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DETERMINANTS OF SCHOOL ENROLMENT IN BHUTAN: DOES INCOME MATTER TO POOR?

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ABSTRACT

Household income is a significant determinant in explaining school enrolment in many of the previous studies. However, the implications of income on poor and rich households are less investigated. Therefore, this article examines the determinants of school enrolment for rich and poor households in Bhutan using data from the Bhutan Living Standard Survey, 2012. Findings suggest that income matters so much to the poor as opposed to the rich households. Consequently, Bhutan government should focus on distribution of income from rich to poor in order to maximize school enrolment.

Contribution/ Originality: This study is one of very few studies that have investigated the implications of income on poor and rich households. The paper's primary contribution is finding that income is very pertinent for poor households indicating that poor are resource constrained to send their children to school.

1. INTRODUCTION

The social and economic benefit of education is well articulated in several studies (OECD, 2007; OECD, 2013). Education is basically considered as the means to reduce poverty and to enhance economic growth (Huisman and Smits, 2008). Education is viewed to enhance the human capital, thereby increasing labour productivity, which ultimately accelerates the economic growth. Education is also regarded to increase the human potential in understanding new technologies, increase innovative capacity, and implement the new ideas which benefit the individuals and the economy (Hanushek and Wößmann, 2010). The importance of education in Bhutan has not been unheeded at all. Monastic education has existed since 8th century and the advent of modern education can be traced back to 1915. After the start of first five-year plan development activities in 1961, the promotion and expansion of formal education became vigorous to develop human resource capacity for socio economic development (Thinley, 2009). Further, section 16, Article 9 of the Constitution of Bhutan guarantees free education to all Bhutanese children up to grade 10 (Royal Government of Bhutan, 2008). Therefore, the first objective of the study is to assess the determinants of school enrolment in Bhutan. Findings from the study suggest that household

income, age, son/daughter, area of residence, and number of dependents are significant in explaining school enrolment in Bhutan.

Poverty is very much pertinent in Bhutan. Bhutan is categorized amongst the low middle-income countries of the World (World Bank, 2012). Around 12 per cent of the population is still found to live below the poverty line of Ngultrum (Nu) 1704.84 per person per month in 2012 (National Statistics Bureau, 2012). Though, the economic growth as measured by real Gross Domestic Product (GDP) averaged around 8.2 per cent in the last ten years (NSB, 2013) it is also observed that the richest 20 per cent of the population in Bhutan consume 6.7 times higher than the poorest 20 per cent (NSB, 2012). Inequality, as measured by Gini Index is recorded at 0.36 (NSB, 2012) suggesting quite high-income disparity in the country. Therefore, the second objective of this study is to find out, whether household income proxied by total expenditure can explain school enrolment for rich and poor households differently in Bhutan. Findings from this study suggest that household income is very important factor in determining school enrolment for the poor. However, it does not matter for the rich.

Rest of the paper is structured as follows. Section 2 summarizes the literature review undertaken in this study. Section 3 provides explanation on data and methodology, followed by results and interpretation in section 4. The final section concludes with policy recommendation.

2. LITERATURE REVIEW

Limited studies have been carried out in Bhutan pertaining to analysis on school enrolment. To the best knowledge of the author, there is only one study on school enrolment in Bhutan by Choden and Sarkar (2013). They mainly focused on gender discrimination in educational enrolment. They found that probability of girls enrolling into schools was less compared to boys, though the girls did not face any discrimination in educational opportunities. Age of the children depending on their age brackets was also found to explain enrolment. Higher the age, it was observed that children were less likely to get enrolled into schools. Among the other determinants, wealth of the household, education of the household head (5-8 years), female headed households, married household heads were found more likely to increase enrolment. On the other hand, more number of dependents, living in rural areas and education of household head between 13 to 18 years were found negatively impacting enrolment.

The current study differs from Choden and Sarkar (2013) on four counts. First, this article uses the latest Bhutan Living Standard Survey (BLSS) data of 2012 as compared to their 2007 data. Second, their focus of analysis is on gender discrimination in educational enrolment, whereas, this article emphases on income differences of the households and how it matters for educational enrolment. Third, the present study uses household expenditure data, unlike their wealth index, constructed using the principal component analysis. Finally, this study employs instrument variable regression compared to their fixed and random effect models.

From the studies on educational enrolment in other countries, the common determinants used in explaining school enrolment can be classified into economic and non-economic characteristics. There is general consensus on the importance of household income or wealth in explaining school enrolment (Tansel, 2002; Maitra, 2003; Song *et al*., 2006). However, Zimmerman (2001) found that the effect of household income for rich and poor households varied. Using median household expenditure to divide the households into poor and rich, he observed that household income mattered for the poor households more than the rich households. Besides, residing in urban areas was also found positively associated and more number of children negatively associated with school enrolment in case of poor households only. Other common determinants between rich and poor households are; mother's education was found positively associated and distance to school was found negatively associated with school enrolment in Bulgaria. Filmer and Pritchett (1998) also made similar observation. They found that children from rich families had higher probability of school enrolment compared to those children from poor families in India. In addition, they also found that male children were more likely to be enrolled in school in case of poor families.

The other common non-economic determinants are age, education of parents or household heads, number of dependents, religion, distance to school and area of residence. Age is found to have positive association with school enrolment indicating that young children are more likely to be in schools (Maitra, 2003; Guimbert *et al*., 2008; Lincove, 2009). Educated parents or household head is found to boost school enrolment for their children (Connelly and Zheng, 2002; Tansel, 2002; Maitra, 2003; Dostie and Jayaraman, 2006). More number of dependents in the house is found to have negative impact on school enrolment (Zimmerman, 2001; Maitra, 2003; Guimbert *et al*., 2008). Islamic religion is found to discourage school enrolment in Nigeria (Lincove, 2009) but it is found insignificantly associated with enrolment in India (Dostie and Jayaraman, 2006). Longer the distance to schools, it is found to act as the deterrent for school enrolment (Dostie and Jayaraman, 2006; Guimbert *et al*., 2008; Lincove, 2009). In most of the studies, urban households are found to have higher probability in enrolling their children into schools (Zimmerman, 2001; Tansel, 2002).

3. DATA AND METHODOLOGY

3.1. Data Source

The data for the study is from the BLSS, 2012. The BLSS is conducted every four to five years to collect comprehensive socioeconomic information for planning and policy purposes. The BLSS follows the World Bank's Living Standard Measurement Study (LSMS) methodology. Out of the total sample size of 10,000 households, the survey covered a sample of 8,969 households with 39,825 individuals.

The BLSS provides a wide range of information. It has data on demographic characteristics of the household members, credit, remittances, housing, accessibility to public facilities and services, employment, health, of household members, household income and prices of commodities. Importantly, it has comprehensive information on household consumption expenditure, education and household assets. This rich information, thus allow for in depth analysis.

As in Choden and Sarkar (2013) the data used in the study include the school-aged population of children in the 6-16 age group. It is within this age category where a child starts his/her pre-primary school and completes high school in Bhutan. The final data set contains 9,272 children. One of the objectives of the current study is to see the enrolment determinants for rich and poor separately. Following Zimmerman (2001) monthly median total household expenditure is used to segregate the households into poor and rich. Households with total expenditure less than local currency Ngultrum (Nu). 18446.42 per month are classified poor and households with total monthly expenditure of above Nu. 18446.42 are considered rich. The final samples for poor and rich households are 4197 and 5075 respectively.

3.2. Variables

Previous study by Choden and Sarkar (2013) finds that girls are less likely to be enrolled in school compared to boys in Bhutan. In order to see if there are any preferences in school enrolment between boys and girls, sex of the children is included in the study. Child age is included, as it is found that school enrolment increases in younger children and decreases as the children ages (Holmes, 2003; Lincove, 2009). A quadratic age term is also included to capture the non-linear effect on school enrolment. There is also indication that biological child will be enrolled in school compared to other dependents residing in the same household (Huisman and Smits, 2008). Therefore, variables; son or daughter is also included in the study to see if such practices are pertinent in Bhutan. More number of dependents in a household is found to compete for scarce educational resources (Huisman and Smits, 2008; Lincove, 2009; Choden and Sarkar, 2013). Therefore, total number of dependents in a household is included.

Education in Bhutan is free but not compulsory. Under such circumstances, the household dynamics are critical in determining whether to send children to school or not. In order to incorporate household factors, the characteristic of the household head is taken into consideration, as household heads in Bhutan mostly takes the

decisions. Characteristics such as sex, marital status, education, and employment status of the household head is included.

In order to capture, whether there are any differences in decisions made by male or female-headed households, a dummy variable of male-headed household is included. Further, the inclusion of marital status of the household head is to show whether unstable marriage life can disrupt school enrolment of their children. As documented in Khanam (2008) and Tansel (2002) educated parents are found to have greater affordability to spend on children's education. In addition, employed household heads are found more likely to enrol their children into schools compared to those unemployed (Tansel, 2002; Huisman and Smits, 2008). So, dummy variable whether the household head has any level of education or not and whether the household head is employed or not is used in the study.

Choden and Sarkar (2013) posit that educational infrastructure and facilities differ significantly between rural and urban areas in Bhutan. In order to see, if such differences influence on school enrolment, urban dummy is included in the study. The crux of the analysis is to measure the impact of household permanent income on school enrolment. More so, children from wealthier families are found to have higher probabilities of being in school (Zimmerman, 2001). To proxy household permanent income, total monthly household expenditure is used. Detailed variable description is provided in Table 1.

Table-1. Variable definition

Variables	Definition
Enrolled	Binary dummy variable taking the value of 1 if the respondent is currently studying, otherwise 0.
richenrolled	Binary dummy variable taking the value of 1 if the respondent in rich household is currently studying, otherwise 0.
poorenrolled	Binary dummy variable taking the value of 1 if the respondent in poor household is currently studying, otherwise 0.
Male	Binary dummy variable taking the value of 1 if the respondent is male, otherwise 0.
Age	Respondents completed age in years.
age_squared	Quadratic age term to estimate non-linear effect on enrolment.
son_daughter	Binary dummy variable taking the value of 1 if the respondent is son/daughter of the household head, otherwise 0.
Hhmale	Binary dummy variable taking the value of 1 if the household head is a male, otherwise 0.
Hhmarried	Binary dummy variable taking the value of 1 if the household head is married, otherwise 0.
hhedunone	Binary dummy variable taking the value of 1 if the household head has never attended school/institute, otherwise 0.
hhunemployed	Binary dummy variable taking the value of 1 if the household head is unemployed, otherwise 0.
Urban	Binary dummy variable taking the value of 1 if the respondent is from urban area, otherwise 0.
dep_under	Total number of household members below the age of 15 in the household.
Hhagemale	Completed age in years of the male household heads.
hhagefemale	Completed age in years of the female household heads.
Adults	Total number of household members, above the age of 15 in the household.
Hhsick	Binary dummy variable taking the value of 1 if the household head has fallen sick in last 4 weeks, otherwise 0.
Lntotexp	Log of total monthly household expenditure.
total_exp	Total monthly household expenditure on food and non-food items.

Source: Author

3.3. Descriptive Statistics

Table 2 provides the descriptive statistics of the variables used in the study. It can be seen that 93 per cent of the respondents are going to school. Around 91 per cent of the respondents are enrolled in schools in the poor category as compared to almost 95 per cent in the rich category. The male and female respondents are almost equally divided. Average age of the respondents is around 11 years in all the samples. The respondents who are son/daughter of the household head is around 77 per cent in the full sample, around 78 per cent in the poor category and around 76 per cent in the rich category. Average dependents in a household are around 2 across the samples.

Table-2. Descriptive Statistics

Variables	Full Sample		Rich		Poor	
	Mean	SD	Mean	SD	Mean	SD
Enrolled	0.931	0.2535	0.9466	0.2249	0.9121	0.2832
Male	0.4975	0.5	0.4936	0.5	0.5023	0.5001
Age	11.12	3.1524	11.1437	3.1534	11.082	3.1513
age_squared	133.5	70.184	134.12	70.37	132.75	69.96
son_daughter	0.7694	0.4212	0.7637	0.425	0.7763	0.4168
dep_under	2.3208	1.2124	2.3472	1.2377	2.2888	1.1806
Hhmale	0.7442	0.4363	0.7431	0.437	0.7455	0.4356
Hhmarried	0.8782	0.327	0.8904	0.3124	0.8635	0.3434
Hhedunone	0.5717	0.4949	0.456	0.4981	0.7117	0.453
Hhunemployed	0.0054	0.0732	0.0047	0.0686	0.0062	0.0785
Urban	0.4757	0.4994	0.6033	0.4893	0.3214	0.4671
total_exp	24543.8	19847.2	34420.2	22213.2	12601.2	3609.6
Sample	9272		5075		4197	

Note: SD is the Standard Deviation.

Source: Author's calculation.

Around 74 per cent of the households are headed by male in all the samples. Almost 88 per cent of the household heads are married in the full sample. Married household heads in the poor category is around 86 per cent, which is less compared to 89 per cent in the rich category. Household head without any kind of education is observed highest among the poor category. Around 71 per cent of the household heads are uneducated as compared to only 46 per cent in the rich category. Overall, none educated household heads are around 57 per cent. Unemployed household heads are also found higher in the poor category. Compared to 0.62 per cent, household heads unemployed in the rich category is only around 0.47 per cent. In the full sample, the 0.54 per cent of the household heads is unemployed.

Around 48 per cent of the respondents reside in urban areas in the full sample. However, only 32 per cent of the poor households are found living in urban areas as compared to 60 per cent of the rich category. The average total monthly household expenditure is around Nu. 24,543.8 in the full sample compared to Nu. 12,601 and Nu. 34,420 of the poor and rich categories respectively.

4. METHODOLOGY

In the various literatures reviewed for this study, school enrolment is found to depend on economic and non-economic characteristics. Therefore, the specification can be presented as follows:

$$SE_i^* = \beta' X_i + \epsilon_i \quad (1)$$

Where SE_i^* is the school enrollment variable of household i. β' is a vector of parameters to be estimated. X_i is a vector of explanatory variables which is described in section 3.1 and ϵ_i is a random error term assumed to be normally distributed.

School enrolment variable is a dichotomous variable. Therefore, the observed binary dummy variable is defined as follows:

$$SE_i = \begin{cases} 1 & \text{if } SE_i^* > 0 \\ 0 & \text{if } SE_i^* = 0 \end{cases} \quad (2)$$

Where SE_i is school enrolment. The probability of event occurring for any value of SE_i is:

$$Prob[SE_i = 1|X_i] = \Phi(\beta' X_i) \quad (3)$$

$$Prob[SE_i = 0|X_i] = 1 - \Phi(\beta' X_i) \quad (4)$$

Where $\Phi(\ldots)$ is the standard normal cumulative distribution function. The parameter β do not measure the marginal effects on school enrolment. Therefore, the marginal effects are calculated as follows:

$$\frac{\partial \, Prob\,(SE_i=0|X_i)}{\partial X_i} = -\phi(\beta' X_i)\beta' \quad (5)$$

$$\frac{\partial \, Prob\,(SE_i=1|X_i)}{\partial X_i} = \phi(-\beta' X_i)\beta' \quad (6)$$

Robust standard errors are computed in order to correct for potential heteroscedasticity in the model.

5. RESULTS AND INTERPRETATION

This section provides the main results on what determines school enrolment followed by whether total expenditure can explain school enrolment for rich and poor households differently in Bhutan.

5.1. Probit Results and Interpretation

The marginal effects from the probit estimates are presented in Table 3. Column one reports the marginal effects for the full sample, followed by marginal effects on rich and poor sub-samples. The log of total expenditure is used for the analysis. Since, total expenditure may be correlated with the error terms leading to potentially endogenous biased estimates, instrument variable (IV) probit is estimated. Instruments used in the study are age of male household head, age of the female household head, number of adults in the household and whether household head has fallen sick or not. In the full sample, the potential endogeneity could not be rejected, indicating total expenditure is an endogenous variable. For rich and poor sub-samples, there aren't any potential endogeneity biases. Therefore, the final marginal effect for full sample is based on IV probit estimate.

The findings suggest that permanent income is a significant determinant for the school enrolment. More importantly, it is found that income matters to the poor compared to the rich households. A percent increase in the permanent income is likely to experience a concomitant increase in school enrolment by around 0.33 per cent in the poor households. Albeit the positive relationship between income and school enrolment in the rich households, it is found insignificant at any reasonable significance level. Upon testing whether the coefficients differ between the two models using Chow test, with χ^2value of 0.04, there is no evidence that the coefficient are different. Further, as explained in Zimmerman (2001) this result indicates that true relationship between income and enrolment is not adequately captured by the most commonly used log household expenditure alone. This suggests the need to segregate households into poor and rich.

There is also evidence that households are less likely to send male children to school compared to their female counterparts. This result further reiterates that potential biases in enrolment depend on whether the households are rich or poor. This is possible because male children have the potential to perform physically demanding jobs to earn

for the family. However, this finding needs to be cautiously understood because the evidence suggested by Chow test indicates that coefficient of gender between rich and poor household differ at 5 percent level of significance.

Age is found to have the predicted quadratic effect. Being son or daughter of the household head is found more likely to be enrolled in school. Uneducated household heads are less likely to enrol their children into school but the impact is found insignificant in the whole sample. Those households residing in urban centres are found more likely to enrol their children into school. Those households having more dependents less than 15 years of age are found less likely to enrol their children into school. However, the effect is found insignificant in case of poor households albeit the negative relationship.

Table-3. Marginal Effects from the Probit Estimates

Dependent variable: School enrolment	Enrolled	Rich enrolled	Poor enrolled
Lntotexp	0.483***	0.0327	0.325***
	(0.140)	(0.077)	(0.085)
Male	-0.0648	0.0227	-0.149**
	(0.042)	(0.061)	(0.058)
Age	0.771***	0.699***	0.835***
	(0.055)	(0.083)	(0.075)
age_squared	-0.0372***	-0.0345***	-0.0394***
	(0.002)	(0.004)	(0.003)
son_daughter	0.356***	0.452***	0.166**
	(0.054)	(0.073)	(0.069)
Hhmale	0.0818	0.000479	0.0501
	(0.053)	(0.075)	(0.070)
Hhmarried	-0.0322	-0.148	0.133
	(0.067)	(0.106)	(0.085)
Hhedunone	-0.0782	-0.141**	-0.229***
	(0.065)	(0.069)	(0.081)
hhunemployed_lf	0.0661	-0.451	-
	(0.302)	(0.350)	-
Urban	0.249***	0.332***	0.409***
	(0.071)	(0.071)	(0.080)
dep_under	-0.0599***	-0.0675**	-0.0262
	(0.019)	(0.027)	(0.026)
_cons	-6.971***	-1.903**	-5.682***
	(1.430)	(0.930)	(0.938)
N	9272	5075	4171
Wald test for Exogeneity			
χ^2	4.81**	2.52	0.93

Note: Standard errors in parentheses. *, **, *** denotes significance level at 10 percent, 5 percent and 1 percent respectively.

Most of the household head characteristics are found insignificantly associated with school enrolment in the study. Whether household head is male or female, whether household head is married or not, whether household head is employed or not is immaterial for school enrolment in Bhutan. This result indicates that enrolments in Bhutan are mostly determined by individual characteristics than the household head characteristics. This also shows that household heads in Bhutan does not have much influence over school enrolment in Bhutan. The employment status of the household head in case of poor households could not be used in the model because the variable was found to predict success perfectly and 26 observations were automatically dropped from the model.

6. CONCLUSION

Many of the previous studies have justified the importance of income in determining school enrolment. However, there are very limited literatures on the determinants of school enrolment by classifying households into

rich and poor. Zimmerman (2001) established that income mattered to the poor compared to the rich households in Bulgaria. Since, Bhutan is also characterized by poverty, the determinants of school enrolment for rich and poor households is merited. Utilizing the Bhutan Living Standard Survey data for 2012, this article studied the determinants of school enrolment for rich and poor households in Bhutan.

The findings from this study thus provide numbers of policy recommendations. Firstly, the finding suggests that household income matters for school enrolment. More so, income is found to be very pertinent for poor households, which indicates that poor people are resource constrained to send their children to school. Therefore, income distribution from rich to poor should be a priority for the Bhutanese government in order to maximize school enrolment. Secondly, government should encourage and enforce school enrolment during early ages, as there are indications that as children ages, enrolment into school is less likely. Thirdly, government should look at providing equal school infrastructure even in the rural schools to promote rural school enrolment. Government should also educate the importance of family planning, as more number of dependent means less opportunity for school enrolment.

Overall, this study has proved that income is important for poor compared to the rich households. Except for educated household heads, there are no evidence to prove that household head characteristics has any influence over school enrolment in Bhutan.

Finally, it is important to point out some limitations of the study. Firstly, despite using the instrument variable approach to address the endogeneity biases, the instruments used may not be sufficient enough to predict the household income. Secondly, using the arbitrary line (median total household expenditure) may not be the right tactic in segregating poor and rich households.

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