CHILD LABOR AND SCHOOL DROPOUT IN LEAST-DEVELOPED COUNTRIES: EMPIRICAL EVIDENCE FROM LAO PDR

Thidavong Xayavong

A Thesis Submitted in Partial
Fulfillment of the Requirements for the Degree of
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Thidavong Xayavong
School of Development Economics

..... Major Advisor
(Professor Piriya Pholphirul, Ph.D.)

The Examining Committee Approved This Thesis Submitted in Partial Fulfillment of the Requirements for the Degree of Master of Economics.

..... Committee Chairperson
(Associate Professor Pungpond Rukumnuaykit, Ph.D.)

..... Committee
(Instructor Thasanee Satimanon, Ph.D.)

..... Committee
(Professor Piriya Pholphirul, Ph.D.)

..... Dean
(Assistant Professor Nada Chunsom, D.B.A)

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ABSTRACT

Title of Thesis	CHILD LABOR AND SCHOOL DROPOUT IN LEAST-DEVELOPED COUNTRIES: EMPIRICAL EVIDENCE FROM LAO PDR
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Even though topics related to child labor and school dropout have been studied worldwide, little attention has focused on child labor and school dropout in the least-developed countries. This paper examines the impact of child labor on school dropout by using national representative data from the Labor Force and First Child Labor survey in the Lao PDR, which serves as a case study of a least-developed country. The endogeneity of child labor to school dropout was controlled by using an average wage of children by province as an instrumental variable. Findings indicate that child labor, especially with regard to girls, has a strong impact on driving school dropout. Our estimations also show that parental educational attainment, particularly mother's education, seems to show a significant effect on reducing the probability of dropping out. With respect to family economic status, results indicate that the probability of children dropping out tends to be greatest for children from poor families. Our evidence supports the need to provide the type of free education programs that have been implemented in all developed countries but which have not yet been established in least-developed countries such as the Lao PDR. At the very least, given limited government budgets, support can be targeted to help vulnerable groups and poor families.

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CHAPTER 1

INTRODUCTION

1.1 Introduction

Even though, the campaign of Education For All (EFA) has been promoted since 1990 to ensure educational opportunity for all children, studies show that globally there are 58 million children who are still not enrolled in school, especially in developing and least-developed countries. Child labor and poverty are believed to be the main factors, as evident in South and West Asia and Sub-Saharan Africa (Sakurai, 2006; UNESCO, 2015).

Both child labor and out-of-school children are widely considered to be significant global issues. According to the International Labor Organization (ILO), there are 264 million children aged 5-17 in employment around the world. When children are asked their reason for dropping out of school, "having to work" is the most common answer (Hovdhaugen, 2015). Poor households need children to work, which prevents them from attending school and eventually leading to their dropping out. Even for developed countries such as Portugal, societies still struggle with the issue of child labor. Goulart and Bedi (2008) found that child labor not only hinders an individual's educational success but that it also presents a barrier to achieving universal education and this affects the country as a whole. Dropping out of school drastically lowers a student's ability to pursue a higher education. Consequently, not only is the income of a school dropout lower, but there is a decrease in the nation's stock of human capital, which consequently affects economic growth in the long run (Glick & Sahn, 2000). As a result, in addition to financial waste and lost opportunity costs (say, toward a country's development), there are social costs related to a lack of job opportunities, leading to social problems such as robbery and other crimes.

Research in developed countries has found that even though dropping out of school is less likely to occur in primary and lower secondary levels, it does occur more frequently in high school and the ethnic groups at highest risk for dropping out are black and Hispanic. A study by Swanson (2001) and Greene and Winters (2008)

indicates that the national high school graduation rate in the United States is around 68-78 percent, which implies that as many as almost one out of three high school students will likely drop out of school. Nonetheless, the evidence in developed countries also found that socioeconomic factors and employment opportunities are important factors leading to children dropping out (Peraita & Pastor, 2000).

In developing countries, both dropping out of school as well as child labor are common problems. Moulin, Doray, Laplante, and Street (2013) found that dropping out was more common among those children who worked long hours compared to children who did not work or worked just a few hours. In addition, Huisman and Smits (2015) investigated the household effect and contextual characteristics of school dropouts in 30 developing countries. Results showed that dropping out of school depended on a family's socioeconomic resources such as parental education, father's occupation, presence of children in the family to help generate income, and family wealth. In Mexico, children tend to drop out between primary and secondary school (Gibbs & Heaton, 2014).

The relationship between child labor and dropping out of school is generally perceived to be positive because work interferes with schooling. In China, for example, it was found that child labor was a barrier to both school enrollment and dropping out of school (Putnick & Bornstein, 2015; Tang, Zhao, & Zhao, 2016). In addition, the Chinese dropout rate in junior high school in poor areas was around 14.2 percent (Yi et al., 2012).

India has the highest number of child dropouts (approximately 17.8 million) due to family financial constraints and a high rate child labor. In order to help their family survive, student dropouts have to participate in the labor force, which thereafter creates trade-off between children attending school and child labor. For children who manage to combine work and education, performance at school often suffers (Ahir, 2015; Guarcello, Lyon, & Rosati, 2006).

As children drop out of school to work, their earning capacity as future adults will be affected. The more children have to work (vs attending school) the greater the numbers of unskilled workers in the economy. Wages for children remain low as a result of restricted educational opportunities, which limit their chances of escaping the cycle of poverty. This in turn makes it difficult for countries to adopt technology that

take advantage of skilled labor (Edmonds, 2015). Thus, the need for developing countries, particularly LDCs, to produce more educated people for development is not met.

In the case of ASEAN countries, Cambodia, in particular, has been facing the challenge of children dropping out from even primary school and the main factors underlying school dropout rates are poverty, working children, household size, and divorced parents (No, Taniguchi, & Hirakawa, 2016). On the other hand, the situation in Malaysia involves dropping out during the transition from primary to secondary school, with language spoken at home also influencing the dropout rate (Tamanna, 2014).

In Vietnam, child labor often substitutes for children going to school, but the school dropout rate is also influenced by government funding (or lack thereof) for education. Education is not fully supported by government funding, which disadvantages poor people (Beegle, Dehejia, & Gatti, 2009; Thanh & Long, 2005). On the other hand, Thailand's solution to students dropping out is to offer free education, school transportation services, free lunches, and financial support for children by providing scholarships (Nicaise, Tonguthai, & Fripont, 2000).

Capturing the interplay between education and child labor is critical for achieving EFA and the targets for eliminating child labor. Other countries have set policies to decrease the dropout rate. For instance, developed and developing countries provide school counseling (Wang et al., 2016). Additional policies include cash transfer programs, providing free education and food at school, and school transportation services – all in order to remove the cost burden of parents and encourage them to send their children to school (Nicaise et al., 2000; Ravallion & Wodon, 2000; Sabates, Hossain, & Lewin, 2013; Sakurai, 2006). However, children also need access to good quality schools since overcrowding and underfunding can lead a higher levels of dropping out.

To address the importance of educational attainment, UNICEF and UNESCO established the Global Out-of-School Children Initiative (OSSCI) in 2010 in order to reduce the dropout rate (UNICEF, 2014). The most critical problem was found in the least-developed countries (LDCs), where high dropout rates and child labor are strongly associated with extreme poverty and subsequent lack of alternatives such as

school supply factors associated with lack of teachers, school locations and quality, and children's poor health and malnutrition (Colclough, Rose, & Tembon, 2000; Sabates et al., 2013).

In addition, universal primary education is far from being achieved in several LDCs due to stunted economic growth. Each country has its own problems in terms of poverty, child labor, population density, and limited educational opportunities – all of which add up to educational inequality. Despite almost every country showing signs of improvement in enrollments, children living in families with insufficient income still cannot afford to go to school. Meanwhile, the largest developed countries have stronger economies that can alleviate dropout rates and reduce educational inequality by expanding opportunities, particularly for poor people.

As a least-developed country, the Lao PDR faces a number of obstacles to achieving the Education-for-All agenda. It is well known as a poor, small, mountainous country with a low population density and many diverse ethnic groups (King & Walle, 2010). The Lao government aims to expand educational opportunity for everyone by continuing to increase the expenditure on education as a percentage of Gross Domestic Product (GDP) – from 2.8% in 2010 to 4.2% in 2014 (World Bank, 2017). The primary school dropout rate dropped from 31.5% in 2008 to 21.2% in 2014 (UNESCO, 2017). While this is good progress, the dropout rates in 2014 for primary schools in other countries in the region were: 4% for Vietnam, 8% for Malaysia, 15% for Thailand, and 17.6% for Timor-Leste 2014 (UNESCO, 2017).

Throughout the country in the many places where the education system is not fully supported (providing neither free education nor school transportation services, imposing high tuition fees, and not providing other crucial resources). The governments try to expanding these programs, but the system has not been implemented due to the slow progress of education reform. Therefore, access to schooling can be limited. Even though the Lao Ministry of Education introduced the "Progressive Promotion" policy in 2009 to reduce the dropout rate (This policy allows student transition to the next grade without examination, basically this program original assign in Cambodia.), the policy may have negatively affected the interaction among students in the school system (Itthida , 2015).

In remote areas, poverty forces children to begin working early on. Since parent cannot afford to send their children to school, the children are convinced to participate labor market in order to generate income for the family, which prevents children from attending school. Reports on child labor statistics in Laos show that 6.5% and 35% of children are involved with work at ages 6-13 and 14-17, respectively (UCW, 2014). This indicates that the more widespread child labor is, the greater the number of children out of school and the less educated future workers will be. As long as child labor depresses wages, leading to more child labor and reduced efficiency of human capital, LDCs cannot break out of the poverty cycle. Given the sizable dropout rates relative to other Asian countries, it is no surprise that Laos lags behind other countries in terms of development.

Therefore, the twin issue of school dropout and child labor presents a significant challenge for the Lao PDR to meet Millennium Development Goals (MDGs) and EFA targets for education. Moreover, the education sector has not addressed the impact of child labor on education. Therefore, the role of the government sector is an essential key to determining the appropriate policies necessary to increase the school enrolment rate as well as decrease the dropout rate and eliminate child labor.

Research on this issue is imperative in order to estimate the impact of child labor on school dropout rates. There is no clear reason due to national influence of different conditions of each country. Therefore, Laos is an interesting case study for several reasons. First, Laos is an LDC and in a region that has a sizable school dropout rate. Secondly are the significant issues of child labor, poverty, wealth disparities, ethnic diversity and educational inequality that plague education systems. Thirdly, there are only a few studies on child education in the Lao PDR, for example a studies by Onphanhdala and Suruga (2008) and King and Walle (2005). Likewise, the issues of children working and dropping out of school have not been widely studied in terms of the causal link, commonly due to insufficient data, small sample size, and limited research scope.

1.2 Objective of study

This study aim to estimate the impact of child labor on school dropout in Lao PDR.

1.3 Benefit of the Study

This paper will provide a good example of the typical situation faced by LDCs as well as contributing to policy intervention in order to tackle the dropout problem in the Lao PDR.

1.4 Scope of the study

This study using a nationally representative data from the Labor Force and First Child Labor survey in the Lao PDR in 2010, which consisted of 10,800 household from 540 villages in 17 provinces.

CHAPTER 2

LITERATURE REVIEW

2.1 Child Labor and School Dropout

Child labor and school dropout are essential academic and political issues in developing and least-developed countries since dropping out of school has a strong effect on children's education as well as the economy as a whole. Child labor has been recognized for producing an adverse effect on child human capital as it impedes school attendance and leads to increasing school dropout rates.

This section will present a review of the economic literature from other countries that discusses the constraints that child labor has on reaching the Education-for-All goals, Ersado (2005) using cross-country data to examine child labor and schooling decisions in Nepal, Peru, and Zimbabwe, found that in all these countries child labor is negatively associated with schooling as well as higher incidences of poverty. He suggests improving access to credit has an important alleviating child labor and increase school enrollment. In addition, the result from all countries recommends supporting adult educational level will help to control the widespread of child labor and encourage children to stay in school.

Assaad, Levison, and Zibani (2010) indicate that in Egypt children working in a household reduces the likelihood of their attending school, particularly for girls, whereas children working in the market were an impediment to attending school for boys. It is difficult to prevent girls from working because generally they work at home, and domestic work is considered part of their responsibilities.

The probability of dropping out of school also increases with the time intensity a child works. For Pakistan and Nicaragua Rosati and Rossi (2003) show that the number of working hours had a negative impact on child schooling in both countries and that children residing in rural areas were more likely to dropout and that girls worked fewer hours than boys. In addition, children in rural areas worked more hours

in Nicaragua and fewer hours in Pakistan. Their paper recommends a reduction in the amount of labor children perform by suggesting schemes such as income transfer.

For Ghana, Boozer and Suri (2001) found that a one-hour increase in a child's working day led to a decrease in schooling by 0.38 hour. Furthermore, Afridi, Mukhopadhyay, and Sahoo (2012) discovered that if a child's mother participated in the labor force, her children spent more time in school. A mother's being employed also improved her child's test scores especially among poor households and for girls, thus translating into a better educational outcome.

Beegle, Dehejia, and Gatti (2009), Bezerra, Kassouf, and Arends-kuenning (2009), and Le and Homel (2015) found a negative effect of a child's working on school performance and achievement. Cardoso and Verner (2006) found that along with child labor and poverty, early parenthood strongly affected school dropout rates in Brazil. It is surprising that a child's working alone is not necessary to affect school attendance and that dropping out of school often leads to inactivity and not work because of the lack of employment opportunities. In addition, their results indicate that working for a few hours could generate income that can reduce the costs of school attendance for the family.

Ravallion and Wodon (2000) examined the impact of child labor on school enrollment by analyzing evidence on behavioral responses to an enrollment subsidy (the Food School Program) in rural Bangladesh. They found that the subsidy program led to a decrease in both children dropping out of school and children participating in work.

To date, most literature on this topic has explored the relationship between child labor and education performance/school attendance. However, there has not been much research directly focused on child labor and school dropout. In the Lao PDR in particular, analysis of this issue has not been carried out due to a lack of nationally representative data.

2.2 The evidence from Laos

Article 19 of the Lao PDR Constitution was added in 1996 as the Decree on Compulsory Primary Education and amended in 2003 (EDF, 2015). The Lao education sector comprises five years at the primary level, four years of lower

secondary level, and three years of upper secondary level (MOEs, 2009). This paper measures school enrollment those students who report being enrolled in general education. These students are supposed to be in school when they are official primary school entrance age is 6. In this study, "children not in school" refers to school-age children who, for any reason, are not enrolled in school, including those who never attended school.

Raw data were analyzed from the 2010 Labor Force and Child Labor Survey (LFCLS), which covers 10,800 households from 540 villages in 17 provinces. Figure 1 presents the status of children's education in the Lao PDR. The grade-specific enrollment rate showing the general level of participation in a given level of education irrespective of age and it indicates the capacity of education system to enroll children particular age group. The rate is below 100 percent and the different with 100 percent, implying that children not enrolled at a specific level of education.

For age-specific enrollment rate, the lowest rate is at age five because most children at that age are still in pre-primary school. For a children at age five has enrolled in primary school indicates that these children early entry to school. The maximum enrollment was found at age 11, after which the rate started to decline. This decline often occurs at the transition between primary and secondary school, and the older the children, the lower the enrollment rate for both of boys and girls.

A "school dropout" is defined as any student who attended school at a pre-level and then left school for any reason before completing the final level (current level), without transferring to another elementary or secondary school.

As shown in Figure 1, despite the fact that there are not many children dropping out during the early grades, the higher the grade the greater the dropout rate. Grade-specific dropout rates are highest at the end of primary school (grade 5). This suggests that children fail to go to a higher level because they dropout after completing primary school. King and Walle (2005) and Onphanhdala and Suruga (2008) also discovered that Lao children dropout for a variety of reasons, namely, because they cannot afford the cost of schooling, they not interested in further study, they work, and/or the distance to a secondary school is too far from home.

Other reasons for not continuing to secondary school are that when children complete grade 5, at age 11, they are able to work and help their families, especially

in the case of low-income families. As a consequence, these children may not continue to study. Secondly, even though each village has its own school, the school may not offer all grades which lead children may choose to give up going to school in another village after completing primary school (King & Walle, 2005; Kosal & Kinkesa, 2015; Onphanhdala & Suruga, 2008).

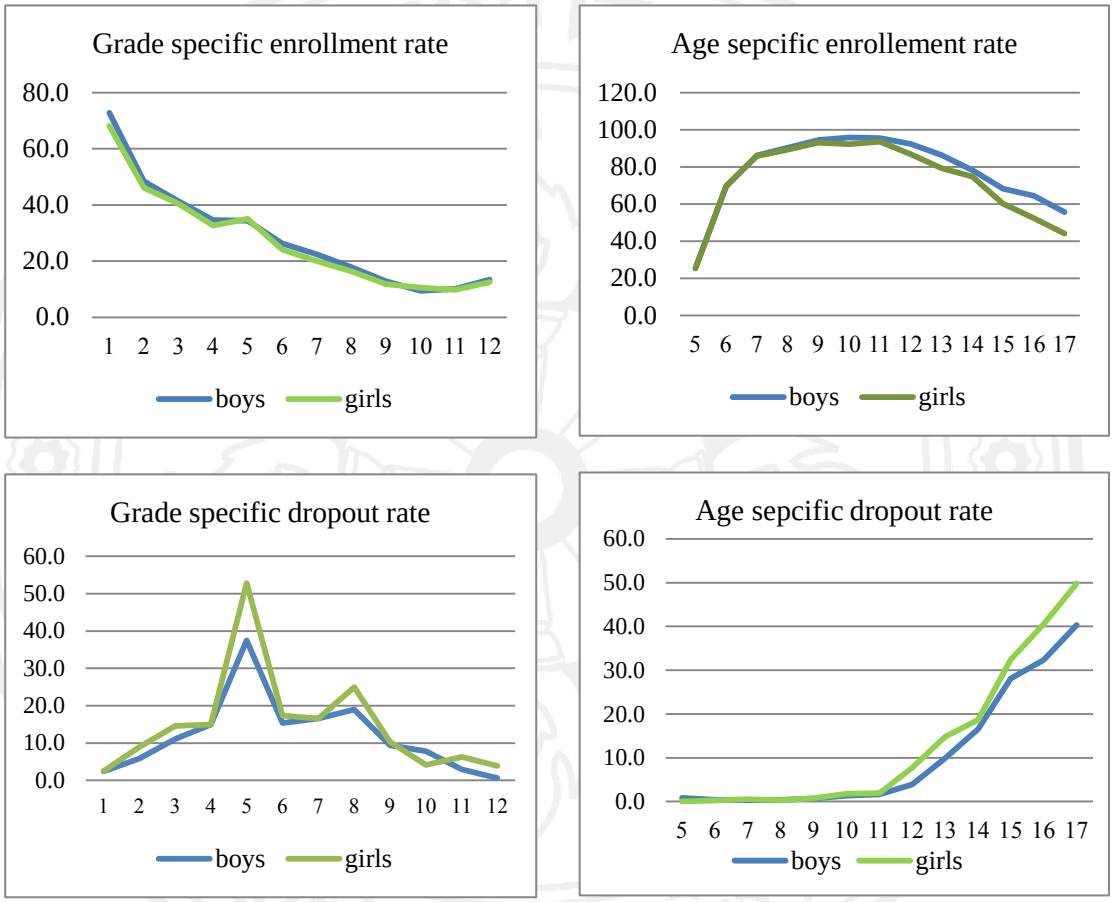

Figure 2.1 Status of children (5-17)'s education in Lao PDR in 20010-2011 (percent)

Source: Authors' Calculation. Data from the 2010 Labor Force and Child Labor Survey (LFCLS)

Age-specific dropout rates were measured by the number of children who had dropped out of school at a certain age divided by the total number of children of that age who were still enrolled in school at that time survey. The dropout rate for children aged five to nine was quite small (less than one percent for each age). However, the age-specific dropout rate increased dramatically as children got older. After age ten

and older, more of children failed to complete their schooling, particularly girls, who often had to help with housework and who tended to get married early.

But even a high enrollment rate does not translate into a high completion rate because there is no certainty that children will complete their last year of secondary school. High dropout rates at the end of primary and lower secondary levels are common in low-income countries, such as those in Sub-Saharan Africa, namely, Uganda, Rwanda, Cameroon, and Kenya (Sabates et al., 2013) while a high dropout rate in upper secondary school is often found in developed countries (Greene & Winters, 2008; Stark, Noel, & Mcfarland, 2015; Swanson, 2001).

This study defines child labor as a person under the age of 18 participating in any work activity, as for children's working status in Laos, including both children who dropped out for work and children who had never been to school, the average number of hours increased as they got older. Children aged 5-13 and 14-17 worked 33.21 and 42.48 hours per week, respectively (Figure 2.2).

Generally, children spending their time working will limit their study time or self-learning time. As a result, long working hours induces children to skip school and reduces their ability to focus on their studies. Thus it is no surprise that such children end up dropping out.

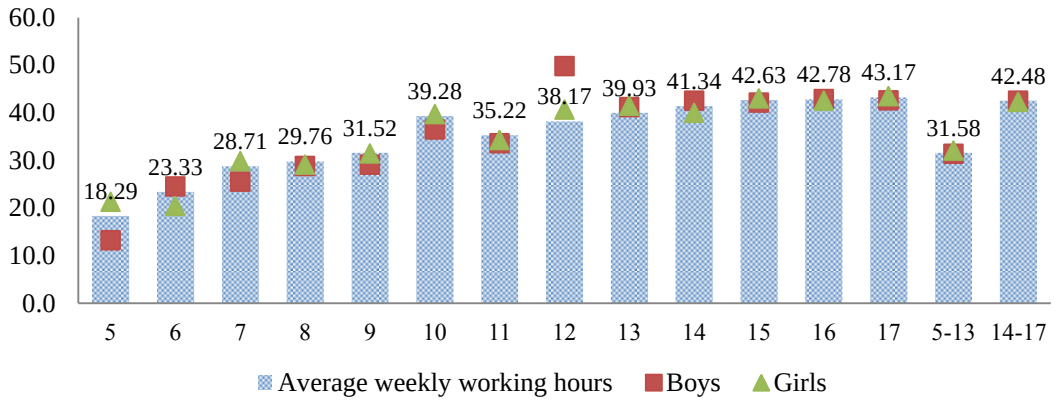

Figure 2.2 Average hour work per week by age and gender (percent)

Source: Authors' Calculation. Data from the 2010 Labor Force and Child Labor Survey (LFCLS)

CHAPTER 3

METHODOLOGY

3.1 Data and Sample selection

The data analysis mainly uses Lao labor force and the first child labor survey (LFCLS 2010) and The technical and finance support was supported by the Labor Organization (ILO) of the United Nation through its Regional Office for Asia and the Pacific, and the International program on the Elimination of child labor (IPEC) and this survey was conducted by Government of Lao PDR, Ministry of Labor and Social Welfare (MLSW) and Lao Statistics Bureau (LSB). The purpose of this survey aimed to collected information about household composition and the characteristic of household members, Education background for all household members starting with age five above, economic activity status. The information was obtained by a paper questionnaire that filled in by head household or another member of the household.

Using the 2010 Lao Labor Force and the First Child Labor Survey which covers 10,800 households from 540 villages in 17 provinces in Lao PDR. Children who completed their studies through the upper secondary level were taken out of the data. We also excluded children who had never attended school and selected only children who had attended school before and asked whether they were still in school or had dropped out. The authors rejected and restricted observations with the missing values for relevant variables (Table 3.1).

Descriptive statistics show that from the total sample of 11,772 children in dropout regression, 48.5 percent were girls and 51.5 percent were boys. The average age of children was about 11 years while the average ages of mothers and fathers were 36 and 42 years, respectively. With respect to child marital status, unbelievably, there were 1.4 percent of children who were married, which can be another risk for their probability of dropping out of school.

Up to 27.8 percent lived with a father who had no formal education and 37.8 percent with a mother with no formal education. And 41.9 percent lived with a father

who had a primary education while 37.7 percent lived with a mother with a primary education. Those living with a father who had completed upper secondary education amounted to 6.4 percent and those living with a mother who had done so amounted to 4.9 percent. Although 90 percent of villages in Laos have their own primary school, but only half of schools could provide the full program for all primary grades (Onphanhdala & Suruga, 2008). As for family characteristics, around 96.2 percent of children were living with married parents, and for 89.5 percent the head of the household was male.

Grouping of children in terms of economic status shows that households mired in extreme poverty comprised the largest share of the sample, amounting to 24.2 percent. Children from these poor families tended to be more likely to drop out of school. Regarding family economic activity, 95.3 percent of fathers and 91.8 percent of mothers worked. For children, the ratio of those participating in the labor market was 43.8 percent. But children also helped with housework such as cooking, washing clothes, and cleaning house (unpaid work) at a rate of 73.4 percent.

Table 3.1 Description statistic of total children (Percent)

Variables	Dropout	Enrolled
Children characteristic		
Gender		
Boys	51.52	51.7
Girl	48.48	48.3
Marital status		
Married child	1.42	1.39
Unmarried child	98.58	98.61
Family characteristic		
Mother's education attainment		
None	37.8	38.11
Primary	37.7	37.8
Lower secondary	14.4	14.21
Upper secondary	5.21	5.08
Higher upper secondary	4.89	4.8

Table 3.1 (Continue)

Variables	Dropout	Enrolled
Father's education attainment		
None	27.8	27.98
Primary	41.98	42.29
Lower secondary	16	15.87
Upper secondary	6.35	6.29
Higher upper secondary	7.87	7.77
Marital status of parent		
Married	96.20	96.14
Unmarried	3.80	3.86
Gender of head household		
Male	89.51	89.61
Female	10.49	10.39
Economic status		
Poorest	24.16	24.41
Poor	23.24	23.47
Middle	21.23	21.34
Rich	16.77	16.56
Richest	14.6	14.2
Residence		
Urban	21.3	20.88
Rural	68.76	69.01
Rural without road	9.94	10.11
Region		
Vientiane capital	8.33	8.07
North	36.64	36.58
Central	31.6	31.75
South	23.43	23.6
Economic activity		
Mother's working		
Working	91.84	91.92
Non-Working	8.16	8.08
Father's working		
Working	95.31	95.31
Non-Working	4.69	4.69
Children's working		
Working	43.78	43.69
Non-Working	56.22	56.31
Household working	73.37	73.51
non-household work	26.63	26.49
Total (person)	11772	13432

Source: Authors' Calculation. Data from the 2010 Labor Force and Child Labor Survey (LFCLS)

As we have considered the sample of children is depends on socioeconomic factors and household characteristic. Unfortunately, it has some shortfall because The LFCLS survey does not include a question that provides a measure of school characteristic and quality of education such as distance to school, the number of a classroom in each village, information about student teacher ratio nor the score test of children. Therefore, we cannot capture these effect in this paper.

The descriptive indicators above can only inform as to the correlation between factors. However, this is insufficient for policy design due to its limitations. Because it is difficult to draw the cause and effect conclusion since these indicators could interact among themselves regard to the decision to dropout.

3.2 Analytical Method

In terms of method, a binary probit model was used to estimate the difference between the probability of dropping out of school and remaining enrolled in school. The dependent variable y has two discrete values. For the dropout regression model, the dependent value is y=1 if children dropout of school and 0 if children do not dropout (and remain in school). While in the school enrollment model, the dependent value is y=1 if children were currently attending school and y=0 if a child did not attend school.

However, when we estimate the impact of labor on children dropping out of school, there may have been some omitted factors that we could not capture but that affect a child's dropping out. The main issue is endogeneity due to unobserved heterogeneity and simultaneity. For instance, the decision of parent for child education also affects their decision whether to send their children to work or to school.

Along with the strong correlation between the decision for work and children's education, one way to address the endogeneity problem of child labor, we need an instrumental variable that is strongly correlated with children working but that does not affect dropping out directly.

For example, in a Ghanaian context Assaad et al. (2010) the occupation local people as an instrumental variable for the decision to take up market work and use

household access to basic needs as an instrumental variable for domestic work. In addition, Boozer and Suri (2001) and Afridi et al. (2016) employed the variation in the pattern of rainfall shock as an instrumental variable for child labor. Similarly, Beegle et al. (2009) applied rice price and community disasters as instrumental variables of child labor, and Ray and Lancaster (2004) applied household access to basic needs, Bezerra et al. (2009) and Le and Homel (2015) and used an averages wage for unskilled workers, and Cardoso and Verner (2006) took minimum wage to indicate the instrument for child labor.

This paper considers the impact of child labor on two endogenous variables, the dummy variable child work and the number of working hours (Bezerra et al., 2009). Therefore, we also applied an instrument variable approach to determine the impact of child labor on children dropping out of school. The model is reported as follows (Cardoso & Verner, 2006):

$$Dropout_i = \alpha + \beta L_i + \gamma X_i + u_i \qquad \text{i=1….n} \qquad (1)$$

$$L_i = \alpha + \gamma X_i + \delta Z_i + V_i \qquad \text{i=1….n} \qquad (2)$$

Where L_i is a vector of endogenous variables that represent the information of child labor for each child i. X_i is a vector of exogenous variables that include the sets of variables such as the characteristics of child, parents, household, and economic activities. Z_i is an instrument variable. In addition, there are error terms u_i and V_i that represent unobservable characteristics that affects school dropout that are not captured in this model.

To generate good instrumental variables, we consider the average wage of children by province as an instrument variable for child labor. The underlying idea is to determine the amount of money that children might accept to be willing to start working (Bezerra et al., 2009; Cardoso & Verner, 2006; Le & Homel, 2015). We found that the average wage of children by province has a strongly significant impact on child work without affecting school dropout. Therefore, it could be used as an indicator of lost earnings or opportunity cost of children schooling at risk of dropping

out. We decide to use average wages in 17 provinces in Laos as instrumental variables for child labor.

Independent variables were suggested in previous studies, and the definition of control variables are given in Table 3.2 Children's characteristics include child's age, gender, and marital status. Fortunately, the data design allows us to match a child with family characteristics such as parent's age, parent's educational attainment, gender of head household, and marital status of parents. Additional variables include economic status of family (poorest, poor, middle, rich, and richest), place of residence (urban, rural and rural without road), regions (Northern, Central, and Southern and one capital city in Laos). The last set of independent variables include household activity such as parent's working status, the impact of child labor, and child's time spent contributing to domestic activity (household work).

Table 3.2 The definition of variables

Variables name	Definitions	Mean	SD	Min	Max
Dummy for child characteristic					
Boy	Yes =1, Otherwise = 0	0.52	0.50	0	1
Married child	Yes =1, Otherwise = 0	0.01	0.12	0	1
Age					
age	Year	11.43	3.34	5	17
Mother's age	Year	36.07	9.61	18	57
Father’s age	Year	42.17	11.56	18	75
Dummy for mother's education attainment if				0	1
Primary	Yes =1, Otherwise = 0	0.39	0.49	0	1
Lower secondary	Yes =1, Otherwise = 0	0.15	0.36	0	1
Upper secondary	Yes =1, Otherwise = 0	0.05	0.23	0	1
Higher upper secondary	Yes =1, Otherwise = 0	0.05	0.22	0	1
Dummy for father's education attainment if					
Primary	Yes =1, Otherwise = 0	0.42	0.49	0	1
Lower secondary	Yes =1, Otherwise = 0	0.17	0.37	0	1
Upper secondary	Yes =1, Otherwise = 0	0.07	0.25	0	1
Higher upper secondary	Yes =1, Otherwise = 0	0.08	0.28	0	1
Dummy for household characteristic					
Parental married	Yes =1, Otherwise = 0	0.96	0.19	0	1
male is head household	Yes =1, Otherwise = 0	0.90	0.30	0	1
Dummy for Economic status if					
Poor	Yes =1, Otherwise = 0	0.23	0.42	0	1
Middle	Yes =1, Otherwise = 0	0.22	0.42	0	1
Rich	Yes =1, Otherwise = 0	0.18	0.38	0	1
Richest	Yes =1, Otherwise = 0	0.15	0.36	0	1
Dummy for residence if					
Rural	Yes =1, Otherwise = 0	0.68	0.47	0	1
Rural without road	Yes =1, Otherwise = 0	0.09	0.29	0	1
Dummy for region if					
North	Yes =1, Otherwise = 0	0.37	0.48	0	1
Central	Yes =1, Otherwise = 0	0.32	0.47	0	1
South	Yes =1, Otherwise = 0	0.22	0.42	0	1
Dummy for economic activity if					
Working mother	Yes =1, Otherwise = 0	0.92	0.28	0	1

Table 3.2 (Continue)

Variables name	Definitions	Means	SD	Min	Max
Working father	Yes =1, Otherwise = 0	0.95	0.21	0	1
Household working	Yes =1, Otherwise = 0	0.73	0.44	0	1
Working children	Yes =1, Otherwise = 0	0.44	0.50	0	1
Hours Worked	The number of hours worked	16.66	17.62	0	77
Instrument variable					
Average wage of children by province (kip)		759,535	249671	500,000	1,518,500

Source: Authors' calculated. Data from the 2010 Labor Force and Child Labor Survey (LFCLS)

CHAPTER 4

RESULT

This section presents the estimation of school dropout and school attendance according to child labor for children in the 5-17-year age group in Table 4.1. Respect to the impact of child labor is indicated into different ways. In the first regression as a dichotomous variable implied that children decide to work or not. For the second regression as a number of hours worked. In all regression, we include the same set of independent variables such as children, parent, and household and economic activity status. The first stage regression was estimated by using probit model and the second stage we applied an instrument of probit model, using an average wage of children by 17 provinces as instrumental variable which help to capture the endogeneity problem.

By interpreting results that were estimated by using an instrumental variables approach by treating child labor as endogenous variables (although we interpret a result from the second stage, the first stage regression had a good predictor with high R-square. The Wald test statistic in the second stage regression is significant; it implied that we should reject the null hypothesis of endogeneity of instrumental variable. Therefore, interpreting the result in the IV regression is more appropriate). Model 3 estimates child labor, whether children worked or not. Model 4 estimates child labor according to the number of working hours.

Results indicate that the effect of child labor correlates positively and significantly with children dropping out of school as children going to work leads to an increase in the probability that they will dropout of school by around 12.3 percent. In addition, an increase in each hour of work per week also increases the likelihood of dropping out by around 10.6 percent (Model 4) and lowers the probability of children attending school by around 77.5 percent (Model 7). Overall, both indicators of child labor, children working and hours worked, have a positive impact on children dropping out school for Laotian children. This contrasts with Cardoso and Verner (2006), who find that such a pattern of child labor does not damage children's schooling because working for a limited number of hours can earn money to pay for

school. For children who work in their home, the probability of dropping out seems to decrease by 6.7-25 percent. This result indicates that children's working at home seems to be less risky in terms of dropping out than is working outside the home for pay.

The estimation discovered that boys are less likely to dropout of school than are girls. This result is consistent with several other studies (Hanushek, Lavy, & Hitomi, 2008; Kosal & Kinkesa, 2015; No, Tanigochi, & Hirakawa, 2016; Onphanhdala & Suruga, 2008). Generally, girls in Laos are doubly disadvantaged and are more likely to stay at home and less likely to gain benefits from education.

As a child's age increases by one year from an average age, the probability of the child's dropping out increases by 34 percent. Theoretically, older children have more ability to work compared to younger children. Therefore, older children tend to drop out of school, particularly in urban areas, where job opportunities are more available than in rural areas. In terms of cultural factors, young married child students in Laos have a 6.7 percent probability of dropping out of school compared to unmarried children due to household poverty and as a survival strategy, parents often encourage their daughters to get married in order to receive a dowry. Similar to the case in Thailand and Bangladesh, children who marry decrease their chances of staying in school (Shahidul, 2012; Tharmmapornphilas, 2013).

With regard to parental education attainment, children with mothers who had completed at least lower secondary and upper secondary levels were less likely (3 percent likely) to drop out of school compared to uneducated mothers (5 percent likely). In addition, children with fathers who had completed lower secondary school less likely to dropout than children living with uneducated father by 2 percent and 1.9 percent for those with father had completed higher upper secondary school compare to father who were uneducated. Highly educated parents, especially in the case of mothers, were found to have a higher negative impact on the probability of their children dropping out than in the case of father's being highly educated, which is consistent with other studies (Glick & Sahn, 2000; Kosal & Kinkesa, 2015; Sabates et al., 2013; Shahidul, 2012; Wahba, 2005; Yi et al., 2012).

With respect to economic status, poverty has a direct impact on children dropping out of school. The dropout rate tends to be lower when children live with

families who enjoy relatively better economic circumstances. Children from poor families were less likely to dropout of school than were children from the poorest families by 1.3 percent. And children from the richest families were 6 percent less likely to dropout than were children from the poorest families. Additionally, children living in rural areas and, especially, rural areas without roads faced a significantly greater risk of being out of school compared to children in urban areas by 3.3 and 3.7 percent, respectively. Children living in the northern part tend to dropout lower than did children in Vientiane Capital by 2.7 percent while children living in the central part are more likely to dropout school than did children in Vientiane Capital by 4.2 percent.

As for economic activity of parents, children living with a working father led to a decrease in the likelihood of them dropping out by 21 percent for Model 3 and 43.2 percent for Model 4. This is consistent with previous studies (Micklewright et al., 2016; Petrongolo & San segundo, 2002). Along with the interpretation of the IV probit model, the impact is similar to the estimation of the probit model. But some variables are not significant in the second estimation of probit model.

We now look at whether there is any evidence of a differential effect among children in school and those out of school. For schooling regression, we include children who never attended school whereas in dropout regression, we exclude children who had never been to school. To arrive at a precise result, this paper also compares both of these results, and it is expected to get an adverse effect from dropout regression.

In terms of the probability of school enrollment in Models 5 to 8, the effect of child labor is negative and significant on school enrollment. The number of hours that children spend working decreases the probability that children will attend school. We also found that boys in Laos were more likely to attend school than were girls and that school attendance decreases together with increase in age. Additional control variables such as marital status, parental education, family wealth, residence location, and region are strongly significant effects on both the probability of dropping out of school and the probability of school enrollment. Overall, results indicate that the probability of school enrollment had an inverse effect sign with the probability of school dropout. However, the meanings of the results were similar

Table 4.1 Estimation of school dropout according to child labor

Variables	School dropout			
	Probit(dy/dx)		IV Probit (dy/dx)	
	(1)	(2)	(3)	(4)
Children economic activity (Reference: Non-working)				
Working	0.11***	-	0.123***	-
	(0.007)		(-0.0025)	
Hours worked	-	0.006***	-	0.106***
		(0.001)		(0.00413)
Household working (Reference: Non-working)				
Working	-0.02***	-0.02***	0.067***	-0.246***
	(0.004)	(0.008)	(0.0130)	(0.0765)
Gender (Reference: girl)				
boy	-0.01***	-0.014***	-0.02***	-0.0523
	(0.001)	(0.005)	(0.001)	(0.0721)
Child's age	0.001***	0.015***	0.034***	0.0355
	(0.0001)	(0.001)	(0.001)	(0.0640)
Child marital status (Reference: Unmarried child)				
Married child	0.03***	0.097**	0.067***	0.0217
	(0.012)	(0.041)	(0.0130)	(0.282)
Parent's age				
Mother's age	-0.0001	-0.001*	-0.00025	-0.004
	(0.0001)	(0.0003)	(0.00028)	(0.0034)
Father's age	0.0001	0.0001	0.00031	-0.0005
	(0.0001)	(0.0003)	(0.00025)	(0.003)
Mother education attainment (Reference: Non-education)				
Primary	0.001	0.005	0.002	0.082
	(0.002)	(0.006)	(0.0055)	(0.061)
Lower secondary	-0.007***	-0.0079	-0.029***	-0.015
	(0.002)	(0.008)	(0.0083)	(0.010)
Upper secondary	-0.009***	-0.029***	-0.051***	-0.460**
	(0.001)	(0.005)	(0.0131)	(0.216)
Higher upper secondary	-0.005*	-0.019**	-0.018	-0.243
	(0.002)	(0.008)	(0.0128)	(0.160)
Father education attainment (Reference: Non-education)				
Primary	-0.0002	0.008	-0.001	0.086
	(0.002)	(0.007)	(0.0058)	(0.067)

Table 4.1 (Continue)

Variables	School dropout			
	Probit(dy/dx)		IV Probit (dy/dx)	
	(1)	(2)	(3)	(4)
Lower secondary	-0.005***	-0.007	-0.025***	0.001
	(0.002)	(0.008)	(0.0083)	(0.098)
Upper secondary	0.001	0.006	-0.0005	0.117
	(0.003)	(0.014)	(0.0115)	(0.119)
Higher upper secondary	-0.004*	0.002	-0.019*	0.075
	(0.002)	(0.013)	(0.0105)	(0.120)
Head household Characteristic				
Gender head household (Reference: female)				
Male	0.001	-0.002	0.006	-0.021
	(0.00289)	(0.011)	(0.0109)	(0.105)
Parent's marital status (Reference: unmarried)				
Parental married	-0.004	0.001	-0.011	0.016
	(0.006)	(0.015)	(0.0156)	(0.147)
Economic status (Reference: Poorest)				
Poor	-0.004**	-0.015**	-0.013**	-0.180**
	(0.002)	(0.006)	(0.0066)	(0.0849)
Middle	-0.005***	-0.027***	-0.020***	-0.265**
	(0.002)	(0.006)	(0.0071)	(0.125)
Rich	-0.003	-0.013*	-0.011	-0.126
	(0.0002)	(0.010)	(0.0080)	(0.0967)
Richest	-0.011***	-0.032***	-0.061***	-0.344*
	(0.002)	(0.006)	(0.0107)	(0.182)
Residence (Reference: Urban)				
Rural	0.001***	0.001	0.037***	-0.129
	(0.002)	(0.068)	(0.0075)	(0.100)
Rural without road	0.005	0.06**	0.033***	0.006
	(0.00364)	(0.024)	(0.0115)	(0.214)
Region (Reference: Vientiane capital)				
North	-0.007***	-0.036***	-0.027**	-0.358**
	(0.003)	(0.009)	(0.0113)	(0.169)
Central	0.024***	-0.03***	0.042***	-0.200
	(0.00589)	(0.0110)	(0.0132)	(0.152)
South	0.002	-0.015*	0.016	-0.508***
	(0.003)	(0.009)	(0.0117)	(0.126)

Table 4.1 (Continue)

Variables	School dropout			
	Probit(dy/dx)		IV Probit (dy/dx)	
	(1)	(2)	(3)	(4)
Economic activity (Reference: Non-working mother, non-working father)				
Working mother	0.002	-0.003	0.004	-0.0290
	(0.002)	(0.010)	(0.0090)	(0.0910)
Working father	-0.011*	-0.061***	-0.023*	-0.432***
	(0.006)	(0.023)	(0.0121)	(0.137)
Observation	11772	8016	11772	8016
Pseudo R-square	0.476	0.785		
Wald chi2(28)			1258.19	4821.28
Wald test Prob > chi2			0.0027	0.0110

Note: Standard errors are in the parentheses; *** indicates the significance at the 1% level, ** indicates the significance at the 5% level, and * indicates the significance at the 10% level

Table 4.2 Estimation of school attendance according to child labor

Variables	School attendance			
	Probit(dy/dx)		IV Probit(dy/dx)	
	(5)	(6)	(7)	(8)
Children economic activity (Reference: Non-working)				
Working	-0.248***	-	0.775***	-
	(0.00858)		(0.103)	
Hours worked	-	-0.003***		0.0232
		(0.001)		(0.0169)
Household working (Reference: Non-working)				
Working	0.0438***	0.137***	0.0938**	0.00799
	(0.00698)	(0.014)	(0.0452)	(0.0765)
Gender (Reference: girl)				
boy	-0.002	0.040***	0.162***	0.177***
	(0.00108)	(0.012)	(0.0229)	(0.0259)
Child's age	-0.002**	0.041***	-0.0412***	-0.0602**
	(0.001)	(0.002)	(0.00390)	(0.0268)
Child marital status (Reference: Unmarried child)				
Married child	-0.275***	-0.390***	-0.781***	-0.933***
	(0.0396)	(0.064)	(0.0921)	(0.155)
Parent's age				
Mother's age	-0.0005	-0.0001	-0.000627	-0.000653
	(0.0004)	(0.0007)	(0.00145)	(0.00156)
Father's age	0.0004	0.0007	0.000497	1.05e-05
	(0.0004)	(0.0007)	(0.00129)	(0.00143)
Mother education attainment (Reference: Non-education)				
Primary	0.034***	0.017	0.119***	0.121***
	(0.008)	(0.014)	(0.0281)	(0.0304)
Lower secondary	0.055***	0.032	0.167***	0.134***
	(0.011)	(0.021)	(0.0425)	(0.0444)
Upper secondary	0.073***	0.040	0.162**	0.108
	(0.015)	(0.031)	(0.0648)	(0.0683)
Higher upper secondary	0.052***	0.071**	0.125*	0.127*
	(0.017)	(0.030)	(0.0658)	(0.0763)
Father education attainment (Reference: Non-education)				
Primary	0.024***	0.008	0.0968***	0.0978***
	(0.009)	(0.015)	(0.0292)	(0.0319)
Lower secondary	0.054***	0.062***	0.254***	0.219***
	(0.011)	(0.019)	(0.0414)	(0.0482)

Table 4.2 (Continue)

Variables	School attendance			
	Probit(dy/dx)		IV Probit(dy/dx)	
	(5)	(6)	(7)	(8)
Upper secondary	0.033**	0.033	0.169***	0.186***
	(0.016)	(0.028)	(0.0589)	(0.0603)
Higher upper secondary	0.060***	0.065***	0.238***	0.228***
	(0.014)	(0.025)	(0.0544)	(0.0612)
Head household Characteristic				
Gender head household (Reference: female)				
Male	0.026*	0.029	0.0405	0.0527
	(0.014)	(0.022)	(0.0441)	(0.0458)
Parent's marital status (Reference: unmarried)				
Parental married	-0.005	-0.006	-0.0297	-0.0127
	(0.021)	(0.031)	(0.0677)	(0.0658)
Economic status (Reference: Poorest)				
Poor	0.042***	0.046***	0.102***	0.110***
	(0.090)	(0.016)	(0.0327)	(0.0399)
Middle	0.067***	0.098***	0.293***	0.338***
	(0.010)	(0.016)	(0.0366)	(0.0510)
Rich	0.055***	0.053***	0.205***	0.242***
	(0.011)	(0.020)	(0.0423)	(0.0469)
Richest	0.107***	0.136***	0.424***	0.432***
	(0.012)	(0.021)	(0.0556)	(0.0766)
Residence (Reference: Urban)				
Rural	-0.05***	0.001	-0.291***	-0.258***
	(0.011)	(0.019)	(0.0378)	(0.0423)
Rural without road	-0.06***	-0.147***	-0.504***	-0.598***
	(0.018)	(0.032)	(0.0527)	(0.0640)
Region (Reference: Vientiane capital)				
North	0.022	0.049*	0.114*	0.137**
	(0.018)	(0.029)	(0.0595)	(0.0627)
Central	-0.091***	0.065**	0.152**	0.210***
	(0.0200)	(0.0282)	(0.0652)	(0.0610)
South	-0.062***	-0.037	-0.335***	-0.454***
	(0.020)	(0.032)	(0.0594)	(0.0640)
Economic activity (Reference: Non-working mother, non-working father)				
Working mother	-0.011	0.013	-0.0158	-0.0201
	(0.013)	(0.023)	(0.0450)	(0.0475)

Table 4.2 (Continue)

Variables	School attendance			
	Probit(dy/dx)		IV Probit(dy/dx)	
	(5)	(6)	(7)	(8)
Working father	0.032	0.028	-0.0401	-0.0357
	(0.020)	(0.029)	(0.0594)	(0.0604)
Observation	13432	9527	13,432	9,527
Pseudo R-square	0.129	0.499		
Wald chi2(28)			1250.45	1442.13
Wald test Prob > chi2			0.0000	0.0000

Note: Standard errors are in the parentheses; *** indicates the significance at the 1% level, ** indicates the significance at the 5% level, and * indicates the significance at the 10% level

CHAPTER 5

CONCLUSION AND POLICY IMPLICATION

5.1 Conclusion

While most empirical studies of developing countries focus on the tradeoff between school participation and child labor, this paper examines the impact of child labor on school dropout by using national representative data from a Labor Force and First Child Labor Survey in the Lao PDR, which is representative of least-developed countries. Our binary probit model was used to estimate the probability of school dropout. However, to address the endogeneity problem of child labor on school dropout, we applied an average wage of children by province as an instrumental variable.

Findings indicate that child labor, especially among girls, has a strong impact on school dropout. Married children of school age tend to receive a lower level of education, particularly in the case of married girls, compared to unmarried children. In addition, parents' educational attainment, particularly mother's education, seems to show a significant effect on reducing the probability of dropout and increasing that likelihood that children whose mothers are educated attend school themselves.

Results also indicate that access to education remains disproportionate because dropping out tends to be greatest among children from circumstances of extreme poverty, particularly in rural areas and in rural without roads, while children from wealthy families have greater access to school.

Interestingly, school-age children in the Lao PDR engage in income-generating activity and may not understand the importance of education. That's why most the children remain illiterate. Despite the government's expansion of educational opportunities by increasing expenditures on education, results here indicate that whether children attend school or not depends on household income. Awareness must be raised so that parents pay more attention to the education of their children.

5.2 Policy implication

Some policy implications follow from these results. In the Lao PDR it is necessary to adopt incentives to promote school enrollment and ensure that children start their primary school level at the right age as well as combating child labor by providing incentive schemes such as income transfer to households with a high propensity to send their children to work. Poverty is a leading cause in student dropouts, reducing cost of school (both direct and indirect) could improve the record of school attendance. Our evidence supports the need for a free education program and a food for education program, both of which have been implemented in all developed countries but not yet implemented in least-developed countries such as the Lao PDR. At the very least, due to limited government resources, the support can be targeted to help vulnerable groups and poor families. Moreover, it may be also important to support adult education programs by government to be rolled out in all parts of the countries. The importance of adult education is predicted to helper in enhancing attitudinal change among illiterate and ignorant parents in favor of education.

5.3 Limitation of the study

This empirical paper has several limitations, for example, lack of school supply side data and household size characteristics for each individual. In addition, wage is not classified as each as district in Laos. Therefore, we cannot identify the average children's wage by a district. Even if we used an average wage for 17 provinces as an instrument variable, the data for this variable would have small variations. Collecting data extensively would contribute to a more precise analysis of the impact of child labor on child education that would help researchers provide more appropriate policy recommendations.

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APPENDICES

APPENDIX A

The education status

Table A.1 Present the status of children age 5-17 in Lao PDR, Children are classified into three groups: currently attending, attended by dropout and never attended school.

Table A.1 Attendance Status by age and other characteristics of children age 5-17 (%)

		Attending school	Attended but dropped out	Never attended school	Total
Total		**76.70**	**10.66**	**12.64**	**100.00**
Age	5	1.40	0.01	4.11	5.51
	6	5.36	0.02	2.32	7.70
	7	6.31	0.03	0.99	7.33
	8	7.53	0.03	0.82	8.38
	9	6.24	0.05	0.37	6.65
	10	9.29	0.15	0.43	9.86
	11	6.64	0.12	0.26	7.02
	12	8.02	0.49	0.43	8.94
	13	6.68	0.93	0.44	8.05
	14	5.96	1.27	0.55	7.78
	15	5.41	2.33	0.66	8.40
	16	4.69	2.67	0.67	8.03
	17	3.17	2.58	0.59	6.34
Gender	Girls	35.99	5.67	6.79	48.45
	Boys	40.70	5.00	5.85	51.55
Residence	Urban	19.83	1.54	1.31	22.68
	Rural	49.82	7.80	9.00	66.61
	Rural without road	7.05	1.33	2.33	10.71
Wealth	Poorest	15.65	2.46	5.11	23.22
	Poor	16.78	2.69	3.60	23.06
	Middle	16.85	2.36	1.81	21.02
	Rich	14.14	2.11	1.29	17.53
	Richest	13.29	1.04	0.83	15.16

Source: Authors' Calculation. Data from the 2010 Labor Force and Child Labor Survey (LFCLS

APPENDIX B

Education Indicator

1. Enrollment rate

To determine the number of children enrolled in school at a different age or grade. Enrolment of a specific single age (Grade) enrolled, irrespective of the level of education (Age), as percentage of the population of the same age (official age). Age specific enrollment rate and grade specific enrollment rate show the extent of the educational participation of a specific age (grade) cohort. It could interpretation that a high enrollment rate denotes a high degree of education participation of the child particular age and grade.

Age specific enrollment (ASER)

$$\mathrm{ASER}_{\mathrm{a}}^{\mathrm{t}} = \frac{\text{Enrolment of the population of age a in school year t}}{\text{Population of age a in school year t}} * 100$$

Grade specific enrollment (GSER)

$$\mathrm{GSER}_{\mathrm{a}}^{\mathrm{t}} = \frac{\text{Enrolment of the population of Grade a in school year t}}{\text{children at official age in grade a in school year t}} * 100$$

Each dominator in each grade we include overage and underage children; for instance, Grade specific enrollment rate at grade 1, normally children at grade 1 are supposed to be aged at 6 (official age), though children in this grade including overage and underage children. Therefore, children at the age of 5-7 years olds in this paper are concerned as the dominators of children at grade 1. In addition, grade specific enrollment at grade 2, the dominator is children age 6-8. For another grade we use the same technic to measure grade specific enrollment.

2. School dropout

A “school dropout” is defined as any student who attended school at a pre-level and then left school for any reason before completing the final level (current level), without transferring to another elementary or secondary school.

- Primary school dropout: Student who leave school during grade 1 to grade 5 (these Students have not completed grade 5).
- Lower secondary school dropout: Student leave school during grade 6 to grade 10 (these Students have not completed grade 10) and it also refers to student who completed primary level (pre-level) is supposed to study in lower secondary level (Current level) with school going-age, but these students don't further schooling into lower secondary (Current level) with school going-age.
- Upper secondary dropout: Student leave school during grade 11 to grade 12 (these Students have not completed grade 12) and it also refers to student who completed lower secondary level (pre-level) is supposed to study in upper secondary level (Current level) with school going-age, but these students don't further schooling into upper secondary (Current level) with school going-age.

Note that among children who already completed in upper secondary education were not selected.

Age specific dropout rate (ASDR)

$$\mathrm{ASDR}_{\mathrm{a}}^{\mathrm{t}} = \frac{\text{Dropout of the population of age a in school year t}}{\text{Enrollment of population in age a in school year t}} * 100$$

Grade specific dropout rate (GSDR)

$$\mathrm{GSDR}_{\mathrm{a}}^{\mathrm{t}} = \frac{\text{Dropout of the population of grade a in school year t}}{\text{Enrollment of population in grade a in school year t}} * 100$$

3. Non enrollment children or Out of school children (OSSC)

Children in the official primary school age rang who are not enrolled in either primary or secondary schools. OOSC identifies the size of the population in the official primary school age range who should be targeted for policies and efforts in achieving universal primary education.

Out of school children could be interpreted that the higher number of out of school children, the greater need focus on achieving universal primary education. Some children of primary school-age who have never been in school may or may not eventually enroll as late entrance. Other children may have initially enrolled but dropout before reaching the official age of primary completion.

Table B.1 Present the out of school children school by age 5-17, we include all children with school age-going between 5-17 ages.

Table B.1 Out of school children (OOSC) aged 5-17 (%)

		Out-of school children	%	
	Total	4080	23.30	
Age	5	720	4.11	Primary
	6	410	2.34	
	7	179	1.02	
	8	149	0.85	
	9	72	0.41	
	10	101	0.58	
	11	67	0.38	Lower secondary
	12	161	0.92	
	13	240	1.37	
	14	319	1.82	
	15	523	2.99	Upper secondary
	16	584	3.34	
	17	555	3.17	
Gender	Girls	2181	12.46	
	Boys	1899	10.85	
Residence	Urban	499	2.85	
	Rural	2940	16.79	
	Rural without road	641	3.66	
Wealth	Poorest	1325	7.57	
	Poor	1101	6.29	
	Middle	731	4.18	
	Rich	595	3.40	
	Richest	328	1.87	

Source: Authors' Calculation. Data from the 2010 Labor Force and Child Labor Survey (LFCLS)

In Lao PDR, Children whose age at 6 are supposed to attend school at grade 1, they are expected to complete primary school at age 10 and expected to finished lower and upper secondary school at age 14 and 17 respectively.

As generally explained, the shares of children at age 5 are not enrollment will larger because it has not reach the school age going. Anyhow, out of school children decreasing when age increase in some point during the primary school then it start rising again when age increase. Children are expected to be in school but they do not go to school in primary, lower and upper secondary school approximately 9.3%, 4.5% and 9.5% respectively.

The higher number of out of school children, the greater the need to focus on achieving universal primary education. Some children of primary school age who have never been in school may or may not eventually enroll as late entrants. Other children may have initially enrolled but dropped out before reaching the official age of primary completion. When disaggregated by geographical location, this indicator can identify areas needing the greatest efforts. Policies can also focus efforts on priority population group or a particular gender.

APPENDIX C

The estimation result of the impact of child labor on school dropout in three level of education

Table C.1 Estimate the impact of child labor on school dropout in three level of education (IV Probit model)

Variables	Primary		Lower secondary		Upper secondary	
	IV probit (dy/dx)		IV probit (dy/dx)		IV probit (dy/dx)	
	(9)	(10)	(11)	(12)	(13)	(14)
Children economic activity (Reference: Non-working)						
Working	0.965***	-	0.601	-	1.468	-
	(0.295)		(0.405)		(1.025)	
Hours worked	-	0.07***	-	0.08***	-	-0.018
		(0.006)		(0.017)		(0.13)
Household working (Reference: Non-working)						
Household working	-0.244**	-0.083	-0.129	-0.181	-0.368	-0.224
	(0.098)	(0.06)	(0.111)	(0.136)	(0.329)	(0.48)
Child Characteristic						
Gender (Reference: girl)						
Boy	-0.114**	0.019	-0.25***	-0.0646	-0.110	0.007
	(0.051)	(0.053)	(0.05)	(0.171)	(0.160)	(0.14)
Child age	0.155***	-0.059*	0.22***	-0.011	0.167*	0.234
	(0.011)	(0.034)	(0.016)	(0.13)	(0.09)	(0.59)
Child marital status (Reference: Unmarried child)						
Married child	0.129	-0.5***	0.60***	0.289	0.866*	0.694
	(0.146)	(0.15)	(0.130)	(0.493)	(0.45)	(1.44)
Parent's age						
Mother age	-0.00114	-0.0007	-0.002	-0.003	0.0057	0.019
	(0.003)	(0.003)	(0.003	(0.005)	(0.01)	(0.04)
Father age	0.0008	-0.001	0.002	-0.0014	0.014	-0.003
	(0.003)	(0.002)	(0.002)	(0.005)	(0.01)	(0.03)
Mother education attainment (Reference: Non-education)						
Primary	-0.09	-0.018	-0.051	-0.0513	0.361	0.884
	(0.06)	(0.05)	(0.06)	(0.154)	(0.227)	(1.31)
Lower secondary	-0.289***	-0.055	-0.3***	-0.0918	-0.068	0.0426
	(0.10)	(0.09)	(0.09)	(0.235)	(0.282)	(0.29)
Upper	-0.48***	-0.259	-0.4***	-0.524	-0.146	-0.349

Variables	Primary		Lower secondary		Upper secondary	
	IV probit (dy/dx)		IV probit (dy/dx)		IV probit (dy/dx)	
	(9)	(10)	(11)	(12)	(13)	(14)
secondary						
	(0.18)	(0.17)	(0.142)	(0.385)	(0.380)	(1.267
Higher upper secondary	-0.241	-0.165	-0.217	-0.339	0.333	0.642
	(0.163)	(0.15)	(0.136)	(0.291)	(0.366)	(0.88)
Father education attainment (Reference: Non-education)						
Primary	-0.0542	-0.0126	0.0312	0.174	-0.247	-0.721
	(0.063)	(0.05)	(0.07)	(0.134)	(0.236)	(0.89)
Lower secondary	-0.190*	-0.067	-0.184**	0.0784	-0.639**	-1.295
	(0.099)	(0.09)	(0.0919)	(0.141)	(0.282)	(2.18)
Upper secondary	-0.319*	-0.180	0.059	0.117	-0.025	-0.276
	(0.167)	(0.15)	(0.121)	(0.168)	(0.347)	(0.29)
Higher upper secondary	-0.108	0.0113	-0.178	0.028	-0.631*	-0.933
	(0.125)	(0.11)	(0.116)	(0.191)	(0.326)	(1.12)
Head household Characteristic						
Gender head household (Reference: female)						
Male	0.0482	0.0459	0.045	-0.133	0.0134	0.24
	(0.124)	(0.10)	(0.129)	(0.169)	(0.50)	(0.67)
Parent's marital status (Reference: unmarried)						
Parental married	-0.022	0.0063	0.0722	0.465	-1.27***	-0.792
	(0.189)	(0.14)	(0.178)	(0.316)	(0.49)	(1.59)
Economic status (Reference: Poorest)						
Poor	-0.3***	-0.25***	-0.129	-0.306	0.846*	0.354
	(0.07)	(0.07)	(0.0848)	(0.214)	(0.487)	(1.14)
Middle	-0.353***	-0.25**	-0.24***	-0.383	0.519	-0.133
	(0.078)	(0.11)	(0.08)	(0.343)	(0.474)	(1.57)
Rich	-0.508***	-0.39***	-0.154	-0.185	0.471	-0.149
	(0.095)	(0.131)	(0.09)	(0.263)	(0.476)	(1.36)
Richest	-0.800***	-0.454**	-0.53***	-0.372	-0.202	-1.105
	(0.144)	(0.19)	(0.118)	(0.44)	(0.520)	(3.01)
Residence (Reference: Urban)						
Rural	0.247**	-0.102	0.42***	0.069	0.150	-0.402
	(0.09)	(0.10)	(0.07)	(0.35)	(0.202)	(1.48)
Rural without road	0.268*	-0.0779	0.6***	0.396	-0.0275	1.123

Variables	Primary		Lower secondary		Upper secondary	
	IV probit (dy/dx)		IV probit (dy/dx)		IV probit (dy/dx)	
	(9)	(10)	(11)	(12)	(13)	(14)
	(0.138)	(0.18)	(0.139)	(0.91)	(0.452)	(629.9)
Region (Reference: Vientiane capital)						
North	-0.262	-0.113	-0.118	-0.132	-0.283	-1.784
	(0.163)	(0.14)	(0.113)	(0.225)	(0.309)	(4.09)
Central	0.334*	0.046	0.229	-0.0947	0.671	-1.052
	(0.179)	(0.13)	(0.160)	(0.278)	(0.417)	(2.52)
South	0.176	-0.32**	0.266**	-0.448	0.480	-0.361
	(0.164)	(0.157)	(0.117)	(0.377)	(0.302)	(2.39)
Economic activity (Reference: Non-working mother, non-working father)						
Working mother	-0.017	-0.042	0.01	-0.110	0.136	0.548
	(0.10)	(0.1)	(0.09)	(0.13)	(0.277)	(1.48)
Working father	0.0193	-0.0639	-0.317**	-0.63**	0.217	-0.087
	(0.149)	(0.118)	(0.13)	(0.26)	(0.435)	(1.02)
Observations	11,772	8,016	4,321	3,062	938	629
Wald chi2(28)	485.03	3143.4	451.45	1732.9	52.25	234.33
Wald test Prob > chi2	0.6779	0.0099	0.0002	0.6009	0.2921	0.3094

Note: Standard errors are in the parentheses; *** indicates the significance at the 1% level, ** indicates the significance at the 5% level, and * indicates the significance at the 10% level.

APPENDIX D

The status of child working

This study defines child labor as a person under the age of 18 participating in any work activity that is depriving them of their childhood, potential and dignity, and that is harmful to physical and mental development.

Table D.1 represents the status of child work in Lao PDR by school status and residence of children which separate into group of children.

Generally children in Laos working for generate household income; often there is little else to do, particularly if that area no has school available. Normally, those who not in school are tend to participated in labor market. However, many children enroll in school also employed.

Table D.1 The status of child work in Lao PDR (percent)

Child's working	All children		ages 5-13		ages 14-17	
	Girls	Boys	Girls	Boys	Girls	Boys
Total	21.76	21.55	12.25	12.75	9.5	8.8
Current attending school (Ever attend school)	13.14	14.57	12.09	7.93	3.63	4.07
Dropout	5.31	4.66	0.9	0.68	4.41	3.98
Never attend school	3.31	2.32	1.84	1.57	1.47	0.75
Residence						
Urban	4.42	2.98	1.85	2.02	1.81	1.72
Rural	19.94	9.26	8.29	8.63	6.43	5.85
Rural without road	4.38	2.34	2.11	2.11	1.27	1.22

Source: Authors' Calculation. Data from the 2010 Labor Force and Child Labor Survey (LFCLS)

APPENDIX E

Questionnaire

Labor Force and Child Labor Survey in Lao PDR

Province: ……
District: ……..
Village: …….
Village type (1.Urban, 2.Rural with road, 3.Rural without road)

Table E.1 Questionnaire detail

<table>
<tr><td colspan="3">HOUSEHOLD INFORMATION HH</td></tr>
<tr><td colspan="3">HH1. No. of sample household:</td></tr>
<tr><td>HH2. NAME OF HEAD OF HOUSEHOLD:</td><td colspan="2">HH3. NAME AND LINE NO. OF PERSON INTERFIEWD:

LINE NUMBER(HL1):</td></tr>
<tr><td>HH4. INTERVIEW’S NAME</td><td colspan="2">HH5. SUPERVISOR’S NAME:</td></tr>
<tr><td colspan="3">INTERVIEWER VISITS</td></tr>
<tr><td>Visit 1</td><td>Visit 2</td><td>Final Visit</td></tr>
<tr><td>DATE:__ __ /__ __/__ _
Date Month YEAR
RESULT……...__</td><td>DATE:__ __ /__ __/__ __
Date Month YEAR
RESULT…….....__</td><td>DATE:__ __ /__ __/__
__ Date Month YEAR
RESULT…….__</td></tr>
<tr><td>HH6. RESULT OF HH INTERVIEW:</td><td colspan="2">Completed……..1
Not House ……..2
Entire Household absent for extended period of time……..……..3
Refuse…….……4
Party competed……...5
Other (specify):..……6</td></tr>
<tr><td colspan="3">After all questionnaires for the household have been completed, fill in the following information</td></tr>
<tr><td>HH7. TOTAL NUMBER OF HOUSEHOLD MEMBERS:__ __</td><td colspan="2">HH8.No. of children 5-114 years old (HL6): __ __</td></tr>
</table>

Module I: Household Composition and Characteristic of Household Members

Question

HL3: What is (name)'s relationship to head of household?

HL4: Gender

HL5: How was (name) at (his/her) last birthday?

HL7: What is (name)'s marital status?

HL8: Write S (if she is among the household member)

HL9: Write ID code of natural father (if she is among the household member)

Module II: Education attainment for household members aged 5 and above

ED2: Has (name) ever attended school?

ED3: At what age did primary school start?

ED4: Is (name) currently attending school?

ED8: Highest level and grade of school/college attained?

ED9: At what age s/he has left school/college?

Module III: **Current Activity Status for Last 7 days**

AC1: Engaged in any work (economic activity) for at least 1 hours in previous week/ past 7 days? [Include agricultural, frame, business, worker engaged by household to provide service to household members and domestic work performed in another household, whether aid (in clash and/or kind) or unpaid].

AC7: Status in employment in main work?

AC8: Amount of money (KIP)

AC11: Hours worked in previous week/past 7 days, separately by main work and other work.

Module IV: Unpaid Household Service (Household Chores)

UH1: During the past 7 days have you worked unpaid household services (Household Chores)?

BIOGRAPHY

NAME	Miss Thidavong Xayavong
ACADEMIC BACKGROUND	Student at Graduate School of Development Economics, National Institute of Development Administration
EXPERIENCES	Bachelor's degree with a major Applied Economics from the Faculty of Economic and Bussiness Management at National University of Laos, Vientiane capital, Lao People Democratic Republic (2011-2015)