 7, 49–76.

Alderman, H., J. R. Behrman, D. R. Ross, and R. Sabot (1996) Decomposing the Gender Gap in Cognitive Skills in a Poor Rural Economy. *Journal of Human Resources* 31, 229–254.

Alderman, H., P. F. Orazem, and E. M. Paterno (2001) School Quality, School Cost, and the Public/Private School Choices of Low-Income Households in Pakistan. *Journal of Human Resources* 36, 304–326.

Ali, Karamat and Rana Ejaz Ali Khan (2004) Simultaneous Decision Making of Child Schooling and Child Labour in Pakistani Urban Households. *The Lahore Journal of Economics* 9, 127–148.

Arends-Kuenning, Mary, and Suzanne Duryea (2006) The Effect of Parental Presence, Parents' Education, and Household Headship on Adolescents' Schooling and Work in Latin America. *Journal of Family and Economic Issues* 27, 263–286.

Baluch, Mazhar ul Haq and Saima Shahid (2008) Determinants of Enrolment in Primary Education: A Case Study of District Lahore. *Pakistan Economic and Social Review* 46, 161–200.

Becker, G. S. (1965) A Theory of the Allocation of Time. *The Economic Journal* 75, 493–517.

Buis, Maarten L. (2015) Logistic Regression: Why We Often Can Do What We Think We Can Do Presented at the 19th UK Stata Users Meeting. London.

Buvinić, M. and Geeta Rao Gupta (1989) Female-Headed Households and Female-Maintained Families: Are They Worth Targeting to Reduce Poverty in Developing Countries? *Economic Development and Cultural Change* 45, 259–280.

Chant, S. (2004) Dangerous Equations? How Female-headed Households Became the Poorest of the Poor: Causes, Consequences and Cautions. *IDS Bulletin* 35,19–26.

Desforges, C. and A. Abouchaar (2003) The Impact of Parental Involvement, Parental Support and Family Education on Pupil Achievements and Adjustment: A Literature Review. Department for Education and Skills, London, UK. (Research Report No. 433).

Hamid, Shahnaz (1993) A Micro Analysis of Demand-side Determinants of Schooling in Urban Pakistan. *The Pakistan Development Review* 32, 713–723.

Joshi, S. (2004) Female Household-Headship in Rural Bangladesh: Incidence, Determinants and Impact on Children's Schooling, Economic Growth Centre, Yale University, New Haven, Connecticut. (Centre Discussion Paper No. 894).

Kabubo-Mariara jane and Domisiano K. Mwabu (2007) Determinants of School Enrolment and Education Attainment: Empirical Evidence from Kenya. *South African Journal of Economics* 75, 5,l72–593.

Khalid, U. and Sajjad Akhtar (2011) Poverty Dynamics of Female-headed Households in Pakistan: Evidence from PIHS 2000-01 and PSLM 2004-05. Pakistan Institute of Development Economics, Islamabad. (PIDE Working Papers 2011: 80).

Lawson, David (2007) A Gendered Analysis of Time Poverty: The Importance of Infrastructure Economic and Social Research Council, UK. (GPRG-WPS-078).

Lincove, J. A. (2009) Determinants of Schooling for Boys and Girls in Nigeria under a Policy of Free Primary Education. *Economics of Education Review* 28, 474–484.

Lloyd, Cynthia B. and Ann K. Blanc (1996) Children's Schooling in Sub-Saharan Africa: The Role of Fathers, Mothers, and Others. *Population and Development Review* 22, 265–298.

Lloyd, Cynthia B., Cem Mete, and Zeba A. Sathar (2005) The Effect of Gender Differences in Primary School Access, Type, and Quality on the Decision to Enrol in Rural Pakistan. *Economic Development and Cultural Change* 53, 685–710.

Mankiw, N. G., D. Romer, and D. N. Weil (1992) A Contribution to the Empirics of Economic Growth. *Quarterly Journal of Economics* 107, 407–421.

McLanahan, Sara and Gary Sandefur (1994) *Growing Up With a Single Parent: What Hurts, What Helps*. Cambridge, Massachusetts: Harvard University Press.

Maitra, P. and Ranjan Ray (2002) The Joint Estimation of Child Participation in Schooling and Employment: Comparative Evidence from Three Continents. *Oxford Development Studies* 30, 41–62.

Mansuri, Ghazala (2006) Migration, School Attainment, and Child Labour: Evidence from Rural Pakistan. The World Bank, Washington, D. C. (World Bank Policy Research Working Paper 3945).

Memon, Ghulam Rasool (2007) Education in Pakistan: The Key Issues, Problems and the New Challenges. *Journal of Management and Social Sciences* 3, 47–55.

Mohiuddin, Y. (1989) Female-headed Households and Urban Poverty in Pakistan. *The Pakistan Development Review* 28, 759–775.

Mood, Carina (2010) Logistic Regression: Why We Cannot Do What We Think We Can Do, and What We Can Do About It. *European Sociological Review* 26, 67–82.

Pong, Suet-Ling (1996) School Participation of Children from Single-Mother Families in Malaysia. *Comparative Education Review* 40, 231–249.

Painter, Gary and David I. Levine (2000) Family Structure and Youths' Outcomes: Which Correlations are Causal? *The Journal of Human Resources* 35, 524–549.

Qureshi, M. Gohar (2012)The Gender Differences in School Enrolment and Returns to Education in Pakistan. Pakistan Institute of Development Economics, Islamabad. (PIDE Working Papers 2012: 84).

Qureshi, M. Gohar, Saman Nazir, and Hafsa Hina (2014) Child Work and Schooling in Pakistan: To What Extent Poverty and Other Demographic and Parental Background Matter? Pakistan Institute of Development Economics, Islamabad. (PIDE Working Paper No. 105).

Ray, R. (2000) Child Labour, Child Schooling, and Their Interaction with Adult Labour: Empirical Evidence for Peru and Pakistan. *The World Bank Economic Review* 14, 347–367.

Ray, R. (2000a) Poverty and Expenditure Pattern of Households in Africa: A Comparative Study. *Journal of International Development* 12, 241–256.

Ray, R. (2002) Simultaneous Analysis of Child Labour and Child Schooling: Comparative Evidence from Nepal and Pakistan. *Economic and Political Weekly* 37, 5215–5224.

Rosati, Furio Camillo and Mariacristina Rossi (2003) Children's Working Hours and School Enrolment: Evidence from Pakistan and Nicaragua. *The World Bank Economic Review* 17, 283–295.

Saqib, Najam us (2004) Willingness to Pay for Primary Education in Rural Pakistan. *The Pakistan Development Review* 43:1, 27–51.

Saqib, Najam us and G. M. Arif (2012) Time Poverty, Work Status and Gender: The Case of Pakistan. *The Pakistan Development Review* 51:1, 23–46.

Sathar, Zeba A., Asif Wazir, and Maqsood Sadiq (2013) Struggling against the Odds of Poverty, Access, and Gender: Secondary Schooling for Girls in Pakistan. *The Lahore Journal of Economics* 18: SE (September 2013), 67–92.

Toor, Imran Ashraf and Rizwana Parveen (2004) Factors Influencing Girls' Primary Enrolment in Pakistan. *The Lahore Journal of Economics* 9:2, 141–161.

United Nations (2015) *The Millennium Development Goals Report 2015.* New York: United Nations.

Villarreal, A. and Heeju Shin (2008) Unravelling the Economic Paradox of Female-Headed Households in Mexico: The Role of Family Networks. *The Sociological Quarterly* 49, 565–595.

Comment [T2]: Inconsistent – previously Americanised spelling used throughout the article