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Policy Research Working Paper 5534

Determinants and Dynamics of Schooling and Child Labor in Bolivia

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The World Bank
Poverty Reduction and Economic Management Network
Public Sector Unit
January 2011

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Abstract

This paper investigates the determinants of primary school enrollment, attendance and child labor in Bolivia from 1999 to 2007. The analysis also aims at identifying the substitution and complementary relationships between schooling and working. Although enrollment rates show a significant improvement, lack of attendance remains an issue. The empirical results reveal that the increase in enrollment is led by indigenous children and those living in urban areas. Moreover, contrary to common belief, being extremely poor and indigenous are the main determinants of school attendance. Although extremely poor children increased their school attendance, they were not able to reduce child labor. However, for indigenous children school attendance and child labor were substitutes, increasing schooling and reducing child labor.

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Produced by the Research Support Team

Determinants and Dynamics of Schooling and Child Labor in Bolivia

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JEL Classification Code: H52, I21, J20, J24
Keywords: Bolivia, Child labor, Education, Latin America

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1. Introduction

Bolivia remains among the three poorest countries in the western hemisphere and the poorest in South America [26], with a per capita GDP of 1,378 US dollars and with 37.7 percent of the population living below the extreme poverty line in 2007[1]. According to the United Nations, achieving primary education represents a key factor for enhancing development progresses in the poorest countries[2]. Efforts have been made to guarantee the continuous provision of universal, free-of-charge primary education. However, the fact that Bolivia has an illiteracy rate of 13 percent for people aged 15 or older confirms that the difficulties experienced by its educational system are among the most severe in Latin America [29].

In order to reaffirm the commitment of the state to improve the educational system, a series of cash-transfer benefits and school feeding programs have been approved over the last 20 years. These programs are believed to be effectively contributing to higher enrollment and attendance rates, nevertheless several challenges concerning lack of homogenous implementation across municipalities and schools still need to be overcome. Likewise, with the goal of creating enabling conditions to guarantee the effective, multiethnic and non-discriminatory access to educational services, special programs such as the Intercultural Bilingual Educational Program have been developed to attend the needs of the vast indigenous population of the country[3].

Moreover, Bolivia represents a country with a high share of child labor. This share achieves about 30 percent among extremely poor families. Child labor not only represents an exploitative activity, but it is also associated with a low level of education (see Basu and Van [6] for example), therefore jeopardizing human capital growth. Yet, as emphasized by Baland and Robinson [4], the real issue is to better understand the determinants of child labor so as to evaluate its welfare implications. More generally, it is crucial to jointly investigate the factors driving schooling and child labor decisions.

This paper aims at analyzing the determinants of primary school enrollment, attendance and child labor in Bolivia from 1999 to 2007, identifying how the substitution and complementary relationships among such activities evolve over time.

The unprecedented use of Bolivia's national household survey MECOVI for several years allows for an in-depth historical analysis of the recent trends of schooling and child labor. Due to the lack of empirical literature on this specific issue for Bolivia, this study represents a contribution that aims at filling the gap.

Results at the descriptive level reveal that enrollment became progressively more widespread in Bolivia. Nonetheless, the attendance figures are discouraging, as about 40 percent of the enrolled children did not go to school.

Triprobit estimations show that the increase in enrollment is led by indigenous and children living in urban areas, whereas poverty and indigenous are

[1] GDP data are from the United Nations National Accounts Main Aggregate Database, data on poverty are from MECOVI 2007.

[2] More specifically, this represents the second Millennium Development Goal (MDG) as established by the United Nations.

[3] According to the MECOVI surveys employed, more than 50 percent of the total Bolivian population declare themselves belonging to indigenous groups.

the main characteristics driving the attendance behavior. While school feeding and conditional cash transfer programs are likely to have allowed extremely poor children to attend school, at the same time these do not seem sufficient to let them forgo child labor. In fact, the proportion of working children seems not to be affected by school incentives since extremely poor children manage to allocate their time between school and working activities (presumably reducing their leisure time), making those complements. On the contrary, indigenous children made them substitutes, increasing schooling and decreasing working.

Furthermore, the empirical evidence also shows that the implementation of the *Bono Juancito Pinto* (BJP) scholarship in 2006 has a negative effect on attendance in 2007 as possibly children tend to enroll to benefit from the first installment but they do not attend school afterwards. In addition, the BJP does not discourage children abandoning working activities.

The paper structure is as follows. Section 2 briefly reviews the education system reforms in Bolivia. Section 3 goes through some of the main contributions in the empirical literature. The theoretical framework used for the analysis is presented in Section 4. The empirical strategy and the model are described in Section 5. In Section 6, the descriptive statistics and the empirical findings are presented. Section 7 reports the conclusions.

2. The Education System in Bolivia: a Historical Perspective

This section introduces a brief summary of the main education policies adopted in Bolivia in the last two decades.

Reforms of the education system in Bolivia have been undertaken since 1905, when the first reform established a national education system. In 1955, the second important reform increased education coverage and supported a homogenous national culture. The 1970s and the 1980s were marked by a variety of education interventions which lacked central coordination or long-term plans.

The current Education Reform Program (ERP) is considered the third important reform of the Bolivian education system. The Ministry of Planning established the Technical Support Team of the Education Reform (ETARE), and the Education Reform Law was successfully introduced in 1994. The Educational Reform Law stipulates that the Bolivian State has the duty to offer free-of-charge education to all citizens, which is equivalent to a sub-guarantee of financial protection of the pre-primary, primary and secondary education. As a matter of fact, however, educational spending focuses on primary education due to the national priority of guarantying access to this level.

The reform aimed at improving the quality and efficiency of education, making it more relevant to the country's economic needs, broadening its coverage, promoting the permanence of educators in the system, and addressing the needs of the vast indigenous population of the country[4]. Toward these ends, it restructured the education system and its administration, extended the years of

[4] Many of the programs of the Educational Reform have introduced a set of guarantees that can be subject to redress by indigenous people if their right to access educational services in accordance to their languages and cultural characteristics is not granted by the State.

mandatory education from five to eight, improved the teacher training system, and prioritized primary education incorporating the Intercultural Bilingual Educational Program[5]. Although a conclusive evaluation is not available, data suggest that there have been substantial improvements at the national level. Despite this, Bonifaz and Ochoa [8] highlight some deficiencies across municipalities, income groups and ethnic groups that jeopardize the achievement of the universal primary education.

There have been other initiatives such as the *Programa de Atencion a Niños y Niñas Menores de 7 Años* (PAN), which was created in April of 1997 by the Bolivian government within the 1997-2001 Country Programme of the World Food Programme (WFP) with the goal of achieving adequate development and growth of children under the age of six. It reaches 72,000 children that are in a situation of extreme poverty, and provides them with education, nutrition, healthcare and protection. The children who attend these daycare centers are fed breakfast and lunch and receive general care during the day while their mothers are in class. The Day Care Center has more than 450 centers in the province of Chuquisaca, and serves 8,500 children. Unfortunately the budget that the centers receive from the state is insufficient and does not cover the basic needs.

In 2004, the Street Children Programme was introduced with the aim to contribute to the development of 7,200 boys, girls and adolescents who live and work on the street through greater access to integrated educational services, health and nutrition within a framework of gender equality. The mechanism is food for training.

Among the main policies adopted by the president Evo Morales, the BJP became law in 2006. These scholarships benefited approximately 1.2 million public school students, from roughly 13,000 schools across the nation. Over half of the children targeted by the law (those between the ages of five and ten years old) have never attended or do not currently attend school. The money is distributed in cash directly to the children in nationwide ceremonies conducted with the help of the armed forces. It is paid in installments of 100 *Bolivianos*, one at the beginning and one at the end of the school year (nearly 26.5 US dollars a year). All public school children who are in the designated grade levels are eligible, regardless of their family's income. This bonus should encourage the children to enroll and remain at school during their required term. However, after being enrolled and therefore receiving the first payment, students are not coerced to attend school. At the same time, if they do not attend, they prevent themselves from being awarded the second trench.

Today, several school feeding programs are implemented in some communities in Bolivia[6]. These kinds of programs are believed to be effectively contributing to higher enrollment and attendance rates, and are sometimes combined with cash transfer programs conditional upon households letting the children go to school. An example is the In-School Breakfast Program (*Desayuno*

[5] Education may be monolingual in Spanish with the additional study of an indigenous language or it may be bilingual with an indigenous language as the first language and Spanish as the second language.

[6] The Ministry of Culture and Education (MEC) declared that the primary targets of such program are the children from rural areas. However, during the first years the implementation has been very inhomogeneous.

Escolar), which started to be delivered in 1990. Many children walk at least one mile to get to school, and receiving a breakfast before starting classes alleviates their short-term hunger and lets them benefit more from the lesson. Clearly, it was conceived as a supplementary meal, meaning that the parents are supposed to provide the children with a first breakfast. However, it is not usually the case.

Another example is the *Programa de Alimentación Escolar* (PAE) introduced during the 2003-3007 Country Programme of the WFP, from which 42,000 children over the age of six are benefitting. The aim is to support regular primary school attendance and to improve learning capacity by means of hunger relief in the short term.

3. Determinants of School Enrollment, Attendance and Child Labor: Literature Review

Education constitutes the main means through which a country invests in human capital. Many developing countries still experience low levels of education attainment, and this is one of the reasons why they unsurprisingly lag far behind the developed world.

The literature on the determinants of education is vast and to review it completely it is beyond the scope of this paper. Nonetheless, before moving to the empirical analysis it is worth reviewing some of the main contributions on the determinants of households' demand for schooling and child labor.

Low levels of education in developing countries might be related to high levels of child labor as discussed in Basu and Van [6]. In this paper, which constitutes a pillar in the economic literature on child labor, the authors clarify the positive relationship between poverty and child labor and therefore the negative effect of poverty on children's education. They claim that education, as well as leisure, is a "luxury good" for poor families with an extremely low income[7]. In their altruistic model, household wealth is the most important factor in the decision to send children to school or to work. That is, child labor arises only if adult wages are insufficient to sustain the household. Therefore, they argue that a ban on child labor may even be welfare reducing for a poor household if poverty is the main cause of child labor.

On the contrary, Baland and Robinson [4] find that a small ban on child labor may constitute an actual Pareto improvement even though it does not directly compensate parents. The reason is that endogenous changes in wages induced by a reduction in child labor may make parents and firms better off.

The empirical investigation carried out by Jayachandran [19] for India supports the theoretical results of Basu and Van [6]. He shows that poverty is among the key factors that explain why parents cannot afford to send their children to school. Along the same line, Psacharopoulos [21] analyzes the determinants of school failure and working, confirming that child labor reduces educational attainment in Bolivia and Venezuela[8]. For the African context,

[7] Such concept is called "luxury assumption" or "luxury axiom".

[8] Note that Psacharopoulos [21] does not focus on the determinants of school enrollment and attendance in Bolivia. More specifically, the author does not analyze whether or not a working child is less likely to be enrolled or attend school.

Canagarajah and Coulombe [9] find a significant negative relationship between going to school and working in Ghana.

In contrast, Ravallion and Wodon [22] question that child labor displaces schooling in Bangladesh. In addition, Ray [23] and Bhalotra [7] do not find empirical evidence of the "luxury axiom" in the context of Pakistan and India respectively[9].

It is not easy to identify standard key determinants of education due to the country-specific socio-cultural characteristics. Schultz [24] attempts to identify three key socioeconomic determinants of households' demand for schooling and comes up with public expenditure on education, parental education and the wealth of families.

Spending in public education in developing countries (where the level of public infrastructure is typically low) may have a huge impact on stimulating education enrollment and attendance. Duflo [12], for example, focuses on the case of Indonesia, where a massive school construction program, implemented by the national government during the 1970s, led to a strong increase of the enrollment rate. Also Handa [15] and Handa and Simler [16] point out that building more schools in the context of Mozambique had a strong impact on school enrollment.

On the other hand, the lack of government support in fostering education might have drastic effects on education. In fact, Glewwe and Ilias [13] noted that enrollment rates declined in Ghana during the late 1970s and early 1980s due to a reduction of public spending in education. Nevertheless, Al-Samarrai [1], investigates the link between educational access and public education expenditure in a cross-country framework and finds that it is weak.

Household characteristics, such as the education of parents, probably represent one of the most relevant factors leading to children enrollment and attendance in the developing world. The idea underlying such claim is that educated parents by and large understand the importance of achieving basic education and therefore feel responsible to send their kids to school. The reverse is true for non-educated parents who started to work at an early age. This is evident in Wahba [28] that shows that Egyptian parents, who were child laborers themselves, would most likely send their children to work. In other words, for those parents education may not necessarily be considered as an investment.

Some studies also consider cultural aspects such as gender issues that may influence some disparities in enrollment and attendance. Tansel [25] points to gender as one characteristic that should not be neglected when analyzing the determinants of education. He noted that the effect of income on the schooling of girls was larger than that of boys. Al-Samarrai and Peasgood [2] find that household characteristics such as parental education may have a totally different impact on the education of females and males in Tanzania. Using some descriptive statistics, Bonifaz and Ochoa [8] find that Bolivia does not present a significant gender gap in terms of total school attendance, even though minor differences emerge when considering the socioeconomic status and the living area.

[9] See Basu [5] for an analytical survey.

4. Theoretical Framework

In order to carry out the analysis, Ravallion and Wodon's [22] theoretical framework is adopted, as they jointly analyze the decision of working and schooling when school incentives are provided by the government. In fact, as noted in Section 2, the school feeding programs provided by the government makes this framework appropriate.

It is assumed that parents are free to determine the time allocation of their children. In addition, assuming that parents are altruistic and want the best for their kids, they will allocate their time to school, leisure and labor depending on the household's socioeconomic characteristics.

Drawing from Basu and Van [6], if no school incentive is available and if households' wages are too low, families will be forced to send their children to work in order to survive. However, if the government provides children with incentives for schooling, households' decisions on their children's allocation of time may vary according to the relationships occurring among leisure, school and work. In particular, as in Ravallion and Wodon [22], it is assumed that families have the following utility function:

$$U = U(C; S; H; Z) \tag{1}$$

where C is consumption, S stands for schooling, H is leisure and Z is a vector of household characteristics. In addition, the child's total time available is:

$$T = S + H + L \tag{2}$$

where L is the time devoted to labor. Considering w as the wage received for working and b as the incentive received to enroll/attend school, the budget constraint faced by the families is:

$$C = wL + bS + Y(Z) \tag{3}$$

where $Y(Z)$ represents the household's income as a function of the above mentioned vector of household characteristics. Therefore, if parents maximize the utility function subject to the time available and the budget constraint, the latter can be rewritten as:

$$C + (w - b)S + wH = wT + Y(Z) \tag{4}$$

Note that $(w-b)$ is the price of attending school[10]. Thus, w and b are turn out to be crucial when allocating time. Assuming strict quasi-concavity of the utility function, the problem here is to evaluate the impact of an increase of school incentive on labor. As shown in Ravallion and Wodon [22], the impact of an

[10] The final constraint can be obtained by pricing the amount of time by w (as the wage determines the price of the time). Moreover, by inserting wT in the initial constraint on both side of the equation and rearranging, the final constraint is obtained.

increase of the subsidy on labor can be analyzed considering the Slutsky decomposition:

$$\frac{\Delta L}{\Delta b} = \frac{\Delta S}{\Delta(w-b)} + \frac{\Delta H}{\Delta(w-b)} - S\frac{\Delta(H+S)}{\Delta(wT+Y(Z))} \quad (5)$$

Under the concavity assumption of U, the first and third term are strictly negative. On the other hand, the second term might be either positive or negative. Therefore, the effect of a subsidy that increases schooling has an ambiguous effect on child labor. More specifically, if leisure and schooling are (utility-compensating) substitutes, a school incentive may have either no or positive impact on child labor. On the other hand, the effect on child labor is negative if schooling and leisure are complements. Thus, in the former scenario child labor increases or stays the same as schooling increases, whereas in the latter child labor decreases.

According to the previous setup, by identifying the determinants of school attendance, enrollment and child labor in Bolivia, the empirical analysis as described in the following section allows inferring how Bolivian households allocate time and thus whether these goods are complements or substitutes. More specifically, the evaluation of the determinants across time (1999-2007) helps shading light on the dynamics of the joint schooling/child labor decisions made by different groups such as (not) indigenous and (not) extremely poor households.

5. Empirical Strategy

This section describes the chosen empirical strategy, while the model specification is illustrated in the following subsection.

The enrollment, attendance and working decisions are modeled assuming that these are made by a representative agent within the household wishing to maximize his or her family's welfare.

Therefore, a linear random utility function is employed, where the utility associated with both the decision to enroll or not to enroll the child in primary school is assumed to be a linear function of a set of household's socio-economic characteristics (X_i), and of a stochastic term, which represents unobservable and measurement errors (ε_i). Hence, the indirect utility of household i associated with the enrollment decision $(U_{i,E})$ and not enrollment $(U_{i,N})$ can be expressed as:

$$(U_{i,E}) = X_i\beta_E + \varepsilon_{i,E} \quad (6)$$

$$(U_{i,N}) = X_i\beta_N + \varepsilon_{i,N} \quad (7)$$

Thus, the representative agent of the household i will choose to enroll the child if the utility associated with the decision is higher than the utility associated with the alternative decision: $(U_{i,E}) > (U_{i,N})$. If a variable Y is defined such that $Y_{i,E} = 1$ if the i^{th} household enrolls the child and $Y_{i,E} = 0$ if it does not, the probability that the i^{th} household enrolls the child is

$(Y_{i,E} = 1) = \Pr(U_{i,E} > U_{i,N}) = \Phi\left[X_i(\beta E - \beta N)\right]$, where Φ is the cumulative distribution function of $\varepsilon_{i,E} - \varepsilon_{i,N}$.

Normalizing the utility of not enrolling the child in school to zero $(U_{i,N} = 0)$ it is possible to derive the empirical equation for the enrollment decision:

$$\Pr(Y_{i,E} = 1) = \Pr(U_{i,E} > 0) = \Phi\left[X_i \beta\right] \quad (8)$$

Similarly, other two equations are derived to model the probability of the same household i to let the child attend school and work:

$$\Pr(Y_{i,A} = 1) = \Pr(U_{i,A} > 0) = \Phi\left[X_i \theta\right] \quad (9)$$

$$\Pr(Y_{i,W} = 1) = \Pr(U_{i,W} > 0) = \Phi\left[X_i \gamma\right] \quad (10)$$

where $U_{i,A}$ and $U_{i,W}$ are the indirect utilities associated with sending the child to school and to work.

Therefore, it is possible to empirically analyze the household's determinants of enrollment, attendance and working behavior through the estimation of β, θ and γ parameters in the empirical equations (8), (9) and (10).

The most common econometric regression procedure to estimate these equations by Maximum Likelihood Estimation (MLE) is the Probit model[11]. It assumes that the error term is normally distributed with mean zero and variance σ equal to one, and $\Phi(.)$ is the cumulative distribution function for a standard normal random variable. Nonetheless, a possible issue with this approach is that it does not consider the correlation among the household's decisions on enrollment, attendance and working. Hence, the univariate approach estimation of the three correlated equations is not a fully efficient econometric procedure, as it ignores the correlation among the error terms.

Due to the clear interrelation among the dependent variables of interest, the estimation method must reflect the joint decision making process. More specifically, enrollment, attendance and working cannot be treated as independent decisions. This rules out the possibility of using a multinomial Logit model since it assumes that all variables are considered independent. That is, as already considered by Wabha [28], using a multinomial Logit model would imply that the decision to work is independent or, in other words, not affected by whether or not a schooling option is available. It should be noted that the empirical works aiming at analyzing jointly the schooling and working decisions did not pay enough attention to the interdependence problem. For example, Psacharopoulos [21], Patrinos and Psacharopoulos [20] as well as Ravallion and Wodon [22], when modeling schooling and working do not allow for a multivariate specification that would have tackled the endogeneity among the dependent variables. Only Wabha [28] uses a bivariate Probit procedure in modeling child labor and schooling.

[11] The alternative is to use Logit regressions, assuming an error term logistically distributed. However, the Probit model has been preferred because of its theoretical extensions associated to the multivariate Probit methodologies.

Thus, given the hypothesis of interdependence among the three variables of interest, a trivariate Probit model (Triprobit) is employed. This, in fact, allows for the existence of possible correlated disturbances.

$$\Pr(Y_{i,E} = 1) = \Phi\left[X_i \beta\right] \tag{11}$$

$$\Pr(Y_{i,A} = 1) = \Phi\left[X_i \theta\right] \tag{12}$$

$$\Pr(Y_{i,W} = 1) = \Phi\left[X_i \gamma\right] \tag{13}$$

In this model, the error terms follow a trivariate normal distribution:

$$\begin{aligned} &E(\varepsilon_{i,E}) = E(\varepsilon_{i,A}) = E(\varepsilon_{i,W}) = 0 \\ &V(\varepsilon_{i,E}) = V(\varepsilon_{i,A}) = V(\varepsilon_{i,W}) = 1 \\ &Cov(\varepsilon_{i,E}, \varepsilon_{i,A}, \varepsilon_{i,W}) = \rho \end{aligned} \tag{14}$$

The evaluation of the likelihood function requires the computation of trivariate normal integrals. For example:

$$\begin{aligned} &\Pr(Y_{i,E} = 0, Y_{i,A} = 0, Y_{i,W} = 0) = \\ &\int_{-\infty}^{-X_i\beta} \int_{-\infty}^{-X_i\theta} \int_{-\infty}^{-X_i\gamma} \phi_W(\varepsilon_{i,E}, \varepsilon_{i,A}, \varepsilon_{i,W}, \rho_{12}, \rho_{13}, \rho_{23}) d\varepsilon_{i,E} d\varepsilon_{i,A} d\varepsilon_{i,W} \end{aligned} \tag{15}$$

The model is estimated by the method of simulated maximum likelihood (SML). In particular, the Geweke-Hajivassiliou-Keane (GHK) smooth recursive simulator is used to evaluate the three-dimensional Normal integrals in the likelihood function (see Hajivassilious et al., [17]).

For each observation, a likelihood contribution is calculated for each replication, and the simulated likelihood contribution is the average of the values derived from all the replications. The simulated likelihood function for the sample as a whole is then maximized using the standard maximum likelihood technique.

Given the nature of the data, the Triprobit methodology does not consider fully the character of the correlation (selection) between the variables in this empirical case. In fact, the enrollment decision determines completely the possibility of attending school, selecting households that can actually take the latter decision, and a non-random sample selection could generate biased estimates as specified in Heckman [18]. An econometric approach that can be considered to deal with this problem is to specify a tivariate Probit with sample selection model, and adapt the Heckman two-step procedure to this dichotomous case (Van de Ven et al., [27]). However, the lack of an instrumental variable did not allow the authors to adopt such extension.

Moreover, the longitudinal dimension of the data is not explored, as any methodology that takes it into account (i.e. pseudo panel or pooled cross sections) would not allow investigating the substitution and complementary relationships of the dependent variables over the considered period.

Gouriéroux and Montfort [14] show that under standard conditions the SML estimator is consistent as the number of observations and the number of

draws tends to infinity, and is asymptotically equivalent to the true maximum likelihood estimator as the ratio of the square root of the sample size to the number of draws tends to zero.

Note that since the Triprobit is an ad-hoc procedure, the calculation of the marginal effects and their standard deviations is not provided by the standard statistical packages. Therefore, both the marginal effects and the standard deviations have been computed using the procedure suggested by Anderson and Newell [3] and subsequently corrected by Carlevaro and Sénégas [10].

5.1. The Model

Considering the methodological issues presented in the previous section, the following equation is estimated for each year:

$$\Pr(Y=1) = \Phi(\alpha + \beta_0 Age + \beta_1 Male + \beta_2 Indigenous + \beta_3 Urban + \beta_4 Spanish + \beta_5 EdMHead + \beta_6 EdFHead + \beta_7 ExtPoverty + \beta_8 BJP) \quad (16)$$

Where Y is the probability of the event Enrollment in the first equation, Attendance in the second one and Working in the last one.

Note that, apart from Age, all the variables used in the equations are dichotomous. The dependent variable Enrollment takes the value one when the child is enrolled in the current year into primary school and zero otherwise. Attendance takes the value one if the child answers that he is currently attending the course he got into during the current year and zero otherwise. Finally, Working takes value one when the child answers that he worked at least one hour during the previous week and zero otherwise.

Beyond the continuous variable Age, a set of dummy variables has been added as regressors of the three equations. Namely, Male identifies a male child; Indigenous takes the value if the child answers positively the question about his feeling of belonging to an indigenous group and zero otherwise. However, since many children were not able to answer this question, those who have both the mother and the father declaring to belong to an indigenous group are also defined as indigenous. Urban, Spanish and Poverty identify a child that respectively lives in an urbanized area, can speak Spanish as first or second language, and that is living in extreme poverty conditions[12] and zero otherwise[13].

Moreover, EdMHead (educated male head) and EdFHead (educated female head) have been added to the equations. These take the value of one if the child belongs to a family with an educated male or female head, and zero otherwise. A head is defined as educated if he or she has completed at least primary school.

Finally, using the available data the impact of the BJP is analyzed by adding a dummy variable in the 2007 regression that identifies those who received such scholarship in 2006.

[12] The definition of extreme poverty used in the surveys is based on the Unsatisfied Basic Needs (NBI) Index.

[13] For 1999, the variable Poverty does not use the definition of extreme poverty due to the lack of data.

6. Empirical Analysis

This section firstly describes the data employed and illustrates some descriptive statistics. Secondly, the results from the estimation of the model are presented and discussed.

6.1. Data and Descriptive Statistics

The data used in this paper was obtained from Bolivia's national household survey MECOVI[14] for 1999, 2000, 2001, 2002, 2005, 2006 and 2007. This survey is conducted at the end of each year, typically in November and December.

The age of entry in primary school is six and the duration of compulsory education is eight years. Therefore, samples of children who are between five and fifteen years[15] are selected in this analysis. The academic year is composed of about forty weeks, five days a week and four hours per day.

The focus of the analysis does not encompass private schools[16], as the enrollment and attendance behaviors are likely to be driven by different factors.

Table 1 shows the proportions of children for each of the above mentioned characteristics.

[Table 1 about here]

It is relevant to note that the population is fairly distributed in many of its features as gender, ethnic origin, living area and extreme poverty.

In fact, the proportion of male children in the population is roughly the same of the female one. Moreover, the proportion of indigenous children is slightly higher than the non-indigenous one. Likewise, extremely poor children are faintly more than non-extremely poor ones in all but one year (data in 1999 are out of the average because the definition of poor instead of extremely poor has been adopted). In the last two years, the proportion of children coming from urban areas exceeded the one of those coming from rural ones, albeit maintaining a certain level of symmetry in the population.

Finally, children speaking Spanish are more than 90 percent in all years and it is quite unusual for a child to have an educated head, but it is relatively more common that this is the father instead of the mother.

The data presented in Table 2 shows the proportions of children enrolled in primary public school, attending it and carrying out working activities. It is clear that the percentage of enrolled children has been increasing over the considered years. However, the attendance proportions do not show any clear

[14] MECOVI is a regional program that aims at standardizing household surveys in the Latin American and Caribbean region, funded by the World Bank, the Inter-American Development Bank, and the United Nations.

[15] A slightly wider age interval has been used to allow for children that go to school one year before or one year later the traditional age of entry.

[16] The percentage of those enrolled in private schools is on average below 10 percent.

pattern, and displays the worst value in 2007 after some years of improvement. Finally, the working proportions seem to be relatively stable over the years.

[Table 2 about here]

Although the figures on enrollment are suggesting that the country is on path for achieving universal primary education, attendance proportions cast doubts on the fulfillment of the target relative to the completion of primary school.

Table 3 presents the characteristics of children who enroll/attend school and those of children that are involved in working activities.

[Table 3 about here]

Unsurprisingly, indigenous children enrolled less than non-indigenous ones. However, the gap has been reducing over time, nullifying the difference between the two groups. More interestingly, the proportion of children who attend primary school is somewhat higher for indigenous people than for non-indigenous ones for all the years. Therefore before 2002, indigenous children enrolled less, but if they did so, they attended more than non-indigenous ones. Likewise, even when the enrollment proportions became roughly equal, indigenous children attend relatively more. Looking at the working proportions, it is clear that indigenous children work more than non-indigenous ones. However, after a peak in 2005, the indigenous proportion started to decrease by more than 5 percentage points each year, whereas the non-indigenous remained the same.

If a child is extremely poor, he is less likely to enroll in primary school, but, again, if he does so, he attends more than a non-extremely poor one. For both extremely and non-extremely poor the enrollment proportion has increased, while the attendance proportion is quite volatile and no clear trend emerges. As expected, extremely poor children work more than non-extremely poor ones.

Figure 1 illustrates the working proportion gap between extremely poor and indigenous children.

[Figure 1 about here]

The gap from being negative became positive and progressively widened, reaching its maximum amplitude in 2006 and 2007. Given that indigenous and extremely poor children report similar child labor proportions, this suggests that indigenous children reduced labor compared with extremely poor children. On the contrary, extremely poor children seem not having reduced child labor (see also Table 3). Moreover, given that both groups increased attendance as discussed above, it is then relevant to further investigate whether or not indigenous (and poor children) were able to substitute (complement) schooling and working.

Living in an urbanized area seems to be important for enrolling although this feature seems to lose importance in the last two years. As for the indigenous people, the proportion of not enrolled children from the rural areas has been substantially declining across the considered period, whereas it has been only slightly reducing for those not enrolled in the urban areas. Yet, the proportion of enrolled children in urban areas remains higher than that in rural areas. Contrary to the common belief, children from rural areas tend to attend primary school more than those living in urban areas in most of the years.

Spanish-speaking children usually enroll in school much more than non-Spanish-speaking ones. As mentioned, this has been one of the main focuses of the ERP that addressed the problem through the Intercultural Bilingual Educational Program. As for the indigenous, a non-Spanish speaking child, when enrolled, tends to attend more than a Spanish speaking one. Non-Spanish speaking children tend to work more than Spanish speaking ones. Nonetheless a downward trend in the last three years is observable.

Gender does not seem to be an issue for the enrollment and attendance in Bolivia; however, if for both males and females the proportion of enrolled children improves across years (in particular from 2005), this is not true for the attendance behavior. Males tend to work more than females for all but one year. Yet, the surveys do not provide a detailed household members' domestic activity section for all years. Therefore, it is important to be aware about a potential bias.

Finally, the education of the head seems to play a relevant role in let children enrolling and in taking them away from labor.

6.2. Presentation and Interpretation of the Results

Tables 4 and 5 show the empirical results relative to the trivariate Probit estimation. As illustrated in Table 4, overall the cross-equation error terms appear strongly correlated, justifying the adoption of a multivariate framework and tackling the working endogeneity problem.

[Table 4 about here]

[Table 5 about here]

According to the econometric results, extremely poor children tend not to enroll in the first years of the analysis. Yet, in the last three years this pattern changes and in 2006 a positive and significant coefficient shows up. Interestingly, indigenous children are more likely to enroll than the non-indigenous ones.

Among the regressors of the enrollment equation, it is evident that urban is the most important determinant positively affecting the choice to be enrolled in primary school for the whole period.

Being able to speak Spanish positively affects the probability of being enrolled across years. In addition, older children tend to enroll less.

Averaging across years, around 60 percent of working children's fathers is not educated. In other words, parents with little or no education may not consider

schooling as an investment as also noted in Whaba [28] for Egypt. The empirical analysis supports the previous statement since having an educated parent positively affects the probability of being enrolled.

Undesirably, the gender issue is evident for almost every year under consideration. In fact, males are generally more likely to enroll in primary school.

Overall, it seems that the picture of enrollment of children in primary school is positive and improving across time. The proportion of not enrolled children drop from 9.2 percent in 1999 to 4.4 percent in 2007 and the empirical analysis of the determinants as in Tables 4 and 5 shows that the increase of enrollment happens in urban areas and among indigenous.

Regrettably, the attendance analysis does not draw the same encouraging picture. As seen in Table 2, the proportion of children who attend school is on average clearly below 60 percent. In other words, almost all the children enrolled in primary school but few attended it. Thus, it turns out to be crucial to analyze the determinants of attendance.

The most interesting and important variables in the attendance equation are indigenous and extreme poverty. The indigenous variable reports the strongest positive marginal effect in the attendance equation and the impact shows an upward trend over the years, achieving about 20 percent in 2007. Such result could be linked to the effects of the inclusive policies for people belonging to indigenous groups. Moreover, it is clear from Tables 4 and 5 that being extremely poor has a positive and significant impact in most of the years. In addition, in the last two years the marginal effects increase up to 14 percent. It seems plausible that extremely poor children are more motivated than non-extremely poor ones to attend school because of school feeding and conditional cash transfers programs adopted in several municipalities in Bolivia. In this sense, attending school turns out to be very important for an extremely poor child and the family.

The Spanish variable is positive and significant in most of the years, highlighting that not being able to speak Spanish not only discourages children to enroll, but also represents an obstacle for the children to attend. Therefore, it seems that policies that introduced the bilingual intercultural education were not successful.

As for the enrollment probability results, older children tend to attend less. However, the magnitude of the marginal effects is quite low after 2000.

Children with educated parents are more likely to attend school, although this is not as evident as for the enrollment equation.

The coefficients of the urban variable show an interesting trend. From 2000 through 2002 children in urban areas attended school more than those in rural areas. Nevertheless, the trend has changed across time and in the last two years the coefficients become negative and significant, meaning that children from rural areas started to attend more than in the previous years. This is in line with previous results, in that extremely poor indigenous children tend to live in rural areas.

The results relative to the BJP variable deserve special attention. Note that those children who benefited from the scholarship in 2006 tend to enroll, but do not attend school in 2007. This is particularly evident when considering that the variable has the highest marginal effect in the 2007 enrollment equation while it reports a negative but not significant sign in the attendance equation. Thus,

children get only the first installment (that is the one due at the enrollment act), foregoing the second one (disbursed at the end of the academic year). Therefore, it seems that this program encourages free riding behavior since children seem to take advantage of it without caring about the learning phase.

Finally, the working estimation results help to better understand the interaction among the three phenomena. Child labor is mainly concentrated in rural areas and parental education plays a relevant role in reducing the probability of the child to engage in working activities.

The variable age shows a positive and significant effect in all the years under analysis. This is likely to be due to the increase in child labor productivity as age rises. Unsurprisingly, those who do not speak Spanish tend to work more.

Being indigenous generally leads to child labor across the initial years. However, the effect of such determinant diminishes afterwards and in the last two years is not significant. In other words, indigenous children are less likely to work after 2005, the year of the election of the first indigenous President Morales. On the other hand, it can be observed an increasing and significant impact of the extremely poor variable across years. Therefore, as already noted from Figure 1, despite indigenous children reduced working, the reverse is true for extremely poor children.

Being male is a relevant determinant of child labor. Nevertheless, it should be remembered that the definition of working does not encompass the domestic work, typically carried out by females. Therefore, such coefficients could be biased as noted in Contreras et al [11].

Interestingly, the BJP variable reports a positive though not significant coefficient and this is an important finding that comes along with the result of the BJP in the attendance equation. More specifically, not only the BJP seems not to increase school attendance but it also does not discourage children to leave working activities.

To sum up, the decision of attending school is mainly driven by indigenous people and by a welfare improvement of the extremely poor families. In other words, extremely poor families need to benefit from the higher income provided by both child labor and school attendance. Although schooling programs oriented to extremely poor children achieved some positive results, the proportion of enrolled children who do not attend school is still high and those poor who attend are not able to forgo the income coming from labor. Accordingly, it seems that the “luxury assumption” by Basu and Van [6] does not hold in the case of Bolivia since the majority of children attending primary school are extremely poor. Nevertheless, the Bolivian context is characterized by incentives that are not considered in the authors’ framework.

Finally, the empirical results allow explaining how schooling/labor decisions interact across different groups and time. More specifically, given the theoretical framework considered in section 4, two clear features seem to emerge from our analysis. In fact, empirical evidence shows that in Bolivia there is no substitution between working and schooling among extremely poor children. However, the same cannot be argued for the indigenous children, who became able to substitute between such goods. It should be also observed that attending school seems to be an option for non-extremely poor families and this should be

taken in consideration in order to implement further educational policies oriented to increasing school attendance.

7. Conclusions

This paper contributes to the existing education literature by analyzing the determinants of school enrollment, attendance and working in Bolivia from 1999 to 2007.

Using a trivariate Probit model, evidence is found of a significant increase in enrollment among indigenous children and children living in urban areas. In general the proportion of not enrolled children in primary school is steadily decreasing, achieving 4.4 percent in 2007. However, about 40 percent of the enrolled children are not attending school. When analyzing the determinants of the attendance behavior, poverty and indigenous turn out to be the most important characteristics. Nonetheless, the same variables show different patterns in the working estimation. In fact, if indigenous children are progressively quitting their jobs, extremely poor children cannot.

The enrollment figures look promising when evaluating the achievement of the second MDG on universal primary education, but suggest that further efforts are required to allow children to attend school and abandon work activities.

Education policies aiming at spreading primary education to indigenous and extremely poor children seem to have produced positive effects. More specifically, inclusive policies toward the indigenous, school feeding, and conditional cash transfer programs allowed indigenous and poor children to attend school. On the other hand, the BJP initiative seems to encourage free riding behavior, leading people to enroll but not to attend. The reason for this might be that the second installment of the BJP is not large enough for many extremely poor children to forgo working.

Thus, it is evident that the attendance decision, corresponding to the learning phase, is led by a plain welfare improvement of the extremely poor families rather than an investment for the future. In fact, it can be inferred that there is no substitution between working and schooling among extremely poor children. In other words, as already found by Ravallion and Wodon [21] in the case of Bangladesh, it seems that child labor does not displace schooling among extremely poor individuals in Bolivia. On the contrary, indigenous children became able to substitute between such goods.

There are three main caveats of the analysis. First, as mentioned, the absence of domestic work data could bias the obtained results with relation to the gender issue. Second, the analysis is carried out at the national level, disregarding any different dynamic that is occurring at the local level. Finally, the absence of a good instrument to control for the selection problem could be a potential source of bias.

The results have four main policy implications. Policies aiming to foster enrollment in rural areas should be promoted. At the same time, incentives and measures to stimulate school participation need to be revised in order to encourage child labor abandonment by the poorest. Moreover, a different setting of the installments of the BJP should be devised to avoid free riding and consequently promote human capital growth. Finally, educational policies should

not forget those non-extremely poor children that are fully enrolled but hardly ever attend school.

Acknowledgements

We wish to thank Soren Anderson, Fabrizio Carlevaro, Richard G. Newell and Marc-Alexandre Sénégas for the kind support in carrying out the econometric analysis. A special thank to Fabio Montobbio, Simona Iammarino, Dena Ringold, Robert Vos and the participants to the XV Network on Poverty and Inequality for providing us with important comments. Note that all mistakes and opinions expressed in the paper belong to the authors only.

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Table 1: Proportions in the population

	1999	2000	2001	2002	2005	2006	2007
Male	51.2	50.8	50.6	50.9	53.6	52.4	50.6
Female	*48.8*	*49.2*	*49.4*	*49.1*	*46.4*	*47.6*	*49.4*
Indigenous	63.8	53.5	58.5	54.8	54.7	50.9	51.3
Non-indigenous	*36.2*	*46.5*	*41.5*	*45.2*	*45.3*	*49.1*	*48.7*
Urban	43.1	46.5	43.3	49.2	45.3	56.7	57.4
Rural	*56.9*	*53.5*	*56.7*	*50.8*	*54.7*	*43.3*	*42.6*
Spanish	99.1	97.0	93.7	91.2	98.7	96.8	95.0
Non-Spanish	*0.9*	*3.0*	*6.3*	*8.8*	*1.3*	*3.2*	*5.0*
Ed M Head	-	-	27.8	20.0	26.9	32.2	29.9
Non-ed M Head	-	-	*72.2*	*80.0*	*73.1*	*67.8*	*70.1*
Ed F Head	-	-	4.1	10.0	5.5	5.3	6.6
Non-ed F Head	-	-	*95.9*	*90.0*	*94.5*	*94.7*	*93.4*
Extr. poor	78.4	54.4	55.6	54.3	52.4	48.5	53.4
Non-extr. poor	*21.6*	*45.6*	*44.4*	*45.7*	*47.6*	*51.5*	*46.6*
Observations	2912	4622	5848	5614	1187	3102	3165

Source: MECOVI.

Table 2: Enrollment, Attendance and Working

	1999	2000	2001	2002	2005	2006	2007
Enrollment (%)	90.8	91.1	90.9	91.1	94.6	94.2	95.6
Attendance (%)	53.2	71.2	49.5	55.0	62.1	75.4	50.6
Working (%)	26.5	19.1	22.2	20.3	17.04	19.5	21.9

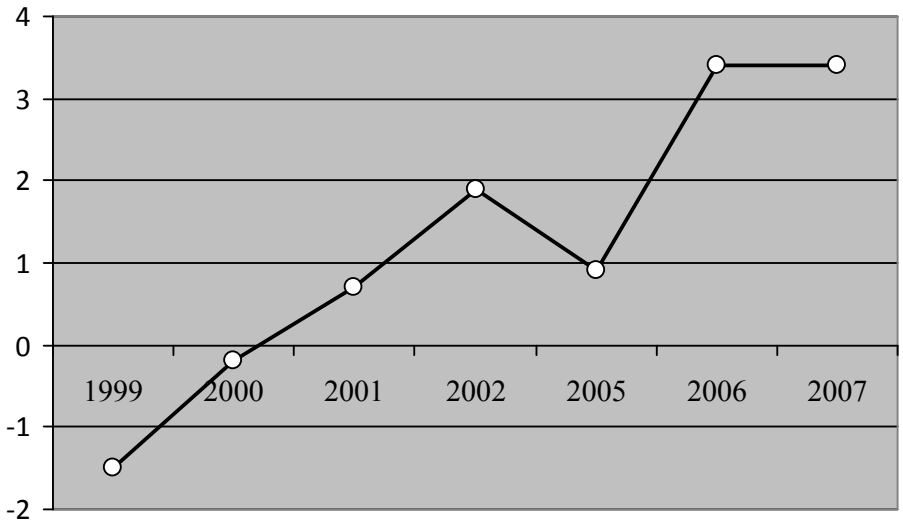
Source: MECOVI.

Table 3: Enrollment, Attendance and Working Proportions

	Enrollment						
	1999	2000	2001	2002	2005	2006	2007
Male	85.9	83.5	84.9	85.1	90.9	89.5	91.3
Female	*82.3*	*82.5*	*83.1*	*83.4*	*88.2*	*86.2*	*89.2*
Indigenous	81.1	82.0	84.0	84.4	89.6	88.2	89.6
Non-indigenous	*88.6*	*83.8*	*83.2*	*84.8*	*89.6*	*87.7*	*90.4*
Urban	90.2	87.6	88.7	88.2	94.0	89.7	91.5
Rural	*77.8*	*77.9*	*78.8*	*80.1*	*84.9*	*86.2*	*88.8*
Spanish	84.0	84.2	85.6	86.0	90.4	88.4	90.9
Non-Spanish	*42.9*	*29.5*	*61.6*	*67.9*	*54.8*	*76.8*	*79.4*
Ed M Head	-	-	85.8	84.7	95.6	90.7	92.8
Non-ed M Head	-	-	*82.5*	*78.9*	*87.2*	*87.0*	*88.1*
Ed F Head	-	-	90.8	88.6	96.9	95.5	92.5
Non-ed F Head	-	-	*84.6*	*73.1*	*83.5*	*83.3*	*91.1*
Extr. poor	82.7	80.4	81.9	82.2	88.0	87.2	89.3
Non-extr. poor	*89.3*	*85.9*	*86.4*	*86.8*	*92.1*	*88.9*	*91.5*
	Attendance						
	1999	2000	2001	2002	2005	2006	2007
Male	55.0	67.7	52.1	59.9	62.3	73.0	48.3
Female	*54.9*	*65.0*	*52.5*	*59.7*	*58.4*	*74.7*	*50.6*
Indigenous	62.4	73.5	55.4	66.8	74.4	81.9	58.8
Non-indigenous	*40.0*	*58.1*	*45.7*	*49.2*	*40.9*	*60.5*	*33.6*
Urban	43.2	60.6	55.8	67.7	54.8	66.5	42.4
Rural	*69.0*	*73.6*	*48.1*	*50.4*	*67.4*	*81.3*	*58.1*
Spanish	52.5	65.7	51.5	60.9	60.1	73.8	49.0
Non-Spanish	*50.4*	*77.8*	*69.4*	*58.4*	*94.8*	*73.7*	*60.0*
Ed M Head	-	-	52.4	60.3	57.6	69.4	50.7
Non-ed M Head	-	-	*50.4*	*48.5*	*61.5*	*76.8*	*47.4*
Ed F Head	-	-	51.1	63.2	70.3	57.7	44.7
Non-ed F Head	-	-	*62.0*	*56.5*	*59.3*	*70.3*	*54.8*
Extr. poor	58.9	72.5	52.7	60.6	67.2	82.0	59.2
Non-extr. poor	*41.9*	*60.1*	*51.9*	*58.9*	*54.2*	*64.7*	*38.7*
	Working						
	1999	2000	2001	2002	2005	2006	2007
Male	26.4	20.6	23.2	23.0	31.0	24.4	21.9
Female	*26.1*	*15.8*	*18.3*	*18.6*	*22.6*	*22.0*	*17.5*
Indigenous	31.0	24.1	25.4	25.9	35.3	30.0	24.6
Non-indigenous	*17.2*	*11.5*	*14.4*	*14.2*	*15.2*	*15.4*	*15.6*
Urban	8.8	6.7	7.8	7.4	10.2	6.4	5.4
Rural	*45.1*	*31.7*	*35.9*	*36.0*	*45.2*	*40.2*	*36.8*
Spanish	37.0	27.2	20.1	18.8	26.3	22.3	19.0
Non-Spanish	*85.8*	*75.4*	*36.8*	*45.3*	*64.7*	*60.5*	*39.7*
Ed M Head	-	-	17.7	20.2	14.1	12.2	10.0
Non-ed M Head	-	-	*22.7*	*33.8*	*34.7*	*32.0*	*27.7*
Ed F Head	-	-	12.8	14.2	8.5	3.7	8.8
Non-ed F Head	-	-	*23.2*	*33.0*	*32.1*	*19.9*	*19.3*
Extr. poor	29.5	23.8	26.1	27.8	36.2	33.4	28.0
Non-extr. poor	*15.0*	*12.1*	*14.9*	*12.8*	*16.8*	*11.9*	*10.3*

Source: MECOVI. – appears whenever the number of observations is below 10.

Figure 1: Child Labor Proportions Gap (Extremely Poor vs. Indigenous)



Source: MECOVI.

Table 4: Enrollment, Attendance and Working Coefficients: Trivariate Probit Regressions

	Enrollment						
	1999	2000	2001	2002	2005	2006	2007
Age	-.334***	-.435***	-.184***	-.169***	-.412***	-.231***	-.258***
	(-5.66)	(-7.70)	(-10.25)	(-9.77)	(-6.09)	(-6.76)	(-5.43)
Male	.413***	.159	.060	.168**	.184	.323***	.078
	(3.48)	(1.45)	(0.86)	(2.54)	(1.37)	(3.15)	(0.57)
Indigenous	.073	.149	.271***	.203***	.104	.419***	.320**
	(0.53)	(1.25)	(3.83)	(2.91)	(0.78)	(3.70)	(2.40)
Urban	.856***	.627***	.616***	.348***	.361**	.400***	.379***
	(6.61)	(5.20)	(7.88)	(4.35)	(2.02)	(3.51)	(2.57)
Spanish	.808	1.204***	.744***	.548***	.822**	.613**	.292
	(1.29)	(4.86)	(5.35)	(5.08)	(2.32)	(2.48)	(1.11)
EdMHead	dropped	dropped	-.005	.255**	.494***	.634***	.383**
			(-0.06)	(2.44)	(2.64)	(4.35)	(2.10)
EdFHead	dropped	dropped	-.009	.258*	5.451***	.582*	.111
			(-0.05)	(1.67)	(29.94)	(1.79)	(0.30)
Extr. poor	-.040	-.257**	-.113	-.129*	-.030	.234*	-.190
	(-0.23)	(-2.25)	(-1.49)	(-1.76)	(-0.22)	(1.89)	(-1.25)
BJP	.	.	.	.	.	.	.845***
							(4.29)
Constant	.823	1.102**	.584***	.630***	.212	.603**	1.371***
	(1.19)	(3.39)	(3.83)	(4.01)	(0.55)	(2.26)	(4.35)
	Attendance						
	1999	2000	2001	2002	2005	2006	2007
Age	-.168***	-.208***	-.018*	-.022**	-.161***	-.052***	-.001
	(-3.43)	(-4.98)	(-1.74)	(-2.25)	(-3.38)	(-3.51	(-0.04)
Male	.190*	.065	-.008	.028	.116	.066	-.073
	(1.91)	(0.77)	(-0.18)	(0.59)	(1.18)	(0.97)	(-1.10)
Indigenous	.297***	.450***	.299***	.619***	.788***	.497***	.569***
	(2.69)	(4.91)	(5.88)	(12.07)	(7.69)	(7.17)	(8.34)
Urban	-.235**	.230***	.439***	.647***	.048	-.157**	-.186**
	(-2.28)	(2.65)	(8.92)	(11.94)	(0.43)	(-2.05)	(-2.35)
Spanish	.865	.961***	-.196*	.189**	.275	.451**	.216
	(1.27)	(3.95)	(-1.64)	(2.08)	(0.72)	(2.09)	(1.30)
EdMHead	dropped	dropped	.012	.247***	.081	.206***	.385***
			(0.22)	(2.77)	(0.70)	(2.62)	(5.09)
EdFHead	dropped	dropped	-.099	.296**	.572**	.144	.300*
			(-0.71)	(2.44)	(2.16)	(0.83)	(1.91)
Extr. poor	.038	.100	.016	.149***	.152	.371***	.415***
	(0.30)	(1.14)	(0.33)	(2.88)	(1.45)	(5.07)	(5.63)
BJP	.	.	.	.	.	.	-.023
							(-0.29)
Constant	-.652	-.573*	-.299**	-1.084***	-.829*	-.400*	-.842***
	(-0.92)	(-1.90)	(-2.32)	(-8.50)	(-2.09)	(-1.75)	(-3.31)

Table 4 (*Continued*)

	Working						
	1999	2000	2001	2002	2005	2006	2007
Age	.118**	.234***	.138***	.158***	.145***	.151***	.141***
	(2.36)	(4.57)	(11.93)	(13.84)	(3.05)	(7.97)	(7.00)
Male	-.052	.286***	.238***	.254***	.350***	.123	.214**
	(-0.47)	(2.94)	(4.29)	(4.59)	(3.36)	(1.37)	(2.52)
Indigenous	.280**	.164***	.160***	.174***	.431***	.087	.010
	(2.23)	(1.52)	(2.71)	(3.07)	(4.03)	(1.05)	(0.12)
Urban	-1.105***	-.808***	-1.003***	-.986***	-.964***	-1.083***	-1.175***
	(-9.32)	(-8.12)	(-17.07)	(-16.18)	(-8.73)	(-11.11)	(-12.91)
Spanish	-.773*	-.799***	-.367***	-.610***	-.398	-.534**	-.154
	(-1.65)	(-3.22)	(-2.95)	(-6.83)	(-1.14)	(-2.41)	(-0.92)
EdMHead	dropped	dropped	-.074	-.157*	-.277**	-.111	-.231**
			(-1.17)	(-1.76)	(-2.03)	(-0.78)	(-2.28)
EdFHead	dropped	dropped	-.159	-.043	-.522*	-.604	-.274
			(-1.04)	(-0.31)	(-1.82)	(-1.61)	(-1.11)
Extr. poor	.148	.117	.147**	.159***	.145	.472***	.239***
	(1.07)	(1.22)	(2.54)	(2.60)	(1.40)	(5.26)	(2.54)
BJP	.	.	.	.	.	.	.104
							(1.08)
Constant	.289	-.560*	-.491***	-.262**	-.319	-.324	-1.990***
	(0.55)	(1.64)	(-3.63)	(-2.01)	(-0.87)	(-1.34)	(-6.73)
Log ps. Likelihood	-8.2e+5	-7.5e+5	-1.7e+6	-1.8 e+6	-8.0 e+5	-1.6 e+6	-1.6 e+6
Wald Test (ρ=0)	280.91	269.60	783.83	950.09	3831.58	501.22	608.30
(Prob> Chi2)	(.000)	(.000)	(.000)	(.000)	(.000)	(.000)	(.000)
Observations	935	1416	4517	4459	1186	2421	2487
ρ 21	.677***	.808***	.467***	.580***	.493***	.517***	.419***
	(13.33)	(26.59)	(14.18)	(19.88)	(7.17)	(10.45)	(7.65)
ρ 31	-.382***	-.450***	-.145***	-.241***	-.253***	-.266***	-.051
	(-6.21)	(-8.08)	(-3.54)	(-6.09)	(-3.66)	(-4.12)	(-0.61)
ρ 32	-.265***	-.405***	-.082**	-.132***	-.014	-.049	.042
	(-4.35)	(-6.92)	(-2.44)	(-4.20)	(-0.22)	(-0.95)	(0.86)
LR test	1.6e+6	1.5e+6	3.5e+6	3.7e+6	1.6e+6	3.4e+6	3.2e+6
(Prob> Chi2)	(.000)	(.000)	(.000)	(.000)	(.000)	(.000)	(.000)

Source: Authors' estimations based on MECOVI. In 1999 and 2000 the variables EdFhead and EdMhead have been dropped because there are very few educated heads.
Notes: The number in parenthesis report z-statistics. Estimations performed using the expansion factor. *** Significant at 1%, **significant at 5%, * significant at 10%.

Table 5: Enrollment, Attendance and Working Marginal Effects: Trivariate Probit Regressions

	Enrollment						
	1999	2000	2001	2002	2005	2006	2007
Age	-.107***	-.117***	-.065***	-.058***	-.163***	-.082***	-.048***
	(-2.36)	(-4.24)	(-7.98)	(-7.85)	(-6.15)	(-4.95)	(-2.60)
Male	.097*	.032*	.020	.052***	.070**	.096***	.012
	(1.36)	(1.29)	(0.87)	(2.46)	(1.39)	(2.63)	(0.57)
Indigenous	.020	.030	.083***	.062***	.040	.120***	.040*
	(0.49)	(1.13)	(3.52)	(2.69)	(0.76)	(2.96)	(1.53)
Urban	.159	.093**	.164***	.100***	.133*	.115***	.045**
	(1.22)	(2.10)	(6.13)	(4.01)	(2.02)	(2.90)	(1.69)
Spanish	.154	.125**	.187***	.145***	.265**	.161**	.037
	(0.83)	(1.87)	(3.98)	(3.93)	(1.90)	(1.97)	(0.91)
EdMHead	dropped	dropped	-.002	.076**	.176***	.165***	.045**
			(-0.63)	(2.25)	(2.70)	(3.30)	(1.68)
EdFHead	dropped	dropped	-.003	.077**	.416***	.155**	.016
			(-0.52)	(1.69)	(2.78)	(2.11)	(0.31)
Extr. poor	-.011	-.064**	-.039*	-.044**	-.012	.072**	-.033
	(-0.23)	(-1.81)	(-1.51)	(-1.81)	(-0.22)	(1.73)	(-1.36)
BJP	.	.	.	.	.	.	.072**
							(1.70)
	Attendance						
	1999	2000	2001	2002	2005	2006	2007
Age	-.051*	-.066***	-.007**	-.005**	-.042**	-.019***	-.000
	(-1.56)	(-2.96)	(-1.74)	(-2.13)	(-2-25)	(-3.39)	(-0.42)
Male	.065*	.023	-.003	.006	.034	.025	-.020
	(1.53)	(0.76)	(-0.17)	(0.58)	(1.09)	(0.97)	(-1.07)
Indigenous	.104**	.168***	.117***	.182***	.280***	.194***	.192***
	(1.98)	(4.59)	(5.94)	(8.58)	(5.16)	(7.32)	(6.89)
Urban	-.070*	.082***	.173***	.192***	.014	-.056**	-.048**
	(-1.43)	(2.47)	(8.93)	(7.70)	(0.42)	(-2.05)	(-2.20)
Spanish	.327*	.368***	-.072*	.046**	.086	.176**	.065*
	(1.48)	(4.46)	(-1.59)	(2.17)	(0.79)	(2.21)	(1.38)
EdMHead	dropped	dropped	.005	.062***	.023	.079***	.124***
			(0.22)	(2.85)	(0.66)	(2.55)	(4.09)
EdFHead	dropped	dropped	-.037**	.076***	.195**	.054	.094**
			(-0.72)	(2.32)	(1.79)	(0.82)	(1.74)
Extr. poor	.012	.035	.006	.036***	.046*	.144***	.134***
	(0.30)	(1.13)	(0.33)	(2.86)	(1.38)	(5.17)	(5.34)
BJP	.	.	.	.	.	.	-.006
							(-.29)

Table 5 (*Continued*)

	Working						
	1999	2000	2001	2002	2005	2006	2007
Age	.044**	.085***	.050***	.062***	.056***	.058***	.048***
	(1.97)	(5.44)	(9.51)	(13.47)	(2.87)	(6.97)	(5.56)
Male	-.020	.104***	.089***	.100***	.137***	.048*	.074***
	(-0.47)	(2.55)	(4.18)	(4.59)	(3.31)	(1.37)	(2.47)
Indigenous	.101**	.058*	.058***	.068***	.170***	.033	.003
	(1.95)	(1.56)	(2.72)	(3.00)	(4.11)	(1.06)	(.12)
Urban	-.406***	-.202***	-.244***	-.291***	-.275***	-.293***	-.228***
	(-6.29)	(-3.18)	(-7.81)	(-9.96)	(-3.53)	(-5.21)	(-4.33)
Spanish	-.299*	-.200***	-.116***	-.205***	-.138	-.178**	-.048
	(-1.67)	(-2.10)	(-2.65)	(-5.90)	(-1.05)	(-1.31)	(-.87)
EdMHead	dropped	dropped	-.026	-.059**	-.099**	-.041	-.070**
			(-1.18)	(-1.72)	(-2.06)	(-.79)	(-2.26)
EdFHead	dropped	dropped	-.054	-.016	-.175**	-.196**	-.081
			(-1.08)	(-0.31)	(-1.96)	(-1.92)	(-1.21)
Extr. poor	.055	.041	.054***	.062***	.056*	.186***	.083***
	(1.03)	(1.24)	(2.56)	(2.62)	(1.41)	(5.43)	(2.61)
BJP	.	.	.	.	.	.	.035
							(1.09)

Source: Authors' estimations based on MECOVI. In 1999 and 2000 the variables EdFhead and EdMhead have been dropped because there are very few educated heads.

Notes: The number in parenthesis report z-statistics. Estimations performed using the expansion factor. *** Significant at 1%, **significant at 5%, * significant at 10%.