

An Empirical Analysis of Demand for Education in Pakistan

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The present study is an attempt to empirically analyze the role of household characteristics in demand for education. The demand for education is separately analyzed for three levels of education, i.e., school (class 10 and below), college (class 11 to 14) and university (above class 14) levels. The dependent variable is categorized into five groups (none enrolled, at most 25% enrolled, above 25% and at most 50% enrolled, above 50% and at most 75% enrolled and at least 75% enrolled among the targeted age group) and it takes the form of categorical limited dependent variable. We found that education of head, number of educated earners and proportion of males in targeted age group had in general positive impact on demand for education for all levels of education. Household size had negative effect on demand for education. The study further found that income does not explain variations in the demand for education.

Keywords: education demand, multinomial logit, earnings, Pakistan

Education is considered as one of the major determinants of economic growth in endogenous growth theories and it is recognized as a key variable in the Human Development Index (HDI). Moreover, Krueger and Lindahl (2001) reveal that many other factors of growth and development are likely to be determined by education levels. As growth and development are objectives of almost all developing countries, it is imperative to understand the factors that affect demand for education at different levels. Therefore, the study investigates demand for education at school, college and university level (all levels of education) in the context of a developing country, Pakistan.

The Constitution of Pakistan lays down that "State shall be responsible for eradication of illiteracy and provision of free and compulsory education up to secondary level, within minimum possible time".¹ Yet, adult literacy rate is just 57% in Pakistan. Moreover, "there are currently 5.03 million children of primary-school-going age out of school. At the middle, high and higher secondary level the out of school children are 6.40 million, 4.88 million and 6.33 million respectively. Among the age group 5 to 16 years, only 28.53 million children attend an educational institution, while 22.64 million children are out of school".²

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¹ Article 37-B, Constitution of Pakistan, 1973.

² The Pakistan Education Statistics, 2016.

In an important study, Sawada and Lokshin (2009) highlight that low levels of education in Pakistan may negatively affect its long-term economic growth. While Glewwe and Jacoby (2003) argue that supply side policies have been less successful in improving education levels in developing countries. It suggests that the focus should be on the demand-side of education rather than on the supply side of education. Precisely, Birdsall et al., (1993) argue that low enrollment rates in Pakistan are because of the demand side of education (Cynthia et al., 2005). On the other hand, Khan and Ali (2003) document that household's demand for education is determined by the characteristics of the household. Therefore, a study of this nature is essential that focuses on the characteristics of the household and systematically analyzes the household's education demand for children, adolescent and above all for adults at school, college and university levels.

There is a large (and still expanding) literature on demand for education but the focus has been traditionally on primary and secondary school education despite the fact that there are different levels of education. Several studies have analyzed basic school enrollment in developing countries (Lloyd et al., 2007). Although, Cynthia et al., (2005) and Satharet al., (2013) have already identified the determinants of schooling in Pakistan, yet the main limitation of these studies is that these studies are meant for basic school education. Likewise, Sawada and Lokshin (2009) estimate demand for education from primary to post-secondary (class 12) levels in Pakistan, however, the study does not consider education demand for university level.

Despite the fact that university education is recognized as a key factor for individual and social development, the analysis of demand for university education at national level is rather unusual. Butt and Rehman (2010) though examine the factors behind students' satisfaction for higher education in Pakistan yet, do not examine demand side of higher education. There are limited studies that empirically analyze the demand for higher education. In particular, with reference to Pakistan, there is hardly any study that explores the role of socio-economic variables into decision making of households to send their children to university or not at national level. Hence, this study attempts to fill this research gap by estimating household's demand for education at all levels including university level.

Another gap with existing literature is that most of the studies estimating demand for education in Pakistan consider dichotomous dependent variable (Saqib, 2004). That is either there is demand or no demand for education (0 or 1). Therefore, Irineu (2012) highlights, that when only two outcomes are assumed for the dependent variable, then it is bounded between 0 and 1. However, this study attempts to fill this research gap by providing three different categories for dependent variables.

Hence, this study is an attempt to bridge these research gaps and the objective is to estimate household's demand for education at different levels. The approach in this study differs from that taken in previous studies in two aspects. We estimate household demand at school, college and university levels of education. Secondly, the dependent variable is categorized into five groups to provide useful information for five different classifications of demand yet for the same level of education. The study includes region of residence, household size, household's earnings, education of the head, number of earners, number of educated elders and the male proportion in the household as explanatory variables. The data is taken from the Pakistan Social and Living Standard Measurement Survey (PSLM, 2014-15) and the study employs a multinomial logit for the estimation of demand for education at household's level.

The study proceeds as follows. The Section 2 presents brief review of education literature and Section 3 explains the data and the variables. Section 4 provides methodological framework for the study while Section 5 reports and discusses results of the study. Lastly, Section 6 concludes the study.

Review of Literature

Education is one of the basic tools for human resource development and an essential element for the sustainable development of a country, as it contributes to development through the broader application of skills and knowledge. The investigation of education is important for various reasons, for example, it has been found that education plays an important role in the adoption of new agricultural technologies in developing countries. In addition, the desirable outcomes of education include improvement of public health, reduction of poverty and inequality and good governance in the implementation of policies. Besides, education is seen as an intrinsic good in itself and globalization has multiplied opportunities for economies with good levels of education (Glewwe & Kremer, 2006; Barro & Lee, 2013; Khan & Akram, 2018).

In view of the widespread consensus on the importance of education, policymakers of developing countries focus education from demand as well as supply side. However, Pushkar (2003) argues that supply side policies aimed at increasing education levels have been less successful in developing countries. Similarly, Ahmad (2016) argues that a larger dependent population can result in lower demand for schooling. Therefore, Quang (2012) suggests that the researchers should focus on the determinants of the demand for education rather than on the supply side of education.

Sawada and Lokshin (2009) identify basic problems to school education by conducting field surveys in the twenty five villages of Pakistan. The study finds that supply side constraints for education arise from the lack of education demand, or in other words, supply side constraints are demand driven. The study further highlights that it is perhaps challenging for the government to manage education demand. Thus, in this scenario, it is important that education demand should be addressed at the household level.

While the literature on demand for primary and secondary schooling is relatively well developed for Pakistan, the literature on higher education is too limited. It may be because of large investments in basic school education. Cynthia et al., (2005) also mention that there has been a shift of funding away from tertiary education towards basic education in Pakistan. Likewise, our argument is also supported by the evidence provided by the Education Report (2016) that the major part of education system in Pakistan, is shared by primary schools education that is 49%, while universities have the least share of 0.05% in education system.

Conversely, the research shows that returns to education are higher with higher levels of education and investing in higher education together with basic education boosts economic development in a country (Idrees & Khan, 2019). Mankiw et al., (1992) establish that education increases human capital of labor force, improves its productivity and finally, stimulates long-run economic growth of the country. Similarly, Glewwe (2002) emphasizes that a higher level of education promotes economic growth in developing countries.

However, a number of cross-country studies reveal that human capital investments measured by educational performance are poor for Pakistan. Easterly (2001) explains that the poor performance of the economy of Pakistan is mainly because of the low levels of education. In the same vein, Khan and Ali (2003) reveal that the low enrolment rates at primary and secondary levels of education result in a very low level of participation at the university level. Therefore, the objective of the present study is to estimate household's demand at school, college and university levels of education by categorizing dependent variable into five different classifications of demand to provide useful information for education policy.

Data and Variables

The Pakistan Social and Living Standard Measurement Survey (2014-15) conducted by Pakistan Bureau of Statistics, has been used to estimate demand for education at school, college and university levels in Pakistan. The PSLM survey covers population in all rural and urban areas of Pakistan including federal capital Islamabad. In PSLM, the unit of identification is household and it provides information on economic, demographic and social characteristics of the household. Table 1 gives the distribution of Primary Sampling Units (PSUs) and Secondary Sampling Units (SSUs) in rural and urban areas.³

Table 1

Distributions of PSUs and SSUs in Urban and Rural Areas

Province/Area	Sample PSUs			Sample SSUs		
	Urban	Rural	Total	Urban	Rural	Total
Punjab	594	1860	2454	6814	29188	36002
Sindh	375	901	1276	4399	14336	18735
Khyber PakhtonKhua	104	764	868	1184	11898	13082
Baluchistan	110	572	682	1276	8971	10247
Islamabad Capital Territory	27	19	46	292	277	569
Total	1210	4116	5326	13965	64670	78635

Source: *Pakistan Social and Living Standard Measurement Survey-2014-15*. Government of Pakistan, Statistics Division, Pakistan Bureau of Statistics, Islamabad.

The survey covers 78,635 households with 5,13,099 individuals and the sample consists of 82.69% of the rural population and 17.31% of the urban population.

The study divides education into school, college and university levels. Therefore, the study selects only those household from the data set where individuals belonging to the age group of school, college or university levels of education are found. The age groups roughly correspond to individuals who may be enrolled at the school, college and university levels of education. In specific, for analyzing demand for school education (till class 10) we considered individuals between 4 and 18 years. As quite often it is found that children of age 4 are enrolled in school and they complete their secondary school up till 18 years. The age limit for college education (class 11 to 14) is taken between

³ In PSLM surveys the cities and town are divided into enumeration blocks, the number of enumeration blocks represents the Primary Sampling Units (PSUs), while the households selected from enumeration blocks represent Secondary Sampling Units (SSUs).

18 and 25 years, while for university education (above class 14) we considered individuals with ages between 20 and 28 years.⁴

The dependent variable is categorized into five groups. For that reason, the study computes proportion of household members accruing education. For this purpose, we take the ratio of household members enrolled for a given level of education to the total number of household member in the target age group for that specific level of education. Accordingly, the study categorizes households demand for education into category 1, 2, 3, 4 and 5 for the households having demand in the range of 0, 0.01-0.25, 0.26-0.50, 0.51-0.75 and above 0.75 respectively. This classification of households with respect to demand for education is indicated in Table 2.

Table 2
Grouping of Households with Respect to Demand for Education

Groups	Proportion of Enrolled (or passed) Members From the Targeted Age Group
1	0 (No Household Members of the Targeted Age Group is Enrolled)
2	0.01 to 0.25 (At most 25% Household Members of the Targeted Age Group are Enrolled)
3	0.25 to 0.50 (More than 25% but at most 50% Members of the Targeted Age Group are Enrolled)
4	0.51 to 0.75 (More than 50% but at most 75% Members of the Targeted Age Group are Enrolled)
5	0.76 to 1.00 (At least 75% Members of the Targeted Age Group are Enrolled)

A comprehensive study of household behavior is very complex and the range of research depends on the availability of the required data. Despite that, the empirical studies on demand for education use a number of socioeconomic variables that relate to household’s characteristics. The study has included region of residence, household size, household’s earnings, education of the head, number of earners, number of educated elders and the male proportion in the household as explanatory variables following Sawada and Lokshin (2009), Qureshi (2012) and Sathar et al., (2013). The study examines three separate demand functions for school, college and university education for five categorizes of demand at households level.

Method

The given specification shall be followed to analyze demand for education at three levels:

$$Y_i = \beta_0 + \beta_1 REG_j + \beta_2 ERN_i + \beta_3 ERNS_i + \beta_4 MEM_i + \beta_5 MPR_i + \beta_6 H.ED_i + \beta_7 E.ED_i + \mu_i \quad (1)$$

Where,

Y_i is the categorical limited dependent variable with values ranging from 1 to 5, 1 reflecting households belonging to Group:1 with no demand for education and so on.

REG_j is the region of residence.

ERN_i reflects the household monthly earnings.

⁴ The criteria is enrolled or passed the upper limit of education, for instance in school education upper limit is class 10 (or equivalent). Therefore for group1 we considered all individuals (age between 4 and 18) who are enrolled or have passed class 10 (or equivalent). Same criterion is followed for other groups.

$ERNS_i$ is the number of earners in a household.

MEM_i is the household size.

MPR_i is the proportion of males in target age.

$H.ED_i$ is the education of head.

$E.ED_i$ is the number of elders having at least defined level of education.

and μ_i is Error term.

Since the dependent variable takes the form of categorical limited dependent variable, therefore we shall use multinomial logit model.⁵ With five levels of demand for education the econometric specification for the multinomial logit is as follows:

$$\ln\left(\frac{P_i}{P_1}\right) = \alpha_i + \gamma_i X, \quad \text{where, } i = 2, 3, 4 \text{ or } 5 \text{ and } 1 \text{ is taken as base category.}$$

Where, P_i are the probabilities of demand for education, α_i are the intercepts of relative probability and γ_i are the slopes of relative probabilities, X shows a vector of explanatory variables.

Results and Discussions

In the following discussion, the results of multinomial logit regression model for school, college and university levels of education are given for five different classification of demand at the household's level. The study takes the first group of no demand as a base group and estimates marginal effects of all explanatory variables. The marginal effects show change in the probability of engaging a family into demand for education for a given change in the explanatory variables. The results show not only substantial differences in demand for education with different levels of education but the behavior of determinants of education demand differs by group even at the same level of education.

Results of Demand for Basic School Education

The results of demand for education at school level that is basically primary, middle and matric are given in Table 3. The table shows that the region of residence has a considerable impact in making a choice about demand for basic education. The results indicate that the effect of urban region is positive for all other groups in our analysis except for group 2 however, it is not significant for that group. The coefficient also becomes larger for successive groups of demand for basic education which imply that in urban regions households are more likely to educate their members from targeted age group as compared to household in rural areas. It may be because of our social set up that household in rural areas are less likely to enroll their children at school level of education. Previous empirical studies also support this finding that there are significant enrollment differentials by place of residence at school level in Pakistan (Ahmad, 2016).

Table 3 also shows that the relative probability of demanding basic education, other things remaining constant, relative to first group increases with the increase in household size. Although the household size has a significant and positive influence on child schooling for all groups in the analysis however, it is relatively weak for the last group. It means that the larger families are more likely to educate their children. This finding suggests that due to joint family system in Pakistan, perhaps larger households pool their resources to educate their children. Qureshi(2012) also finds positive impact of household size at school level in Pakistan.

⁵ See also Greene (2008) and Lu (1999).

In developing countries, household earning is generally considered a constraint for poor families to educate their children. However, Table 3 shows that earnings of the households have no role in determining household's demand towards basic school education in Pakistan. Khan and Ali (2003) find that income of the head of household has little effect on the children's enrolment in Pakistan. While Song et al., (2006) explain that students from poorer families also attend school in China as income has a slight impact on school enrollment. Basic school education up to matriculation is free in Pakistan. In addition, syllabus books are provided freely in government institutions. Therefore, being poor is not an obstacle to enroll children into school in Pakistan.

Table 3 also shows that the relative probability of demanding basic education, other things remaining constant, relative to first group decreases as there is increase in number of earners at household level. The coefficient of the number of earners indicates a significant negative impact on the household's demand for school education. This situation may appear in case of a household that is involved in child labor. So, despite the increase in the number of earning members of household, the household will be less likely to demand for basic education.

Table 3

Multinomial Logit Estimates of Demand for Basic Education (School education, Class 10 and below)

Variables	Group: 2 (0.01 to 0.25)	Group: 3 (0.26 to 0.50)	Group: 4 (0.51 to 0.75)	Group: 5 (0.76 to 1.00)
Region	0.9257 (-1.08)	1.2337 (5.35)	1.6094 (11.83)	2.0290 (21.13)
Household Size	1.4537 (50.62)	1.2609 (42)	1.3536 (52.52)	1.0758 (13.52)
Household Earnings	0.9999 (-1.23)	1.0000 (7.75)	1.0000 (9.6)	1.0000 (14.76)
Education of Head	1.0292 (4.47)	1.0695 (18.7)	1.1185 (29.99)	1.1199 (35.88)
Number of Earners	0.8230 (-9.67)	0.7906 (17.11)	0.6447 (-27.22)	0.5974 (-34.79)
Matriculate Elders	0.6187 (-11.08)	1.0324 (1.46)	1.0859 (3.74)	1.7524 (29.47)
Male Proportion in Targeted Age Group	1.0172 (0.26)	1.7952 (15.62)	2.6198 (22.93)	2.8601 (31.62)

Base Category: Group 1

The results show that the presence of matriculate elders in the household has different impact for different groups. When we look at higher groups of demand, we find that the effect of number of matriculate elders is significant and positive in choosing higher group of demand. It means that educated older siblings can promote the education of younger ones. Khan and Ali (2003)

describe that children learn easily from the experience of older siblings through home teaching and an economy of scale may exist at household level. Mukhopadhyay and Sahoo (2016) explain that educated elder siblings may teach and motivate younger ones to attend school. According to the study, the school participation in India may have improved because of this sibling externality.

It is also evident from Table 3 that the male proportion in targeted age group has a significant impact in making a choice about school level demand for education. The coefficient of male proportion of target age group shows that it has a significant positive impact on demand for basic education relative to first group. Lloyd et al., (2007) explain that parents are less willing to make an investment in the schooling of girls as compared to boys because of cultural constraints and it is also obvious from several enrollment indicators. It may be because of the fact that more market opportunities are available for boys in male dominating societies, like Pakistan. Hence, male education is weighted more as compared to female education.

Results of Demand for College Education

Table 4 presents the results of demand for college education (class 11 to 14). It shows that households residing in urban region are significantly more likely to demand for college education. The coefficient becomes larger for successive groups of demand for college education. It means that urban households are more concerned about the education of their children at college level as compared to their rural counterparts. Same point is also highlighted by Song et al., (2006) that there are significant regional variations in enrollment decisions because of regional differences in educational systems in China. Ahmad (2016) explains that urban areas in OECD as well as in non-OECD countries generally provide a better quality of education than rural areas. This may be a reason for the rural urban difference in demand for education at college level.

The results illustrate that household size has a positive influence in determining demand for education for the first three groups while it affects negatively last group. The positive relationship between these two variables is possible because of joint family system in Pakistan, where the responsibility of educating children is shared among the family members. However, the negative relationship between the two variables for the last group may be because of the performance of the students at school and college level. Satharetal., (2013) report high probability of drop out at secondary school level for larger families. Thus, the result shows that till basic education households demand education for all of their members from target age group but for college education it may not be achieved for all groups may be because of the performance of the students.

The results also show that if households want to educate their children beyond secondary level, then financial constraints are not hurdle in Pakistan. Cameron and Heckman (2001) show that although income of the household effects higher education enrollment by impacting the college-readiness of children, however, it has no key role in financing college education. Moreover, Cameron (2009) shows that poverty has no effect on the completion of senior secondary education in Indonesia.

Table 4

Multinomial Logit Estimates of Demand for College Education (College education, class 11 to 14)

Variables	Group 2 (1% – 25%)	Group 3 (0.41 – 0.60)	Group 4 (0.61 – 0.80)	Group 5 (75% – 100%)
Region	1.7400 (5.72)	1.7509 (12.85)	2.6326 (12.18)	2.6855 (24.21)
Household Members	1.1848 (19.23)	1.0787 (14)	1.1090 (10.59)	0.9775 (-3.51)
Household Earnings	1.0000 (6.53)	1.0000 (13.26)	1.0000 (13.7)	1.0000 (16.25)
Education of Head	1.1019 (10.5)	1.1327 (30.56)	1.178602 (19.82)	1.1534 (35.05)
Number of Earners	1.1297 (3.89)	0.8963 (-5.88)	0.9206 (-2.31)	0.5738 (-22.49)
Graduate Elders	0.8638 (-1.37)	1.3481 (6.79)	1.6282 (8.07)	2.0835 (17.87)
Male Proportion in Targeted Age Group	1.8242 (5.28)	2.2303 (16.61)	2.4145 (8.9)	3.3372 (25.52)

Base Category: Group 1

Table 4 also shows that if head of household is educated it is significantly more likely to have demand for college education. Sawada and Lokshin (2009) explain that although father's education impacts primary school enrollment decision, however, school progression after primary school (post-secondary) admission is highly influenced by mother's education. Chudgar (2011) also mentions that positive effect seems to exist for head's education and enrollment rates at the higher secondary level in India. The reason may be that more educated family heads understand more precisely the benefits of education. Hence, there is a complementarity between the education of the parents and education of the children.

Number of earners in a family has though significant yet different impact on having demand for college education for different groups. It has positive impact for group 2 while impact is negative for all other groups relative to no demand. The positive impact shows that it may be relatively easy to send less than 25% of family members for education as the number of earners increases, however, it may not be possible for all. This situation may happen if a household chooses to engage his children in domestic work. In that case as the number of earners increases, probability of getting education may decrease.

The study finds that presence of educated elders in the household plays an important role in making decisions for demand for college education. The coefficient of educated elders shows that it affects significantly and positively the decision of educating children except for group 2 however, it is insignificant for that group. Sawada and Lokshin (2009) estimating demand for education from primary to post-secondary levels in Pakistan, explain that family members can share different

educational inputs and there may be an economy of scale at household level for the public good, education. In that case the presence of educated older siblings promotes education of the younger children.

Our results show a strong, significant and positive association between demand for education and male proportion of the college age members. In Pakistan, it is generally considered that investment in the education of male members will pay back in future while investments in education of female will not. It is due to the fact that sons can contribute to household's monetary resources while educated daughters have only nonmarket domestic labor contribution. Sawada and Lokshin (2009) also explain that at the postsecondary levels of education, the number of brothers, instead of the number of sisters, increases schooling probabilities. Results of Song et al., (2006) for China also support our findings.

Results of Demand for University Education

The results for university education (class 15 and above) are shown in Table 5. Table 5 shows that the likelihood to have demand for higher university education is positive for urban residents. Frenette (2006) finds that a student who lives away from third level institutions has a lower probability of participation at the university level in Canada, as larger travel distance negatively influences university enrollment. Darragh and Cathal (2009) also explain that as the majority of higher education facilities are given in urban areas in Ireland, the students living in rural areas face extra transportation costs and possibly extra living costs which play a key role in the decision to participate in the university education. Same is true for Pakistan, as more facilities for higher university education are given in urban areas hence, an urban setting is more helpful for higher education participation in Pakistan.

Table 5

Multinomial Logit Estimates of Demand for Graduate Education (University education, class 15 and above)

Variables	Group 2 (0.21 – 0.40)	Group 3 (0.41 – 0.60)	Group 4 (0.61 – 0.80)	Group 5 (0.81 – 1.00)
Region	1.7601 (4.41)	1.6299 (7.25)	2.4045 (5.08)	2.2164 (10.19)
Household Members	1.1645 (13.32)	1.0447 (4.9)	1.0386 (1.69)	0.9041 (-7.06)
Household Earnings	1.0000 (9.65)	1.0000 (16.75)	1.0000 (11.37)	1.0000 (16.61)
Education of Head	1.1490 (10.92)	1.1859 (24.43)	1.1981 (9.47)	1.1923 (20.22)
Number of Earners	1.1927 (3.89)	1.0041 (0.13)	1.1951 (2.44)	0.8634 (-3.16)
Post Graduate Elders	1.1588 (1.09)	1.3211 (3.68)	1.7263 (4.11)	2.0035 (8.88)
Male Proportion in Targeted Age Group	1.4967 (2.34)	1.9065 (7.68)	2.2334 (3.52)	1.6179 (4.97)

Base Category: Group 1

Table 5 also shows that the effect of household size for different categories of demand becomes weaker, insignificant and ultimately negative for university education. There are two explanations for this result. It may be because of the performance of the student at school or college level as discussed before. Ravallion and Wodon (2000) also mention that children from larger households are neither less nor more likely to get education, it is basically their performance that matter. Secondly, it may be because of strong gender effects. Sawada (1997) explains that Pakistani parents favor sons in terms of education. While Song et al. (2006) explains that it is actually demographic composition of the household that seems to matter when parents are making decisions of demand for education while Satharetal.,(2013) shows that girls are less likely to get education in Pakistan. So, it may not be possible to educate all of the children from target age at university level in the context of a developing country, Pakistan. Where gross enrollment ratio at college level is weak and gender effects are strong.⁶Qureshi (2012) also reports negative impact of household size for tertiary education in Pakistan.

The results also show that household earnings play no role in establishing household's demand towards university education in Pakistan. Ryan et al., (2007), rejects the hypothesis that household income gives a greater chance of entering third level education. While Darragh and Cathal (2009) find that household income does not affect the probability of entering higher university education in Ireland. The insignificance of household income in their model suggests that credit constraints may not be a huge barrier to entry to higher education. The results suggest that financial situation of the households may not influence the number of students seeking to enter higher university education in Pakistan.

The education of the head of household affects positively and significantly the participation decision for higher university education in Pakistan. Darragh and Cathal (2009) also report that higher levels of parental education positively influence the probability of entering university education in Ireland. Similarly, Qureshi (2012) explains that father's education, is more important towards increasing the likelihood of enrolment for girls at the tertiary level in Pakistan.

The number of earner in the household positively affects the probability of entry into the university education except for the last group where we can see a trade-off between earnings and university education. The positive relationship shows that household earners are facilitating the university education of the children. While negative relationship shows that it may not be possible for the household to send all of his children from target age group to university education may be because of gender effect as discussed earlier or may be because of household tasks. Benin and Debra (1990) indicate that girls in full-time dual-earner families spend 25% more time on chores as girls in traditional families with single earner.

As far as the impact of educated elders (class 16 or above) is concerned it has significant and positive effect for all groups. Darragh and Cathal (2009) also explain that students make their educational decisions on the basis of outcomes of adults in their neighborhood. Hence, the study

⁶The Pakistan Education Statistics (2016) shows that the gross enrollment ratio for 9 to 12 classes is 34% in the country.

finds that children are more likely to get university education if the average education level in their family is high.

Our results show that male proportion in the targeted age group significantly and positively influences demand for university education. It reflects a perception that education of son is an investment good, which should be funded regardless of income whereas education of daughter is luxury consumption good (see Song et al., 2006). Likewise, Butt and Rehman (2010) explain that proportion of male students is high in the universities of Pakistan, since male students face less problems in reaching at university level of education. A generalized male or pro-son bias in our country may better explain why a higher weight is given to the welfare and education of sons than to that of daughters.

Conclusions

In present study the demand for education is separately analyzed for three levels of education, i.e., school (class 10 and below), college (class 11 to 14) and university (above class 14) levels. First we defined age limits; for school education we considered individuals between 4 and 18 years. The age limit considered for college education is between 18 and 25 years and for university education we considered individuals with ages between 20 and 28 years. In each analysis, only those household are considered in which at least one individual of the specific age group is found.

In each case, households are categorized in five groups with respect to demand for education. Group 1 comprise of the households in which no one from the defined age limits demands education. Group 2 consists of the households in which at most 25% members of the defined age limits demand for education. Group 3 includes those households in which more than 25% and at most 50% members of the defined age limits demand for education. Group 4 comprise of households in which more than 50% and at most 75% members of the defined age limits demand for education and group 5 consists of all those households in which more than 75% members of the defined age limits demand for education. By demand for education we mean that either they are accruing education or have acquired maximum defined level of education.

The results indicate that by and large households residing in urban areas are more likely to educate their members as compared to the household in rural areas. This is true for all levels of educations. It is also seen that for all levels of education, the presence of educated elders in the household has positive effect on demand for education. Another interesting and expected finding is that the male proportion in targeted age group has a positive impact on demand for all levels of education. It may be because of the fact that more market opportunities are available for boys in male dominating societies, like Pakistan. Hence, male education is weighted more as compared to female education.

It is also found that with reference to school education, household size has a positive impact in determining demand for education for all groups except last. However the magnitude declined for every next education level. Interestingly, we found that difference in household earnings do not explain difference in demand for education across groups. The coefficient of earnings showed that with reference to school education, there is no change in demand for education. The results suggest that financial position of the household do not influence the decision of accruing education. Regarding the education of the head of household, results showed that education of head has positive effect at all levels of education. It is also interesting to note that by and large the impact of different variables on determining demand for education is the same for all levels of education.

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