Dropping Out of School in the Course of the Year in Benin: A Micro-econometric Analysis

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List of abbreviations and acronyms

AERC	African Economic Research Consortium
BREDA	Bureau régional pour l'Éducation en Afrique.
CAPOD	Projet de renforcement des capacités en Conception et Analyse des Politiques de Développement
DES	Direction de l'Enseignement Secondaire
DPP	Direction de la programmation et de la Prospective
EML	Embedded Multinomial Logit
FASEG	Faculté des Sciences Economiques et de Gestion
GDP	Gross Domestic Product
HIPC	Highly Indebted Poor Countries
IIA	Independence of Irrelevant Alternatives
INSAE	Institut National de la Statistique et de l'AnalyseEconomique
MCA	Multiple Components Analysis
ML	Multinomial Logit
MPDEPPCAG	Ministère de la Prospective, du Développement, de l'EvaluationdesPolitiques Publiques et de la Coordination de l'Action Gouvernementale
NGO	Non-Governemental Organisation
PASEC-CONFEMEN	Programme d'Analyse des Systèmes Educatifs de la Conférence des Ministres de l'Education nationale
RGPHII	Recensement Général de la Population et de l'Habitat II RRR: relative-risk ratio
UNESCO	United Nation for Educational, Scientific and Cultural Organization

Abstract

The important role of education in economic growth has long been recognized in ecomonic literature. The aim of this study is to analyse the phenomenon of dropping out of primary school in the course of the year in Benin by identifying its causes.

The study used individual data about schoolchildren and classes, which enabled a close examination of the causes of each individual case of dropping out of school. These data were complemented with interviews with stakeholders in the education system in Benin, especially the schoolchildren's parents. With a multinomial logit model, we estimated the probability that the schoolchild would be found in one of the three situations which are "to attend school regularly", "to take to absenteeism", and "to abandon school altogether".

The results obtained show that variables such as the level of health, stundent's doing activities outside of school hours, level of household, the quality of education and teachers' absenteeism are determinants of dropping out during the year, and that the phenomenon of dropping out is more pronounced among girls compared to boys. In view of these results, policy elements have been formulated ito slow the phenomenon of dropping out.

Keywords: *absenteeism, Benin, dropping out, education, logit multinomial, schooling*
JEL: *C01, I22, I25*

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1. Background to the study and research problem

The important role played by education in economic growth has long been recognized: the first studies on the link between education and growth were based on the neoclassical model (Solow, 1956); the pioneer study was the article by Mankiw et al. (1992). The basic idea in this approach is that, human capital plays the same role in production as physical capital, and that accumulating years of schooling amounts to increasing the workforce, or, in other words, increasing productive efficiency while technology is held constant. This increased efficiency enables compensation for the decreasing returns to capital and, as a result, sustainable growth in the long term. The per capita GDP growth rate during a given period is, thus, proportional to the growth rate of the level of education during the same period, with the proportionality factor being the macroeconomic return to education. More recently, Lucas (2002) insisted on the contagion effects (or "externalities") of human capital: not only will an educated person be more productive to himself/herself, but he or she will also cause others to be more efficient by getting them to accept new ideas, and by advocating better utilization of existing resources. Evidence for the relationship between education and economic growth has been not only macroeconomic, but also microeconomic, as shown by Becker's (1964) study, which has led to the gain function (Mincer, 1974).

Aware of its role, both on the microeconomic and macroeconomic levels, countries have accorded an increasingly important role to education. This renewed interest in education was translated into the goal of universal primary school education, which countries set themselves on the occasion of the World Education Forum held in Dakar from 26 to 28 April, 2000. In this connection, the policies that have been followed during the last decade have consisted of improving the conditions of access to primary school education, thanks to investment in infrastructure and furniture.

The classical approach to education considers that, increasing the rate of school enrolment is the chief goal, that parents are the principal stakeholders to be convinced, and that the financial costs of education are a real obstacle. But, according to Duflo (2010), this approach is fundamentally flawed to the extent that it does not take into account school absenteeism. Indeed, depending on the degree of motivation on the part of children, which is perhaps even more crucial in an environment where they are the first target of education (Duflo, 2010), the rate of school absenteeism throughout the world is quite telling (e.g., 49% in the rural area of India in 2005, 13% in the rural area of Western Province in Kenya in 2006, and 14% in the rural area of Madagascar in 2007).

Benin, like other countries in Africa, experiences this problem of school absenteeism. The history of the education system in Benin shows that in 1975, the country adopted

reforms that defined the concept of "New School". The implementation of these reforms had positive effects on schools in Benin during the first years,[1] effects which started dwindling between 1983 and 1985, in part, due to the political and social crises the country was going through. As a consequence of the economic crisis, in 1989, Benin signed with the Bretton Woods institutions its first structural adjustment programme and the start of the implementation of a retrenchment programme, as part of which, there was voluntary and forced retirement of public service employees.

These events had significant and determining consequences on the quality of education in general, and on its volume in particular, as the figures in Table 1 show.

Table 1: Trends in the gross school enrolment ration in Benin

Year	1980	1983	1990	1994	2004	2009
Gross enrolment ratio	68%	62.2%	49.7%	62.26%	95.87%	109.1%

Source: *INSAE*, 2010, Ministères en charge de l'Education, DPP and DES

As shown in the table, it is at the height of the social crisis in 1990 that the gross school enrolment ratio was at its lowest level; later it dramatically rose to reach 109.1% in 2009.

At first sight, one could be led to believe that Benin is very close to achieving universal primary school education, thus meeting the quantitative requirement of school enrolment. However, this impressive gross enrolment ratio is offset by a low rate of retention or survival (the proportion of children enrolled in primary school and who reach the fifth and sixth years of primary school), even though access to the first year of primary school is almost universal, thanks to the abolition, in 2000, of primary school tuition fees within the framework of the Highly Indebted Poor Countries (HIPC) initiative.

Table 2: Trends in the rates of primary school children reaching Class 6

Year	1990 - 1991	2001 - 2002	2003 – 2004	2005 – 2006	2015*
Rate of reaching Class 6	23%	28%	50%	52%	71%

Source: *INSAE*, 2010, Ministères en charge de l'Education, DPP and DES

In 1990-1991, 77% of the children in the age of starting primary school (Class 1) were indeed at school, against only 23% of children aged 11 who were in Class 6. In 2003-2004, these rates had reached 100% and 50%, respectively. If this trend is maintained, it is projected that 71% of children will be in the final year of primary school in Benin in 2015, against the 100% hoped for (UNESCO/BREDA, 2006).

These figures show a high level of dropping out of primary school. Such a high level calls for an investigation into the causes of this phenomenon, especially when it is known that both repeating a school year and dropping out of school cost resources that should have been used to increase the school enrolment ratio or to improve the quality of educational services. In relation to this, the Constitution of Benin stipulates, in article 13: "The State shall provide for the education of the youth in public schools. Primary school education is compulsory. The State shall progressively guarantee free education in public schools."

It is against this background that the present study set out to investigate the persistent phenomenon of dropping out of school in Benin in spite of the efforts made, and the resources used by the government to retain children in school. The study, thus, sought to address the following question: What are the causes of the persistent dropping out of school in the course of the year despite the policies that the country has been implementing for about two decades? More specifically, what are the factors related to the schoolchildren's environment that contribute to their dropping out of school in the course of the year? Are some of these factors school-related? Answers to such questions will be a contribution to the achievement, by 2015, of the education-for-all goal by a country like Benin, where education is a social policy priority. The scope of the present study is limited to primary education in Benin because the country's constitution has made access to primary school compulsory for all children.

2. Objectives of the study

The aim of the study was to analyse the phenomenon of dropping out of primary school in the course of the year in Benin by identifying its causes. Its specific objectives were:

- To identify the factors related to schoolchildren and their environment and which are likely to influence their staying at school.

- To identify the factors related to the provision of education and that are likely to influence the schoolchildren's staying at school.

3. Literature review

There have been quite a number of studies, both in the social sciences and economics, on the phenomenon of dropping out of school. Most of these studies focused on the explanatory factors for this phenomenon. The various studies looked at these factors from several angles: some analysed the role of information (Becker, 1964; Jensen, 2007; Nguyen, 2008; Duflo, 2010), others analysed the role of health (Grossman and Kaestner, 1997; Hammond, 2002; Dickson et al. 2000; Bobonis et al., 2006; Bleakley, 2007a & 2007b; Duflo, 2010), still others looked at the role of parents (Hanushek et Woessman, 2007); Duflo, 2010), and yet others the role of the quality of the school (Behrman et Birdsall, 1983); Harbison et Hanushek, 1992); Hanushek et Woessman, 2007).

The role of information in schooling

Going to school is both an action and a consequence of a decision. This means that before a child is sent to school, the people involved must have sought information from someone. Since the various developments of economic theory have placed the emphasis on the benefits of education (Becker, 1964; Mincer, 1974), it appears necessary that the economic players involved in educational decisions be aware of those benefits. An experiment conducted in the Dominican Republic provides evidence of the role of information in sending children to school (Jensen, 2007): this study found that in upper secondary school, dropout rates were high (about 45%), a situation which the author attributed mostly to the fact that students systematically underestimated the benefits of education. The researcher's intervention, a simple one, consisted of providing the same students with data on the average salaries of employees with different levels of qualification. This had the effect of reducing the dropout rate, which fell to 41% the following year. Another experiment was conducted in rural schools in Madagascar. Nguyen (2008) reports that the schoolchildren's regular attendance of classes improved when the teachers provided their parents with information on the benefits of education.

Giving parents and their children information on the benefits of education can, thus, have a significant effect on dropout rates, as confirmed by Duflo (2010). However, it is equally important not to lose sight of the effect of the parents' level of poverty, since keeping their children at school is also a financial burden.

The schoolchildren's health and its effect on dropping out of school

Research that has shown a correlation between education and health in general (Grossman and Kaestner, 1997; Hammond, 2002) and in particular between the health of schoolchildren and their staying at school (Dickson et al., 2000; Kremer and Miguel, 2004; Bobonis et al., 2006; Bleakley, 2007a & 2007b). The latter studies have shown that, in general, schoolchildren's ill health can be an impediment to their attending school. In sub-Saharan Africa, for example, bilharzia is an enormous public health problem which has had a significant effect on primary attendance rates (Duflo, 2010). Collective treatment of bilharzia contributed to reducing school absenteeism to 14%, which is the equivalent of 0.14 additional years of instruction per schoolchild (Kremer and Miguel, 2004). And, in India, treating anaemic schoolchildren reduced school absenteeism, too (Bobonis et al., 2006). Such results confirm the important role that the schoolchildren's health can play in their schooling.

Who should be at the heart of the decision to send children to school: The parents or the children?

Knowing who makes the decision to send a child to school is an essential step in identifying the causes of school absenteeism. Even though children are hardly involved in the process of making decisions about their education, the rate of their absenteeism can be very high (Duflo, 2010). At a high level of education, one could conclude that schooling is a personal decision resulting from an optimization process. According to Hanushek et al. (2007), the opportunities that are available to students during and outside their schooling are determining factors in their decision to abandon school. The theoretical framework that underlies this link models the students' maximization behaviour using a utility function by choosing a level of education that is determined by the opportunities available to them and which are a function of the time spent at school and that still to be spent at school.[2]

However, when it comes to enrolling children in primary school, the decision is largely assumed to be taken by the parents. This means that the regularity and quality of relations with parents is a determining factor in the achievement of the mission assigned to the public education sector. The State's obligation to guarantee that the parents' educational action is respected mostly means that this action is a shared undertaking, which requires the support and strengthening of the necessary partnership between the school and the students' parents who are legally responsible for their children's education. The report published under the title *"Les Français et leur école - Le miroir du débat"*[3] reports what was said during the national debate on the state of education that took place between September 2003 and March 2004. In this report, there is frequent mention of the role and place of the parents and of the reciprocal expectations of parents and the school.

The role of the quality of the school

The quality of the school and the number of students who complete their education have been reported to be correlated, which has led to an overestimation of return rates by traditional approaches. This correlation is deemed important when an analysis is made in terms of differences in resources between schools (according to Behrman and Birdsall, 1983) and of differences in performance among students (according to Harbison and Hanushek, 1992).

After studying a sample of primary school children in Egypt, Hanushek and Woessman (2007) estimated a model of behaviour of dropping out of school and found that there existed a link between the quality of the school attended and the school dropout rate. Indeed, according to their research, given the schoolchild's specific abilities and his/her level of effort, the probability that a schoolchild would drop out of school was higher if he or she attended a lower-quality school than if he or she attended a better quality one. Therefore, not taking into account this link between dropping out of school and the quality of the school attended would inherently lead to an overestimation of the yields of years of schooling.

4. Methodology

The present study used individual data about schoolchildren and classes, which enabled a close examination of the causes of each individual case of dropping out of school. These data were complemented by interviews with stakeholders in the education system in Benin, especially the schoolchildren's parents. The aim was to compare the interview responses with the results obtained from individual data. The following paragraphs present the analytical model, the variables used, the sources of individual data and the tools used to analyse the data.

The analytical model

The aim of the present study was to analyse the phenomenon of dropping out of school in the course of the year in Benin by identifying its causes in primary school. From a purely micro-econometric point of view, and following Hanushek and Woessman. (2007), the study assumed that there were three choices for each schoolchild: to attend school regularly, to take to absenteeism, and to abandon school altogether. The study set out to estimate the probability that the schoolchild would be found in one of these three situations.

Suppose that Y_i represents the situation in which a given schoolchild is during a given year. Y_i takes one of three values of j (j =0 is the schoolchild attends school regularly, j =1 if he or she takes to absenteeism, and j =2 if he or she abandons school altogether). The probability to be estimated is:

$$P\left(Y_i = j\right) = f\left(X_i\right) \tag{1}$$

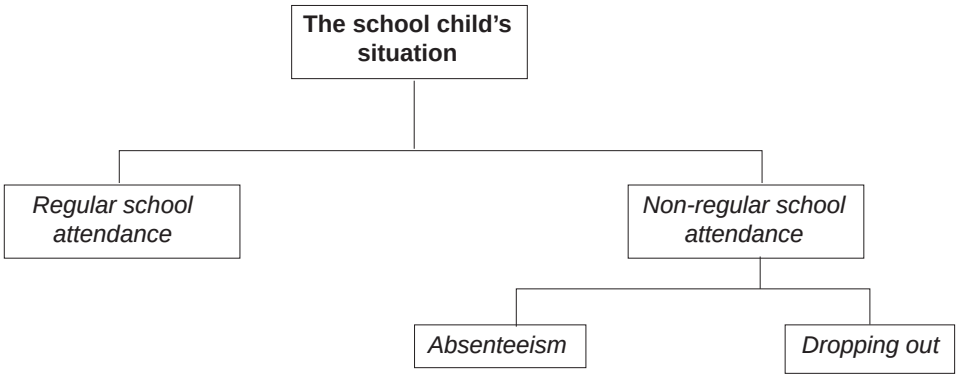
where X_i represents a vector of explanatory variables for the situation in which the schoolchild is. These are variables related to the demand for education and the provision of education.

- *Those related to the demand for education are:* the schoolchild's characteristics (age, sex, previous education, his/her activities during out-of-school time, etc.), his/her state of health, the characteristics of the household where he or she lives (income, level of education, number of children, ethnic group affiliation, religion, etc.).

- *Those related to the provision of education are:* the quality of the school (as reflected in the availability of infrastructure and teaching materials, types of classrooms, electricity supply in the classrooms, etc.) and the way the school functions (as reflected in the presence of teachers, the length of time they have been in the job and at the school, the nature of their contract, their level of training, etc.).

In its analysis, the present study split the situation of the schoolchild into different aspects, as shown in the tree of situations in the following figure, where the "regular school attendance" situation has been separated from the other situations (of non-regular school attendance).

Figure 1: The school child's situation



Let us now turn to how all this was specified mathematically. Two specifications are possible, depending on whether or not the independence or otherwise of the non-relevant alternatives (Hypothesis IIA) was taken into account: the Multinomial Logit (ML) specification and the Embedded Multinomial Logit (EML) specification (Mc Fadden, 1987).

With the ML model, the probability that a schoolchild would take to absenteeism or abandon school altogether, meaning that he or she does not attend school regularly, was estimated using the following equation:

$$P\left(Y_i = j/p\right) = \frac{\exp\left(\beta'_j Z_i\right)}{\sum_{k=0}^{2} \exp\left(\beta'_k Z_i\right)} \qquad (2)$$

The probability that the schoolchild would attend school regularly was going to be different in an EML model. This probability was estimated using the following equation:

$$P(Y_i = 0) = \frac{\exp(\beta'_0 Z_{i0})}{\exp(\beta'_0 Z_{i0}) + \exp(\lambda . I_i)} \quad \text{where} \quad I_i = \ln\left(\sum_1^2 \exp(\beta'_k Z_i)\right) \quad (3)$$

In this specification, the vector Z_{i0} corresponds to a set of variables that are specific to the explanation of regular school attendance or the lack of it. These variables can be different from the explanatory variables of the type of non-regular school attendance (absenteeism or dropping out) Z_{i0}. The term I_i represents the inclusive value for the cluster of situations concerned (in this case the two of non-regular school attendance). In this formulation, if λ is equal to 1, the EML model is reduced to a standard ML one. It is only by enabling the λ term to be different from 1 that the EML model relaxes the hypothesis IIA through the different "branches" of the situation tree above. This hypothesis is maintained between the choices belonging to the same cluster but is released between groups. The probability that the schoolchild will be in one situation or another can be expressed as follows:

$$Prob(Y_i = j) = \Pr ob(Y_i = j / p).(1 - Prob(Y_i = 0)) \quad (4)$$

The specification used here is that of the multinomial logit (ML), since the choices are obviously independent.[4]

The variables

In the model that was used in the different tests of the validity of the hypothesis IIA, the explained variable is the situation in which the schoolchild was during the year; it was written as SITUATION. This is a discreet variable that was assigned the values 0 (if the schoolchild attended school regularly), 1 (if he or she had taken to absenteeism) and 2 (if he or she had dropped out of school). As specified earlier, the explanatory variables are those related to the demand for and provision of education.

The variables taken into account regarding the demand for education were the following:

- **Age mismatch** (written as *RETAGE*)**:** This measured the number of years which the schoolchild had lost in relation to the age required for the class he or she was in. The study assumed that the schoolchild whose age was higher than that required for the class would be less inclined to attend school regularly.

- **Sex** (*SEXE*): In view of the sociological context in Benin, the study expected a positive effect of this variable on the explained variable, given that households tend to send more boys to school than girls.

- **Previous education** (*SCOLANTEk*): This variable measured the schoolchild's performance during previous years. It was assumed that this variable would have a positive effect on dropping out of school, because if a schoolchild repeated a year many times, this was likely to discourage parents from keeping him or her at school and, instead, involved them in income-generating activities.

- **Activities carried out during out-of-school time** (*ACTIVITE*)**:** Domestic chores, working on the farm (especially in rural areas), and small trade (especially in urban areas),for example, are activities usually done by schoolchildren during out-of-school time and which are likely to affect their regular school attendance (Manier, 1999). It was assumed that such activities would have a positive effect on absenteeism or dropping out of school.

- **State of health** (*SANTE*): The schoolchild's state of health was estimated based on the number of times he or she had fallen sick during the previous year. It was assumed that the more often a schoolchild would fall sick, the lower the probability of attending school regularly (Bobonis et al., 2006).

- **Household characteristics**: the household's income, its expenses, its size, the parents' level of education, their religion, etc. Since education is an investment (Becker, 1964), sending children to school is a question of financial means, which means that children whose parents have a high income tend to stay at school longer. Likewise, children of educated parents also tend to stay at school longer. The size of the household was assumed to have a negative impact on keeping a child at school for the same economic reasons (Altinok, 2007). As a sociological factor, the effect of religion was assumed to be indeterminate, as it depended on where the schoolchild lived.

The variables taken into account regarding the provision of education were the following:

- **Quality of the school** (*QUALITE*): Recent research has brought to the fore the issue of the quality of education which, as Hanushek and Woessman (2007) underscore, counts for more when it comes to accounting for the differences in the average number of years of school or the school enrolment ratio. An *index of the availability and quality of school facilities* was constructed using the multiple components analysis (MCA). This index was obtained from eleven variables (among which the availability of electricity and materials to build walls, roofs, and floors; the general state of the school buildings, the existence of a clean drinking water point, a canteen, a library, etc.). It was expected that the schoolchildren frequenting the schools with the best facilities would be less likely to take to absenteeism or drop out of school (Hanushek and Woessman, 2007).

- **Functioning of the school**: This variable covered the presence of teachers, their length of service, the nature of their contract, and their level of education.

Following *PASEC Bénin's* (2005) findings, the present study postulated that the most regular teachers, those who had been in service for a long time, those who were on a permanent contract, and those who had a high educational or teacher training qualification would tend to keep the schoolchildren at school longer.

Table 3 presents the description of the variables, their features and values and their expected effects on dropping out of school.

Table 3: Description of variables, their features and values and expected effects

Category of variable	Specific variable	Description	Features and values	Expected effect on dropping out of school
Education demand variables	RETAGE	Schoolchild's age mismatch	Discrete (in years)	+
	SEXE	Schoolchild's sex	1, if a girl; 0, if not	+
	SCOLANTE_k[5]	Schoolchild's previous schooling	1, if schoolchild has not repeated the year; 0, if he/she has	-
	TRANSFERE	Whether the schoolchild was transferred from another school	1, if the schoolchild was transferred from another school; 0, if not	+/-
	$ACTIVITE_1$	Schoolchild does domestic chores	1, if he/she does domestic chores; 0, if not	+/-
	$ACTIVITE_2$	Schoolchild participates in small trade activities	1, if he/she is used in small trade activities ; 0, if not	+
	$ACTIVITE_3$	Schoolchild works on the farm	1, if he/she works on the farm; 0, if not	+
	SANTE	Schoolchild's state of health (number of times he/she fell sick in the course of the year)	Discrete	+
	MGETAILLE	Size of the household	Discrete	+

continued next page

Table 3 Continued

Category of variable	Specific variable	Description	Features and values	Expected effect on dropping out of school
Education demand variables	MGEREVENU	Household's average income	In CFAF	-
	REVENU_INF1	Schoolchild's parents belong to the 1st income quintile	1, if the parents are in the 1st income quintile; 0, if not	+
	REVENU_INF2	Schoolchild's parents belong to the 2nd income quintile	1, if the parents are in the 2nd income quintile; 0, if not	+
	REVENU_MOY	Schoolchild's parents belong to the 3rd income quintile	1, if the parents are in the 3rd income quintile; 0, if not	+/-
	REVENU_SUP1	Schoolchild's parents belong to the 4th income quintile	1, if the parents are in the 4th income quintile; 0, if not	-
	REVENU_SUP2	Schoolchild's parents belong to the 5th quintile	1, if the parents are in the 5th income quintile; 0, if not	-
	MGEDEPENSE	Household's average monthly expenses	In CFAF	-
	RELIGION_christian	Parents or tutors are Christians	1, if the parents are Christians; 0, if not	+/-
	RELIGION_musulman	Parents or tutors are Muslims	1, if the parents are Muslims; 0, if not	+/-
	RELIGION_animism	Parents or tutors are animists	1, if the parents are animists; 0, if not	+/-
	PEREEDUC	Father's literacy	1, if the father is literate; 0, if not	-
	MEREEDUC	Mother's literacy	1, if the mother is literate; 0, if not	-

continued next page

Table 3 Continued

Category of variable	Specific variable	Description	Features and values	Expected effect on dropping out of school
	SEXE_CHEF_MGE	Sex of the head of the household	1, if the head of the household is female; 0 if not	-
Education provision variables	QUALITE	School's quality index	Continuous (between 0 and 1)	-
	MTPRESENCE	Teacher's rate of absenteeism	Discrete (number of days of absence)	+
	MTANCIENTE	Teacher's length of service	In number of years	-
	MTPERMANENT	Teacher's contract status	1, if permanent; 0, if not	-
	MTNIVEDUC	Teacher's level of education	1, if he/she completed secondary school; 0, if not	-
	MTDIPLPED	Teacher's level of teacher training education	1, if he/she underwent teacher training; 0, if not	-

Source: Constructed by the author

Data sources and analytical tools

The individual data used in the present study were drawn from the database of *PASEC-CONFEMEN Bénin 2004-2005*.[6] To this end, requests were made, both to the *CONFEMEN* office in Dakar and its branch in Benin, to get the various databases: databases for schoolchildren and those for teachers for the second and fourth years. Some 86% of the sample came from public primary schools.

5. Presentation, analysis and interpretation of results

Statistical analyses of the results

The statistical analyses were carried out with the aim of offering an overall view of the main variables at play in the analysis of dropping out of school. Table 4 presents the descriptive statistics for some key variables for the second and fourth years of primary school.

Table 4: Descriptive statistics for key variables

	2nd year of primary school		4th year of primary school	
	Number of observations: 1986		Number of observations: 1700	
Variable	**Mean**	**SD**	**Mean**	**SD**
ABANDON	0.2342975	0.3413245	0.1890937	0.2850980
TRANSFERE	0.1495868	0.2173143	0.1153610	0.1230784
RETAGE	0.1671583	0.3732089	0.3794090	0.4853556
SEXE	0.4464110	0.4972422	0.3956149	0.4890989
SCOLANTE1	0.1912488	0.3933812	0.0962822	0.2950481
SCOLANTE2	0.1386431	0.3456587	0.1010486	0.3014649
SCOLANTE3	-	-	0.1720686	0.3775301
SCOLANTE4	-	-	0.2178265	0.4128672
SCOLANTE5	-	-	0.2016206	0.4013060
REVENU_INF1	0.4095015	0.4070087	0.3995538	0.4151290
REVENU_INF2	0.3102790	0.3420228	0.3208112	0.0947550
REVENU_MOY	0. 207601	0.3775382	0.2109125	0.3746044
REVENU_SUP1	0.0519163	0.1897007	0.0486110	0.2229475
REVENU_SUP2	0.0207021	0.4346695	0.0201115	0 .478368
PEREEDUC	0.5344149	0.4989369	0.5734032	0.4947005
MEREEDUC	0.2635202	0.4406504	0.2740705	0.4461510
RELIGION_christian	0.281452	0.312547	0.275487	0.201452
RELIGION_musulman	0.19429	0.258965	0.211599	0.215425
RELIGION_animism	0.524258	0.145875	0.512914	0.125896
SEXE_CHEF_MGE	0.631452	0.220547	0.735124	0.289651
PRESENCEMT	1.7109960	2.1053240	2.1958080	2.7017740
ANCIENTEMT	6.1123650	6.9112210	8.599333	7.5048140
PERMANENT	0.0588813	0.2354601	0.0619343	0.2410935
MTNIVEDUC	0.0991168	0.2988921	0.1586470	0.3654336
ACTIVITE1	0.7286136	0.4447843	0.8393700	0.3672761
ACTIVITE2	0.2276303	0.4194058	0.2897998	0.4537775
ACTIVITE3	0.4655851	0.4989369	0.5495710	0.4976553

Source: Author's computations

The figures in Table 4 show that 23% of the schoolchildren dropped out of school in the second year of primary school, while 18% dropped out in the fourth year. They also show that 16.71% of the schoolchildren in the second year had an age that was higher than that required for this level of primary school, while 37.9% were in a similar situation in the fourth-year classes. Repeating the year was found to be a phenomenon affecting an important proportion of the schoolchildren, and one which increased from the lower to the upper years. For example, while 9.6% of the children in the fourth year had repeated the first year of primary school, 21.78% had repeated the fifth year. The majority of schoolchildren lived in low-income households (especially in the first and second quintiles), while very few of them lived in high-income households (notably the fourth and fifth quintiles).

There are three main arguments that can explain the distribution of students in their households' income levels:

(i) The educational system in Benin is run by both the private and public sector. According to the World Bank (see Banque Mondiale, 2009), in 2006, 12% of the schoolchildren were in private schools, while 88% were in public schools.

(ii) In public primary schools, school fees per child were, on average, CFAF 6,187 per year, while in private primary schools, they were CFAF 41,346 (Banque Mondiale, 2009).

(iii) Moreover, the vast majority of households in Benin have a low monthly income: according to data from INSAE (2008), 85% of households have an income of less than CFAF 100,000 per month. The report produced by CAPOD/ MPDEPPCAG (2009) on income inequality reduction and the emergence of a middle class in Benin shows that, according to the income approach, the wealthy class accounts for about 18% of the country's population.

These three elements put together make it clear that sending a child to school requires great financial effort on the part of the parents; yet, very few households can make this effort. The immediate consequence of this is that the majority of parents enrol their children in public schools, where the school fees burden is lighter per child. With the *PASEC* sample used in the present study being composed of 86% of schoolchildren from public schools, it is easy to understand why very few of these children came from high-income households. Indeed their proportion was very low in the sample: 5.19% and 2.07% of second-year schoolchildren had parents in the 3rd and 5th income quintiles, and 4.86% and 2.01% of fourth-year schoolchildren had parents in the same quintiles (i.e., *REVENU_SUP1 and REVENU_SUP2*). This means that the greatest proportion came from middle- and low-income households.

In the second year of primary school, as well as in the fourth year, more than half of the schoolchildren had literate fathers, and about 25% of them had literate mothers. It was also observed that more than half of the schoolchildren (both from the second and fourth year) had animist parents. This observation reflects the structure of Benin's population according to the second National Population and Housing Census (RGPHII), which showed that animism was the religion that was most practised in Benin.

The teachers' average length of service was found to be about six years for the second-year classes, while it was 8.5 years for the fourth-year classes. Regarding the nature of the teachers' contract, the study found that the majority of teachers had a non-permanent contract: indeed, only 5.8% of the teachers for the second-year classes were employed on a permanent basis by the government, and only 6.2% of those for the fourth-year classes were permanently employed.

The reasons given for school absenteeism were related to the health of the schoolchildren, the domestic chores they had to do, the long distance between the school and their home, the lack of motivation on the part of the schoolchildren themselves, and the lack of interest inr school among their families.

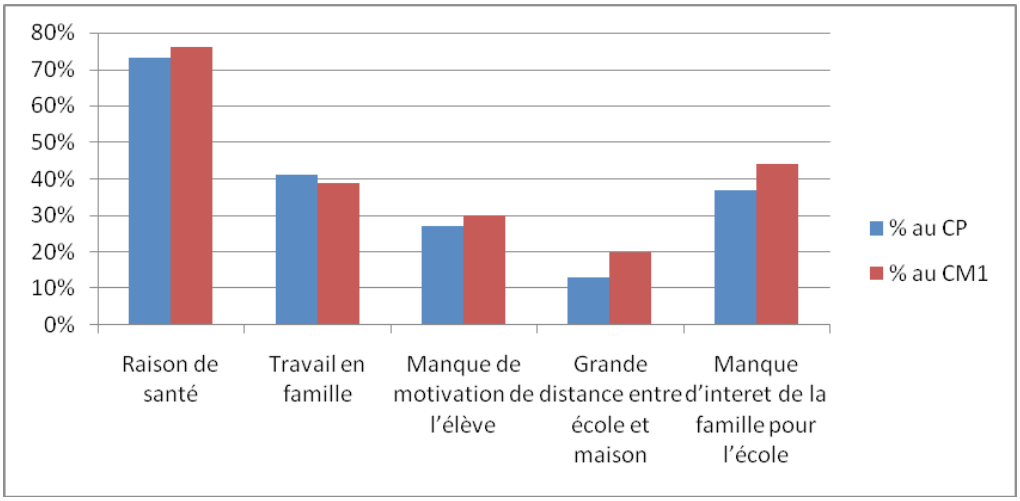
Table 5 shows the extent to which each reason accounted for absenteeism.

Table 5: Reasons for absenteeism

Reason for absenteeism	% for 2nd yr classes	% for 4th yr classes
Health reasons	73%	76%
Domestic chores	41%	39%
Schoolchildren's lack of motivation	27%	30%
Long distance between the school and the home	13%	20%
Lack of interest on the part of families	37%	44%

Source: from PASEC-Bénin's database

The same reasons are represented in the graph below.



Note: IN BLUE: for the 2nd year classes; IN RED: for the 4th year classes

As can be seen from both Table 5 and the graph, the most frequent reason given for absenteeism is poor health, followed by a lack of interest in school among families. According to table 4, 72% (i.e., close to three quarters) of the schoolchildren in the first-year classes reported doing domestic chores, 46% working on the farm, and 22% engaging in small trade activities during out-of-school time.

The corresponding rates for the fourth-year classes were 83.9%, 54.9% and 28.97%, respectively.

Econometric estimations were then used to verify whether or not there was a significant relationship between dropping out of school and the variables used in the statistical analyses.

Results of econometric estimations

The results of the econometric estimations of the school-dropping-out model are presented by level (second-year classes and fourth-year classes). First, the results of the complete model (covering all the explanatory variables) will be presented. Then, the results of the estimations of the reduced ML model will be presented. (This is a model that covers the potentially endogenous variables, such as the age mismatch for the schoolchild, represented as *RETAGE*; previous schooling, represented as *SCOLANTE_k*; the activities in which the schoolchild is involved during out-of-school time, represented as *ACTIVITE_i*; the variables related to household income, represented as *MGEREVENU*, etc.

Results of the estimation of the full multinomial model

The following are the results of the full mutinomial model. It should be noted that the estimation was done using the relative-risk ratio (RRR) to enable an interpretation of coefficients in terms of both their signs and their magnitude.

Table 6: Results of the estimation of the full ML model

Variable	2nd year classes				4th year classes			
	Regular school attendance		Dropping out of school		Regular school attendance		Dropping out of school	
	RRR	p-value	RRR	p-value	RRR	p-value	RRR	p-value
RETAGE	(-).7217925**	0.015	(+).9984251	0.974	(-)1.082614	0.235	(+)1.031165	0.470
SEXE	(-)1.049354	0.811	(+).8536124	0.025**	(-)1.762968**	0.006	(+).9489546**	0.019
SCOLANTE_1	(+)2.241501**	0.001	(-).840548	0.214	-	-	-	-
SCOLANTE_2	(+) .9683457	0.912	(-).8087229	0.235	-	-	-	-
SCOLANTE_4	-	-	-	-	(+)1.019269	0.846	(-)1.311295	0.154
SCOLANTE_5	-	-	-	-	(+)1.744284*	0.065	(+).8059587	0.325
ACTIVITE1	(-) 1.348728	0.479	(+)1.074524	0.757	(-)1.818135	0.225	(+)1.691625	0.101
ACTIVITE2	(-) 1.349478	0.258	(+)1.754875**	0.001	(-)1.016587	0.925	(+)1.18202	0.039
ACTIVITE3	(-) 1.326912	0.185	(+).8004112*	0.096	(-).664145*	0.099	(+)1.199220	0.265
SANTE	(+) 1.032521	0.677	(-).9619578**	0.031	(+).9949352	0.954	(-).731624**	0.001
MGETAILLE	(+)1.135812	0.325	(+)1.435610**	0.001	(-).7773695*	0.098	(+)1.127552	0.224
MGEREVENU	(+)1.134533	0.142	(-)1.000075**	0.001	(+).9999801**	0.0441	(-)1.000002	0.176
PEREEDUC	(+).5898961**	0.012	(-).7896514*	0.079	(+).9834320	0.995	(-).9756299	0.088
MEREEDUC	(+).8353701	0.495	(-)1.252124	0.134	(+)1.140958	0.641	(-)1.224069	0.251
QUALITE	(-)3.194925	0.201	(+)15.70574**	0.001	(-).8009241	0.765	(+).8596410	0.781
RELIGION_christian	(+).185214	0.925	(-).73584	0.568	(+).138527	0.710	(-).351257	0.352
RELIGION_musulman	(+).23589	0.192	(-).50012	0.172	(+).84581	0.684	(-).75881	0.411
SEXE_CHEF_MGE	(-)1.30458	0.047	(+).58245	0.081	(-).96584	0.158	(+).73395	0.049
MTPRESENCE	(-)1.115025**	0.004	(+).6236124**	0.001	(-)1.119588**	0.001	(+).7471120**	0.001
MTANCIENTE	(+)1.003762	0.884	(-)1.006784	0.558	(+)1.052362**	0.034	(-)1.07054**	0.001
DIPLPEDAG	(+)1.273304	0.324	(-)2.324847**	0.0001	(+).8049652*	0.059	(-).8957211*	0.076
MTBAC	(+).5082112	0.115	(+).3294235**	0.0012	(+)1.667968	0.122	(-)1.150025	0.539
Prob > chi2	0.0001				0.0001			
Number of observations	1986				1700			
Likelihood logarithm	484.14				364.32			
Reference situation	Absenteeism				Absenteeism			

* Significant at the 10% threshold; ** Significant at the 5% threshold
(+), (-): the direction in which the explanatory variable affects the explained variable concerned
Source: Author's computations using Stata

Overall analysis of the data

A number of comments can be made about Table 6. First, it can be observed that, overall, for both second-year and fourth-year classes, a number of variables related to the demand for education and those related to the provision of education significantly explain the situation in which a given schoolchild was during the school year. The variables related to the demand for education are the sex of the schoolchild, the activities engaged in during out-of-school time, the size of the household lived in, parents' income and their level of education, and health status. The variables related to the provision of education are the quality of education, as well as the teachers' length of service, level of education, and qualifications.

It should also be noted that the explanatory factors for the phenomenon of dropping out of school were observed to vary according to the level of primary school concerned. The variables that were found to be significant in second-year classes are not the same as those found to be significant in fourth-year classes. For example, it was observed that the explanatory factors for dropping out of school in fourth-year classes were mostly those related to the provision of education, not those related to the demand for it.

Furthermore, it was observed that the significance of variables such as the schoolchildren's status of health and the activities they were involved in during out-of-school time confirmed the results of the statistical analyses done in the previous paragraphs, according to which the main reasons given to justify school absenteeism were those related to health and domestic chores. An element that deserves special mention here is the effect of the schoolchild's sex on dropping out of school: the results presented in Table 6 show that girls tended to drop out of school more often than boys, a finding that is consistent with what would be expected of the context in Benin, but not with what was observed in South Africa (according to the *South Africa State Party Report 2008*; see Box 1).

Box 1: Why are there more boys dropping out of school in South Africa?

> Overall, there are signs that would make one think that fewer girls than boys drop out of school. Some of the reasons for this encouraging trend, one which is the opposite of the trend observed in other African countries, are the following: one, among the available jobs, only those that are relatively prestigious (in particular for African women) require that the applicant has taken the end-of-secondary school examination or a higher qualification; two, families have perhaps started to invest more and more in girl education because women are more often the only family support; three, the general feeling is that educated girls can demand a higher bride price ('lobola'). As for the girls who drop out of school, pregnancy is reported to be the most frequent reason.
>
> Source: South Africa State Party Report 2008, p. 85.

Considering cultural practices, one would have thought that the religion practised by schoolchildren's parents or tutors would have a significant impact on dropping out of school. However, this study's finding was that the impact of religion was not significant,

be it for second-year or fourth-year classes. This finding can be justified by the awareness campaigns that the government has undertaken, since the last decade, to sensitize the parents and the different religious leaders and traditional chiefs on the necessity to send children to school and do everything possible to keep them in the education system.

The sex of the head of the household was also found to be a significant variable in keeping schoolchildren at school: indeed, the present study found that children living in households headed by females were more likely to drop out of school than those living in households headed by males. This, again, raises the issue of the parents' responsibility in their children's education. Indeed, the statistics reported in Table 4 show that the percentage of literate men was higher than that of literate women. So, it would seem logical that the children living in households headed by more educated people would be less inclined to drop out of school.

Let us now turn to the interpretation of the parameters that were estimated within the ML model framework. It should be noted that an interpretation of parameters estimated using the RRR option must be done in terms of how a variable modifies the ratio of the calculated probability to the underlying probability. Moreover, given the fact that among the significant explanatory variables there are both qualitative and quantitative ones, great care must be taken to point out the real impact of the variations in the explanatory variables on dropping out of school.

Analysis and interpretation of the effect of key variables on dropping out of school

The direction in which the different variables affect the explained variables is indicated by the sign given between parentheses in Table 6. By looking at the different signs in the table, it is clear that they were found to be the same overall for both levels of school studied (the second-year classes and the fourth-year ones). More specifically, the variables related to the demand for education, such as the activities which the schoolchildren engage in during out-of-school time, their health status and the size of the households they lived in, were found to have a positive effect on the probability that the schoolchildren would drop out of school, both in second-year classes and fourth-year ones. On the other hand, household income and the father's level of education reduced this probability.

With regard to the variables related to the provision of education, the study found that only two variables, namely the fact that the teacher had secondary school education and the level of teacher absenteeism, increased the probability that the schoolchild would drop out of school in the course of the year. On the other hand, the quality of education, the teacher's length of service, and his or her having a teacher-training qualifications were found to reduce this probability.

The different results reported in the preceding paragraphs are consistent with theoretical expectations, and corroborate the findings of other studies such as those by Hammond (2002), Dickson et al. (2000), Kremer and Miguel (2004), and Hanushek and Woessman. (2007). Similar results were reported for Uganda, as part of the assessment, in 2007, of the country's progress in achieving the Millennium Development Goals (see Box 2).

Box 2: Why do girls drop out of primary school in Uganda?

The rates of dropping out of school and repeating the year in primary school have remained high. This is largely attributable to the families' financial difficulties, their lack of interest, their children's health problems, and the long distance which the children have to cover to reach their school. According to the household survey conducted in 2006, 43% of the cases of dropping out of school among girls and 35% among boys were due to financial constraints. The extra fees and levies imposed by their schools (e.g., examination fees, maintenance fees, grain milling fees, etc.) were an impediment to access to primary school. The preference given by families to boys over girls in relation to sending them to school, a preference fostered by the traditional social and cultural environment, is also partly responsible for a higher school dropout rate on the part of girls.

Source: Millennium Development Goals Uganda's Report 2007, p. 30.

In view of all that, what is the magnitude of the effect of the different variables on the explained variable? The response to this question requires that one make recourse to the value of the estimated RRR coefficients. Let us therefore examine this value for some key variables of the model, namely: the activities the schoolchildren get involved in during out-of-school time, household income, the schoolchildren's health status, the quality of education, teacher absenteeism, and the teachers' teacher-training education.

According to the results of the estimation, engaging in domestic chores did not have a significant influence on the probability of the schoolchildren dropping out of school. However, working on the farm and doing small-trade activities was found to significantly affect this probability: in the case of second-year classes, for a schoolchild involved in trading activities, this probability was 175% that of a schoolchild who simply took to absenteeism; for a schoolchild who worked on the farm, the same probability was 80% that of a schoolchild who took to absenteeism; in the case of fourth-year classes, that probability for the corresponding situations was 118% and 119%, respectively. All this suggests that getting involved in those activities led the schoolchild more to drop out of school rather than simply take to absenteeism.

Regarding the schoolchildren's health, the study found that a spell of illness multiplied by 0.96 the probability of a second-year class child dropping out, rather than simply taking to absenteeism, and multiplied the risk by 0.73 in the case of a fourth-year child. As for the effect of household income, a 1% increase was significantly invariant in the probability of second-year children dropping out of school.

With regard to the level of quality of education in schools, it was observed that a one-point increase in the quality index for the school frequented by a schoolchild in a second-year class divided the probability of dropping out of school, rather than simply takin to absenteeism, by 1.70; in the case of fourth-year classes, the effect of this probability was not significant. This finding could mean that schoolchildren in the lower classes may be more sensitive to the quality of education than those in upper classes because the latter are already getting near the completion of the primary school course and, thus, are encouraged by their parents to complete the course despite the difficulties encountered.

In relation to the teacher's regular presence, it was observed that one additional day of

the teacher's absence was more likely to lead to his or her pupils dropping out of school, rather than simply taking to absenteeism. It was further observed that the probability that schoolchildren in second-year classes would drop out of school rather than simply take to absenteeism was 230% (i.e., more than double) when the teacher had a teacher-training qualification than when he or she did not have one; the same probability was 89% in the case of fourth-year classes. This shows, once again, that the effect of the teacher having a teacher-training qualification on schoolchildren's dropping out of school was more perceptible in the lower classes than in the upper ones.

Results of the reduced multinomial model

This reduced model excludes the variables that are potentially endogenous such as the schoolchildren's age mismatch (RETAGE), their previous schooling (*SCOLANTE_k*), the activities they get involved in during out-of-school time (*ACTIVITE_i*), and the variables related to the income of the households they live in (*REVENU-INF1*, etc.), the aim here is to see whether the estimated RRR's vary significantly so as to measure the real impact of the different explanatory variables on dropping out of school.

Table 7: Results of the estimation of the reduced multinomial model

Variable	Second-year classes				Fourth-year classes			
	Regular attendance		Dropping out of school		Regular attendance		Dropping out of school	
	RRR	p-value	RRR	p-value	RRR	p-value	RRR	p-value
SEXE	(-).048121	0.612	(+).635514	0.023**	(-)1.568459**	0.007	(+).841512**	0.015
SANTE	(-) .042765	0.540	(+).658125**	0.047	(-).588912	0.762	(+).678451**	0.001
MGETAILLE	(+).358124	0.445	(+)1.63701**	0.000	(-).425174*	0.062	(+).587891	0.324
PEREEDUC	(+).458401**	0.010	(-).514253*	0.042	(+).622125	0.929	(-).896524	0.051
MEREEDUC	(+).752958	0.405	(-).501364	0.111	(+)1.129510	0.597	(-)1.175874	0.248
QUALITE	(+)1.025732	0.119	(-)1.35874**	0.001	(+).566352	0.410	(-).658415	0.242
MTPRESENCE	(-)1.01952**	0.001	(+).512251**	0.001	(-)1.152471**	0.001	(+).840101**	0.001
MTANCIENTE	(+).296715	0.654	(-)1.014621	0.481	(+)1.041112**	0.025	(-)1.001914**	0.001
DIPLPEDAG	(+)1.05121	0.295	(-)1.055844**	0.001	(+).625878*	0.034	(-).5986873*	0.071
MTBAC	(+).482132	0.201	(+).3125469**	0.001	(+)1.598625	0.209	(-)1.302155	0.475
Prob > chi2	0.0001				0.0001			
Number of observations	1,986				1,700			
Likelihood Log	480.25				368.22			
Reference situation	Absenteeism				Absenteeism			

* Significant at the 10% threshold; ** significant at the 5% threshold
(+), (-): the direction in which the explanatory variable affects the explained variable concerned
Source: Author's computations using Stata

From the results in Table 7, three observations can be made. First, even though the value of the estimated RRR's has changed vis-à-vis that obtained in the full model, their signs and the level of significance have remained the same overall. Thus, it can be concluded that the analyses done above remain valid overall, especially in terms of the direction in which the different variables affect the phenomenon of dropping out of school. Second, the value of the likelihood logarithm has not increased significantly, which relatively maintains the level of significance of the model. Finally, and most importantly, the "quality of education" variable this time round was found to have had a negative effect on dropping out of school, unlike what was found in the full model. This means that the efforts made towards improving the quality of education significantly reduced the rate of dropping out of school in the course of the year.

Even though the results reported in the previous paragraphs provide useful information on the phenomenon of dropping out of school in Benin, I deemed it useful to seek the views of the stakeholders in the education system on the ground, so as to compare these views with the results obtained from the analysis of the data drawn from the *PASEC-CONFEMEN* database — which, it should be recalled, dates back to 2004-2005. Doing this was all the more appropriate because the phenomenon of dropping out of school can be more dynamic, as the causes can change over time.

The following section presents a summary of the views collected from interviews with the stakeholders in the education system.

Views from the education stakeholders on the ground

From the interviews done with stakeholders on the ground to complement statistical and econometric analyses, three situations transpired which, according to the schoolchildren's households, can explain the phenomenon of dropping out of school. The first situation is where schoolchildren drop out of school because the specific primary school they go to "does not please them", despite the fact that it is relatively near their home. The reasons given for this dropping out are many and varied: for some, the school is not close enough to their home, for others the school's quality (i.e., its educational facilities) and/or the relevance of its programmes is perceived as too low by the parents; for others the teachers are absent too often; and for yet others, the teachers are male while the parents would have wanted female teachers to teach their daughters, etc.).

The second situation is where schoolchildren drop out of school despite the fact that the school is located near their home and its quality and facilities are adequate because both direct costs (school transport fees, tuition fees, book and stationery costs, etc.) and/or occasional costs (e.g., children's contribution to family productive activities) are deemed too heavy for their parents to incur. That is, the burden is too heavy in absolute terms in relation to the ambient poverty, or in relative terms if the parents think that the benefits to expect from their children's schooling are too uncertain.

The third situation is where the school may be located near the schoolchildren's home, but does not have all the classes of the primary school course. Because of this, the children cannot finish their primary education at this school. This means that they would have to look for another school, however far away from their home, in which to finish primary school. In this case, one would not want to talk of schoolchildren abandoning

the school, but rather of the school abandoning them. This last situation is a typical case of inadequate quantitative provision of schooling opportunities.

In view of the different results reported in the previous paragraphs, it is only appropriate to make recommendations aimed at reducing the phenomenon of dropping out of school.

6. Conclusions and policy recommendations

The present study set out to identify the key factors that are likely to influence schoolchildren's dropping out of school. The results reported in previous sections and obtained from analyses of individual data drawn from the *PASEC-CONFEMEN* database as well as from interviews with stakeholders on the ground, show, as one might expect, that both the variables related to the provision of education and those related to the demand for it affect the schoolchildren's propensity to drop out of school in the course of the year. That is why it is urgent for measures to be taken by both the government and the other stakeholders in the educational system, notably NGOs, to curb the phenomenon of dropping out of school.

The following measures are proposed. First, efforts must be made to improve the schoolchildren's health. This can be done, for example, by putting in place special programmes to monitor the health of schoolchildren, which would require providing schools with adequate health centres equipped with basic facilities and medicines to prevent the most frequent diseases, especially public health diseases.

Second, awareness campaigns should be conducted to persuade parents that having their children engage in trading and farming activities outside of school time is detrimental, as it may lead the children to drop out of school. The NGOs that are stakeholders in the education system must be partners in these campaigns for them to be effective.

Third, measures must be taken to improve households' living standards to enable parents to have enough resources to keep their children at school. Such measures could consist of giving households small loans to for income-generating activities.

Fourth, efforts must be made by both the central government and the local governments to improve the quality of education in schools, especially by using quality materials to build schools, and providing them with electricity, clean drinking water points, canteens, libraries, etc. An essential point to bear in mind here is that it is necessary to continue providing education to avoid creating a situation where it is the school that abandons schoolchildren by not having all the classes required for the complete course.

Fifth, efforts must be made by the government to reduce the rate of teacher absenteeism by putting in place, not only measures that are binding on teachers, but also those that offer them incentives. Still regarding teachers, efforts must also be made to offer them teacher-training education to empower them to do their job competently and, thus, contribute to curbing the dropout rate.

If the different measures recommended above are taken, even if the phenomenon of dropping out of school is not eradicated, it will at least be greatly reduced, thus increasing the chances of keeping both boys and girls at school, which is a necessary condition for achieving the education-for-all goal.

Notes

1. These effects are: a rapid increase in the numbers of children enrolled in primary school, a generalization of secondary school education, and a dramatic rise in the numbers of students registering for higher education.

2. See Ben-Porath (1970), Heckman (1976) and Rosen (1976) for an elaborate discussion of optimal decisions to attend school.

3. *Les Français et leur école - Le miroir du débat* [The French people and their school – The mirror of the debate]. The Commission for the National Debate on the Future of Education, 2004, Dunod.

4. This specification could also be justified using a test of independence of non-relevant choices.

5. *k* refers to a year already completed by the schoolchild; at primary school level, for example, this means the first year of primary school for a child who is not repeating the year and the first and second years for one repeating the year.

6. *PASEC- CONFEMEN* is a programme for analysing educational systems used by the Conference of the Ministers for Education. As part of this programme, surveys are organized in French-speaking countries in Africa to assess the quality of their education system.

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