Determinants of School Unattendance of Children Working in Informal Gold Mining Sector in Mongolia

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1. Introduction

Education is seen a right for all children and as a way for individual and societies to develop. The one of the Millennium Development Goals of the United Nations Millennium Declaration, which was adopted by all 189 UN Member States, is to achieve universal primary education before 2015. This objective is based on the UNESCO declaration on education for all, and defined as a reassurance that all boys and girls complete a full course of primary schooling (Grimsrud 2003). To reach this goal is not easy. In many developing countries the existences of illiteracy, lower school attendance and high levels of school dropout have attracted the attention of policy/decision makers. As of 2006, an estimated 115 million children in the primary school ages were not attending school (UNICEF 2007). South Asia and East Asia account for almost half of these children. An estimated 130 million children do not attend school regularly, many because of work commitments.

Child labor is one of the main obstacles for full-time school attendance and, in the case of part-time work, still keeps children from getting complete benefits from their time at school (ILO 2006: 58). A number of studies performed by International Labor Organization (ILO), United Nations Childrens' Fund (UNICEF) and the World Bank found that one of the most dominant factors of lower school attendance appearing in poor countries is child labor (Grimsrud, B. 2003: 14). Moreover, almost all research on child labor shows that school unattendance of child workers is relatively higher than that of non-working children (Rosati F. and M.Rossi 2001). However, the existing literature on the determinants of school unattendance has examined the issue without distinguishing between children that work and those who do not, and has failed to focus specifically on the situation of child workers.

Mongolia is a vast territory of about 1.6 million square kilometers with a scattered population of 2.5 million people. As of 1990, Mongolia was considered a country with a high literacy rate[18], which is equal to that of the developed worlds. However, during the transition from the central planned economy to the market economy, which began in 1990, numbers of illiterates, school dropouts, and street children have actually increased. Decline in the national income led to a drastic downfall in the number of kindergartens and schools run by the government, and because of the economic hardship, children are often forced to work, in order to help sustain their family income (UNESCO 2004).

Although Mongolia has a high literacy rate of 98 percent the country has to pay attention to children's education in the economic transition period (EDF and ILO 2005). The overall school enrollment rate of compulsory school aged children has increased from 89.7 percent to 92.3 percent between 2000 and 2005 (NSOM 2005). However, there are many other statistics showing that compared to the national average, school

[18] The percentage of people aged 15 years and over who can read and write a short, simple statement in their mother or any other language.

attendance rate is considerably lower among children participating in economic activities. For example, during the above mentioned period, the percentage of children aged 7-15 and not attending school was 49.5 percent among children herding livestock for other families (PTRC & ILO 2005: 62), 34.6 percent among children working as domestic workers in urban areas (PTRC & ILO 2005: 16) and 51 percent among children working in market places (PTRC & ILO 2003: 10) in Mongolia[19]. According to the *Baseline Survey on Child and Adult Workers in informal gold/fluorspar mining in Mongolia*[20], among estimated 26699 children aged 5-17 residing in all provinces of Mongolia where informal gold/fluorspar mining is being carried out, 29.9 percent or 7996 children are engaged in informal gold/fluorspar mining. In total, 32.2 percent of those working children do not study at school and are engaged in gold/ fluorspar mining.

To contribute related professionals' action strategies on children's education, this study aims to examine the determinants of school attendance of children working in the informal gold mining sector[21] in Mongolia. The reason for choosing a specific economic sector is based on the fact that informal gold mining sector is already very large for Mongolia- a country with a small population, and it is expanding rapidly. A report by the Mongolian Business Development Agency and Eco-Minex International estimates that 20 percent of the rural workforce (population in the working ages) is involved in the informal gold mining in Mongolia (ILO 2004, cited by PTRC and ILO 2006). Considering this situation, children working in the informal gold mining sector were chosen as representatives of Mongolian child workers in this study. Following objectives are raised to accomplish the study goal:

1. To study variation in school attendance of children working in the informal gold mining sector in Mongolia
2. To determine factors affecting school attendance of children working in the informal gold mining sector in Mongolia

2. Existing literature and study hypothesis

2.1 Determinants of school attendance of children in some developing countries

Education contributes to build a protective environment for all children and is the mechanism for opening up choice, which lies at the heart of the definition of development (ILO 2006: 58). Thus, the researches on education issue, especially, studies on literacy, primary school attendance, and dropouts of children have attracted the attention of policy makers and its importance is rising at this time due to the world's goal on the universal primary education before the year 2015.

At the global level, most of researches on the determinants of school attendance have been done under the ILO and UNESCO projects/ programs; and almost all of them have been focused on the specific one or two factors of school attendance. For instance, whereas

[19] The samplings of these surveys based on probabilistic sampling methods. Thus, the results can represent national trend/profile.[10] Health Insurance Law, 1993

[20] This survey was conducted in Mongolia by the Population Teaching and Research Center (PTRC), National University of Mongolia (NUM) under the request and support of ILO's office in Mongolia. The main goal of this survey was to determine the scope of children and adults engaged in informal gold and fluorspar mining, and to collect primary data showing objective situations in the employment of children and adults engaged in informal gold and fluorspar mining.

[21] According to the resolution approved by the 15th International Conference of Labor Statisticians organized by the ILO in January 1993, the informal sector is the one consisting of production and service enterprises aiming to create workplaces and income sources with regard to private interests. Production and services in this informal sector operate in the form of a small household economy which lack labor and capital distribution or have them in a very small measure.

Guarcello and colleagues (2005); Rosati and Rossi (2001) and many other researchers identified the children's work, regardless of whether work is economic or non-economic, market or non-market, as a determinant of school attendance; Cigno and colleagues (2003) highlighted family income, and parents' education and choices in regard to children's education; and Grimsrud (2003) emphasized availability of education. Also, Guarcello and colleagues (2004) paid attention to the effects of orphanhood on children's schooling in their study.

Among the studies on determinants of school attendance of children, researches concentrated on child labor or child work[22] occur comparatively frequently. According to the Guarcello, Lyon and others (2005), while there has been a considerable discussion of the possible causal mechanism behind the association between child labor and lower school attendance, the analyses, in which causal links have definitely identified, are very few in the literature. This difficulty may be related to the fact that decisions relating to child labor and school attendance are typically jointly determined. However, if we look at more carefully existing literature, there are some interesting studies on school attendance, and child labor issues. Although studies on the effect of child labor on school attendance are differentiated by measurements of child work or child labor (whether or not the child is working, child's involvement in economic or non-economic activities, working hours etc.), the conclusions are similar: often child labor interferes with school attendance of children, even in the case of non-market work[23].

Using data from five countries, Guarcelo and colleagues suggested that more research is needed on the link between child labor and school attendance; and variables/indicators about the intensity of the child's work might be very useful to draw a more plausible and precise picture about the situation (Guarcelo, Rosati et al. 2005: 58). Furthermore, several researches (Rosati and Rossi 2001; Guarcello, Lyon et al. 2005; Cigno et al. 2003) have found that the amount of hours worked by children is an important determinant of school enrollment. According to the Rosati and Rossi (2001) and Guarcello and colleagues (2005), the increase of working hours decreases the probability of school attendance in both cases of children that have worked in economic and non-economic activities. For example, in Guatemala, an increase in working hours from 20 to 40 hours per week is associated with a reduction twice as large in the probability of attending school for children engaged in non-market activity and a reduction of about 20 percentage points (from 70 percent to 50 percent) for children engaged in market activity (Guarcello, Lyon et al. 2005:38). In Bangladesh (Rosati and Rossi 2001) the school attendance rate of working children goes dramatically down when children are involved in work for more than 21 hours per week.

Cigno (2003) and some other researchers argued that light work does not necessarily interfere with formal education. Long working hours, on the other hand, are likely to have more serious developmental consequences on the child. In both Brazil and Cambodia (Guarcelo, Rosati et al. 2005), for example, for the children aged 7-14, work hours appear to have a relatively

[22] Cigno and colleagues (2003) defined the terms «child work» and «child labor» based on the literatures and UN and ILO documentations on child labor. A «child work» is seen as a general term covering the entire spectrum of work and related tasks performed by children (any form of economic activity performed by children). A «child labor» is a subset of children's work that is injurious to children and that should be targeted for elimination.

[23] According to the authors' definition, non-market work includes household chores such as cleaning, laundry, meal preparation, child care, collection/cutting of firewood, repairs and maintenance, gardening, and other domestic work.

small impact on school attendance up to the 21-30 hours cohort, but attendance falls of dramatically when children must work greater than 30 hours. However, Rosati and Rossi (2001) concluded that the assumption that a few hours of work only have negligible effects on child welfare is not supported by the evidence, at least in the case of Pakistan and Nicaragua. All above evidence clearly shows us that child work affects the school attendance with the number of hours worked.

The availability of education is seen as another factor of lower school enrollment in developing countries. Nowadays, education is a public issue in almost all countries, with the authorities requiring that all children receive a minimum basic education free of charge according to suggestion of the UN Convention on the Rights of the Child. All industrial countries without exception have introduced compulsory education, and this was often done at a very early stage of development before industrialization. However, universal primary education still does not prevail in some areas (Sub Sahara Africa, Arab States, South and West Asia)[24] due to lack of school availability. According to the Grimsrud (2003), given that the education options are not legally warranted, it is reasonable for a child (especially for a child from poor family) to choose working instead of studying. Moreover, UNICEF study has found from the Indian case that parents are likely to send their children to school if only schooling was offered.

However, on the other hand, even if education is offered to children with free of charge, children's school attendance still associates with income of the household; and there is a broad tendency that the proportion of children who attend school to increase, as household income increases. In the case of Brazil, for example, the percentage of children studying rises from 65 in the bottom income quintile to 81 in the top one. Moreover, while 20 percent of children from households in the bottom income quintile were working without studying or working and studying simultaneously, only 5 percent in the top quintile were doing that (Cigno 2003: 6).

The reason for why school unattendance exists when education is available can be partly explained in association with parents' or family decision to send a child to school or work. According to many studies, young people are less likely to go to school if they are from poor households, rural areas or families in which mothers are not educated (UNICEF 2007: 13). In practice, it is true that children usually make some important decisions such as to study or to work with their parents' decisions. Then, when poor families face an income shortfall, they tend to pull their children out of school to provide labor (Grimsrud 2003:10). For example, in Guatemala, households that affected by economic hardship reduced their children's school attendance and raised their participation in labor market (Guarcello et al. 2002). Moreover, uneducated parents tend to negatively affect the children's school attendance via their decision to send a child to job because they underestimate the value of formal education due to its usefulness in present days, and do not fully understand the future beneficial effects of education (Grimsrud 2003). In other words, some parents sacrifice child's future long-term gain from education for current family advantage/gain. So, in practice, children of better educated parents are large more likely to go to school; in particular, decision of educated mother has a more positive effect on child's education (Cigno 2003).

[24] *http://www.ilo.org and http://www.unesco.org*

Guarcello and colleagues (2004) investigated that orphanhood is another determinant of school attendance of children. According to their study, orphanhood had significantly reduced a child's chances of attending school in nine out of the 10 analyzed Sub-Saharan African countries; and the size of effect was in many cases very large. For instance, in Gambia, becoming double orphan (loose both father and mother) reduces the probability of school attendance by 21 percentage points, in Burundi by 14 percentage points, and in Angola, Cote d'Ivoire and Kenya by around 10 percentage points. The size of the effect of single orphanhood (loose of father or mother) on schooling was smaller, but large enough to merit concern. In that research, authors also found that leaving the real family members and coming under an alternative care arrangement makes a child more likely to drop or not attend school in the cases of Angola, Cote d'Ivoire, Kenya, and Zambia.

More qualitative studies[25] describe a complex picture about school unattendance and school dropouts. The reasons for school unattendance are not only related to the economic factors or non availability of education, but also can be associated to the qualitative factors such as poor quality of school services from the state, a lack of study motivation, poor academic achievements of children, family behaviors and preferences, which are rarely observable to the researchers (Labor Force Network of Education Policy Centers 2005). Finally, many of the figures cited above tell us that the determinants of the school attendance of children are very complex.

2.2 Education system of Mongolia

Since Mongolia chose the democratic and market-oriented system in 1990, one of its most important tasks has been the development of a new legal basis for education. To achieve this goal, several new legal acts, such as the State Education Policy, the Education Law, the Higher Education Law and the Primary and Secondary Education Law were adopted by the Parliament in 1995. These laws defined policies of democracy and openness in educational administrative structures; decentralized the administration and financing of all public schools; transferred the management of schools to local governments; increased the autonomy of colleges and universities; and enabled the establishment of private educational institutions (Mercedes del Rosario et al. 2005).

The structure of the education system in Mongolia consists of pre-school and primary education system, secondary education system (lower and upper secondary schools), and higher education system. Currently, primary and lower secondary education covers a period of 9 years, and called as a ***basic education*** which is compulsory for every citizen of Mongolia. A combination of basic education and 2-year upper secondary education is termed as a ***general education*** or completed secondary education. A school year consists of thirty-four working weeks at the primary level, thirty-five weeks at the lower secondary, and thirty-six weeks at the upper secondary level[26]. General education can be obtained free of charge in Mongolia, and the Law of Education states that not less than 20 percent of the annual budget of the Government has to be spent on educational sector.

The structure of the Mongolian general education system has changed several times since 1990[27].

[25] Labor Force Network of Education Policy Centers organized an Education Conference in Budapest on July 2005. In that conference key results of studies on school dropouts, which are conducted in seven countries (Estonia, Latvia, Slovakia, Albania, Kazakhstan, Tajikistan, Mongolia), were presented. The methodologies used for those studies were: Review of the literature, analysis of regulations and legislation, individual interviews, and focus-group discussions.

[26] Mongolian Law on Education 2002

This change was due to the transition from a 10-year school system to an 11-year school system, of which goal was "to fit or to become consistent with the standard of world modern education system". Starting from the 01 September 2005, new or 11-year general education system is working in Mongolia.

2.3 School attendance of children and its determinants in Mongolia

Since the mid of 20th century, the national goal of universal basic education is successfully implemented in Mongolia compared to many other countries at similar level of socio-economic development. School dropouts and non-enrolment in primary and secondary schools were steadily negligible in Mongolia until the early 1990s. Unfortunately, this situation did not last long since early 1990s in view of decrease in school enrollment and increase in school dropouts. According to the information of National Statistical Office of Mongolia, the gross enrolment rate of primary education declined to 86.1 percent in 1990 and net enrolment rate went down to 72.5 percent. If we look at the changes in gross and net enrollment rates of compulsory education between 1990 and 2005, the indicators went down between 1990 and 1995, went up between 1995 and 2003, and started to be stable from 2003. In the academic year of 1992-1993, school dropout rate reached the highest point (over 30 thousand children dropped out of the schools and it took 8.8 percent of total students). Boys' dropouts represented more than 70 percent of total dropouts.

These days, the tendency has changed in a positive way which favors the dropout decline and school enrolment increase (Batchuluun.Y and M.Khulan 2005). By 2004, the net school enrolment rate for children aged 8-15 years was 91.5 percent, and the dropout rate was 1.9 percent[28]. The dropout rate is twice higher in rural areas than in urban areas. Out of total children not attending school, 51.7 percent are parental orphan (single orphan 34.6 percent and double orphan 17.1 percent), and 46.4 percent do not attend school due to poor/low living conditions and necessity to work (NSOM 2005).

If we look for related literature in Mongolia, very small number of studies can be found. A few attempts to determine the factors affecting school dropouts of children have been made mainly based on qualitative research methods. The most recent study on school dropouts in Mongolia was held in 2005 by the Mongolian Education Alliance. According to this study, the most common policy related reasons for school dropouts are poverty/low income, child labor, migration, shortage/lack of dormitories, teacher discrimination, and systemic problems with the education system. Besides these reasons, the researchers found out some previously understudied factors, such as physical/ mental disabilities, lack of communication and socialization skills, bullying, or peer discrimination and educational level of parents, in their study.

According to the *"Literacy Country Study 2005"*, the main reason of increased school dropouts and decreased school enrolment in the beginning

[27] The general education system which was structured as 4+4+2 model (primary + lower secondary + upper secondary) changed into 6+2+2 model in 1990. In the 1992-1993 academic years, the education structure was again changed to the 3+5+2 structure; and in 1998-2005 it was structured as former 4+4+2 model. Since September 2005, 5+4+2 system is working.

[28] Some researchers critically analyze the decrease in the dropout rate for the last ten years and note that official statistics may not accurately indicate the real dropout rate, because, first, all school dropped children who re-enrolled in two or three-week non-formal education classes are removed from the «dropout» category; and second, poverty-related dropouts are systematically downplayed in the official statistics (Amgaabazar 2004, cited by Mercedes del Rosario et al. 2005)

of the political and socio-economic transition period was related to the fact that many rural children from herder families dropped out of the schools to help their parents to look after the privatized livestock. Especially, when families started to have more animals due to privatization, boys, more often than girls, are needed to take care of animals. Secondly, it was caused by the lack of value placed on education. During the privatization years, herders tended to think that education is not essential whilst the livestock meant a wealth. Even, at that time, a number of teachers and doctors were leaving their professional work to make their own business. Therefore, inappropriate actions of schools and teachers somehow affected the school unattendance and dropouts of children (Y.Batchuluun and M.Khulan 2005).

Some other studies besides above found the similar reasons for school unattendance. For example, *"The Education for All 2000 Assessment: Mongolia"*[29] shows that the rural provinces which led by their number of livestock per person tended to have less school enrolment, whereas more urbanized provinces with few animals per person tended to lead by the school enrolment indicator in the country. Thus, the increased number of animals due to privatization raised the herdsmen's interest in making children get out of the school and work in animal husbandry. However, *"Innovative approaches to functional literacy for poverty alleviation: A case study of Mongolia"* argues that herdsmen's attitude, which they force children to work in animal husbandry, is an evidence applying to the richer families only (EDF and ILO 2005).

Because of the large territory, small population and nomadic life style, rural children have less access to attend school in Mongolia. Communities in remote rural areas are quite distant from one another. Due to low population density in the rural areas, there is only one school in each *soum*[30] and it is located 10-300 kilometers away from the herdsmen's home. It makes a formidable challenge especially for those children who are responsible for herding their families' livestock (Save the Children, cited by Mercedes del Rosario et al. 2005). Moreover, dormitory problems are one specific feature of Mongolian school unattendance. For remote rural areas, which have a nomadic way of life, the basic method of involving herdsmen children in education was to build dormitories for those provinces and to pay the pupils' expenses by the government. During the years of transition to the market economy system, the resources to finance dormitories were limited; as a result, many of the dormitories came to close its doors. Later, expenses for dormitory[31] had risen in the rural areas and it was difficult for poor parents with many young kids to afford the high costs (EDF and ILO 2005).

Like in other countries, household's income level was conversely related to the school attendance of children in Mongolia. For instance, the school involvement of children from the families in the bottom income quintile is found to be lower by 25 percent than that of children from families in the top income quintile (EDF and ILO 2005).

In conclusion, insufficient school attendance of children in developing countries, including Mongolia, depends on many policy-related factors like poverty, child labor, and availability

[29] Background paper prepared for the UNESCO's Education for All Global Monitoring Report, which titled as The Education for All 2000 Assessment: Mongolia. available at http://*www.unesco.org*/education/efa/wef (accessed on October 9, 2006)

[30] Soum is a Mongolian administrative unit. Administratively, Mongolia is divided into 22 major provinces, including 21 aimags and a capital city. An aimag is comprised of soums; soums in turn are comprised of baghs. In Mongolia there are 331 soums and 1,550 baghs.

[31] Due to the financing problem, the government shut down completely or partially the boarding schools during the first half of the 1990s. From 1996-2000, imposed the «Meat Requirement» policy, which required parents of boarders to pay for dormitory meals. The Meat requirement provided that a family had to pay for 70 kg of meat per child a year (equivalent to two or three sheeps). (Khamsi and Stolpe 2005, cited by Mercedes del Rosario et al. 2005)

of education, as well as other individual's factors such as parents' decision. In Mongolian case, although general or secondary education is free, there is still school unattendance and dropouts. This could lead researchers to study the situation more deeply.

2.4 Study hypothesis

This study tried to determine factors affecting school attendance of children working in the gold mining sector in Mongolia, focusing on three specific factors: *whether or not child is under parents' care and supervision, child labor, and household's economic ability/livelihood.* Based on the results of existing literature and availability of data, the following propositions were tested in this study:

1. *The children living with both parents are more likely to attend school compared to those who live separately from their mother or father or both parents/orphan.* Existing literature gave an idea that children living under parents' direct care and supervision are less vulnerable. In the case of a child who has lost both parents or lives separately from both parents, other care takers may have no altruistic attitude toward child expecting that current investments made for that child will not bring advantage for themselves, thus, may have weaker incentive to invest in such children's education. Moreover, because of the wide-spread poverty and economic hardship among Mongolian households[32], children who are orphan or lived out from parental household may be under particular pressure to work. Especially orphan children might have to allocate more time to income generation rather than studying, since they are mostly lacked of parents' care and support (financial and non-financial supports).
2. The length of work (can be measured by hours, days, weeks, months, and years) is likely to negatively affect children's school attendance. In other words, *school attendance will be greater among children who work shorter period than among those who work for a longer period in a year.* Working-children, particularly those who work longer, might have fewer chances to go to school due to the work burden and time limitation etc. In this study, since all children are working, but some of them attend school, I tested how the length of work (months) is affecting their school attendance.
3. *School attendance tends to be lower among children whose earned income plays a major role in household livelihood than among those who contribute a small or no role.* Families with lower income tend to have a bigger need of people to contribute to household income. If the income earned by working child of household plays important role in the household livelihood, parents possibly have no interest to replace child's work with school. Hence, it can be expected that children, whose earnings from gold mining are the main source of household income, are more likely to not attend school.

3. Data source and research method

3.1 Data source

The data for this study are obtained from the *"Baseline Survey on Child and Adult Workers in informal gold/fluorspar mining in Mongolia"*. The survey's data collection was carried between September 9, 2005 and September 29, 2005 in Mongolia. A stratified random sampling

[32] According to the National Statistical Office of Mongolia, more than one third of population is under poverty line in 2003.

method was employed for building nationally representative sample in that survey[33].

The survey instrument comprised four different semi-structured questionnaires involving *adults* engaged in informal gold/ fluorspar mining, *children* engaged in informal gold/ fluorspar mining, *employers* of children, and *parents* of children. The child questionnaire included modules on children's characteristics, education, health, detailed work histories, earnings from work, work conditions, work security issues, habits, dreams and aspirations for the future and problems faced by them.

A primary data set of the child questionnaire consists of an estimated 7996 cases[34] of children aged 5-17, who are engaged in gold/fluorspar mining; of which, an 7309 cases were children engaged in gold mining and remaining 687 cases were children engaged in fluorspar mining. In this study, reduced data set that includes 6137 cases of **children aged 7-16 who are engaged in gold mining** was used. The criteria of this selection based on the Article 6.3 (about compulsory education) and the Article 46.2.3 (about age, at which every citizen has to be acquired a compulsory basic education) of current Mongolian Law on Education[35].

3.2 Measurements

The descriptions of main variables used in this study are presented in Table 1. The dependent variable of this study – *school attendance* (whether or not the child is currently attending school) - is dichotomous and nominal level measurement; and main independent variables - *living arrangement, length of work, economic value of child labor in household* - are ratio and ordinal level measures. Herein, the variable *living arrangement of a child* (whether or not child lives with parents) implies whether child is under parents' direct care and supervision or not. The variable *length of work* ("zero value" for non-working children; "more than zero value" for working children) is indicating "child labor"; and *economic value of child labor in household* (how does child's income from gold mining contribute to household economy) implies household's economic ability/livelihood. Other independent variables listed in the Table 1 were used as control variables in this study.

Child labor typically measured in quantitative studies by "whether or not a child works". However, the *length of work* (hour, day, week, month, or year) can be a more reliable measure of child labor in some cases. Depending on nature of work, some children work only during school vacations or just for few days or months per year, whereas others work for whole year or for most period of a year. In the cases of children who have few working months, characteristics of that working children are similar to those of children who do not work, and their little length of work do not seriously affect the school attendance (Cigno 2003; Guarcelo, Rosati et al. 2005).

[33] For full information on sampling, see methodology section (Chapter 2) of Baseline Survey Report on Child and Adult Workers in informal gold/fluorspar mining in Mongolia.

[34] This number is a weighted/estimated number. In order to determine the real number of children and adults engaged in informal gold/ fluorspar mining in Mongolia, the researchers used sample weight and determined all estimated numbers of children and adults working in informal gold/fluorspar mining.

[35] According to the Mongolian Law on Education (2002), every Mongolian ... has a right to receive education in his/her native language (article 5.1.4) and must acquire at least the basic education (article 6.3) until 16 years old (article 46.2.3) free of charge as required by the Constitution of Mongolia (article 6.2). In Mongolian recent practice, most children start their schooling at 7 years old.

Table 1. Summary of variable descriptions

Name of variable	Variable definition (question used in the questionnaire)	Value labels	Level of measure
Dependent variable:			
School attendance	Are you studying now at school?	1= does not go school (work only) 0= goes school (work and study)	Nominal
Key independent variables:			
Living arrangement	Whether or not child lives with parents	1= Child living with both parents 2= Child living with mother or father 3= Fostered (child living separately from parents)	Ordinal
Length of work	Months worked per year in gold mining		Scale (Ratio)
Economic value of child labor in household	Contribution of child's income from gold mining in household economy (How do you evaluate your income contribution to household income?)	1= Main source of household income 2= Considerable/somewhat contribution in the household income 3= Small or no contribution in the household income	Ordinal
Other independent variables:			
Age	Age of the child		Scale
Sex	Sex of the child	1= male 2= female	Nominal
Personal bad habit	Use of cigarettes (Do you smoke?)	1= yes 2= no	Nominal
Migration status	Whether or not the child is migrant (In defining the migration status, criterion on residence period was used in the original survey questionnaire)	1= Migrant (those residing in province where the survey was conducted for less than 5 years prior to the survey time; or temporary resident) 2= Non-migrant (those residing in provin-ce where the survey was conducted for 5 or over years prior to the survey)	Nominal
Orphanhood status/Family structure	Whether child is orphan or not	1= Non orphan 2= Single orphan (maternal or paternal)	Nominal
Source of motiva-tion for working in gold mining	By whom have you been firstly motivated /suggested to start working in gold mining?	1= By him/her-self (child worker) 2= By others (parents/siblings/relatives / friends)	Nominal
Expenditure of income from gold mining	For what do you spend the majority of income from gold mining?	1= On household consumption 2= On themselves/having fun/ saving	Nominal

So, the length of work can be a more reliable measure than whether or not child works. In this study, the length of work was measured by months worked per year in a gold mining.

Several studies have tried to measure the economic value of child labor via children's income contribution to the family income. However, those studies had methodological weaknesses; and it was usually not simple to precisely estimate the real income size of household and child workers' contributions (B.Grimsrud 2003). Having the same problem and limited data availability as well, in this study, the *economic value of child labor in household* was not measured by an exact percentage of child's contribution in total family income. Instead, this variable was measured by the question "How

do you evaluate your income contribution to household income?".

3.3 Data analysis

The descriptive analysis (with significance test) and the logistic regression analysis methods were used to test the hypotheses of this study. When investigating differentials in school attendance of child workers, descriptive analysis, including frequency distribution and cross-tabulation, was used. In determining factors of school attendance of children, binomial (or binary) logistic regression method was applied. *Binomial (or binary) logistic regression* is a form of regression analysis used when the dependent is a dichotomy and the independents are of any type. Since the dependent variable in this study is dichotomy, binomial logistic regression analysis method was suitable for this study.

Logistic regression can be used to predict a dependent variable on the basis of continuous and/or categorical independents and to determine the percent of variance in the dependent variable explained by the independents; to rank the relative importance of independents; and to assess interaction effects. Logistic regression applies maximum likelihood estimation after transforming the dependent into a logit variable (the natural log of the odds ratio of the dependent occurring or not). In this way, logistic regression estimates the probability of a certain event occurring and shows it by *odds ratios*. Odds ratio is the predicted change in odds of the dependent variable for a unit increase in the corresponding independent variable. Odds ratios less than 1 correspond to decreases and odds ratios more than 1.0 correspond to increases in odds. Odds ratios close to 1.0 indicate that unit changes in that independent variable do not affect the dependent variable.

4. Study result

This section consists of two parts. First one gives brief information about the children aged 7-16 engaged in informal gold mining in Mongolia and presents the differentials in school attendance of children based on a descriptive statistic analysis. The other one examined determinants of school attendance of children working in informal gold mining using logistic regression analysis.

4.1 Characteristics of children working in informal gold mining in Mongolia

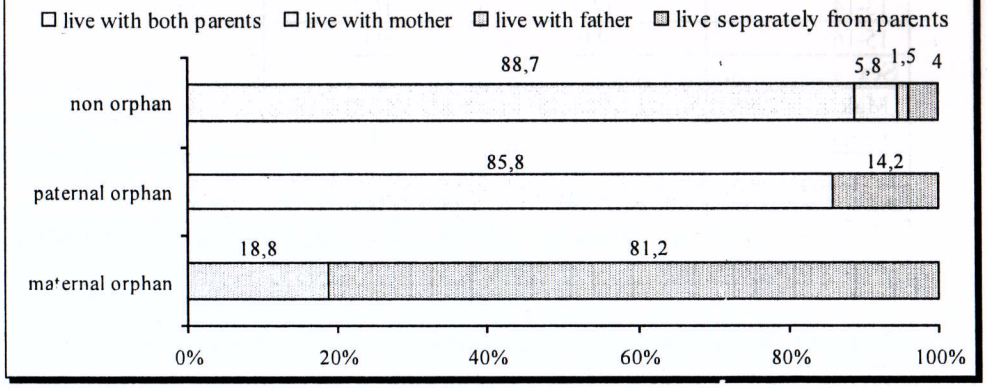
In Mongolia, an estimated 6137 children aged 7-16, who are subjects to compulsory education, are engaging in informal gold mining. Survey results show that 84 percent or 5136 children are working in placer mining, with the remaining 16 percent or 1001 children work in hard rock mining. As for sex, the number of male children working in informal gold mining (82.2 percent) is four times greater than that of female children. By age, children aged 15-16 made up the largest proportion (41.7 percent) followed by 13-14 year-olds (34.3 percent) and 7-12 year-olds (24 percent). The mean age of working children was 13.7, which is 4 years younger than the minimum age for admission to employment at mines as stated in the International Labor Organization (ILO) Convention No.138 and in the Labor Law of Mongolia. Migrant children, who are residing in a place where the survey was conducted for less than 5 years prior to the survey time, account for 26 percent of children engaged in informal gold mining[37]. And 43.2 percent of those migrant children had no registration at the immigrated place or did not know if they have one.

[37] According to the survey report, if children who work in this field during their summer vacation are added, the number will be even greater, and in summer temporary migration to gold mines increases.

Family structure and living arrangement are important factors of school attendance (Guarcello et al. 2004). Children from single parent households took up 20.4 percent, with the percentage of children that have lost a father (19.4 percent) being much higher than the percentage of those who have lost a mother (1.0 percent). Although most of children were non orphan or from two-parent households, there was a group of children who were living separately from their parents/parent (they were fostered or left with other people to be looked after).

Figure 1 presented children working in gold mining sector by their living arrangements and orphanhood status. The percentage of children living apart from their mother or father is greater among children from single parent households. Especially, for the children lost their mothers, only about one in five children were living together with father. This fact shows that children without mother are more similar to "orphans" by being separated from their surviving father.

Figure 1. **Percentage distribution of child workers aged 7-16 by living arrangement, according to orphanhood status**



When the employment history of child workers is examined, the most popular reason (59 percent) for starting work was "to support household income/parents' unemployment". Along with this, a certain percentage of children (19.4 percent) reported that they started work because of the need for own/independent money, or making money for tuition fee, study tools, and others. Children started their working out of home at the age of 11.2 on average and started working in gold mining sector at the age of 11.7 on average. Out of all working children, 73.5 percent reported that current job is their first job; and the remaining 26.5 percent reported having previously performed other jobs. Although 48.7 percent of children started this work on their own initiative, other 43.5 percent informed that their parents, siblings or relatives initiated and suggested them to engage in this work.

One of the indicators, which are used to determine whether or not a particular type of child labor is in the worst form/situation, is the duration of working hours. According to the ILO's Hours of Work Convention (C1), if hours of work in Industrial Undertakings (including mining) exceed 8 hours a day and 43 hours a week for children, that labor/work is included into worst forms of child labor. Children aged 7-16 and working in informal gold mining sector reported that they work in mines on average 4-5 months per year, and their average daily working hours is 9 hours, with no days off during those months.

According to children's self reports, 57.1 percent of all child workers spend majority of their income from gold mining for their households. While 8.5 percent of total children stated that their earned income is the main source of household income, 55.3 percent said that his/her income contribution to household is considerable, but not the main source of household income.

Table 2 shows the percentage of child workers who can not read or write, by age and gender. The table illustrates that one out of seven children working in informal gold mining (13.8 percent) is illiterate (meaning can not read or write). As by age group, the younger the age, the higher the illiteracy rate of children. The difference of illiteracy rate across the sex is only 3.1 points or the illiteracy rate is slightly above among male children (14.4 percent) compared to female children.

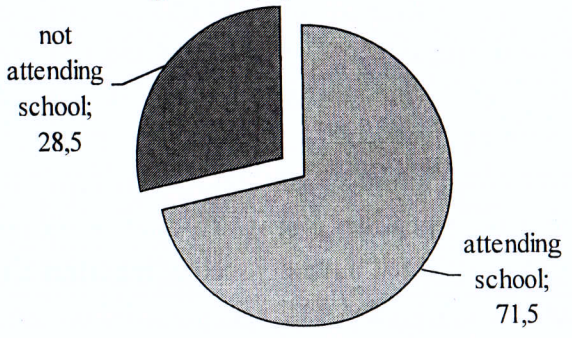
Table 2. Percent of illiterate and working children aged 7-16, according to age group and gender

Age group and gender	Percent of child workers, who can not read	Percent of child workers, who can not write	Illiteracy rate*	Estimated number of working children aged 7-16
Age				
7-12	21.0	21.0	21.0	**1471**
13-14	14.7	16.3	14.7	**2109**
15-16	9.0	9.0	9.0	**2557**
Sex				
Male	14.4	14.4	14.4	**5042**
Female	11.3	14.4	11.3	**1095**
All	**13.8**	**14.4**	**13.8**	**6137**

* - the percentage of children who can not read or write a short, simple statement in their mother or any other language

Figure 2 shows the school attendance level of child workers. As I mentioned before, children aged 7-16 are subjects to compulsory schooling as stated in the Constitution of Mongolia and the Education Law of Mongolia. In total, 28.5 percent of compulsory schooling aged children were not attending school, instead, were engaging in gold mining. However, percentage of children who were simultaneously working and studying was 2.5 times greater than that of children who were working only. This evidence implies that apart from work, there are other factors affecting school unattendance of child workers.

Figure 2. Percentage distribution of child workers aged 7-16, by school attendance



Child workers who are attending school informed that they study in the 6-7th grade on average. In-terms of performance at school, 50 percent of working children received grades lower than 77.5 (C), and the remaining 50 percent received grades over 77.5 (C) in the last academic year prior to the survey.

According to the self-report of children out of school, the biggest three reasons for not attending school are low income of household/because of working (51.7 percent), family domestic problems[38] (34.8 percent), and academic failure (22.7 percent) (See Table 3).

This table shows that reasons for not attending school are largely different by whether children live or not with their parents. For instance, the percentage of children who are not attending school because of working is two times higher among children living separately from their parents (91.5 percent) compared to those living with their parents. On the contrary, the percentage of children not attending school due to family or domestic problems is twice higher among children living with their parents (36.4 percent) compared to those not living with their parents. Generally, this results show that poverty and low living standards of family are the main reasons for school unattendance and child labor.

Table 3. Percent of child workers aged 7-16, who are not attending school by reasons for not attending school, according to living arrangement status

Reasons for not attending school	Living arrangement status		All
	Live with father/ mother/both	Live separately from parents	
Lack of income/Because of working	47.8	91.5	51.7
Domestic problems	36.4	18.2	34.8
Learning unsuccessfully	23.0	18.3	22.7
Health problems	11.0	0.0	10.1
Have no registration/ID	1.9	20.9	3.5
Others*	4.1	29.2	7.2
Estimated number of child workers who are not attending school	**1594**	**153**	**1747**

Note: sum of percentages exceeds 100 percent, because respondents were able to say multiple answers
*- school is too far, classroom is overcrowded

4.2 Differentials in school unattendance of children working in the gold mining sector

School attendance of Mongolian children working in the informal gold mining sector is presented by children's demographic indicators in *Table 4*. This indicator differed by all of selected demographic characteristics of children, except for child's orphanhood status, at a statistically high significant level ($p \leq 0.001$)[39].

By age groups, the highest rate of school unattendance was among children aged 15-16 (34.8 percent) and the lowest rate was among those aged 7-12 (21.0 percent). As for sex, the percentage of male children who are not attending school (30.0 percent) was 9.8 points greater than that of female children ($p \leq 0.001$).

[38] Cases, such as parents or other members of child's household are disabled, elder, or few people able to make money for the big household, etc., are included in this category.
[39] Differentials of school attendance between groups are statistically tested and proved at 99.9 percent probability.

The migration of population is associated with many socio economic issues. In practice, compared to non-migrants, migrants face greater problems in accessing social services, such as education, health and others. By this study, the school unattendance among migrant children (59.6 percent) was considerably high or 3 times higher than that of non-migrant children ($p \leq 0.001$). From this, it can be said that access to education is unsatisfactory for migrant children and it is one of the most urgent issues to pay attention in future.

By orphanhood status, there were no substantial or statistically proved differences in school unattendance were observed.

Table 4. Percentage distribution of child workers aged 7-16 by school attendance, according to demographic characteristics

Demographic characteristics	School attendance		Total	Estimated number of child workers aged 7-16
	Study	Do not study		
Age (C ²=98,510*)**				
7-12	79.0	21.0	**100.0**	**1471**
13-14	74.1	25.9	**100.0**	**2109**
15-16	65.2	34.8	**100.0**	**2557**
Sex (C ²=34,683*)**				
Male	70.0	30.0	**100.0**	**5042**
Female	78.8	21.2	**100.0**	**1095**
Migration status (C ²=1026,753*)**				
Migrant	40.4	59.6	**100.0**	**1598**
Non -migrant	82.5	17.5	**100.0**	**4539**
Orphanhood status (C ²=2,842)				
Non-orphan children	72.0	28.0	**100.0**	**4883**
Single orphan children	69.6	30.4	**100.0**	**1254**
Living arrangement (C ²=144,53*)**				
Live with both parents	76.0	24.0	**100.0**	**4334**
Live with father/mother	60.1	39.9	**100.0**	**1387**
Live separately from parents	63.3	36.7	**100.0**	**416**
Source of motivation for working in gold mining (C ²=91,807*)**				
By him/her-self (child worker)	77.2	22.8	**100.0**	**2987**
By others (parents/siblings/relatives/ friends)	66.2	33.8	**100.0**	**3150**
All	**71.5**	**28.5**	**100.0**	**6137**

*** *Differentials between characteristics are statistically significant at level p ≤ 0.001*

The school unattendance rate significantly differs by child workers' living arrangement status. For example, the school unattendance rate of children who were living together with both parents (24.0 percent) was 12.7 points lower than that of children who were living separately from both parents; and 15.9 points lower than that of children who live with one of their parents ($p \leq 0.001$). Moreover, 33.8 percent of children who started work in gold mining by others' (parents/siblings/relatives/friends) initiative/suggestion were not attending school during the survey time. This indicator is 11 points or 50 percent higher than that of children

who started work by their own initiative ($p \leq 0.001$). Generally, these results imply that the children under parents' care or supervision are less likely to unattend school.

The differentials of school attendance of children are presented in *Table 5* by children's employment characteristics.

Table 5. Percentage distribution of child workers aged 7-16 by school attendance, according to employment characteristics

Employment characteristics	School attendance		Total	Estimated number of child workers aged 7-16
	Study	Do not study		
Years worked out from household (C ²=77,167*)**				
1-12 months	78.1	21.9	**100.0**	**2247**
1.1-2 years	66.9	33.1	**100.0**	**1636**
2.1 or over years	68.3	31.7	**100.0**	**2254**
Working months per year in gold mining (C ²=1447,103*)**				
1-2 months	87.9	12.1	**100.0**	**1279**
3 months	87.1	12.9	**100.0**	**2599**
4-6 months	53.6	46.4	**100.0**	**1389**
7 or longer months	29.7	70.3	**100.0**	**870**
Expenditure of income from gold mining (C ²=367,213*)**				
On household consumption	62.0	38.0	**100.0**	**3503**
On themselves/having fun/saving	84.3	15.7	**100.0**	**2634**
Economic value of child labor in household (C ²=104,824*)**				
Main source of household income	56.0	44.0	**100.0**	**520**
Considerable/somewhat contribution in the household income	70.0	30.0	**100.0**	**3396**
Small or no contribution in the household income	77.5	22.5	**100.0**	**2223**
All	**71.5**	**28.5**	**100.0**	**6137**

****Differentials between characteristics are statistically significant at level $p \leq 0.001$*

School unattendance rate of children who worked out from household for a shorter period of time significantly differs from that of children who worked for a longer period ($p \leq 0.001$). For example, while 21.9 percent of children who worked out from household for less than a year are not attending school, 33.1 percent of children who worked for 1.1-2 years, and 31.7 percent of children who worked for longer than 2 years are not attending school.

Another important result in the Table 5 is that the school attendance rates of children appear to be negatively affected by number of working months per year ($p \leq 0.001$). Among the children who work for only 1-2 months per year in gold mining, school unattendance rate is only 12.1 percent, and it is 3.8 times lower than the rate among children work for 4-6 months, and 5.8 times lower than the rate among those work for 7 or over months per year. These outcomes indicate that the child labor in informal gold mining sector is interfering with children's development and rights to education.

School attendance also can be affected by the living condition and income of child's household. In many cases, household's lower living standard leads children to work by sacrificing school attendance. Table 5 shows that the school unattendance rate is 2.4 times higher among the children, who spend most part of their income on household (38 percent) than among the child workers who spend majority of their income on their own consumption.

If we see how school unattendance is different among children depending on how big or important is the child labor's value/contributions in household economy, children who play a major role in household livelihood are more likely to not attend school than those who play a small role. For example, school unattendance rate was highest among the children who value their income contribution to household as a "main source of household income" (44 percent). This indicator was twice higher than that of children who consider their income contribution to household as small.

Above income related facts show that children's economic roles in their household livelihood are negatively affecting their school attendances. In other words, study illustrated that child labor is one big factor of school unattendance. Therefore, the effective policy measures against child labor are necessary.

4.3 Determinants of school unattendance of children working in the informal gold mining sector in Mongolia

This part tried to answer the question of why some children fail to attend school while others manage to do so even when they work. In other words, it attempted to clarify statistically how demographic, employment related and other indicators affect the school unattendance of child workers.

Table 6. Results of binary logistic regression analysis on determinants of school unattendance of children working in informal gold mining sector

Selected characteristics	Odds ratio for school unattendance			
	p-value (Sig.)	Exp(B)	95% Conf. interval for Exp(B)	
			Lower	Upper
Age	0.000	**1.091**	1.053	1.129
Sex				
Female	0.000	**1.000**		
Male	0.193	**1.142**	0.935	1.394
Migration status				
Non-migrant	0.000	**1.000**		
Migrant	0.000	**6.359**	5.459	7.406
Living arrangement				
Live with both parents	0.000	**1.000**		
Live with mother or father	0.000	**3.371**	2.828	4.019
Live separately from parents	0.000	**3.929**	2.927	5.275
Source of motivation for working in gold mining				
By him/herself (child worker)	0.000	**1.000**		
By others (parents/siblings/relatives/friends)	0.000	**1.954**	1.668	2.290

Table 6. Results of binary logistic regression analysis on determinants of school unattendance of children working in informal gold mining sector				
Selected characteristics	**Odds ratio for school unattendance**			
	p-value (Sig.)	Exp(B)	95% Conf. interval for Exp(B)	
			Lower	Upper
Months worked per year	0.000	**1.605**	1.553	1.658
Expenditure of income from gold mining				
On themselves/having fun/saving	0.000	**1.000**		
On household consumption	0.000	**4.495**	3.782	5.341
Economic value of child labor in household (HH)				
Small or no contribution in the household income	0.000	**1.000**		
Some/considerable contribution in the HH income	0.429	**1.097**	0.873	1.378
Main source of household income	0.000	**2.239**	1.715	2.922
2 LL c ² of Model	**0.000**	**4769.141**		
Number of estimated cases		**6137**		

For conducting analysis, binary logistic regression analysis technique of the SPSS (Statistical Package for Social Studies) was used. Dependent variable *school attendance*, is coded with reference category or "does not attend school" =1, and the "attend school" is coded as 0. In other words, analysis focuses on the probability of "school unattendance". The findings of analysis are described in *Table 6*.

The «Exp(b)» column is label for the odds ratios of the row independent variables with the dependent one. Odds ratios show the child workers' likelihood to not attend school. Model reflects the combined effect of all independent variables on school attendance and its c ² shows that the model can explain a causal relationship of variables at a high statistical significant level (p=0.000).

In the model, all selected independent variables, except for sex of children, had effect on school attendance at statistically significant levels. With one year's increase in children's age, the likelihood to not attend school increases by 1.091 times or 9 percent, when other variables in the model were controlled (p=0.000). In other words, older children who work in informal gold mining sector are more likely to not attend school, and instead, more likely to work compared to younger children.

School unattendance was extremely different depending on migration status of children. The odds of school unattendance of migrant child workers is 6.3 times higher than that of non-migrant children (p=0.000). This result tells us that the education issue of the migrant children (children who are residing in a province where the survey was conducted for less than 5 years prior to the survey time) is in a more serious situation compared to that of the non-migrant children. Although basic education is free in Mongolia, there are many factors that restrict the access to education. One of them, which may be more related to the migrant children, is whether or not children have official documentation. Due to irresponsibility of their parents or any financial problem, many migrant children do not have registration at the new places. Without proper documentation, such as birth certificate/ ID, registration at the residing place, children

cannot attend school in Mongolia.

The living arrangement status of children is significantly affecting child's school attendance. According to statistical analysis, school unattendance tends to be least for child workers who live with parents. For example, the odds of school unattendance of children living with both parents are 3.4 times lower (p=0.000) than that of children living with one of their parents, and 3.9 times lower (p=0,000) than that of children living separately from both parents. Moreover, the odds of school unattendance of children who started work in gold mining by parents/siblings/ relatives initiative are almost twice or 1.9 times higher than that of children who started work by their own initiative (p=0.000). These results confirm that parents supervision is one of the determinants of school unattendance of child workers in Mongolia.

An increase of working month increases the likelihood of school unattendance of child workers by 1.6 times or 60 percent, when other variables in the model were controlled (p=0.000). This trend is consistent with other researchers' findings saying that in cases of child workers, the greater work load of children becomes the reason for school unattendance.

When we look at the expenditure of income from gold mining, children who spend the most part of their income for household are found more likely to not attend school. For instance, as compared with children who spend most of income on their own consumption, the odds of school unattendance is 4.5 times higher for those who spend most part of the income from gold mining on family (p=0.000). Besides this finding, regression analysis shows that the economic value of child labor in household negatively affects the school attendance. Specially, the likelihood of school unattendance of child workers, whose income from gold mining is a main source of household income, is 2.2 times higher than that of children who play a small role or do not contribute to the household income (p=0.000). These income-related results may show that poor economic ability of household is one determinant factor of school unattendance of children in Mongolia. Because of the poor livelihood and direct and indirect costs linked to sending children to school, households with lower income are more likely to put their children to work, instead of sending them to school. Hence, we can conclude that better household's livelihood and/or economic ability can positively affect the school attendance of children.

Conclusions

Although education authorities are generally aware that working children face greater difficulties in school enrollment, there is still insufficient understanding and information about the exact nature of the impact of work and other factors on the school attendance of child workers.

This study aimed to examine the main determinants of school unattendance of children working in the informal gold mining sector in Mongolia. In other words, main puzzle of this study was why some child workers are not attending school, while others are attending, although all children were working. To accomplish this, the descriptive analysis (with significance test) and the binomial logistic regression analysis were executed based on the secondary data representing the 6137 cases of child workers in the ages of compulsory schooling. The school attendance of child workers was various according to children' characteristics. By focusing on study hypothesis, the study indicates the following key results:

1. School unattendance rate does not significantly differ by children's family structure (orphanhood status), but it highly depends on whether children live with their parents or not. The children that live with both parents are less likely to not attend school compared to those who live separately from their mother or father or both parents.
2. There is a pattern that children's work load (child labor) negatively affects their school attendance. Children who worked for a longer period out from household, as well as children who work for a longer months per year in gold mining, are more likely to unattend school.
3. The greater the role of children in household economy, the greater the pattern of school unattendance. That is (i.e.,) school unattendance is greater among the children who play a major role in household livelihood than among those who play a small or no role.

Besides these observations, school unattendance of immigrant children in the area where informal gold mining is being carried out is serious. In general, these findings suggest that school attendance of child workers in Mongolia is closely related to child labor, household economic ability and parents' care toward child. And these results validated children's general self report on reasons for not attending school, which was illustrated by Table 3 in the study.

Finally, it should be noted that this study explained the determinants of school attendance of child workers in terms of a particular working sector and contained a small number of indicators determining school unattendance due to limited data availability. Moreover, all variables used in this study were measured by only children's self report which might be biased in some cases. Future similar research should therefore consider the two issues. Firstly, the analysis should be executed within a broader frame of child workers using a larger set of indicators. Secondly, the use of additional information given by parents or household head of child workers might be useful to improve the validity and reliability of measurements.

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