



Employment growth and out-of-school children in Cambodia and Laos: An empirical study on decision making of households, secondary education students, and teachers.

Viriyasack SISOUPHANTHONG

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**Employment growth and out-of-school children in Cambodia and
Laos: An empirical study on decision making of
households, secondary education students, and teachers.**

Faculty: Graduate School of International Cooperation Studies

Department: Economic Development and Policies

Academic Advisor: Professor Terukazu SURUGA

Student ID: 113i502i

Name: Viriyasack SISOUPHANTHONG

For my family

Executive summary

Education is a vital determinant for economic development, especially in developing countries. It improves labor productivity and increases economic growth. Therefore, governments and development organizations have focused on educational development that in results high school enrollment worldwide. However, the number of out-of-school children remains high. Dropping out of school before the end of compulsory education or leaving school early can become a major problem. School dropout can be the strongest factor impacting on future social and economic status of children. Dropout from school limits choice and opportunity for employment. Students who do not graduate have a higher likelihood of being unemployed and earn less when they are employed. Furthermore, dropped out students are also likely to have difficulty receiving public assistance, in health problems, and may lead to criminal behavior and incarceration. In developing countries, if children from poor socio-economic backgrounds are out of school, they have difficulty improving their living standard and continue to live in poverty. Thus, it exacerbates cycle of the poverty when the poor lose an opportunity to be educated.

Several studies have found factors that influence school dropout and non-enrollment. One important factor that directly and indirectly increases the number of out-of-school children is growth in employment demand. Generally, growth improves wage levels and expands employment opportunities which help households to increase educational resources. However, there is a contrasting effect that increases the number of out-of-school children. When there are more jobs and higher wage levels in the labor market, the attitude of the main educational agents, specifically households, students, and teachers, is effected.

When there are higher paid jobs and more jobs available, the opportunity cost for not working becomes higher and children may drop out from school to take the available jobs as additional source of income. Moreover, some children might need to

work in the household to substitute for adults who take the available jobs. Regardless of whether this is household or child decision, it increases number of out-of-school children.

The growth of employment attracts potential teachers to take non-teaching jobs. The teaching profession in developing countries suffers from low salaries compared to average non-teaching salaries in the labor market. Therefore, when there are many jobs available with higher pay compared to teaching, potential teachers may decide not to join the teaching profession particularly where they need to teach in schools with difficult working environments such as rural locations. Where there are insufficient qualified teachers in a school, there is a probability that pupils would have no education service and would need to be out of school.

Cambodia and Laos have high economic growth; however, both countries have a high number of out-of-school children and school dropouts compared to East Asia and Pacific countries. In 2011/12, the dropout rates for primary, lower secondary, and upper secondary were 3.7, 20.0, and 10.1 in Cambodia and 7.1, 10.4, and 7.2, in Laos, respectively.

The main objective of this study is to estimate the potential impact of the growth of employment on the out-of-school problem. The specific objectives are: (1) to estimate the impact of employment growth on out-of-school children, (2) to analyze secondary students' preference on jobs' characteristics, (3) to examine the possibility of potential teachers not joining the teaching profession. Many previous studies focused on the impact of employment growth on child labor. The significance of this study is that it investigates the impact of the growth on out-of-school children in developing countries like Cambodia and Laos. Also this study distinguishes the effect of growth on different genders and ethnicities. Moreover, many studies estimate the effect of the characteristics of jobs on students who have already dropped out from school. This kind of data hinders an analysis of the characteristics of jobs on every

student; because some students may have access to different information about the jobs available. This study applies choice experiment to measure value characteristics of those jobs preferred by secondary students. In valuing the incentives for recruiting potential teachers, this research is a pioneer in applying the choice experiment analysis to measure the characteristics of difficulties facing the teaching profession, the possibility of moving to non-teaching jobs, and non-direct monetary incentives.

The main findings of this study shows that, firstly, the effect of the growth of un-skilled labor demand on out-of-school suggest that the expansion of agricultural and service sectors increase number of out-of-school children. The effect of the sectors between male and female children is similar, while the effect between major ethnicity and non-major ethnicity children is different in each country. Secondly, the results from the experiment of secondary school students show that an increasing wage increases the possibility of the students to drop out and take the offered jobs. The students are less likely to take the jobs if the location is farther. Also, the students who have a higher probability to take the jobs are non-Lao ethnicity students, come from poor household, have friends working outside of the residential district, and have a difficulty travel to school. Thirdly, the potential teachers are less likely to take the teaching profession if they are assign to teach in school that locates in rural village without several support infrastructures and has poor condition of classroom. The potential teachers prefer the teaching profession over the non-teaching jobs such as the government staff, state-enterprise employee, and private company employee. However, the preference of the non-teaching jobs easily exceeds the preference of the teaching job if the potential teachers need to teach in difficult situation.

This research provides policy implications for educational development. Firstly, children have a possibility to be out of school for working; thus, the government should be considered strengthen the regulations to prevent the use of child labor that causes them to be out of school, particularly compulsory education.

Secondary, households should be educated about the important of the basic education and the risk to be out of school because of working. Thirdly, the particular programs to motivate school enrollment as well as keeping students in school should be considered where there is a high risk for children to be out of school. Also, different characteristics of students influence the decision of dropping out. The programs should be targeted to the particular problem for an effective policy. Fourthly, the difficulty in teaching profession such as the rural location of school and the condition of classroom lowers the preference of potential teachers to join teaching profession; therefore, teachers in the particular location should be provided incentive programs. A particular difficulty in teaching profession should be addressed by a particular and appropriate incentive value. Finally, the government should be concerned using the indirect monetary incentives.

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CHAPTER ONE

INTRODUCTION

1.1. Background of the study

Education is acknowledged as a vital factor that determines economic development, especially in developing countries. It helps to improve labor productivity and consequently increases economic growth. Therefore, governments and development organizations around the world have focused on educational development that in results high school enrollment worldwide. However, the number of out-of-school children remains high. Many children drop out from school or have never enrolled in school. The Global Education Digest 2012 reports that about 131 million children of primary and lower secondary school age were recently out of school (UIS, 2012). Of this number, 26 percent were students who dropped out of school. In addition, the number of students who leave primary school before reaching the final grade increased from 28.9 million in 2000 to 31.2 million in 2010. This means the dropout rate up to final grade of primary education grew from 22.1 percent (1999 to 2000) to 23.2 percent (2009 to 2010).

Dropping out of school before the end of compulsory education or leaving school early can become a major problem. School dropout can be the strongest factor impacting on future social and economic status of children (Jencks et al., 1972; Winship and Korenman, 1999). Dropout from school limits choice and opportunity for employment. Students who do not graduate have a higher likelihood of being unemployed (Sum et al., 2009) and earn less when they are employed (Levin et al., 2007). Leaving school before the 12 grade (compulsory education) results in poorer outcomes in the labor market (Rumberger, 1987). In addition, Bjerk (2012) shows that dropout to work and look after family does not worsen earnings until the

individuals are in their twenties. Furthermore, dropped out students are also likely to have difficulty receiving public assistance (Waldfogel et al., 2007), in health problems (Muennig, 2007), and may lead to criminal behavior and incarceration (Moretti, 2007).

In developing countries, education can help poor households to get out of poverty. If children from poor socio-economic backgrounds are out of school, they have difficulty improving their living standard and continue to live in poverty. Thus, it exacerbates cycle of the poverty when the poor lose an opportunity to be educated.

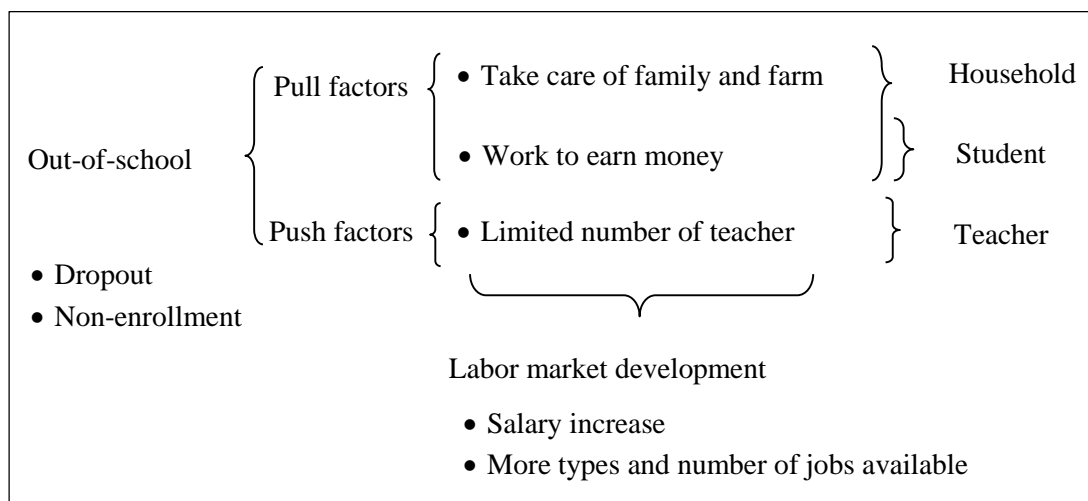
Several studies have found factors that influence school dropout and non-enrollment. The factors that effect school dropout can be clustered into the push and the pull factors (Bjerk, 2012). The push factors are reasons such no education service available, distance to school, low performance in class, dislike of school or study, moving place of residence, health problems, etc. While the pull factors are employment for additional income and/or household work, etc.

One important factor that directly and indirectly increases the number of out-of-school children is growth in employment demand. Generally, growth improves wage levels and expands employment opportunities which help households to increase educational resources. However, there is a contrasting effect that increases the number of out-of-school children. When there are more jobs and higher wage levels in the labor market, the attitude of the main educational agents, specifically households, students, and teachers, is effected.

Figure 1.1 shows the link between the growth of employment and the out-of-school problem. When there are higher paid jobs and more jobs available, the opportunity cost for not working becomes higher and children may drop out from school to take the available jobs as additional source of income. Moreover, some children might need to work in the household to substitute for adults who take the available jobs. Regardless of whether this is household or child decision, it increases number of out-of-school children.

In addition, the growth of employment attracts potential teachers to take non-teaching jobs. The teaching profession in developing countries suffers from low salaries compared to average non-teaching salaries in the labor market. Therefore, when there are many jobs available with higher pay compared to teaching, potential teachers may decide not to join the teaching profession particularly where they need to teach in schools with difficult working environments such as rural locations. Where there are insufficient qualified teachers in a school, there is a probability that pupils would have no education service and would need to be out of school.

Figure 1.1. – Link of Growth of Employment on Educational Agents’ Decision



Cambodia and Laos have high economic growth. In 2013, the gross domestic product (GDP) grew about 7 percent in Cambodia and about 9 percent in Laos. However, both countries have a high number of school dropouts compared to East Asia and Pacific countries (UIS, 2012). In 2011/12, the dropout rates for primary, lower secondary, and upper secondary were 3.7, 20.0, and 10.1 in Cambodia and 7.1, 10.4, and 7.2, in Laos, respectively.

1.2. Objectives

The main objective of this study is to estimate the potential impact of the growth of employment on the out-of-school problem. The specific objectives are:

- A. To estimate the impact of employment growth on out-of-school children
 - A.1. To analyze the effect of employment growth on school dropout
 - A.2. To estimate the effect of employment growth on non-enrollment in school
 - A.3. To distinguish the effect between different genders and ethnicities

- B. To analyze secondary students' preference on jobs' characteristics
 - B.1. To investigate the impact of increasing wages on the probability of secondary students to dropping out of school and taking jobs
 - B.2. To analyze the preference of secondary students by the type and location of jobs
 - B.3. To identify the characteristics of secondary students who are likely to drop out of school and take jobs

- C. To examine the possibility of potential teachers not joining the teaching profession
 - C.1. To measure the preferences of potential teachers in regards to rural location and conditions of classrooms
 - C.2. To estimate the preference of potential teachers for non-teaching jobs
 - C.3. To measure the preference of potential teachers for indirect monetary incentive programs

- C.4. To distinguish the above measurements by characteristics of potential teachers
- C.5. To observe the possibility of potential teachers not joining the teaching profession

1.3. Significance of the study

Many previous studies focused on the impact of employment growth on child labor. The significance of this study is that it investigates the impact of the growth on out-of-school children in developing countries like Cambodia and Laos. Also this study distinguishes the effect of growth on different genders and ethnicities.

Moreover, many studies estimate the effect of the characteristics of jobs on students who have already dropped out from school. This kind of data hinders an analysis of the characteristics of jobs on every student; because some students may have access to different information about the jobs available. In other words, some students who are still in school might want to drop out if they had sufficient information about the job available. This study applies choice experiment to measure value characteristics of those jobs preferred by secondary students.

In valuing the incentives for recruiting potential teachers, this research is a pioneer in applying the choice experiment analysis to measure the characteristics of difficulties facing the teaching profession, the possibility of moving to non-teaching jobs, and non-direct monetary incentives.

1.4. Organization

Chapter two explains the current economic and educational development in Cambodia and Laos. It also includes the situation of school dropout for primary, lower

secondary, and upper secondary in Cambodia and Laos. Chapter three discusses the impact of employment growth on out-of-school children. Chapter four examines the effect of jobs' characteristics on the possibility of secondary students to drop out and work. Chapter five explains the valuation of incentives to recruit potential teachers and shows the possibility that the potential teacher would not join the teaching profession. Chapter six concludes the study.

CHAPTER TWO
EDUCATION DEVELOPMENT AND SCHOOL DROPOUTS
IN CAMBODIA AND LAOS

2.1. Recent economic and education development

2.1.1. Economic development

Cambodia and Laos are located in the center of the Indochina Peninsula. Cambodia has an area of 181,035 square kilometers, a border with Thailand to the West, Laos to the Northeast, Vietnam to the East, and the Gulf of Thailand to the Southwest. Laos has an area of 236,800 square kilometers, a border to Thailand to the West, Myanmar to the Northwest, China to the North, Vietnam to the East, and Cambodia to the South. In 2013, Cambodia and Laos had a population of about 15.1 and 6.7 million, respectively.

Cambodia and Laos have high economic growth. From 2005 to 2013, the annual GDP growth rate of Cambodia was about 7.5 percent and Laos was about 8.2 percent (World Bank, 2015). The high economic growth increased GDP per capita of Cambodia and Laos from 471 USD and 472 USD in 2005 to 1,007 USD and 1,661 USD in 2013, respectively.

In 2013, the share of Cambodian GDP was comprised of 34 percent agricultural sector, 26 percent in the industrial sector, and 40 percent in the service sector. In the same year, Laos had 27 percent in the agricultural sector, 33 percent in the industrial sector, and 40 percent in the service sector (World Bank, 2015). Although the agricultural sector in both countries was less than half of GDP, the majority of the labor force are in the agricultural sector. The proportion of labor in the

agricultural sector to total labor force is about 51.0 percent in Cambodia (ILO, 2015) and 68.4 percent in Laos (NERI, 2013).

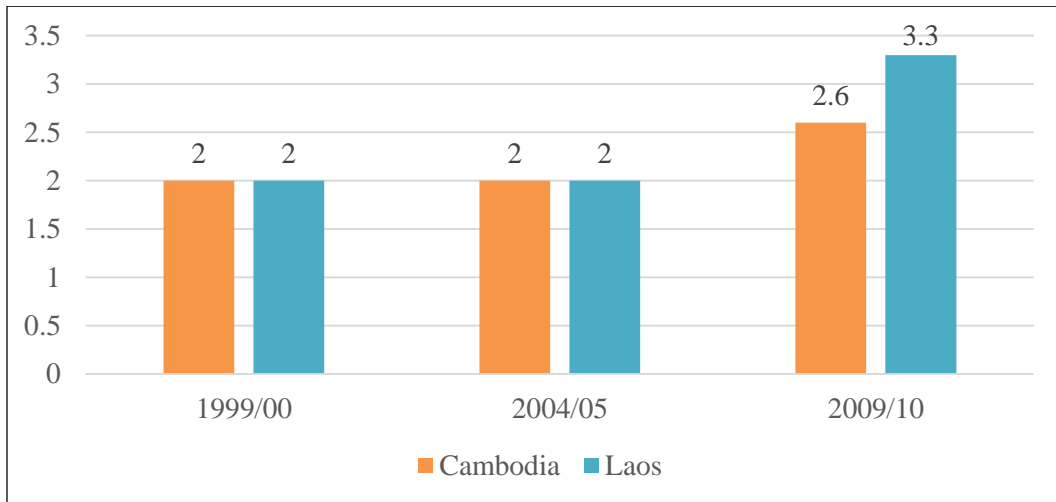
2.1.2. Education development

The Cambodian and Lao educational sectors are in process of development. After the revolution in 1970s, Laos started widespread education development while Cambodia had a later start due to the civil war. The highest administration body of education sector in Cambodia is the Ministry of Education, Youth, and Sport and in Laos is the Ministry of Education and Sports. The next level of administration is the provincial education office, followed by the district education office, and the school.

Figure 2.1 shows the share of GDP of public expenditure on education. From the year 1999/2000 to 2004/05, the share of GDP of public spending on education was about two percent in both Cambodia and Laos. In 2009/10, the share increased in both countries to 2.6 percent in Cambodia and 3.3 percent in Laos (UIS, 2012). In addition, the share of public expenditure on education to total government expenditure is 13.2 percent in Laos. For Cambodia, the education finance is divided into several administrations thus it is difficult to observe as a share of total government expenditure.

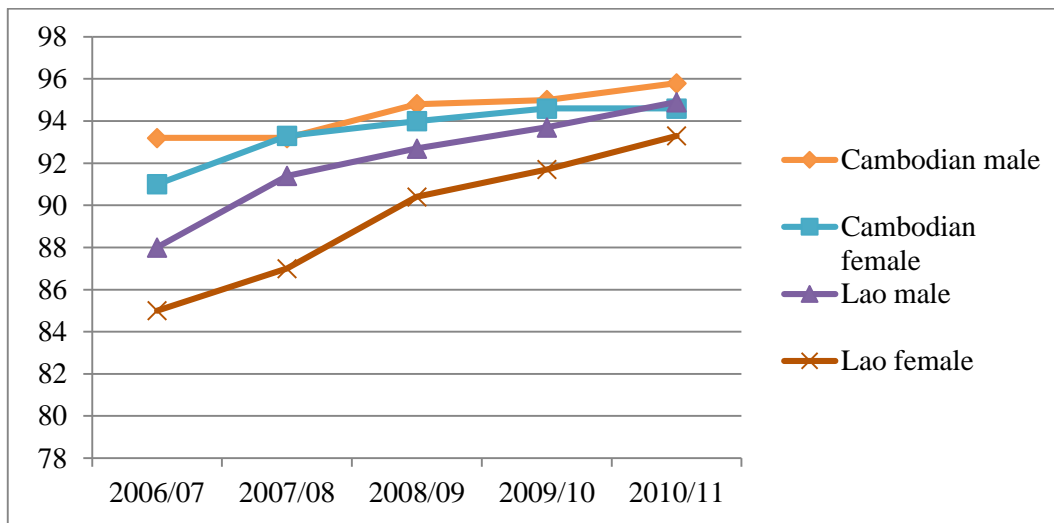
Figure 2.2 shows the net enrolment ratio by gender from 2006/07 to 2010/11 in Cambodia and Laos. Overall, the ratios increased continuously over the period. The ratios in Laos started from a lower level but grew at a higher rate than the ratios in Cambodia. In 2006/07, the net enrollment ratios for male and female were 93.2 percent and 91.0 percent in Cambodia and 88.0 percent and 85.0 percent in Laos. The ratios grew to 95.8 percent and 94.6 percent in Cambodia and 94.9 percent and 93.3 percent in Laos.

Figure 2.1 – Share of GDP of Public Expenditure on Education



Source: UIS, 2012.

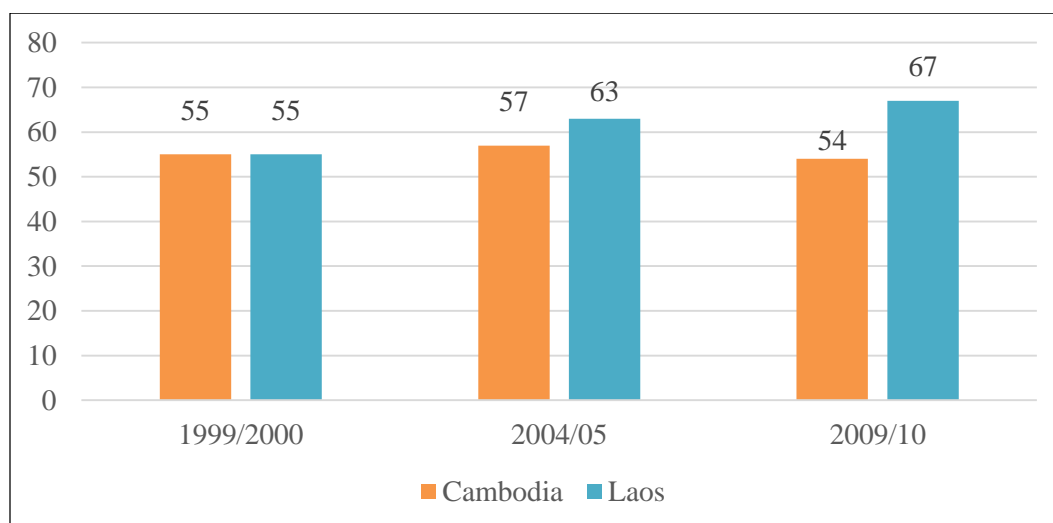
Figure 2.2 – National Net Enrollment Ratio of Primary Level by Gender



Source: Cambodian Ministry of Education, Youth and Sport 2013 and Lao Ministry of Education and Sports 2013.

Although the net enrollment ratios had a high growth, the survival rates are low in both countries. Figure 2.3 shows the primary survival rate from 1999/00 to 2009/10 in Cambodia and Laos. The Cambodian survival rate was 55 percent in 1999/00, 57 percent in 2004/05, and 54 percent in 2009/10. The rate seems to be fairly constant which shows that nearly half of all students do not complete primary education. For Laos, the survival rate increased but following a slow trend. It was 55 percent in 1999/00, 57 percent in 2004/05, and 67 percent in 2009/10. The figure shows that many students did not complete primary level to continue to a higher level of education. The school life expectancy in both countries is in the lowest group when compared to the East Asia and Pacific countries. In 2010, the life expectancy for the primary to lower secondary education, which is netted of repetition, is 8.5 years in Cambodia and 7.5 years in Laos (UIS, 2012).

Figure 2.3 – National Primary Survival Rate to Last grade



Source: UIS, 2012.

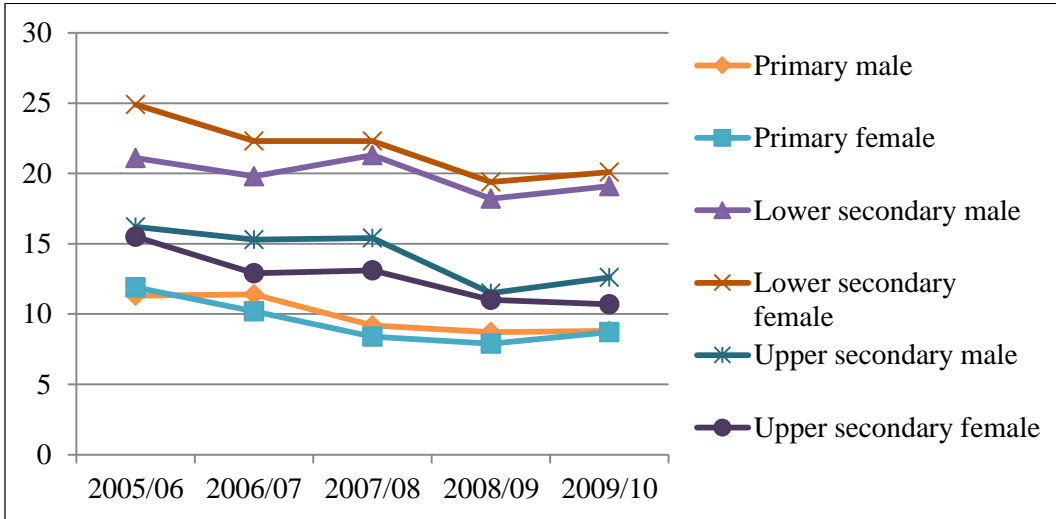
2.2. School dropout

2.2.1. Dropout at national level

Figure 2.2 and 2.3 show the dropout rate in primary, lower secondary and upper secondary education by gender from 2005/06 to 2009/10 in Cambodia and from 2006/07 to 2012/13 in Laos. In Cambodia, the dropout rates in 2005/06 of male and female were 11.3 and 11.9 percent for primary, 21.1 and 24.9 percent for lower secondary, and 16.2 and 15.5 percent for upper secondary level. Beyond that, the dropout rates for male and female decreased to 8.8 and 8.7 percent for primary, 19.1 and 19.9 percent for lower secondary, and 14.2 and 12.6 percent for upper secondary level in 2009/10. In Laos, the dropout rates for male and female were 9.2 and 9.5 percent for primary, 12.3 and 10.6 percent for lower secondary, and 8.2 and 8.5 percent for upper secondary level in 2006/07. In 2012/13, the rates in Laos fell to 6.7 and 6.1 percent for primary, 9.0 and 8.0 for lower secondary, and 8.0 and 7.3 for upper secondary level.

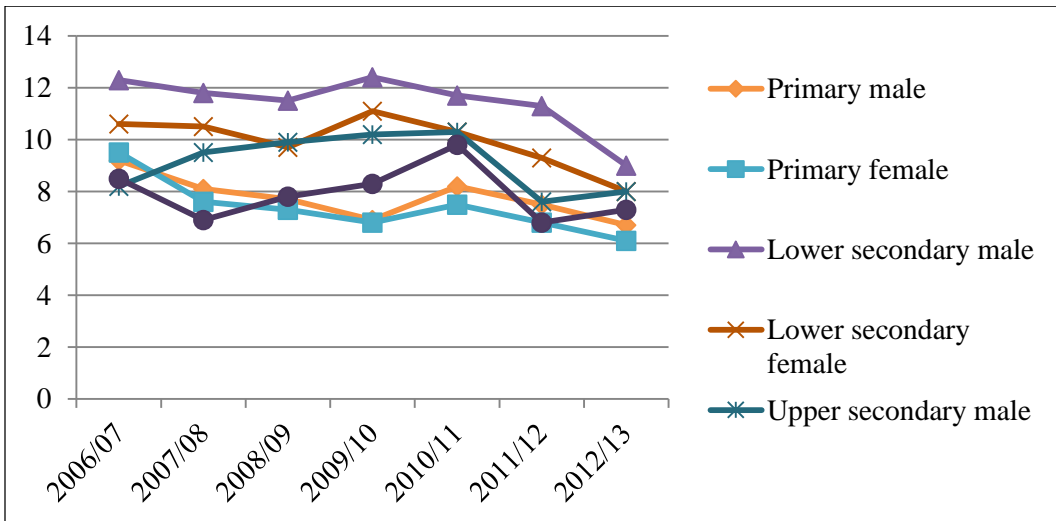
Generally, school dropout rates followed a decreasing trend in both countries. The dropout rates in Cambodia were higher than in Laos in any level of education. The highest dropout rates were in the lower secondary level and the lowest rates were in the primary level. Male dropout rate is higher than female dropout rate in most cases. In Cambodia, the highest dropout rate in 2009/10 was in female lower secondary, followed by male lower secondary, male upper secondary, female upper secondary, male primary, and female primary. In Laos, the highest rate in 2012/13 was male lower secondary, followed by female lower secondary, male upper secondary, female upper secondary, male primary, and female primary.

Figure 2.2 –National Dropout Rate by Level and Gender in Cambodia



Source: Cambodian Ministry of Education, Youth and Sport 2013 and Lao Ministry of Education and Sports 2013.

Figure 2.3 – National Dropout Rate by Level and Gender in Laos



Source: Cambodian Ministry of Education, Youth and Sport 2013 and Lao Ministry of Education and Sports 2013.

2.2.2. Dropout by gender

There is a small difference between male and female dropout rates. Table 2.1 shows the average dropout rate of female and male students by level of education in Cambodia and Laos. The average rate for Cambodia is calculated over 2005/06 to 2009/10 and for Laos is over 2006/07 to 2012/13. The average dropout rates in Cambodia for male and female were 9.9 and 9.4 percent for primary, 20.0 and 21.8 percent for lower secondary, and 14.2 and 12.6 percent for upper secondary in Cambodia. The average dropout rates in Laos for male and female were 7.7 and 7.4 percent for Primary, 11.4 and 10.0 percent for lower secondary, and 9.1 and 8.0 percent for upper secondary level. The male dropout rates were higher than the female dropout rates in every level, except the Cambodian lower secondary.

Table 2.1 – Dropout Rate by Gender

Level of Education	Cambodia		Laos	
	Male	Female	Male	Female
Primary Education	9.9	9.4	7.7	7.4
Lower Secondary Education	20.0	21.8	11.4	10.0
Upper Secondary Education	14.2	12.6	9.1	8.0

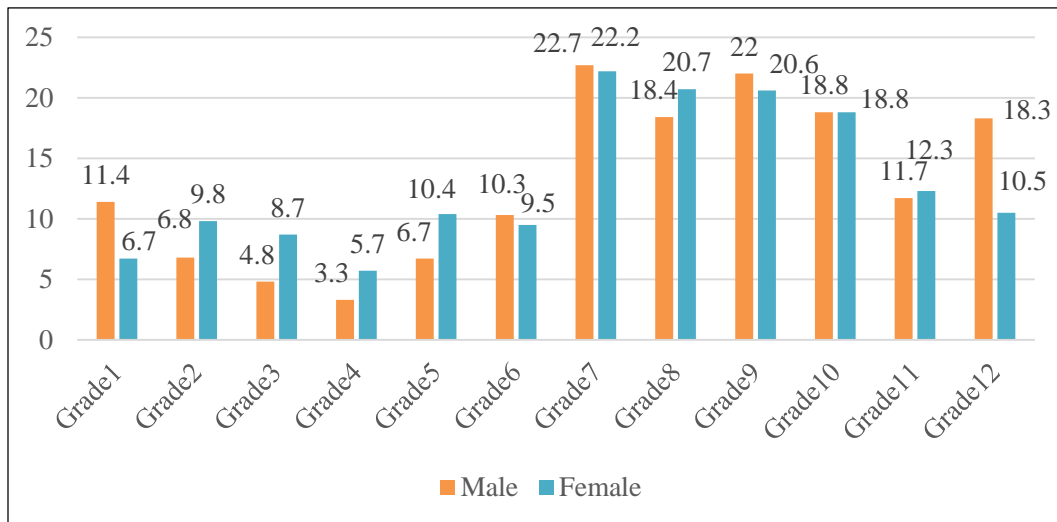
Source: Source: Cambodian Ministry of Education, Youth and Sport 2013 and Lao Ministry of Education and Sports 2013. Note: Cambodian rates are from 2005/06 to 2009/10 and Lao rates are from 2006/07 to 2012/13.

2.2.3. Dropout by grade

Figures 2.4 and 2.5 demonstrate the 2011/12 dropout rates by grade and gender in Cambodia and Laos, respectively. In Cambodia, dropout rates for male and female in primary level (first to sixth grade) fluctuated and did not follow a trend. After grade six, the sharply increased in the first grade of lower secondary level (seventh grade)

which also has the highest rates of all grades (22.7 percent for male and 22.2 percent for female). In the upper secondary level, the rates declined.

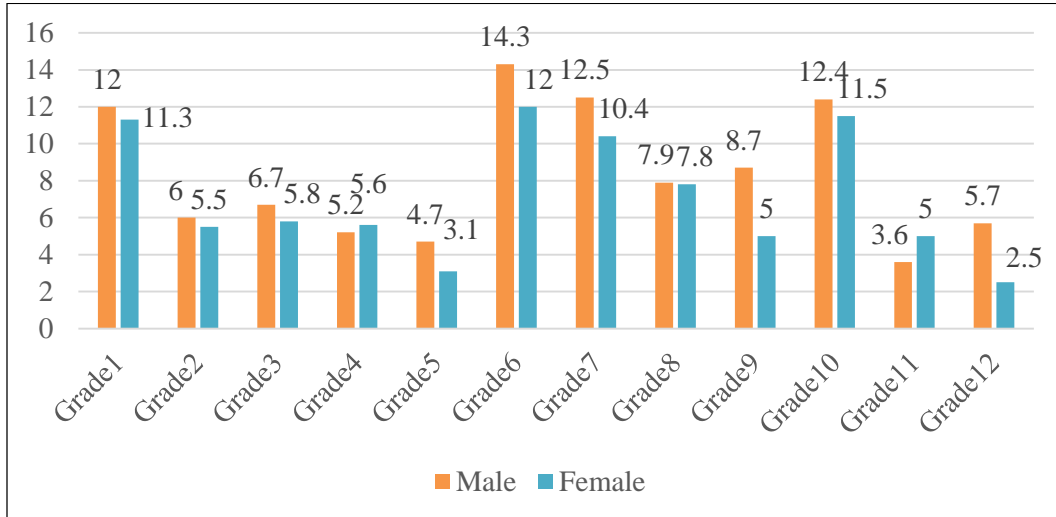
Figure 2.4 – Cambodian Dropout Rate by Grade and Gender in 2011/12



Source: Cambodian Ministry of Education, Youth and Sport 2013 and Lao Ministry of Education and Sports 2013.

In Laos, the dropout rates for male and female were 12.0 and 11.3 percent in the first grade and decreased to 4.7 and 3.1 percent in the fifth grade. Then, the dropout rates markedly increased to the highest point (14.3 percent for male and 12.0 percent for female) in the sixth grade (first grade of lower secondary level) before gradually dropping to the final grade of the lower secondary level. In the first grade of upper secondary level (tenth grade), the dropout rates again jump to a very high level (12.4 percent for male and 11.5 percent for female). In the later grades, the dropout rates decline.

Figure 2.5 – Lao Dropout Rate by Grade and Gender in 2011/12



Source: Cambodian Ministry of Education, Youth and Sport 2013 and Lao Ministry of Education and Sports 2013.

These figures suggest that dropout rates for both male and female pupils were very high in the first grade of each education level (primary, lower secondary, and upper secondary). The possible reasons for the high rates in the first of grade of each education level is that, first, earlier grade contains many students with potential to dropout; thus when students start to dropout, there will be fewer remaining students with the potential dropout. Secondly, students in later grades have a fewer year to complete their education, so they are more likely to stay and complete the level. One more worth noting is that the highest rate for both male and female in both Cambodia and Laos were at the first grade of lower secondary level. This might be because children at the lower secondary level are about 12 years old, an age which is appropriate to start working and earning.

2.2.4. Dropout by province

Table 2.2 and 2.3 report the 2011/12 dropout rate in primary, lower secondary, and upper secondary education at the provincial level in Cambodia and Laos. There are 24 regions (capital city and provinces) in Cambodia and 17 regions in Laos.

The provincial dropout rates varied in each level of education. In Cambodia, the dropout rate at primary level was high in provinces like Koh Kang (18.0 percent), Stung Treng (16.8 percent), and Ratanak Kiri (16.5 percent) while it was low in Kampong Chhang (3.4 percent), Kandal (4.1 percent), and Takeo (4.1 percent). At lower secondary level, the highest rates were in Otdar Meanchey (31.6 percent), Banteay Meanchey (26.6 percent), and Kampong Spue (26.5 percent) and low in Koh Kang (13.5 percent), Phnom Penh (14.9 percent), and Kep (15.2 percent). At upper secondary, Otdar Meanchey had the highest rate of 29.5 percent, followed by Mondul Kiri (26.3 percent) and Pursat (22.0 percent). The dropout rate at upper secondary were low in Phnom Penh (7.1 percent), Preah Vihear (11.4 percent), Takeo (12.8 percent).

In Laos, the provinces with highest dropout rate in primary education were Saravan (15.0 percent), Attapue (11.3 percent), and Sekong (11.0 percent); while the provinces which had low rates were Sayabury (2.1 percent), Vientiane capital (2.4 percent), and Vientiane province (3.5 percent). At lower secondary, the dropout rate was high in Saravan (14.9 percent), Phongsaly (14.6 percent), and Champasak (13.9 percent). In contrast, provinces with a low dropout rate were Vientiane Capital (6.4 percent), Luangnamtha (7.0 percent), and Huaphan (8.0 percent). For upper secondary level, the dropout rate in every province was less than 10 percent. The highest rate was in provinces such as Savannakhet (9.7 percent), Khammouan (9.0 percent), Saravan (8.9 percent). Conversely, provinces with lowest rate were Phongsaly (2.5), Sekong (3.7 percent), Sayaboury (4.9 percent).

Table 2.2 – Dropout Rates by Cambodian Provinces in 2011/12

Province	Primary	Lower secondary	Upper secondary
Banteay meanchey	9.2	26.6	19.7
Battambang	8.7	22.9	21.7
Kampong cham	7.6	23.7	15.6
Kampong chhang	3.4	20.9	17.2
Kampong speu	9.2	26.5	21.0
Kampong thom	8.7	24.6	13.0
Kampot	6.7	18.9	15.3
Kandal	4.1	17.8	13.7
Kep	5.2	15.2	20.6
Koh kong	18.0	13.5	15.7
Kratie	9.9	18.8	15.9
Mondul kiri	12.1	24.8	26.3
Otdar meanchey	11.8	31.6	29.5
Pailin	10.1	15.3	13.6
Phnom penh	5.5	14.9	7.1
Preah sihanouk	11.1	18.8	11.4
Preah vihear	10.1	17.9	19.0
Prey veng	6.5	24.5	18.7
Pursat	8.7	21.4	22.0
Ratanak kiri	16.5	19.5	13.1
Siemreap	9.7	20.4	17.4
Stung treng	16.8	16.8	15.0
Svay rieng	5.0	24.3	15.5
Takeo	4.1	18.3	12.8

Source: Cambodian Ministry of Education, Youth and Sport 2013.

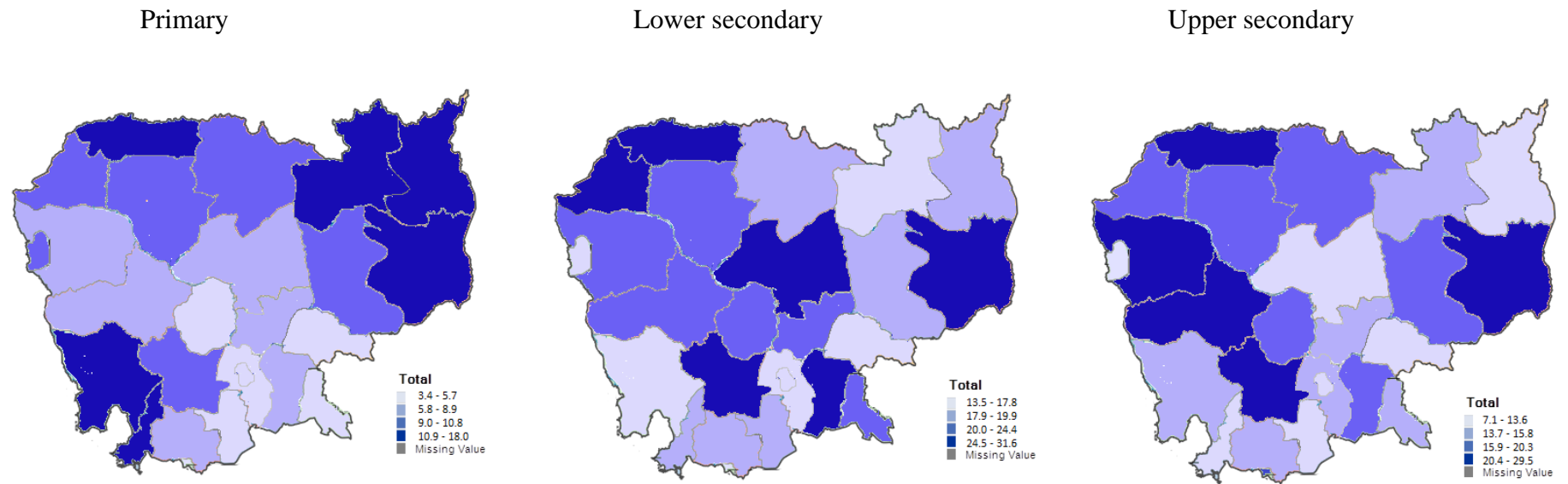
Table 2.3 – Dropout Rates by Lao Provinces in 2011/12

Province	Primary	Lower secondary	Upper secondary
Attapeu	11.3	12.4	7.0
Bokeo	5.0	8.2	7.3
Borikhamxay	4.2	11.3	8.8
Champasak	8.3	13.9	7.4
Houaphan	6.2	8.0	6.5
Khammouan	6.5	13.4	9.0
Luangnamtha	5.4	7.0	6.8
Luangprabang	6.5	10.9	5.8
Oudomxay	10.1	9.0	5.7
Phongsaly	10.0	14.6	2.5
Saravan	15.0	14.9	8.9
Savannakhet	9.7	13.3	9.7
Sayaboury	2.1	8.8	4.9
Sekong	11.0	8.5	3.7
Vientiane Capital	2.4	6.4	6.3
Vientiane	3.5	9.9	8.2
Xiengkhoang	3.9	8.6	7.7

Source: Lao Ministry of Education and Sports 2013.

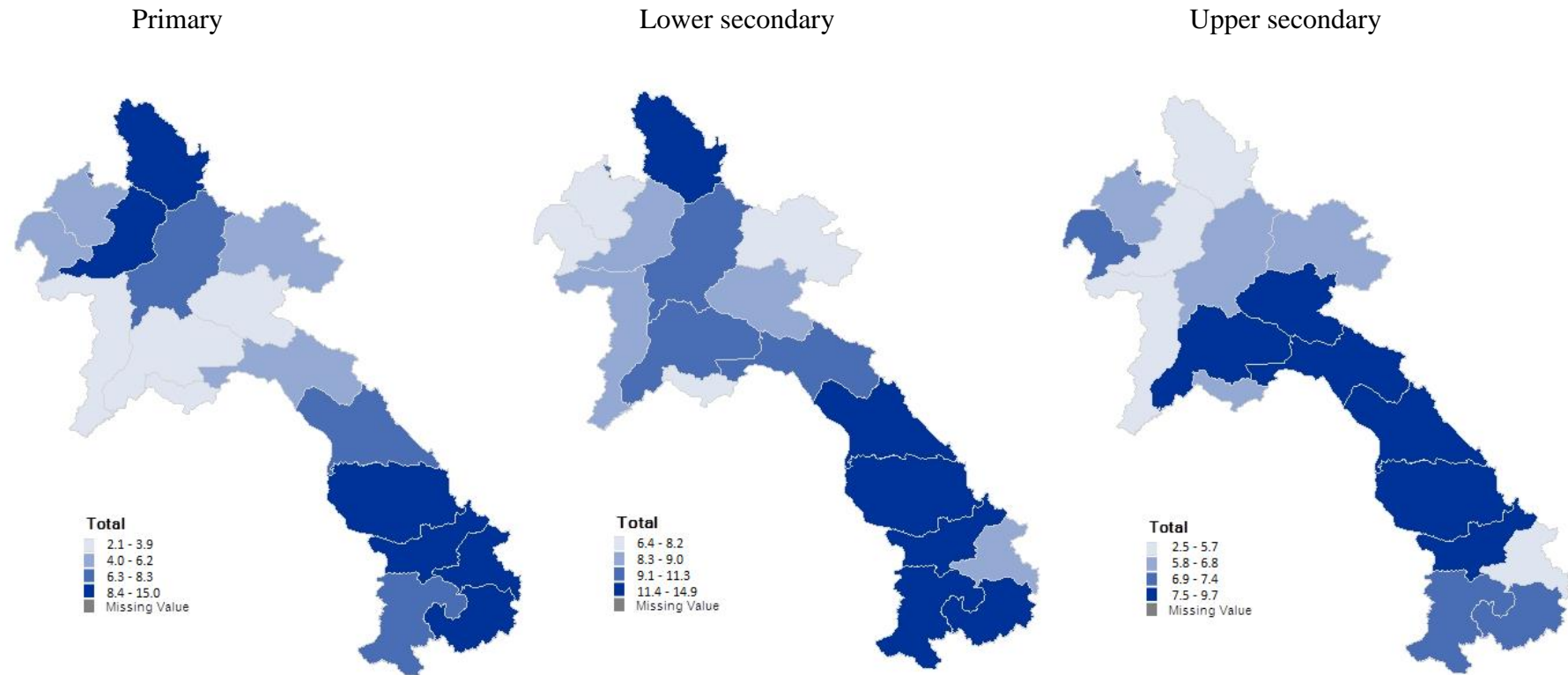
Figure 2.6 and 2.7 are maps of the dropout rates of primary, lower secondary, and upper secondary in 2011/12 in Cambodia and Laos, respectively. The figures show how the dropout rates were distributed at the provincial level. At the primary level in Cambodia, the center and southeast parts of the country had lower dropout rates. For lower and upper secondary levels, the high dropout rates were not in one particular part of the country. In Laos, the primary dropout rate was high in northern and southern provinces, while at lower secondary level, some northern provinces and many southern provinces had a high dropout rate. The dropout rate for upper secondary level was high in the central provinces.

Figure 2.6 – Dropout Rate by Province and Educational Level in Cambodia, 2011/12



Source: Source: Cambodian Ministry of Education, Youth and Sport 2013.

Figure 2.7 – Dropout Rate by Province and Educational Level in Laos, 2011/12



Source: Lao Ministry of Education and Sports 2013.

CHAPTER THREE

THE EFFECT OF EMPLOYMENT GROWTH ON OUT-OF-SCHOOL CHILDREN IN CAMBODIA AND LAOS

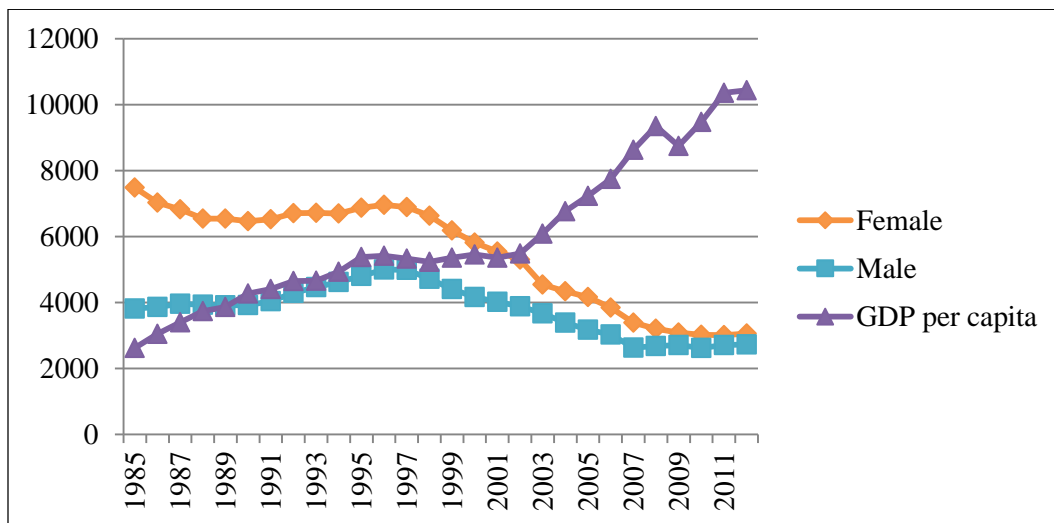
3.1. Introduction

Growth of employment in labor market increases job opportunities and the level of wages. The growth is expected to reduce the number of out-of-school children. More jobs and higher wage levels increase income and economic resources of households which are believed to support school enrolment and study performance of children (Mariara and Mwabu, 2007; Fehrmann, 1987; Barnard, 2004; Kim and Sherraden, 2011; and Nam and Huang, 2009). Figure 3.1 shows the number of out of primary school children and gross domestic product (GDP) per capita globally. As GDP per capita increases, the number of out-of-school children decreases. The figure shows a potential negative relationship of the GDP per capita to the out-of-school children.

However, most research and historical evidence seems to suggest the opposite effect. The growth of employment is a potential cause for increasing child labor which consequently increases number of out-of-school children. Heywoods (1988) states that the beginning of industrialization raised the number of child workers in United Kingdom. Swaminathan (1998) also found that child labor increases in several fast growing regions of India. In developing countries, when there are more job available, particularly in economic sectors which require low skill labor such as agriculture and basic service, households might directly send children to work as an additional income source. Also, although adults take the available jobs for themselves, children might be made to stay at home to look after farming or take care of some family members

(Kak, 2004; Kambhampati and Rajan, 2005). Both situations show the potential effect of employment growth on the number of out-of-school children.

Figure 3.1 – World Out-of-School Children in Primary by Gender and GDP per capita



Source: World Bank Data, 2015. Note: Out of primary school children is in 10,000 people and GDP per capita is in current USD.

Moreover, although some children can work and study at the same time, there is high chance that they will drop out from school. For example, students might skip class during harvesting season to help on a family farm or to work and earn an extra money on other farms. Stopping going to school for a period often leads to school dropout (UCW, 2010; Adamssie, 2003; McNeal, 1997).

Currently, Cambodia and Laos have high growth of employment, but face a high number of out-of-school children. In 2013, the economic grew by 7 percent in Cambodia and 9 percent in Laos (World Bank, 2015). The number of out-of-school children and school dropouts in both countries are among the highest in the East Asia

Pacific countries as shown in the appendix 3.1. This shows the possibility that growth reduces the number of children in schools in these countries.

Previous research focused on the effect of employment growth on increasing child labor. However, it is rare to see studies which focus on the effect of growth on out-of-school children, or in other words, on school dropout and non-enrollment in school. Thus, the objectives of this study are:

- a. To analyze the effect of employment growth on school dropout
- b. To estimate the effect of employment growth on non-enrollment in school
- c. To distinguish the effect between different genders and ethnicity

Section 3.2 will describe the situation of out-of-school children and child labor in Cambodia and Laos. The literature review is in Section 3.3. An analytical framework and econometric specification are explained in Section 3.4. Section 3.5 is a description of the data. Section 3.6 discusses the findings and Section 3.7 concludes the research.

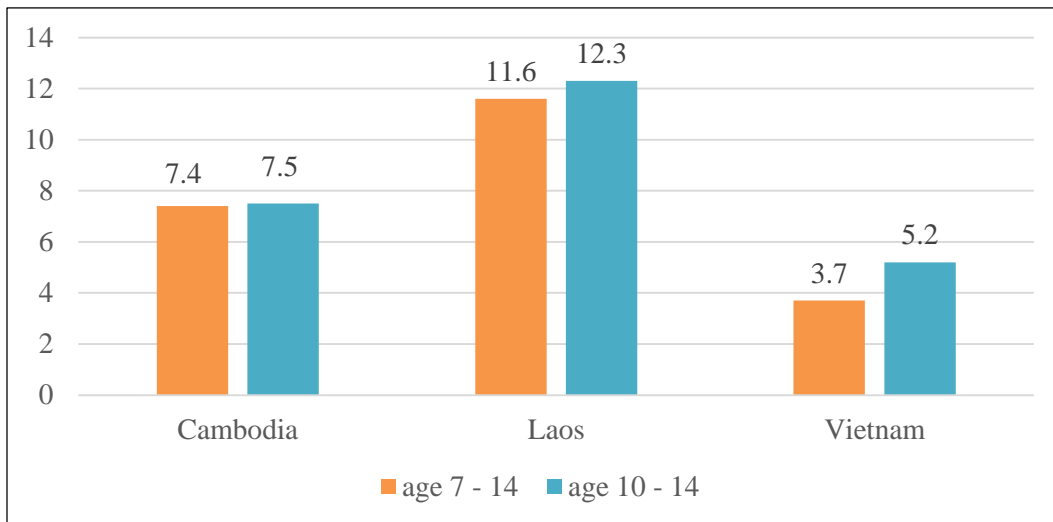
3.2. The situation of out-of-school children and child labor in Cambodia and Laos

3.2.1. Out-of-school children

The proportion of out-of-school children in Cambodia and Laos is high. A report from the Understanding Children's Work program shows a significant number of out-of-school children in South East Asian countries (UCW, 2014). Figure 3.2 illustrates the ratio of the out-of-school children in Cambodia, Laos, and Vietnam. Laos has the highest rate in both the 7 to 14 year old group (11.6 percent) and the 10

to 14 year old group (12.3 percent). The rates are 7.4 and 7.5 percent in Cambodia, and 3.7 and 5.2 percent in Vietnam respectively.

Figure 3.2 – Percentage of Out-of-school Children



Source: Based on UCW, 2014.

Figure 3.3 – Percentage of Children Out-of-school for Work



Source: Based on UCW, 2014.

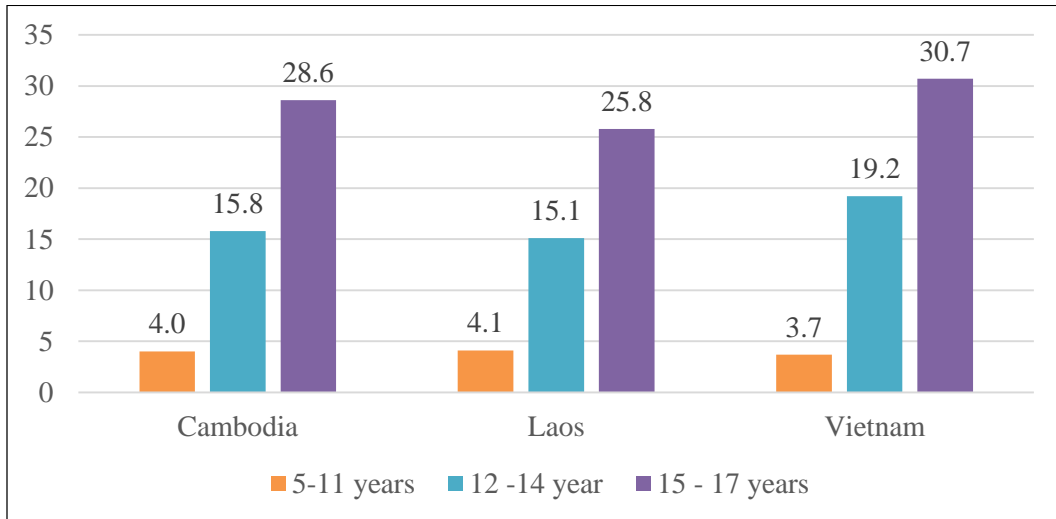
Moreover, Laos also has the highest share of out-of-school children for employment purposes. As shown in Figure 3.3, children who need to be out-of-school because of work are 82.1 percent in Laos, 48.0 percent in Cambodia, and 61.5 percent in Vietnam. Both Figures 3.2 and 3.3 suggest that children in Laos have a high probability to be out-of-school and particularly for employment reasons.

3.2.2. Child labor by age, gender, and residence

Figure 3.4 illustrates the percentage of employed children according to their age in Cambodia, Laos, and Vietnam. The figure shows that the percentage of working children increases as age increases. The percentage for 5 to 11 year old children (primary school age) is 4.0 percent in Cambodia, 4.1 percent in Laos, and 3.7 percent in Vietnam. When children reach the age of 12 to 14 year old (lower secondary school age), the percentage increases to 15.8 percent in Cambodia, 15.1 percent in Laos, and 19.2 percent in Vietnam. Finally, for children 15 to 17 year old (upper secondary school age), the percentage is 28.6 percent in Cambodia, 25.8 percent in Laos, 30.7 percent in Vietnam. The percentages in each aged group are slightly different among countries.

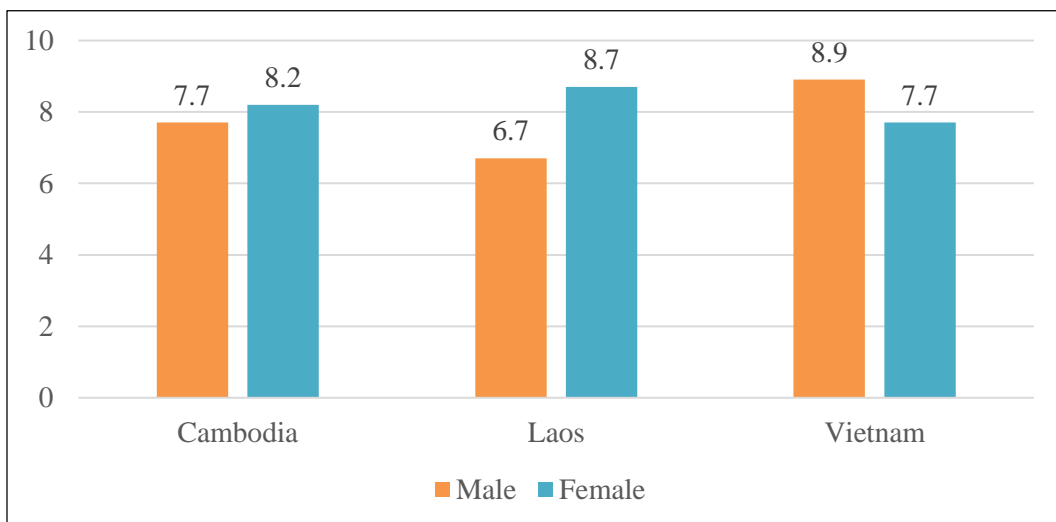
Figure 3.5 and 3.6 shows the percentage of 5 to 14 year old children in employment by gender and residence, respectively. The percentage of female children in work is higher than the percentage of male children in Cambodia and Laos, but the male making percentage is higher than the female percentage in Vietnam. The percentage for male children in Cambodia, Laos, and Vietnam are 7.7, 6.7, and 8.9 percent, respectively; while the percentage for female children is 8.2, 8.7, and 7.7 percent, respectively.

Figure 3.4 – Percentage of Children in Employment to Total Aged Group



Source: Based on UCW, 2014.

Figure 3.5 – Percentage of 5 to 14 Year old Children in Employment by Gender



Source: Based on UCW, 2014.

By residence, in rural areas, there is a higher percentage of working children compared to urban areas in every country. The percentage of working children in urban areas is 4.2 in Cambodia, 2.2 in Laos, and 3.4 in Vietnam; and for rural areas, the percentage is 8.9, 9.2, and 10.3 percent in Cambodia, Laos, and Vietnam, respectively.

Figure 3.6 – Percentage of 5 to 14 Year old Children in Employment by Residence



Source: Based on UCW, 2014.

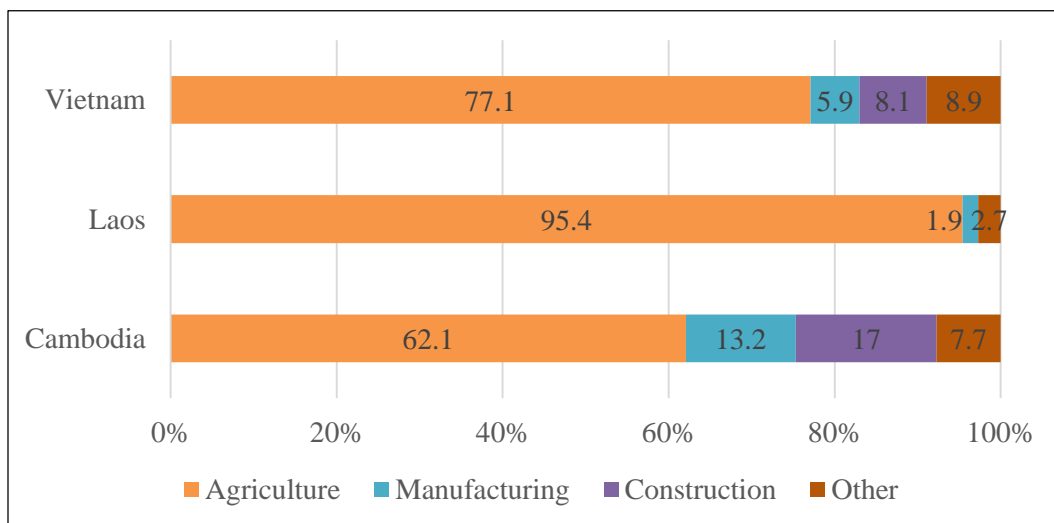
3.2.3. Sector and status of child employment

Child labor is employed in several unskilled activities. The share between employment sectors for 5 to 14 year old children is shown in Figure 3.7. Generally, most child labor is involved in agricultural work. Among the three countries, Laos has the highest share of children working in the agricultural sector (95.4 percent); followed by Vietnam (77.1 percent) and Cambodia (62.1 percent). The high share of agricultural work in Laos leaves a 1.9 percent in manufacturing and 2.7 percent in

other types of work. In Cambodia, the second highest share is in construction (17.7 percent) followed by the manufacturing (13.2 percent) and other work (7.7 percent). For Vietnam, the share in manufacturing is 5.9 percent, construction 8.1 percent, and other work 8.9 percent.

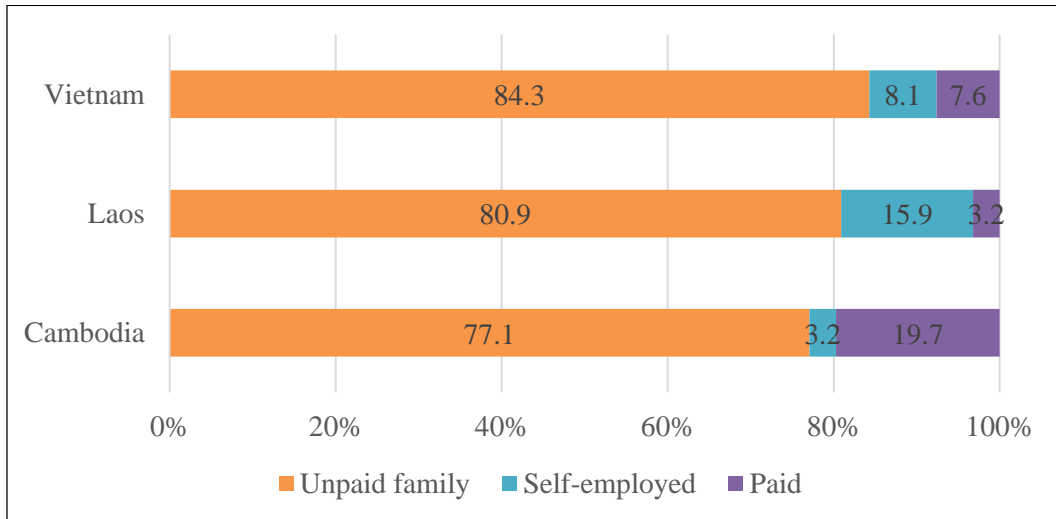
Many children work as unpaid labor for their families. Figure 3.8 shows the working status of 5 to 14 year old children. In Cambodia, the share of unpaid family employment is 77.1 percent, self-employment is 3.2 percent, and for paid jobs is 19.7 percent. For Laos, unpaid employment is 80.9 percent, self-employment is 15.9 percent, and paid job is 3.2 percent. For Vietnam, the unpaid family share is 84.3 percent, self-employment is 8.1 percent, and paid job is 7.6 percent.

Figure 3.7 – Percentage by Economic Sector of 5 to 14 Year Old Children’s Employment



Source: Based on UCW, 2014.

Figure 3.8 – Percentage of Status of 5 to 14 Year Old Children’s Employment



Source: Based on UCW, 2014.

3.3. Literature review

The direct effect of employment growth on the out-of-school children is caused by increasing of child labor. Many studies investigate factors that determine increase in child labor. The factors influencing child labor can be divided into demand and supply sides. The demand side factors are the employment situation in the labor market, while the supply side factors are things such as household economic condition, school service, etc. The growth of employment can influence both supply and demand factors.

When the economy grows, businesses expand their production by investing more capital and recruiting more labor. In minimizing the cost of production, businesses are likely to hire cheap labor; and if the available jobs are for unskilled labor, then there is the possibility that children will be employed. A study by Heywood (1988) states that there is a significant increase in child labor in the period of

industrialization. However, since adults also participate and earn more; the incidence of child labor declines in later periods (Horrell and Humphries, 1995). Swaminathan (1998) shows increasing child labor in the fast growing regions of India. Kambhampati and Rajan (2006) also investigate the effect of employment growth on child labor in India. They found that a higher level of average village wage and regional domestic production decreases child labor, however a higher share of agricultural production increases the probability of child labor.

The growth of employment also increases the effect of supply side factors. When the benefits from available jobs increases, the opportunity cost of schooling for children also increases. As the opportunity cost increases, children from poor households might drop out from school to go to work. Poverty is a major factor that drives child labor (Basu and Van, 1998). In addition, the high cost of schooling lowers the probability of children to enrolling in school, especially children from poor households (Kitaura, 2009; Hunt, 2008; Hammond et al., 2007; Sabates et al., 2010). Moreover, students are more likely to drop out from school if it is difficult to access a school, for example students who need to travel long distances with poor roads condition in rural areas (Hunt, 2008; Sabates et al., 2010).

The indirect effect of employment growth on out-of-school children is when children need to be substituted for adult labor, for example when children need to drop out from school to take over household works from adults (Kak, 2004). When there are jobs available in places like factories, adults are likely to take these jobs rather than children (Bhalotra and Heady, 2003; Lieten, 2002). Furthermore, parents who have their own businesses are likely to make their children work (Edmonds and Turk, 2004).

3.4. Methodology

3.4.1. Analytical framework

A household decision to send a child to school is dependent on the expected return from the child's human capital and the cost of schooling. From a study by Gertler and Glewwe (1990), the expected household utility conditional on a decision to send a child to school is as:

$$[3.1] \quad U_1 = U(S_1, C_1) + \varepsilon_1$$

where S_1 is an increment human capital of the child from another year of schooling, C_1 is a consumption possible after incurring of the cost of schooling. The cost of schooling includes both direct and indirect costs. The direct costs consists of school tuition fee, transportation, etc. The indirect costs includes forgone possible income from child labor when the child is in school. ε is a random taste shifter.

In the opposite case, the expected utility of household which does not send the child to school would be:

$$[3.2] \quad U_0 = U(C_0) + \varepsilon_0$$

where C_0 is the consumption possible without incurring the cost of schooling. The budget constraint of the expected utility function is

$$[3.3] \quad C_1 + P = C_0 = Y,$$

where P is the total cost for sending the child to school and Y is a total household disposable income. From equation [3.1] and [3.2], the unconditional utility maximization problem is as

$$[3.4] \quad U^* = \max(U_0, U_1)$$

where U^* is the maximized utility. From the maximization problem, if the expected utility from sending the child to school is higher than the expected utility of not sending the child to school, then household would keep the child in school. And when the expected utility of not sending the child to school is greater than the utility of sending the child to school, the household would keep the child out of school (Gertler and Glewwe, 1990).

The growth of economic sectors that require unskilled labor increases the indirect cost, which is the forgone income for sending the child to school and substituted labor for household work. When the indirect cost is high, the expected utility of not sending the child to school is likely to exceed the expected utility of sending the child to school. Therefore, the child is dropped from or never enrolled in school.

3.4.2. Econometric equation

For utility maximization, households must select whether to send a child to school or not. In discrete choice analysis, if one alternative is chosen, then the utility is maximized. The relevant factors that influence the probability of selecting the alternatives are stated in an econometric equation below:

$$[3.5] \quad P(OS_j=1) = f(\text{Female, Khmer/Lao, HHeducation, HHincome, HHchild,} \\ \text{P-income, P-agriculture, P-service})$$

where *OS* is a binary variable that indicates whether a school age child is in or out of school. As mentioned, the effect of employment growth can be direct and/or indirect on out-of-school children; thus, the dependent variable specifies children who are in or out of school, regardless of whether they are working.

Table 3.1 shows the definition and measurement of variables of equation [3.5]. There are two types of the dependent variable ($j = 1, 2$). The first type is the school dropout which is equal to one if an individual child had enrolled in school but later dropped out, and zero for otherwise. The second type is whether the child has ever enrolled in school. It is equal to one if the child has never enrolled in school and zero for otherwise. The independent variables are a binary variable, thus the equation [3.5] is estimated by logit model (the maximum likelihood estimation). The coefficients from the estimation are reported in the average marginal effect form.

Table 3.1 – Definition and Hypothesized Sign of Variables

Variables	Definition and measurement	Hypothesized sign
Dependent variables		
<i>Dropout</i>	1 = dropped out from school, 0 = otherwise.	
<i>Non-enrollment</i>	1 = never enrolled in school, 0 = otherwise.	
Independent variables		
<i>Female</i>	1 = female, 0 = otherwise.	+
<i>Khmer/Lao</i>	1 = Khmer in Cambodia/Lao in Laos, 0 = otherwise.	-
<i>HHEducation</i>	Education year of head of household.	-
<i>HHincome</i>	Logarithm form of household expenditure per capita.	-
<i>HHchild</i>	Number of school age children in family.	+
<i>P-income</i>	Logarithm form of 2011 provincial sale in Cambodia and 2012 estimated provincial GDP in Laos.	-
<i>P-agriculture</i>	Logarithm form of provincial rice product.	+
<i>P-service</i>	Logarithm form of provincial service building.	+

Table 3.1 also explains a hypothesized sign of the independent variables. *Female* and *Khmer/Lao* are variables which indicate female gender and whether a child is from the ethnic majority. Female children are expected to have higher probability to be out of school; while ethnic majority children (Khmer for Cambodia and Lao for Laos) are hypothesized to have a lower possibility to be out of school. *HHEducation*, *HHincome*, and *HHchild* variables are the head of household's education, household income level, and the number of school aged children in a household, respectively. They are used to control household socio-economic status. *HHEducation* is expected to have a negative effect on the out-of-school children because a head of household with high education level seems to understand the importance of education and support his or her child's education. Also, *HHincome* is supposed to reduce the probability of a child being out of school, because when household income increases, the educational resource for child's education is expected to increase to support a child in school. In practice, household expenditure per capita is used as a proxy of the household income. An increasing number of school aged children in household (*HHchild*) is hypothesized to lower the probability of a child enrolling in school, because households face budget constraints in sending many children to school, and would select only some children to enter in schools.

P-income is the provincial general income level, *P-agriculture* is the provincial agricultural production level, and *P-service* is the provincial service production level. *P-income* is used to represent the level of development of the province such as infrastructure and provision of education, thus *P-income* is expected to reduce the number of out-of-school children. On the other hand, *P-agriculture* and *P-service* represent the demand for unskilled labor. When the production of both sectors grows, there is a higher likelihood of children being out of school.

There is no precise published data of the provincial income and sectorial production levels in both countries. Therefore, this study uses proxy variables for them. The *P-income* variable is the sales volume of the industrial sector in Cambodia and the estimated provincial GDP in Laos. The estimated regional GDP is predicted from provincial consumption level. A detail of prediction is shown in an appendix 3.2. Annual rice production is the proxy for the agricultural production (*P-agriculture*) in both countries. Rice is the main food in both countries which potentially has a high share in agricultural production, thus rice production is taken as a proxy for agricultural production. *P-service* is the number of new building for service business in the Cambodian case and the stock of buildings for service business in the Lao case. An increase in the number of buildings for service business potentially show an expansion in service production.

3.5. Data

The unit of analysis is an individual level of children who have school age from six to eighteen years old (primary to secondary education). The sample is from household surveys; the Cambodia Socio-Economic Survey 2012 and the Lao Expenditure and Consumption Survey 2012. Both of them are the largest household surveys of the year. They are conducted by the Cambodian National Institute of Statistics and the Lao Statistics Bureau.

The provincial level indicators are from the 2012 statistic year book for the Lao case. However, the latest published statistic year book for the Cambodia case is for year 2011. Therefore, provincial variables for Laos are from 2012, while for Cambodia, the *P-income* is from 2011 and *P-agriculture* and *P-service* are from 2010. The sales volume of the industry sector is from the 2011 National Economic Census.

Data description shows in Table 3.2. The percentage of school dropout is higher than non-enrollment. The percentage of children who dropped out from school is about 16 percent in Cambodia and 14 percent in Laos, while the percentage of children who never enrolled in school is about 5 percent in Cambodia and 8 percent in Laos. The female sample size is about half of the total sample in both countries. Of Cambodian children, a high 96 percent have Khmer ethnicity; whereas, Lao ethnicity children make up 43 percent in the Lao data.

Table 3.2 – Data Description

Variables	Cambodia		Laos	
	Mean	Std. Dev.	Mean	Std. Dev.
Dependent variables				
<i>Dropout</i>	0.16	0.37	0.14	0.35
<i>Neverenrol</i>	0.05	0.23	0.08	0.28
Independent variables				
<i>Female</i>	0.50	0.50	0.49	0.50
<i>Khmer/Lao</i>	0.96	0.18	0.43	0.49
<i>HHeducation</i>	5.30	3.89	3.77	4.15
<i>HHincome</i>	12.99	0.81	11.02	1.77
<i>HHchild</i>	2.45	1.16	3.01	1.54
<i>P-income</i>	6.19	1.36	10.50	1.04
<i>P-agriculture</i>	5.46	1.52	4.93	0.98
<i>P-service</i>	3.41	3.54	5.15	0.73

3.6. Results and discussion

Table 3.3 and 3.4 show the results of the determinants of school dropout and non-enrollment respectively. The coefficients are in the average marginal effect form. In each table, there are five columns for each country.

Table 3.3 – Result of School Dropout

Variables	Cambodia					Laos				
	Total	Female	Male	Khmer	Non-Khmer	Total	Female	Male	Lao	Non-Lao
<i>Female</i>	-0.007 (-0.692)			-0.006 (-0.550)	-0.037 (-0.773)	0.033*** (4.643)			0.019* (1.870)	0.044*** (4.522)
<i>Khmer/Lao</i>	0.032 (1.342)	0.048 (1.582)	0.014 (0.386)			-0.009 (-1.050)	-0.028** (-2.070)	0.008 (0.676)		
<i>HHEducation</i>	-0.012*** (-7.388)	-0.013*** (-5.624)	-0.011*** (-4.794)	-0.013*** (-7.807)	0.009 (0.928)	-0.008*** (-7.179)	-0.007*** (-4.630)	-0.008*** (-5.662)	-0.009*** (-6.367)	-0.005*** (-3.161)
<i>HHincome</i>	-0.033*** (-4.254)	-0.033*** (-3.103)	-0.033*** (-2.964)	-0.031*** (-3.961)	-0.126*** (-3.206)	-0.004* (-1.702)	-0.004 (-1.297)	-0.003 (-1.017)	-0.012*** (-4.006)	0.004 (1.351)
<i>HHchild</i>	-0.006 (-1.311)	-0.007 (-1.145)	-0.005 (-0.736)	-0.004 (-0.916)	-0.012 (-0.586)	0.000 (0.186)	-0.004 (-0.974)	0.004 (1.340)	0.002 (0.476)	0.000 (0.138)
<i>P-income</i>	0.003 (0.715)	-0.004 (-0.680)	0.012* (1.692)	-0.001 (-0.111)	0.138*** (3.651)	-0.043*** (-5.209)	-0.037*** (-3.025)	-0.048*** (-4.398)	-0.037*** (-3.069)	-0.032** (-2.537)
<i>P-agriculture</i>	0.011*** (2.636)	0.010* (1.729)	0.012** (1.998)	0.008* (1.905)	0.061*** (3.256)	0.044*** (7.550)	0.047*** (5.273)	0.042*** (5.467)	0.053*** (5.973)	0.031*** (3.898)
<i>P-service</i>	0.003* (1.827)	0.000 (0.173)	0.005** (2.355)	0.003** (1.971)	0.027** (2.153)	0.017** (2.120)	0.005 (0.415)	0.028*** (2.697)	-0.006 (-0.413)	0.023** (2.321)
Pseudo R ²	0.03	0.04	0.03	0.04	0.17	0.02	0.01	0.02	0.04	0.01
Log likelihood	-2060	-1003	-1053	-1980	-63	-3389	-1818	-1566	-1411	-1960
Observations	4,720	2,360	2,360	4,555	165	8,654	4,304	4,350	3,747	4,907

Note: Reported parameters are in average marginal effect, z-statistics in parentheses, and *** p<0.01, ** p<0.05, * p<0.1.

Table 3.4 – Result of Non-Enrollment in School

Variables	Cambodia					Laos				
	Total	Female	Male	Khmer	Non-Khmer	Total	Female	Male	Lao	Non-Lao
<i>Female</i>	0.002 (0.402)			0.006 (1.092)	-0.117** (-2.092)	0.011*** (2.941)			-0.009** (-2.110)	0.031*** (4.363)
<i>Khmer/Lao</i>	-0.056*** (-2.762)	-0.014 (-0.643)	-0.101*** (-2.827)			-0.051*** (-10.004)	-0.062*** (-8.176)	-0.040*** (-5.899)		
<i>HHEducation</i>	-0.001 (-1.430)	-0.002 (-1.437)	-0.001 (-0.564)	-0.001 (-1.191)	-0.008 (-0.525)	-0.010*** (-13.130)	-0.009*** (-8.608)	-0.010*** (-9.966)	-0.002*** (-3.557)	-0.021*** (-12.798)
<i>HHincome</i>	-0.038*** (-9.698)	-0.039*** (-6.961)	-0.036*** (-6.641)	-0.036*** (-9.452)	-0.100** (-2.217)	-0.002** (-2.000)	-0.003* (-1.852)	-0.001 (-0.906)	-0.001 (-0.803)	-0.004* (-1.724)
<i>HHchild</i>	-0.001 (-0.402)	-0.003 (-0.946)	0.001 (0.346)	-0.003 (-1.112)	0.028 (1.521)	0.004*** (3.387)	0.006*** (3.655)	0.002 (1.033)	0.001 (0.963)	0.007*** (3.209)
<i>P-income</i>	0.001 (0.579)	0.003 (0.862)	-0.000 (-0.092)	0.001 (0.575)	0.025 (0.593)	-0.033*** (-6.743)	-0.047*** (-6.821)	-0.017** (-2.474)	-0.003 (-0.565)	-0.064*** (-6.517)
<i>P-agriculture</i>	-0.000 (-0.012)	-0.000 (-0.035)	0.000 (0.062)	0.001 (0.599)	-0.029 (-1.168)	0.029*** (9.072)	0.029*** (6.538)	0.027*** (6.249)	0.021*** (5.517)	0.048*** (8.055)
<i>P-service</i>	-0.001 (-1.438)	-0.001 (-0.871)	-0.001 (-1.190)	-0.001 (-1.547)	-0.000 (-0.003)	0.011*** (2.866)	0.023*** (4.262)	-0.003 (-0.477)	-0.016** (-2.366)	0.026*** (3.617)
Pseudo R ²	0.07	0.06	0.09	0.06	0.13	0.10	0.13	0.09	0.07	0.08
Log likelihood	-978	-494	-481	-904	-67	-2050	-1060	-972	-487	-1533
Observations	4,720	2,360	2,360	4,555	165	8,654	4,304	4,350	3,747	4,907

Note: Reported parameters are in average marginal effect, z-statistics in parentheses, and *** p<0.01, ** p<0.05, * p<0.1.

The first column is the result from the total sample, followed by a breakdown into female, male, major ethnicity, and non-major ethnicity. The Pseudo R-squared, log likelihood, and number of observations are presented at the bottom of the tables. In general, the Pseudo R-squared in the dropout estimation is about three percent for both countries, except the non-Khmer ethnicity case which is 17 percent. For non-enrollment estimation, the Pseudo R-squared is from 6 to 13 percent.

3.6.1. School dropout

In Table 3.3, *Female* variable is statistically significant in Laos but not in Cambodia. It shows that there is no difference in school dropout between male and female children in Cambodia; but, female children are more likely to drop out from school than male children in Laos. In particular, female children in the non-Lao ethnicity group have a higher propensity to drop out than in the Lao ethnicity group. The variable of *Khmer/Lao* is statistically significant only in the female group of the Lao sample. It shows a negative sign which suggests that, Lao female ethnicity children are less likely to drop out than non-Lao ethnicity female children.

The head of household education (*HHHeducation*) has a negative effect on school dropout and statistically significant at the one percent level in every case, except for the non-Khmer ethnicity group. The result shows the importance of head of household education in reducing the probability of school dropout. Similarly, the household income level also illustrates a negative effect and is statistically significant in every case for Cambodia and several cases for Laos. A possible reason to explain the different statistical significance between Cambodia and Laos is that school enrollment in Cambodia is largely influenced by the wealth of the household; while in Laos, access to education is expanded to more different income household levels. Finally, the number of school aged children in a household does not have any effect

on dropout in any cases. This insignificant result might be because of the correlation between the number of children in a household and household income level. Overall, every variable, except *HHchild*, has a hypothesized sign and is statistically significant.

For provincial income level, the effect is different in Cambodia and Laos. In Cambodia, the effect is positive and statistically significant for male and non-Khmer ethnicity groups. On the other hand, the effect in Laos is consistently negative and statistically significant. The different sign for Cambodia and Laos might be due to the different type of proxy that is used. For interpretation, the result in the Lao case is used because of its consistency. The negative sign shows that growth in provincial income reduces the number of school dropouts. The result is as expected. Increasing provincial income, firstly, increases household income which supports children's education, and secondly, provides better infrastructure and other public services such as schools which consequently reduce school dropout.

The proxy for an expansion of agricultural production (*P-agriculture*) has an expected result. *P-agriculture* has a positive sign and is statistically significant for every case in both Cambodia and Laos. The result suggests that the growth of agricultural production, which potentially increases the number of unskilled jobs, increases the probability of school dropout. Overall, its effect in Cambodia is smaller than in Laos. The effect for the total sample is 0.011 in Cambodia and 0.044 in Laos. The effect on female and male children is very similar in Cambodia (0.010 for female and 0.012 for male) and in Laos (0.047 for female and 0.042 for male children). The effect for non-Khmer ethnicity children (0.061) is much higher than for Khmer ethnicity children (0.008) in Cambodia. While the effect on Lao ethnicity children (0.053) is higher than the effect on non-Lao ethnicity children (0.031). The results from both countries suggest a similar effect between genders; however, major ethnicity children are less effected in Cambodia but more effected in Laos.

The *P-service* variable also has a positive sign and is statistically significant in several cases. Similar to *P-agriculture*, the effect of *P-service* in Laos is also higher than in Cambodia. The effect on the total sample is 0.003 in Cambodia and 0.017 in Laos. Unexpectedly, the effect for female children in both countries is very low and statistically insignificant. The result shows that male children are impacted by the growth of service sector more than female children. It is important to note that the proxy for the service sector is the number of buildings, thus the proxy might be correlated to the construction sector, which mainly recruits male labor. The effect on non-Khmer ethnicity children (0.027) is higher than on Khmer ethnicity children (0.003) in Cambodia; while in Laos, the effect on non-Lao ethnicity children only is statistically different from zero. Results from both countries suggest a similar situation; that is non-major ethnicity children have a higher chance of dropping out because of service sector growth.

3.6.2. Non-enrollment in school

In Table 3.4, many determinants on non-enrollment are statistically significant in the case of Laos; however, several of them lose their statistical significance in the Cambodian case. For Cambodia, the *Female* variable is statistically significant in the Non-Khmer ethnicity group only. It has a negative sign which mean that female children have a lower probability to never have enrolled in school than male children. In Laos, the *Female* variable is statistically significant in every case. Generally, female children have a higher probability of non-enrolment school than male children. Surprisingly, the *Female* variable is negative in the Lao ethnicity group but positive in the Non-Lao ethnicity group. This suggests interesting results. Lao female children have a higher probability of enrolling in school than Lao male children; however, non-

Lao female children, in contrast, have a lower probability of enrolling in school than non-Lao male children.

For ethnicity in Cambodia, Khmer ethnicity children have a lower possibility of non-enrollment than non-Khmer ethnicity children in the total and male sample. This means that Khmer male children are more likely to enter school than non-Khmer male children. In Laos, the variable of *Khmer/Lao* has a negative sign and is statistically significant at the one percent level for both male and female samples. The major ethnicity children in Laos are less likely to never enroll in school compared to the non-major ethnicity children.

The head of household education (*HHEducation*) also shows a negative sign in non-enrollment as also in school dropout. However, this is statistically significant in Laos, not in Cambodia. Household income is statistically significant in every Cambodian case and in several cases in Laos. The effect of household income on non-enrollment is also similar to its effect on school dropout.

Unexpectedly, *HHchild* and the provincial variables are statistical insignificant in the case of Cambodia. The possible reason for the insignificance is that non-enrollment in Cambodia is only about 5 percent of the sample size; thus several variables cannot be explained by a small variation of the dependent variable.

Although several variables are statistically insignificant in Cambodia, they remain statistically significant in Laos. For non-enrollment, the number of children in a household is statistically significant in several cases in Laos, whereas the result from school dropout is insignificant. It has a positive sign which means that as the number of children in household increases, an individual child would have a lower propensity to enroll in school. This result is as expected and consistent with the result of school dropout. When there are more children in a household, parents need to select which children to educate due to cost of schooling; but when the selected children are in school, they are unaffected by the number of children in a household.

Provincial income shows a negative effect on non-enrollment in school. It is statistically significant for most cases in Laos. This indicates that employment growth provides more resources for households to enroll children in school and also support the government provision on education supply.

For non-enrollment, *P-agriculture* has a positive sign and is statistical significant in every sample; and the results are the same in school dropout. The effect on female (0.029) is slightly higher than the effect on male children (0.027). Furthermore, the effect is higher for non-Lao ethnicity group compared to Lao ethnicity group. It show that agricultural production has a bigger impact on non-Lao ethnicity children than on Lao ethnicity children.

The effect of *P-service* also shows a positive sign. The effect on the total sample is 0.011. There, the effect for female children is statistically significant but not for male children. This makes sense when we compare the result of non-enrollment to school dropout. In Table 3.2, *P-service* increases the probability for male children to dropout, while in Table 3.3, *P-service* increases the probability of non-enrollment for female children only. Growth of the service sector, initially, reduce the possibility for female children to enroll, then growth subsequently results in dropping out of school. The effect of *P-service* is positive and very high (0.026) in the non-Lao ethnicity sample but negative in the Lao ethnicity sample. A possible reason is that Lao ethnicity children use the growth of service as a resource to support children in school.

3.7. Conclusion

Out-of-school children are a major problem worldwide. Cambodia and Laos have a high rate of out-of-school children. One of the most important factors that drives children out of school is the growth of particular economic sectors. As economic sectors growth, business expands production and increases demand for

labor. When there is demand for unskilled labor, children might directly drop out of school to work for an additional income; or, indirectly stay out of school to substitute for adult labor on family farms and/or to take care of family members. This study aims to investigate the effect of the growth by economic sector on school dropout and non-enrollment in school.

Household data from 2012 from Cambodia and Laos are used with a logit model equation. The unit of analysis is the individual child level. The dependent variables are school dropout and non-enrollment in school. The control variables are children's gender and ethnicity, head of household education, household income level, and the number of children in a household. The interested variables to be tested are provincial income level, provincial agricultural production, and provincial service production. The estimation is separated into total sample, female, male, main ethnicity (Khmer or Lao), and non-main ethnicity groups.

In general, the results suggest that a higher level of provincial income can reduce the probability of school dropout and help children to enroll in school. In contrast, growth of the agricultural sector pulls children out of school and reduces the possibility of school enrolment. Similarly, growth in the service sector increases school dropout and reduces the probability for children to enter school.

The results from this study are important for policy implementation. They show that economic sectors such as agriculture and service increase the number of out-of-school children. Thus, the government should be concerned in regions with large increases in agricultural and service production. The government should provide school support programs or incentives for households to send their children to school in the regions.

A future study should consider several economic sectors that potentially increase the number of out-of-school children. Also future research should use more accurate measurement of provincial level indicators, and also be concerned with the

effect of employment growth on other education development variables such as the quality of education.

Appendix 3.1.

Table A.3. Out of school and dropout in East Asia and the Pacific

Country	Out of school rate		Cumulative dropout rate	
	Primary	Lower secondary	To the last grade of primary	To the last grade of lower secondary
Australia	2.34	0.92	..	..
Brunei Darussalam	..	0.32	..	0.92
Cambodia	2.59	..	35.77	38.93
Cook Islands	1.27	10.29	23.43	17.74
Fiji	1.31	3.98	2.85	12.69
Indonesia	4.56	14.81	18.20	15.30
Japan	0.05	0.11	..	..
Laos	6.21	26.59	26.66	25.06
Malaysia	..	10.07	..	9.50
Nauru	23.28	1.36	..	..
New Zealand	1.58	0.26	..	..
Papua New Guinea	12.84	..	..	..
Samoa	3.89	..	..	..
Solomon Islands	..	..	25.11	19.81
Tonga	1.58	5.58	..	..
Viet Nam	1.80	..	5.50	17.81
East Asia and the Pacific	4.21	8.40	7.48	..

Source: UIS, 2015. Note: compared to school education age group.

Appendix 3.2.

The provincial GDP is predicted according to the method adopting from Chow and Lin (1971). They predict the quarterly GDP from the yearly. The procedure is, first, estimate the yearly equation as:

$$[A3.1] \text{GDP}_y = \beta_{0y} + \beta_y x_y + \varepsilon_y$$

where GDP_y is the yearly GDP, x_y is the yearly predictor of GDP which has an information in quarterly level (for example: an amount of M2 in economy), β_{0y} is the constant term, β_y is the correlation parameter of the yearly GDP to the yearly

predictor, and ε is the disturbance term. After obtaining the estimated value of β_y , the quarterly GDP can be predicted by equation below:

$$[A3.2] \text{GDP}_q = \beta_{0q} + \beta_y x_q + \varepsilon_q,$$

where β_{0q} is the yearly constant term by quarter, x_q is the quarterly predictor, and ε_q is the disturbance term by quarter. In general, if the disturbance term satisfies the white noise condition, the ε_q is a value of ε_y divided by four. In this study, we would like to estimate the provincial GDP. Thus, instead of the quarterly level data, we use the provincial level data. First, the yearly GDP is used to estimate the correlation parameter with the predictor. Since there is no provincial data of M2, this study apply the non-food consumption, number of motorbike consumption in provincial level, as the predictor. After obtaining the correlation parameter, the provincial GDP is predicted as:

$$[A3.3] \text{GDP}_p = \beta_{0p} + \beta_y x_p + \varepsilon_p,$$

where β_{0p} is the yearly constant term by number of province, x_p is the provincial non-food consumption, and ε_p is the disturbance term by number of province.

The data use in predicting provincial GDP is 10 years which are from 1993 to 1997, 2005, and 2010 to 2013. The estimated coefficient of the predictor is shown in the equation below:

$$[A3.4] \widehat{\text{GDP}}_y = 62529.32 + 9215.918 x_y.$$

A unit of measurement is in 10,000. The coefficients are used to predict the provincial GDP as mention before.

CHAPTER FOUR
JOB CHARACTERISTICS AND THE POSSIBILITY OF SECONDARY
STUDENTS DROPPING OUT FOR WORK: EVIDENCE FROM CHOICE
EXPERIMENT IN LAONGARM DISTRICT, LAOS.

4.1. Introduction

Human capital plays an important role in economic development. A higher education level increases labor productivity and consequently promotes production efficiency. Thus, governments and international organizations pay attention to educational development. However, although school enrollment has increased, the education sector still faces several problems in development and one of the most important problems is early school leaving or school dropout. In 2010, the number of global out-of-school children of primary and lower secondary age was 60.7 million and 70.6 million people, respectively. The number is the equivalent of 10 percent of all primary school children and 18 percent of lower secondary school children (UIS, 2012). Of the total number of out-of-school children, 26 percent were students who dropped from school. The high rate of school dropout stows that even when more students are enrolled, they fail to stay in the system to complete their education.

School dropout can effect a child's future social and economic status (Jencks et al., 1972; Winship and Korenman, 1999). Students who drop out from school have a limited choice in employment and a lower chance of being employed (Sum et al., 2009; Rumberger, 1987). Although they can enter the labor market, they earn less than those who complete school (Levin et al., 2007). Moreover, other problems that dropout students face are, a difficulty receiving public assistance (Waldfogel et al., 2007), health problems (Muennig, 2007), and even crime (Moretti, 2007).

Dropout from school is caused by several factors. Poverty is very important factor. Children from poor households tend to repeat or leave school early (Hunt, 2008; Hammond et al., 2007; Sabates et al., 2010). Poor households might require children to drop out of school to work as a source of income. Some children need to work while they are studying and this increases the risk of them repeating and dropping out from school (UCW, 2010). Also, parents with low level education seem stress the importance of education less and make their children drop out from school (Hunt, 2008). Long distances to school with difficult transportation discourage households from sending their children of school (Hunt, 2008).

In addition to these factors, the growth of employment in the labor market is the potential to increase school dropout. The growth increases wage levels and job availability which increases the opportunity cost of not working. Increasing wages in the labor market attract appropriate working age students (secondary students) to drop out from school and join the labor market. Moreover, students who do not do well in school or who have difficulty to access to school have a higher possibility to be pulled out of school.

Studies show that employment opportunities pull students out of school and the characteristics of jobs can effect the student decision to drop out (McNeal, 1997; Bickel and Milton, 1983; Papagiannis et al., 1983; Greenberger and Steinberg 1986). Many previous studies which use individual level data examine the effect of the employment opportunities on the already dropped students. However, using this data does not allow us to fully examine students' willingness to drop out for work. Because each student seems not to have equal information about jobs available, students' decision would vary depend on how much they know about the jobs available. In other words, some students who want to drop out decide not to because they do not have enough information about jobs available. The information about employment such wage level, location, type, and so on can play an important role in

decision making.

To overcome the problems discussed above, a choice experiment was applied in this research. In the experiment, information about hypothetical jobs was provided to secondary education students. We asked them about their willingness to accept a job. The experiment eliminated the knowledge gap between students because every student receives the same amount of job information before making a decision.

The purpose of this study is to investigate the effect of employment opportunities and job characteristics on the possibility of secondary students to drop out of school and take the jobs. The specific objectives are:

- a. To investigate the impact of increasing wages on the probability to secondary students dropping out of school to work.
- b. To analyze the preference of secondary school students for specific characteristics of jobs.
- c. To identify the characteristics of secondary school students who are likely to drop out of school to take jobs.

The site of our experiment was in Laongarm district of Saravan Province, Laos. Among East Asia and Pacific countries, Laos was one of the highest dropout rates and Laongarm district is a district with a very high dropout rate. The district is economically growing; however, the number of out-of-school children is high. Many secondary students who drop out of school, seek jobs in cities and even cross the border to work in Thailand. Thus, Laongarm is an ideal location for the experiment.

This paper is organized as: Section II describes of the situation of school dropout in Laognarm and other districts in Saravan province. Section III is a literature review. An analytical framework, a development of attributes and levels of the choice

experiment, and econometric strategy are explained in Section IV. Section V discusses the findings and the conclusion is in Section VI.

4.2. Saravan school dropout situation

Saravan province is located in the Southern part of Laos. It has a border with Sawanakhet province to the North, Vietnam to the East, Champasak and Sekong provinces to the South, and Thailand to the West. It has an area of 10,691 square kilometers and a population of 362,836 in 2012. Totally, there are 14,398 poor households (24%) and 84,224 poor people (23%). It is composed of eight districts: Saravan (main district), Ta Oi, Toumlan, Lakonpheng, Vapi, Konxedon, Laongam, and Samouay.

In 2012, Saravan province had the highest dropout rate from primary (15.0%) and lower secondary (14.9%) education in Laos. It is also ranked with the third highest upper secondary dropout rate (8.9%). The dropout rates at district level are shown in Table 4.1. The district with highest dropout rate in primary level is Lakhonepheng (18.7 percent) and in lower and upper secondary is Samuoi (30.2 percent and 32.7 percent, respectively). Laongarm district had the dropout rate 15.3, 13.5, and 7.7 percent in primary, lower secondary, and upper secondary, respectively.

Although Laongarm does not have the highest dropout rate among districts, it has better road conditions to connect to other developed cities (for example Pakse city) that provide access to employment in other wealthier cities. Additionally, the main population urban areas are Lao people who can take job opportunities more easily than other ethnic people. Moreover, there are many young laborers from the district who cross the border to work in Thailand.

Table 4.1 –Dropout Rate by Districts of Saravan Province in 2012

District	Primary	Lower Secondary	Upper Secondary	Share of Poor Households*
Khongxedone	16.8	10.9	10.1	7
Lakhonepheng	18.7	12.0	14.8	18
Lao ngarm	15.3	13.5	7.7	22
Samuoi	11.4	30.2	32.7	94
Saravan	12.1	12.0	4.7	10
Ta Oi	14.0	24.5	22.1	95
Toomlarn	18.4	20.4	6.3	42
Vapy	15.0	8.8	9.4	9
Saravan province	15.0	14.9	8.9	

Source: Saravan Planning and Investment Division, Ministry of Planning and Investment, and Department of Statistics, Ministry of Education and Sports. *Share of poor households is in 2011.

4.3. Literature review

Factors that influence school dropout can be divided into push and pull factors (Bjerk, 2012). Dropout due to reasons such as health issues, moving house, difficulty accessing education, low performance in class, and so on are categorized as push factors. While, dropout to work for additional household income, supplement labor for household farm or household work, look after the family, and so on are categorized as pull factors.

The expanding of employment opportunity directly effects the probability of secondary students dropping out through pull factors, particularly dropping out to work for extra income. When the economy is growing, businesses increase production, which increase investment and hire more labor. Usually, businesses hire cheap labor to minimize the cost of production, and if the jobs are unskilled such as work in restaurant, retail shops, and so on, secondary students, who are the appropriate age for working, have a possibility of being hired (Duncan, 1965). As demand for unskilled

and low-paid labor increases, secondary students have the opportunity to drop out for work. In addition, with the increasing income of households in big cities, rich households require unskilled and cheap labor for household work. Through family connection, secondary students are sometimes asked to drop out from school and seek the jobs in big cities.

The effect of push factors on dropout decisions are enhanced by employment opportunities. Students who have a high probability to drop out, such as those from poor families, have difficulty accessing education, have no interest and perform badly in class, would decide to leave school more easily. Furthermore, working and studying at the same time increases the probability of dropping out (McNeal, 1997).

Some studies show that information about job availability can effect a decision about schooling. A study in India of Jensen (2012) suggested that informing students and household about job opportunities can make a change of their decision. Jensen experimentally sent job recruiters to villages to inform them about available employment for highly educated female labor, then he found an increasing number of female children entered and stayed in school. In this study, the decision of students when the offered unskilled jobs are requiring no education is observed.

4.4. Methodology

4.4.1. Analytical framework

The student's decision to drop out from school is dependent on the expected return and the cost of schooling. From adaption of Gertler and Glewwe (1990), let's assume an expected utility function conditional on an expected return from education and a cost of schooling as:

$$[4.1] \quad U = U(S, C) + \epsilon$$

where S is an expected return on education after completing secondary education and C is the consumption possible. Now, let's consider the case where a student continues to study,

$$[4.2] \quad U_s = U(S_s, C_s) + \epsilon_s$$

where S_s is the expected return after completing secondary education and C_s is the consumption possible after incurring the cost for completing secondary education. The cost includes the direct and indirect costs. The direct costs are such things as a tuition fee, school travelling cost, school uniform and materials, etc.; while the indirect costs are the opportunity cost of being at school such as the forgone income of not earning. Now let's consider the case of the student who decides to drop out from school,

$$[4.3] \quad U_d = U(S_d, C_d) + \epsilon_d$$

where S_d is the expected return from not completing (dropout) secondary education and C_d is the consumption possible from not completing secondary education. The expected return of completing secondary education (S_s) is generally greater than the expected return of not completing secondary education (S_d), and the consumption possible of completing secondary education (C_s) is generally lower than the consumption possible of not completing secondary education (C_d).

In deciding whether to complete the secondary level, the expected utility maximization is

$$[4.4] \quad U^* = \max(U_s, U_d).$$

Thus a student would choose to attend and complete secondary education if U_s is higher than U_d , and drop out from secondary school if U_d is greater than U_s instead.

Increasing wages of available unskilled jobs in the labor market increases the opportunity cost of being at the secondary school. This would decrease the consumption possible after incurring the cost of secondary schooling (C_s) and U_d is likely to exceed U_s . Therefore, the student would decide to drop out from the secondary school. The choice of the students whether to complete or drop out from the secondary level allows us to observe the effect of jobs' characteristics (for example increasing wages) on the decision to drop out for working.

4.4.2. Development of attributes and levels and their combination in the alternative

After a group discussion with heads of villages around the experiment site and a consideration of relevant literature, the attributes and levels of the choice experiment are selected as shown in Table 4.2. There are three attributes: wage levels, locations, and type of jobs. The wage levels are from 0.4 million Kip to 2 million Kip. The range of the wage is from very unskilled work to high-skilled work in the Laongarm district. The location of jobs includes three domestic cities (Laongarm district, Pakse district, and Vientiane capital) and one foreign country (Thailand). Laongarm district has the lowest development level but it is the residential city of the students in this experiment. Pakse is the closest district with a better development level than Laongarm and Vientiane capital is the farthest location but it is the most developed location in Laos. Thailand is the most developed location and closer to Laongam district than Vientiane

capital. However, to work in Thailand, the students need to migrate. The map of the location is shown in appendix 4.1.

Table 4.2 – Characteristics of Offered Jobs

Attributes	Levels
Wage in millions Kip	0.4, 0.8, 1.2, 1.5, 2.
Locations	1 = Laongam district 2 = Pakse district 3 = Vientiane capital 4 = Thailand
Type of jobs	1 = Garment factory work, 2 = Agriculture farming, 3 = Selling in local shop, 4 = Housework.

Note: 1 USD \approx 8000 Kip in 2013.

The offered jobs in our experiment are for unskilled labor. They are for work in a garment factory, in an agricultural farm, in a retail shop, and in a house as housemaid. The jobs are modified from a study of McNeal (1997). The garment factory job represents the industrial sector, the agricultural farm is for the agricultural sector, and the retail shop and housework are for the service sector.

4.4.4. Experiment design

The basic idea of the experiment is to inform the secondary students about available jobs and to observe their willingness to take the jobs. The experiment was conducted in the Laongarm completed secondary school which is the biggest

secondary school, and is located in the center of Laongarm district. We selected October 2013, the opening period of the new school year, for the experiment; because, students usually come to school in October and are absent or drop out in later period.

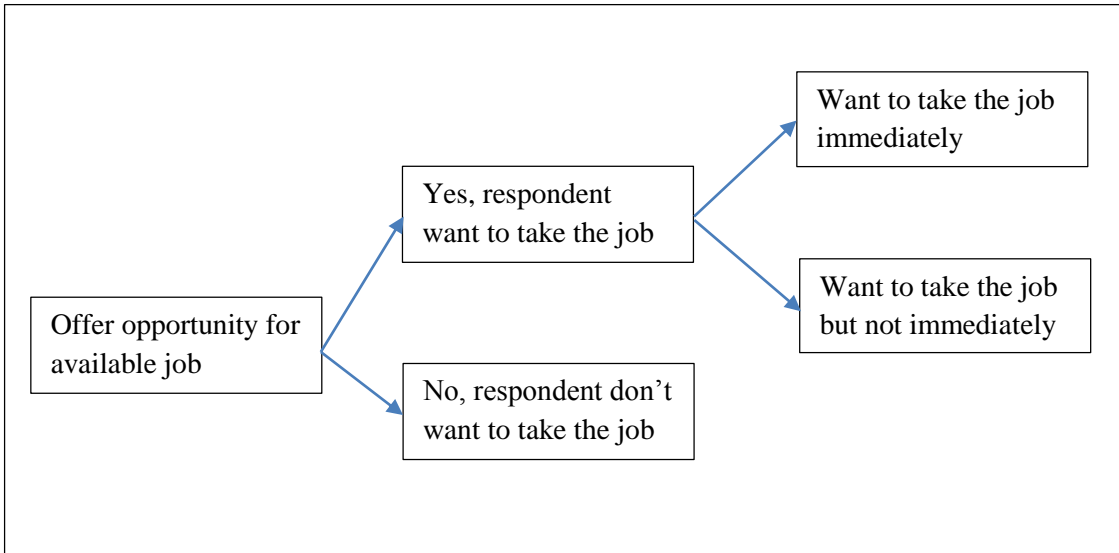
There were 11 enumerators in the experimental team who are students from Champasak University. The enumerators randomly went to classrooms of every grade in the school and randomly selected secondary students to participate in the experiment. The enumerators interviewed students individually. The students were informed that the team was working for the government and some private companies to examine the potential labor force for job recruitment. Then the enumerators offered the students the hypothetical jobs and asked them if they would like to take the job.

The levels of attributes were randomly selected to construct the offered job. The students were also informed that if they prefer and are willing to take the job, they have the opportunity to be recruited. Every student is offered two choices of job in order to increase the sample size. The example of questionnaire is shown in appendix 4.2.

The answers of the students can be explained as in Figure 4.1. After a job is offered to an student, if the student says that he/she wants to take the job, then the enumerator to ask when time that they want to start the job. There are two possible answers, first, he/she is available to start the job now and, second, he/she wants to start the job later.

For those who cannot take the job immediately, it means that they might want to consider the jobs carefully (for example: consulting with their parents). This does not completely mean that they want to complete the education level before taking the jobs; because, if they said that they do not want the jobs, there will be no jobs for them after completion of secondary education.

Figure 4.1 – Experiment Procedure



If the student want the job now, it means the characteristics of the student can highly motivate the student to drop out and, or, the attributes of the job can highly attract the student out of school for work. If the student want to take the job but not immediately, then the effect of both characters of student and the job has some influence. And if the student does not want the job, the characters of the student and, or, the attributes of the job do not increase the probability of school dropout. In order to separate the effect of the characteristics of students and the attributes of the job, an econometric equation is used as shown in the next section.

4.4.5. Econometric estimation

The student's decision is used as the dependent variable in the econometric equation [4.5] below:

$$[4.5] \quad P(\text{prefer}) = f(\mathbf{X}, \text{wage}, \mathbf{L}, \mathbf{T}),$$

where *prefer* indicate if individual student want to take the offered job, \mathbf{X} is a vector of students' characteristics, *wage* is the wage level, \mathbf{L} is a vector of location variables, and \mathbf{T} is a vector that include the types job variables.

There are two types of the dependent variable. The first is a binary variable which equal to one if an individual student prefers the offered job and zero for otherwise. The second type is a rank of probability to take the offered job which equal to one if the individual student does not prefer the offered job, equal to two for prefer to job but not immediately, and equal to three for prefer the job for working now. Thus the equation is estimated by the logit model for the binary type and the ordered logit for the ranking type. The coefficients reported in the results are also shown in an odd ratio form. After that, the estimated coefficients from logit model are used for calculation of the average willingness to accept by diving the estimated coefficients of students' characteristics and jobs' attributes to the estimated coefficient of the wage variable.

Table 4.3 explains a definition and hypothesized sign of variables. The variables of students' characteristics are gender, ethnicity, household member, knowledge on working outside of district, level of household's income, and difficulty in access to school. The gender (*Female*) is a binary variable which equal to one if the student is female and zero for otherwise. It does not seem to influence on the decision to take the offered job. For ethnicity, the variable of *Lao* is used to divide students into Lao and non-Lao groups. The Lao group students are expected to have a lower possibility to take job. Because many government and high occupation status staffs, who are required to have high education level, are usually Lao persons; thus, Lao students seem to have a better knowledge on the return to education. The household member (*HHmember*) is expected to have no effect on the decision to take the job. On

one hand, having many members might require students to be an additional income source, thus they might want to drop out for work. On the other hand, having many members can mean that there is a sufficient number of earners, thus students would not want to drop out for work.

The knowledge of working outside Laongarm (*Knowofwork*) is measured by asking the students if they have friends working outside of Laongarm. By knowing friends working outside of the district, it provides an example to the student and increases the possibility of the student to take the job. For the household income (*HHincome*), this study uses a proxy because students cannot provide a reliable information about their household's income. Thus, we asked students for the main material of their house. It is measured as if the material is a concrete or cheaper material. Students from a concrete house are assumed to come from richer family who would not want to drop school for work. Walking or riding bicycle and motorbike is used as a proxy to indicate the difficulty for traveling to school (*Walkschool*). If the students walk to school, they might find it difficult to come to school and want to drop from school and take the job comparing with the students who travel to school by bicycle, motorbike, and someone sending to school.

The wage variable has five levels. The location variables in a vector L are *Pakse*, *Vientiane*, and *Thailand* which represent of Pakse district, Vientiane capital, and Thailand, respectively. Laongarm district is used as a referent group. The job in Laongarm is expected to be the most preferred, followed by jobs in Pakse, Vientiane Capital, and Thailand due to the difficulty in travelling back to Laongarm. The jobs in a vector T are the work in garment factory (*Garment*), selling in local shop (*Selling*), and housework (*Housework*). The working in farm is a comparison group. The least preference job is expected to be the work on farm because it requires hard labor. The following preferred jobs are in the garment factory, housework, and selling in local shop.

Table 4.3 – Variable Definition and Hypothesized sign

Variable	Definition	Hypothesized sign
<u>Students' characteristics</u>		
<i>Female</i>	1 = female, 0 = otherwise	+/-
<i>Lao</i>	1 = Lao ethnic student, 0 = otherwise	-
<i>HHmember</i>	Number of household member	+/-
<i>HHincome</i>	1 = if a main material of house is concrete, 0 = otherwise	-
<i>Knowofwork</i>	1 = if friends work outside Laongarm, 0 = otherwise	+
<i>Walkschool</i>	1 = if the student walk to school, 0 = otherwise	+
<u>Job's attributes</u>		
<i>Wage</i>	5 levels from 0.4 to 2 million Kip	+
<i>Pakse</i>	1 = job in Pakse district, 0 = otherwise	-
<i>Vientiane</i>	1 = job in Vientiane capital, 0 = otherwise	-
<i>Thailand</i>	1 = job in Thailand, 0 = otherwise	-
<i>Garment</i>	1 = work for garment factories, 0 = otherwise	+
<i>Selling</i>	1 = work for local shop, 0 = otherwise	+
<i>Housework</i>	1 = work as housemate, 0 = otherwise	+

4.5. Data

Table 4.4 shows the data description. The total sample size after data cleaning is 133 students. Because each student answers two choices, the total observation is 266. The data description is in Table 4.3. Of the sample, 56 percent are female students and 91 percent are Lao ethnic students. On average, students are from a household size of six people. Thirteen percent of students report that they have friends who are currently working outside of the district. About 38 percent of students say their house

is of concrete construction. Half of all students walk to school and another half mainly use bicycles or motorbikes.

Table 4.4 – Data Description

Variable	Mean	Std. Dev.	Min	Max
<u>Students' characteristics</u>				
<i>Female</i>	0.56	0.49	0	1
<i>Lao</i>	0.91	0.28	0	1
<i>HHmember</i>	6.10	2.00	3	12
<i>HHincome</i>	0.38	0.48	0	1
<i>Knowofwork</i>	0.13	0.34	0	1
<i>Walkschool</i>	0.50	0.50	0	1
<u>Job's attributes</u>				
<i>Wage</i>	1.09	0.48	0.4	2
<i>Pakse</i>	0.25	0.43	0	1
<i>Vientiane</i>	0.24	0.43	0	1
<i>Thailand</i>	0.24	0.43	0	1
<i>Garment</i>	0.23	0.43	0	1
<i>Selling</i>	0.23	0.42	0	1
<i>Housework</i>	0.26	0.44	0	1

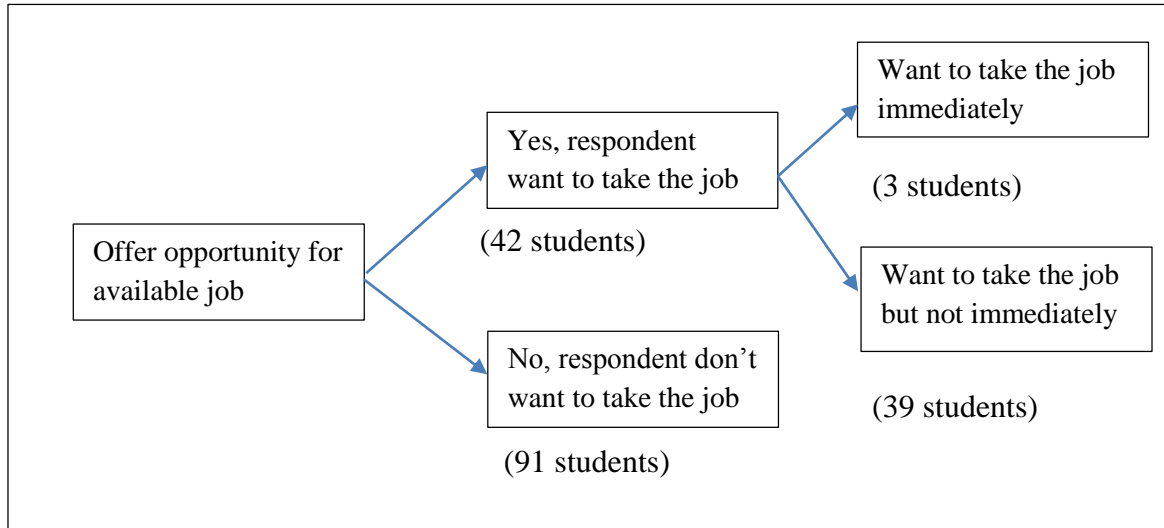
4.6. Results and discussion

4.6.1. Interest of job offer

Figure 4.2 is Figure 4.1 with the number of students who answered each category added to the diagram. Of 133 students, 42 students answered that they are interested in the jobs. Three students said that they could take the jobs immediately.

The figure shows that 31.5% of the total sample are interested in the job offer and about 2.2% would drop out of school to take the job immediately.

Figure 4.2 – Answer of Students



4.6.2. Equation estimation result

The results from the equation [4.5] are shown in Table 4.5. The results are reported in coefficient of the logit, odd ratio of the logit, coefficient of the ordered logit, and odd ratio of orders logit, from left to right respectively. The Pseudo R-squared of the logit is 0.12 and of the ordered logit is 0.11.

Overall, several variables have the expected sign. The *Female* variable has a positive sign but is statistically insignificant. However, although the variable is not statistically significant, its impact is seemingly large. An odd ratio shows that female students are 1.51 times more likely to take the jobs than male students. The variable *Lao* has the expected negative sign but it is statistically significant only in the ordered logit estimation. This shows that Lao ethnicity students are less likely to

Table 4.5 – Estimation Results

Variable	Logit		Ordered logit	
	Coefficient	Odd ratio	Coefficient	Odd ratio
<i>Female</i>	0.412 (1.326)	1.510	0.349 (1.133)	1.419
<i>Lao</i>	-0.770 (-1.526)	0.463	-0.883* (-1.766)	0.413
<i>HHmember</i>	-0.054 (-0.704)	0.947	-0.041 (-0.541)	0.959
<i>HHincome</i>	-1.020*** (-2.934)	0.361	-0.998*** (-2.886)	0.368
<i>Knowofwork</i>	0.854** (2.023)	2.351	0.917** (2.200)	2.502
<i>Walkschool</i>	0.586* (1.885)	1.797	0.658** (2.123)	1.932
<i>Wage</i>	0.538* (1.691)	1.714	0.556* (1.753)	1.745
<i>Pakse</i>	-0.633 (-1.550)	0.531	-0.670* (-1.653)	0.511
<i>Vientiane</i>	-0.667 (-1.615)	0.513	-0.758* (-1.852)	0.469
<i>Thailand</i>	-1.125** (-2.486)	0.325	-1.176*** (-2.632)	0.308
<i>Garment</i>	-0.571 (-1.370)	0.565	-0.471 (-1.154)	0.624
<i>Selling</i>	-0.138 (-0.329)	0.871	-0.118 (-0.284)	0.888
<i>Housework</i>	-0.649 (-1.577)	0.522	-0.656 (-1.608)	0.518
Constant	-0.006 (-0.008)	0.993		
Constant cut 1			0.004 (0.005)	1.005
Constant cut 2			3.286*** (3.546)	26.742
Chi-squared	38.2		40.4	
Pseudo R-squared	0.12		0.11	
Observation	266		266	

Note: z-statistics are in parentheses and *** p<0.01, ** p<0.05, * p<0.1. Both equations control for the second choice.

drop out for work. The number of people in household cannot explain the likelihood of secondary students to take the offered jobs. The *HHmember* is not statistically significant in both logit and ordered logit estimations.

The household wealth level has a significant effect on the decision of the secondary students to take the jobs. Both the logit and ordered logit show the expected negative sign of the *HHincome* variable. The odd ratio illustrates that students from rich households (main material of house is concrete) have the probability to accept the jobs 0.36 times the students from poor households (main material of house is poorer condition than concrete).

The *Knowofwork* variable has the expected sign and is statistically significant. Interestingly, the *Knowofwork* has a large impact on the secondary students' decision. The odd ratio of *Knowofwork* shows that the students who have friends working outside Laongarm district are 2.35 times more likely to drop out than students who do not have. The difficulty in travelling to school is also important for the secondary students' decision. The variable of *Walkschool* has the expected positive sign and is statistically significant. Students who walk to school are 1.80 times more likely to take the offered jobs than students who travel to school by bicycles or motorbikes.

In the jobs' attributes, the variable of *wage* has the expected positive sign and is statistically significant at the 10 percent level. This confirms the possibility that a higher level of wage can draw secondary students out of school and into work. Regarding location of jobs, students are less likely to take jobs that are distant from the Laongarm district. Every location variable is statistically significant in the ordered logit estimation but only the variable *Thailand* is statistically significant in the logit estimation. This result is interesting because it shows that students prefer to work in a location closer to their home town. Thus, several secondary school age children move to work in developed locations such as Vientiane Capital and Thailand because there is a higher level of wages. For the type of jobs, all variables have a positive sign but

are statistically insignificant. The result shows that students have an equal preference for every type of job.

4.6.3. Willingness to accept work

Table 4.6 shows the willingness to accept the offered jobs in monetary term for variables that are statistically significant at the 10 percent level (for either logit or ordered logit estimation). The willingness to accept value is reported in million Kip and USD units; however, for simplicity, the values in USD are used for interpretation.

Table 4.6 – Willingness to Accept Offered Jobs

Variable	Value in millions Kip	Value in USD
Average WTA for taking the offered job	3.22	403
<i>Student's characteristics</i>		
<i>Lao</i>	1.43	179
<i>HHincome</i>	1.89	237
<i>Knowofwork</i>	-1.59	-198
<i>Walkschool</i>	-1.09	-136
<i>Job's attributes</i>		
<i>Pakse</i>	1.18	147
<i>Vientiane</i>	1.24	154
<i>Thailand</i>	2.09	261

Note: 1 USD = 8000 Kip

The average willingness to accept the offered job is 403 USD. The Lao ethnicity students prefer 179 USD higher wage than non-Lao ethnicity students. The students from rich household would accept the jobs with 237 USD higher than

students from poorer household. The variable of *Knowofwork* and *Walkschool* have a negative value which mean that students who have friends working outside of Laongarm and need to walk to school would accept the jobs with lower wage of 198 USD and 136 USD than the students who do not have friends working outside Laongarm district and ride bikes to school, respectively. If the students need to go out of Laongarm district to work in Pakse city, Vientiane capital, and Thailand, they prefer 147, 154, and 261 USD, respectively.

4.7. Conclusion

School dropout lowers the future socio-economic outcome of students. The school dropout is caused by several reasons. One of the most important factors is the employment availability in the labor market. An increasing wage and employment expansion pull students, particularly secondary students who have an appropriate working age, out of schools by increasing the opportunity cost for not working. Thus, the main objective of this study is to analyze the effect of the characteristics of jobs on the possibility of secondary students to drop out from school.

Many previous studies investigated the impact of job's characteristics on the secondary students' decision to drop out by using the data of the already dropped students. However, some students might not drop out of school because of lack of knowledge about employment. Therefore, the studies did not show the precise effect of the job's characteristics on all students. This study employs the discrete choice experiment to address the problem. In the experiment, the students were provided an information of hypothetical jobs. Then, the answer of students on willingness to accept the job would show the potential dropout. The experiment equalizes students' knowledge about job.

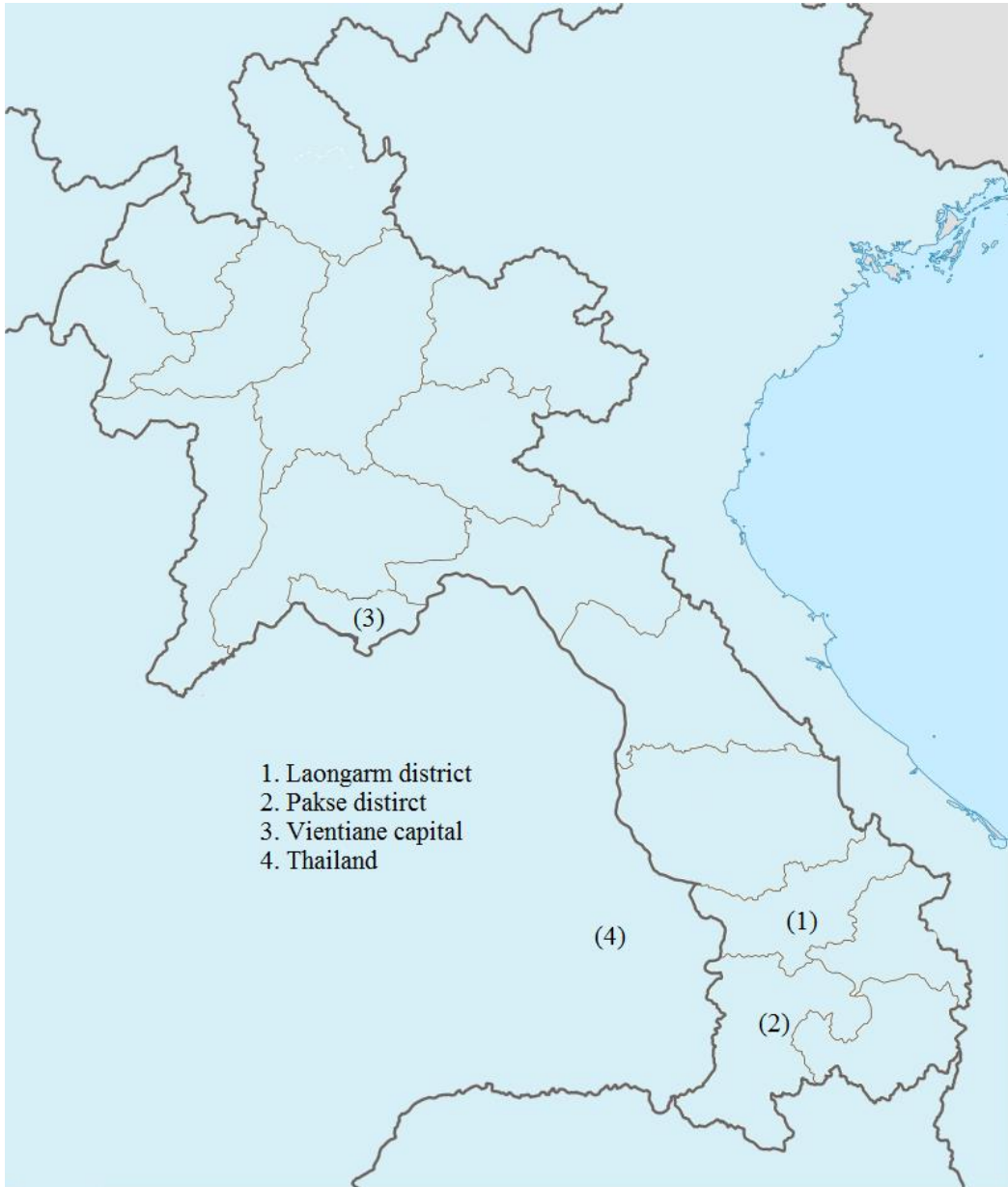
The experiment was conducted at October 2013 in the Laongarm complete secondary school in Laongarm district, Laos. There are three attributes in the choice set. The first attribute is the wage which includes five levels. The second attribute is the location of job which have four levels (within Laongarm district, Pakse district, Vientiane capital, and Thailand). The third attribute is the type of job which includes farming, shop retailing, working in garment factory, and doing housework. The levels of attributes are randomly selected to construct each alternative.

From 133 students who participate in the experiment, there are 42 students answered that they want to take the offered jobs and three students can take the jobs immediately. The number of students who are interested in the jobs show the potential of dropping out. The results from the econometric analysis shows that Lao ethnicity students have a lower possibility to drop out and take the offered jobs. If the students are from rich household, they would have lower probability to drop out for the jobs. The students also have higher chance to take the jobs if they have friends who are working outside of the Laongarm district. This shows that the information about working can play an important role in taking jobs. Another important factor is the travelling from house to school. If the students walk to school, they have higher possibility to take the jobs more than students who use bicycle or motorbike in travelling to school.

In the characteristics of job, an increasing wage can attract the students to take the jobs. This shows the probability of the secondary students to drop out and take the jobs. For location of jobs, if the jobs are located in farther place from the Laongarm district, the students are less likely to take the jobs. The highest level of WTA for location is for Thailand. For the type of jobs, there is no statistical significance among working in farm, retail shop, garment factory, and as housework.

Appendix 4.1. Map of location

Figure A.4.1. Map of Location of the Offered Jobs



Appendix 4.2. Example of questionnaire

Questionnaire for potential labor			
We are a group of researchers from the National University of Laos cooperated with companies which would like to search for potential labor in Laongarm district. Your answer would be kept as secrete and would not have any effect on you. Thus, please answer the question below correctly.			
No.	No. of questionnaire		
Village			
Interviewer			
Name	Name and surname		
Phone	Telephone number		
	Question	Way to answer	Answer
p3q1	Sex	1 = male. 2 female.	
p3q2	Grade level		
p3q3	Ethnicity		
p3q4	Household member		
p3q5	Sibling member		
p3q6	Number of household member who work outside of district		
p3q7	Number of household member who work in Thailand		
p3q8	Do you have friends working outside of district?	1 = yes, 2 no	
p3q9	Who are you currently living with?	1 = farther and mother, 2 = farther, 3 = mother, 4 = other.	
p3q10	Occupation of your parent	1 = agriculture, 2 = retailer, 3 = employee, 4 = government, 5 = teacher, 7 = unemployed, household and farm work, other = please indicate	
p3q11	Parent's education	0 = illiteracy, educated = indicate, 9 = do not know.	
p3q12	Does your house access to electricity	1 = yes, 2 no	
p3q13	Number of car	Number	
p3q14	Number of motorbike	Number	
p3q15	Tractor	Number	
p3q16	Number of castle	Cow	
p3q17		Buffalo	
p3q18		Poultry	
p3q19	Material of house's walls	1 = woods, 3 = concrete, 4 = other	
p3q20	Travel to school	1 = walk, 2 = bicycle, 3 = someone send to school, 4 = motorbike, other = please indicate	

p3q21	How many minutes do you spend to travel to school?		
p3q22	Total score of last glade	9 = do not remember, other = please indicate	
p3q23	How many time have you repeat glade?		
p3q24	How often do you skip your class?	0 = never, 1 = few, 2 = half, 3 = half of total class	

If companies offer a job as show below, would you accept it?			
p3q25	Would you like to take this job?	Location	Vientiane
p3q26		Type of job	On farm
p3q27		Salary	1,000,000
p3q28		1 = accept, 2 = do not accept.	
p3q29	If you accept the job, when would you take the job?	1 = immediately, other = please indicate	
If companies offer a job as show below, would you accept it?			
p3q30	Would you like to take this job?	Location	Thailand
p3q31		Type of job	Garment factory
p3q32		Salary	1,500,000
p3q33		1 = accept, 2 = do not accept.	
p3q34	If you accept the job, when would you take the job?	1 = immediately, other = please indicate	

CHAPTER FIVE

VALUATION OF INCENTIVE TO RECRUIT TEACHERS IN RURAL SCHOOL AND PREVENT THEM FROM LEAVING PROFESSION: EVIDENCE FROM CHOICE EXPERIMENT IN CAMBODIA AND LAOS

5.1. Introduction

After decades of educational development such as the universal primary education goal of the Millennium Development Goals and the Education for All program, international organizations and governments have been focusing on school enrollment. As a result, the number of enrolled students has increased consistently. The global net enrollment ratio of primary and secondary education has increased from 82.9 percent and 52.9 percent in 2000 to 89.3 percent and 62.7 percent in 2011, respectively (World Bank, 2014). Also the gross enrollment ratio has risen from 34.3 percent, 99.3 percent, and 60 percent for pre-primary, primary, and secondary levels in 2000 to 50.1 percent, 107.1 percent, and 70.6 percent in 2011, respectively. This increase shows the need to provide corresponding educational resource, particularly teachers.

Increase number of teacher can promote quality of education. More number of teacher reduces a pupil-teacher ratio which increases students' performance (Angrist and Lavy, 1999) and future earning (Card and Krueger, 1992). In addition, recruiting qualified and academically talented teachers enhance the quality of teaching and improve learning outcome (Hanushek and Rivkin 2010; McKenzie et al., 2005). The development of education quality can promote economic growth (Hanushek and Woessmann 2007). A number of studies have examined the factors that influence a

teacher's decision to join the teaching profession (Rots et al., 2014; Gunnduz, 2014; Skaalvik and Skaalvik, 2011; Stinebrickner, 2002; Yong, 1995; Chivore, 1988).

Studies have reviewed the factors that influence potential teachers not to join the teaching profession. The salary and benefit are regarded as the most important factors. High salaries motivate potential teachers to join the teaching profession (Figlio 1997; Hanushek, Kain, and Rivkin 1999; Barber, Mourshed, and Whelen, 2007; Leigh 2009). Also, the living and working conditions are very important. Remoteness of villages and poor working conditions of school discourage potential teachers from taking teaching jobs (McEwan, 1999; Kelly et al., 1981; Chapman and Hutcheson, 1982; Heyns, 1988; Lortie, 1975). Furthermore, increasing benefits of non-teaching jobs can also attract the potential teacher to leave teaching. The potential teachers are very keen to compare salaries in teaching jobs to non-teaching jobs (Boyd et al., 2006; Wolter and Denzler, 2003; Dolton, 1990). Unlike other civil servants such as doctors, polices, soldiers, etc.; graduates with teaching certificates seem to adapt more easily to other jobs in the labor market.

In order to encourage potential teachers to join and keep teachers in the teaching profession, governments of many countries provide incentive programs to increase benefits in the teaching profession. Increasing financial support such as raising salaries and allowances and indirect monetary incentives such as housing, transportation, continued education, promotion, and so on are common used in many countries. (Urquiola and Vegas, 2005; McEwan, 1998; ILO, 1991; Carnoy and Torres, 1994; Lockheed and Verspoor, 1991; Dove, 1986).

To provide an appropriate incentive, the important questions are “how much should we pay?” and “which factors influence potential teacher's decision the most?”. In practice, it is very difficult to estimate the price of these factors because of an absence of a market. Many previous studies value and measure the important of factors by simply asking teachers to rank their level of satisfaction on each factor one

by one. However, such procedure cannot give a value in monetary term and does not provide a precise ranking because factors does not appear the same time for comparison. To address such problem, this study employs a discrete choice experiment (DCE) analysis. In DCE, we can introduce several factors in same choice set, then teachers can compare and select the most important factor. The DCE is a well-known tool for estimating a non-market value in many research fields. Using DCE to analyze a professional participation is widely practiced in health economics (Li et al., 2014; Vujicic et al. 2010; Lin, 2014; Scott, 2013). However, it is still rare to see researches that apply DEC to analyze potential teacher's preference (see Burke et al., 2015). Therefore, the main of objective of present research is to value the factors that discourage and encourage potential teacher's decision on joining the service. The specific objectives are:

- a. To value the characteristics of rural location of school and conditions of classrooms
- b. To estimate the preference of non-teaching jobs
- c. To value indirect monetary incentive programs
- d. To compare the estimated WTA to actual market of non-teaching jobs for possibility of not joining.

The sample is teacher trainees in Cambodia and Laos. They are potential teachers for primary and lower secondary level. Using data from current trainees rather than actual teachers provides an opportunity to examine a general preference of all teachers, who might and might not join the teaching profession. Cambodia and Laos have a high number of out of school children among the East Asia and Pacific countries (UIS, 2012). Both countries have high economic growth and increasing

salary in the labor market. The high salaries of the non-teaching profession indicate a high opportunity cost for the teaching profession.

The remainder of this paper is organized as follows: Section II explains the current situation of teachers in Cambodia and Laos. Section III is a review of relevant literature. The methodology is discussed in Section IV, which includes an analytical framework, a development of attributes and levels, and econometric equations. Data collection and description are explained in Section V. Section VI discusses the results. Section VII is the final conclusion.

5.2. Teachers in Cambodia and Laos

In both Cambodia and Laos, primary to lower secondary teachers are expected to graduate from teacher training college, while upper secondary school teachers are expected to study up to from university level. Usually, trainees who enroll in teacher training college are from households with poor socio-economic backgrounds and cannot enroll in university (MoE, 2006; Nock and Bishop, 2008). Some trainees enroll in the teacher training college through village or regional quotas and some need to take an entrance exam. However, trainees who can enter teacher training are likely to come from urban areas and do not select teaching as their first choice (MoE, 2006). Thus there is the probability that they will leave teaching.

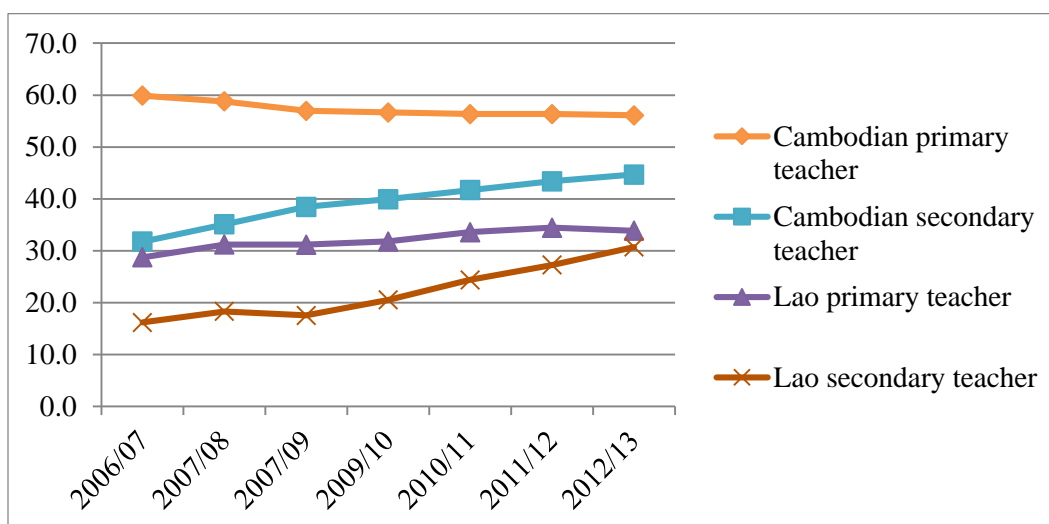
Figure 5.1 illustrates the number of teachers from 2006/07 to 2012/13 in Cambodia and Laos. In general, the number of teachers in Cambodia was higher than in Laos for both primary and secondary levels. Also there are more teachers in primary level than in secondary level because there are more classes. The number of teachers in Cambodian primary education slightly decreased from 2007/08 to 2009/10 and then remained constant. In contrast, the number of Lao primary teachers increased

continuously. The quantity of secondary teachers increased consistently over the period in both countries.

Although, the number of teachers in Cambodia was greater than in Laos, Lao pupil teacher ratio was lower than in Cambodia. Figure 5.2 presents the pupil teacher ratio from 2006/2007 to 2012/2013. In general, the ratios have a decreasing trend. The ratio in Cambodia decreased from 36.1 students per teacher in 2006/07 to 29.7 in 2012/13; while in Laos, it decrease from 28.7 in 2006/07 to 22.0 in 2012/13.

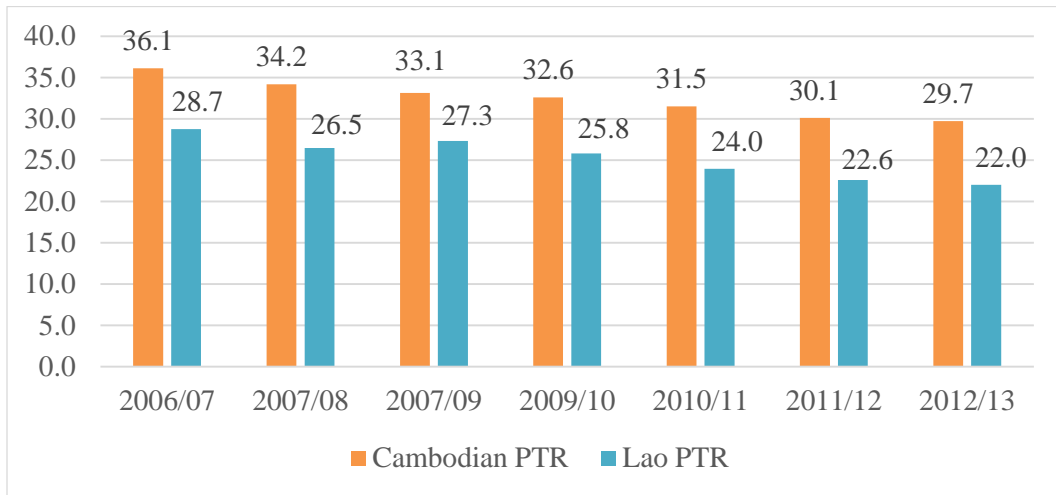
There are several common problems in Cambodia and Laos. The most important of which are low level of teacher salaries and delay of payment (Tandon and Fukao, 2012; Benvebiste et al., 2008). Teacher salaries are insufficient to cover basic living cost, especially for families. Tandon and Fukao (2012) show that teacher earnings are generally lower than other professions in Cambodia. They also state that many potential teachers decide to enter the teaching profession because of its respectability, importance in society, and job security.

Figure 5.1 – Total Number of Teacher in Cambodia and Laos



Source: EMIS, 2012 and MoES, 2012. Note: the unit is in 1000 teachers.

Figure 5.2 – Pupil Teacher Ratio in Cambodia and Laos



Source: EMIS, 2012 and MoES, 2012.

Due to the low level and delay in salary payment, some teachers need to take additional jobs to secure their income (Benvebiste et al., 2008; WB and MoE, 2008). These jobs are usually farming or other work in the village. This shows a likelihood of moving to non-teaching jobs when the opportunity cost of teaching is high. Studies on incentive programs in Cambodia show that incentive programs, especially financial support, can increase teacher motivation and satisfaction (Nock and Bishop, 2008; Benvebiste et al., 2008). The governments in both countries provide incentive programs to compensate teachers. However, the actual amount of incentive is small and does not seem to attract good and qualified teachers.

5.3. Literature review

5.3.1. Remoteness, workplace, and non-teaching jobs

One of the earliest papers that clarifies the influences on teacher's decision is by Chapman (1983). The factors are categorized into personal characteristics, training and primary teaching experience, professional and social influences, and career satisfaction. Ingersoll (2002) also mentions similar factors which are family or personal reasons, school staffing actions, pursuing another job, and dissatisfaction with the job and workplace.

After teacher training school, some trainees are assigned to teach in schools located in rural villages. Teaching in rural areas isolate them from social life, expose them to security risks, and has difficult living conditions (ILO, 1991; Lockheed and Verspoor, 1991; Murnane, 1993). The remoteness of villages reduces teachers' willingness to teach (McEwan, 1999). Usually, infrastructure such as hospitals, mains water, electricity, and regular markets are absent from rural villages. Thus, rural schools usually can attract only teachers with a lower formal education level, lack of experience, and insufficient skills in specific subjects (Psacharopoulos et al., 1993; McEwan, 1999).

Additionally, the condition of school is also important for teacher's decision. Teaching is effected by the condition of working place (Vegas, 2005). The teacher's satisfaction for job is related to enthusiasm and decision to remain teaching (Kelly et al., 1981; Chapman and Hutcheson, 1982; Heyns, 1988; Lortie, 1975) and poor working condition (for example: lack of equipment and facility for teaching) is one of the main influential factors on teacher's satisfaction (Buckley, Schneider, and Shang, 2005). Also, teacher usually prefers a class with fewer number of students (Theobald, 1990).

Sufficient financial support is very important for keeping teacher. Many studies point out that a low pay can pushes teacher to leave teaching (Ingersoll, 2000;

Liu and Meyer, 2005; Macdonald, 1995; Stinebrickner, 2001; Tye and O'Brien, 2002). Murnane et al. (1989) demonstrates that the higher paid teachers tend to keep teaching longer than the lower paid teachers. Similarly, study of Ingersoll (2002) also suggests that the main factor for leaving is the low salaries. Kersaint et al. (2007) found that teachers who left teaching usually care more about financial benefit than teachers who remained teaching. Pursuing other careers with higher salary and other benefits is the most relevant reason for teacher to leave (NCES, 1997). An increasing benefit of non-teaching job increases the opportunity cost for teaching. When the opportunity cost is very high, teacher would not join and leave the system (Rogers and Vegas, 2010).

The factors that influence teaching decision effects teacher differently depend on their characteristics. The personal characteristics like age, gender, ethnicity, marital status, socio-economic status, and degree of profession play a significant role in teacher's decision (Chapman, 1983; Heyns, 1988; Lortie, 1975). For example, new teachers usually start working when they are young and single, and after they are married and have more family member, they have a possibility to change their job for a sufficient income issue (Stinebrickner, 2002). In other words, the decision to remain teaching is often related to family situation. Particularly for female teachers because usually they need to take care of household works and children. Study of Kersaint et al. (2007) states that times spend with family and responsibility for family are highly concerned in the leaving decision.

5.3.2. Teacher incentive

Effective incentives result in better quality and more teaching in the education service. Different types of incentive programs are used to motivate teachers to teach in rural areas, to retain teachers, and to recruit qualified teachers.

They can be divided into non-monetary and monetary incentives (Kemmerer, 1990). Non-monetary incentives are common tools for the government when it has an insufficient budget. There are things such as social status, recognition, higher positions, and approval from very important people, etc. The monetary incentives can be separated into direct and indirect incentives. The direct monetary incentives are things such as an increasing salary, allowance, etc.; while the indirect incentives are things such as special training, materials for teaching, instructional supervision, and support for housing, transportation, etc.

Jones (2013) examines performance pay by asking teachers how long they would continue teaching. The results show that teachers with a pay incentive say they are less likely to leave than teachers without the incentive. Moreover, Stevenson et al. (1999) show that the increasing salary and bonus incentives increase the number of potential teachers; but to ensure the retention, an effective quality teaching environment are necessary.

Incentive programs are adapted by the education system of many countries. Urquiola and Vegas (2005) studied financial incentives in Bolivia, which increased the salary, and concluded that the incentive is not effective in attracting suitable teachers to rural area. They reveal that the increase in salary is too small to have an impact. In developing countries, recruitment policies such as increasing salary, bonus, housing, and training are frequently practiced (ILO, 1991; Carnoy and Torres, 1994; Lockheed and Verspoor, 1991; McEwan, 1998; Dove, 1986). The bonus and payment incentives are found in countries such as Argentina, Costa Rica, Jamaica, Philippines, etc. Venezuela uses the condition of time spent in rural areas to increase salaries. Honduras accepts three years of rural service as the equivalent of five years regular service in their seniority calculation. Moreover, other forms of benefit such as housing support are also found in many countries. Free housing is provided in Iraq, Mexico reduces house rent, and Senegal affords a housing allowance. For indirect-monetary

incentives, Bangladesh provides a special training for teachers in rural areas; and in Guyana, rural teachers get quicker promotion (ILO, 1991).

Additionally, some studies investigate the effect of incentives on educational outcome. Duflo et al. (2007) found that teacher absenteeism in rural India can be decreased by monitoring and salary incentives. Another study of Mizala and Romaguera (2005) suggests that student outcome can be improved by increasing the level of teacher salaries. Additionally, students in Mexico perform better in secondary education when their teachers receive monetary incentives (McEwan and Santibanes, 2005; Santibanes et al., 2007).

5.4. Methodology

5.4.1. Analytical framework

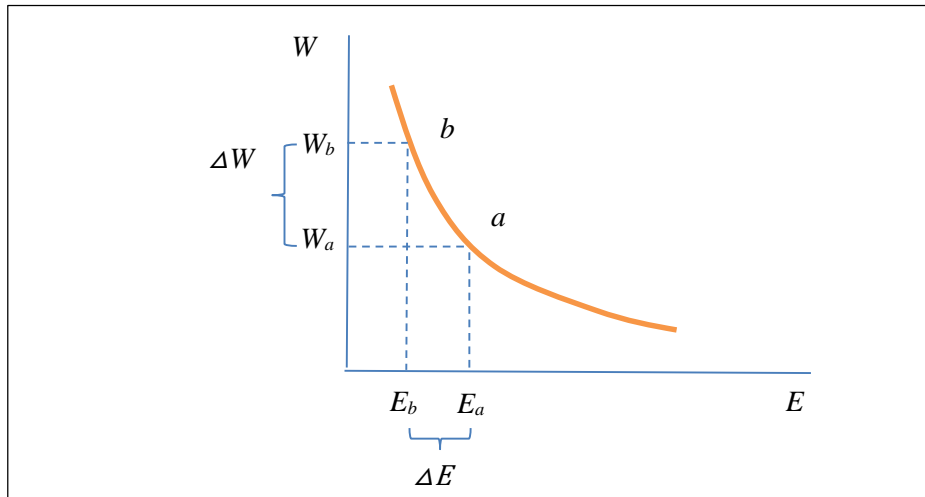
The decision of a potential teacher to join the teaching profession is dependent on the benefits and workplace environment of teaching profession compare to other professions. Let's assume an expected utility of the potential teacher conditional on joining the teaching profession as:

$$[5.1] \quad U_t = U(W_t, E_t) + \epsilon_t$$

where W_t and E_t are the benefits and workplace environment of the teaching profession, respectively. The benefits include direct benefits such as salary and other financial support, and indirect benefits such as social status, etc. The workplace environment (E) measures things such as development of infrastructures, etc. ϵ_t is a

disturbance term. W_t and E_t are assumed to have a positive effect on the expected utility, thus they are compensated as shown in the indifference curve in Figure 5.3.

Figure 5.3 – Indifference Curve for Teaching



Source: Created by author.

Point a and b in Figure 5.3 lie along the same indifferent curve which mean that both points result the same utility level. Point a has a better environment of workplace than point b but a lower level of benefit. If we compare from point a as an initial point and to point b as a final, we can see that a change in the environment of workplace (ΔE) is equivalent to the change in benefit (ΔW). In other words, teachers who need to teach at the poorer environment of work place as ΔE should be compensated of the higher benefit as ΔW . The aim of this study is to categorize the poor workplace environment and estimate the compensation of benefit in monetary term.

Now let's consider the possibility of not joining the teaching profession or deciding to join other professions. The expected utility for joining another profession is:

$$[5.2] \quad U_o = U(W_o, E_o) + \epsilon_o$$

From [5.1] and [5.2], the unconditional utility maximization problem is:

$$[5.3] \quad U^* = \max(U_t, U_o).$$

From the maximization problem, the potential teacher would choose to join the teaching profession if the expected utility of working as a teacher (U_t) is greater than the expected utility for joining another profession (U_o) and vice versa. Let's consider cases of W and E that effect the decision of potential teachers.

$$[5.4] \quad W_t > W_o \text{ and } E_t = E_o \rightarrow \text{potential teacher to join}$$

$$[5.5] \quad W_t < W_o \text{ and } E_t = E_o \rightarrow \text{potential teacher not to join}$$

(non-teaching jobs effect)

$$[5.6] \quad W_t = W_o \text{ and } E_t > E_o \rightarrow \text{potential teacher to join}$$

$$[5.7] \quad W_t = W_o \text{ and } E_t < E_o \rightarrow \text{potential teacher not to join}$$

(workplace environment effect).

The potential teacher will join the teaching profession if there is a greater benefit or a better workplace environment as shown in [5.4] and [5.6]. In contrast, if the environment of both professions is same and the benefit of the other profession is greater than the benefit in the teaching profession, the potential teacher will not join the teaching profession. The decision not to join is caused by the non-teaching job

effect [5.5]. Also, if the benefit is equal in both professions but the workplace environment of the teaching job is lower than the environment in the other profession, the potential teacher will not become a teacher. The decision not to join is caused by the poor workplace environment effect [5.7].

5.4.2. Development of attributes and levels

There are four choice experiments which are the rural location of schools, classroom conditions, preference for non-teaching jobs, and indirect monetary incentive programs. Attributes and levels in alternatives of each experiment are listed in Table 5.1. They are designated after considering the relevant literatures and focus group discussions of the educational specialists. Some of the attributes and levels were tested at a pilot survey in Laos, then modified and used in the actual survey.

Every choice sets include attributes of salary level for estimating the willingness to accept teaching in monetary terms. There are three levels of salaries for each country, 0.25, 0.5, and 0.75 million Riel for Cambodia and 1, 2, and 3 million Kip for Laos. The level of salaries is taken from levels of above and below a regular teacher salaries in both countries. There are six attributes for the choice experiment of the rural location of schools; which are the salary levels, travel times to closest town, electricity, mains water supply, hospitals, and regular markets. For the experiment of classroom, there are four attributes which are salary levels, material of classroom floor, number of pupils per class, and ethnicity of pupils. The experiment for non-teaching jobs includes the salary levels and types of jobs which are teachers, government staff, state enterprise employees, and private company employees. The experiment for indirect monetary incentive contains salary levels, in-service training, continuing education in university, dormitory, motorbike, and ability to select a school to teach.

5.4.3. Experimental design

A total combination (full factorial design) of levels in the rural location of school is 144 ($3^2 \cdot 2^4$), the classroom conditions is 54 ($3^3 \cdot 2$), the non-teaching jobs is 12 ($3 \cdot 4$), and the indirect monetary incentive is 96 ($3 \cdot 2^5$). The full factorial design requires a large sample size, thus this study applies a fractional factorial design. A combination of levels in alternatives for every experiment is constructed by a D-optimality with main effect design.

The D-optimal design is one of the most famous techniques in experimental design. This kind of design helps to minimize an overall variance of estimated coefficients by maximizing the determinant of $\mathbf{x}'\mathbf{x}$ (Atkinson and Donev, 1992). Thus the experiment would not require a huge number of respondents. The combination result from the design is shown in Appendix 5.1.

A questionnaire consists of four choice experiments (one experiment per page). One experiment includes three choice sets and each choice set contains four alternatives (except for the non-teaching job experiment which has five alternatives). Each choice set is randomly selected to form one experiment set, and each experiment set is also randomly selected to form one questionnaire. Examples of questionnaire and the choice sets are shown in Appendix 5.2. Every questionnaire set is randomly distributed to respondent with equal frequency.

Table 5.1 – Attributes and Levels

Attributes	Levels
Rural location of school	
Salary	For Cambodia: 0.25, 0.5, 0.75 million Riel For Laos; 1, 2, 3 million Kip
Travel time to closest town	3, 5, 10 hours
No Electricity	Yes, No
No Mains water	Yes, No
No Hospital	Yes, No
No Regular market	Yes, No
Classroom	
Salary	For Cambodia: 0.25, 0.5, 0.75 million Riel For Laos; 1, 2, 3 million Kip
Floor	Dirt, Concrete
Class size	20, 30, 40 pupils
Ethnicity of pupils	For Cambodia: non Khmer pupils and Khmer pupils For Laos: non Lao pupils and Lao pupils
Non-teaching jobs	
Salary	For Cambodia: 0.25, 0.5, 0.75 million Riel For Laos; 1, 2, 3 million Kip
Jobs	Teacher, Government, State enterprise, Private company, No selection
Indirect monetary incentives	
Salary	For Cambodia: 0.25, 0.5, 0.75 million Riel For Laos; 1, 2, 3 million Kip
In-service training	Yes, No
Continuing education in university	Yes, No
Dormitory	Yes, No
Motorbike	Yes, No
Choose school	Yes, No

5.4.4. Data collection

The experiments were conducted in October 2014 for Laos and February 2015 for Cambodia. Two teacher training colleges were selected from Cambodia; Kandal teacher training college and Kandal regional teacher training college, and two teacher training colleges were selected from Laos; Dongkhamxang teacher training college and Bankern teacher training college. The two colleges from Cambodia are located in Kandal province which is very close to Phnom Penh. The Kandal teacher training college is for primary teacher trainees and Kandal regional teacher training college is for lower secondary teacher trainees. Both schools in Laos have primary and lower secondary teacher trainees. The Donkhamxang college is located in Vientiane capital and Bankern college is in Vientiane province, about 120 kilometers from the capital city.

Trainees are selected from several classes to participate in the experiments. The trainees for lower secondary are from local language and mathematics subjects. Before the trainees start to answer the choice sets, the enumerators show a sample questionnaire on A1 size paper to explain the meaning of each attribute and the method to select the alternatives.

Altogether, there are 205 trainees from Cambodia and 240 trainees from Laos. However, there are some mistakes in answering the questionnaire, thus the number of observations varies in each estimation. The respondents' information is shown in Table 5.2. Female trainees make up 68.7 percent in Cambodia and 69.6 percent in Laos. Khmer ethnic trainees within Cambodian sample are 98.5 percent and 80.4 percent of total Lao sample have Lao ethnicity. Trainees for lower secondary make up 56.6 percent in the Cambodian sample and 23.3 percent in Lao sample.

Table 5.2 – Demographic of Respondents

	Cambodia	Laos
Female (percentage)	68.7	69.6
Khmer/Lao ethnicity (percentage)	98.5	80.4
To be lower secondary teacher (percentage)	56.6	23.3

5.4.5. Econometric equation and calculation of willingness to accept

A different selection among potential teachers allows us to analyze the probability to join the teaching profession conditional on the benefit and workplace environment. In DCE, a random utility model is used. Let a utility of alternative j for individual i is as:

$$[5.8] \quad U_{ij} = \mathbf{x}'_{ij}\boldsymbol{\beta}_i + \varepsilon_{ij}$$

where \mathbf{x} is a vector of alternative specific regressors, which are job characteristics, and $\boldsymbol{\beta}_i$ is a vector of coefficients which is distributed by density $f(\boldsymbol{\beta}|\boldsymbol{\theta})$. The $\boldsymbol{\theta}$ is the mean and covariance of $\boldsymbol{\beta}$. ε is a disturbance term and is assumed to be identically and independently distributed as extreme value distribution. The equation [5.8] is the mixed logit model (Train, 2009). The mixed logit model relaxes the independent of irrelevant alternatives assumption by allowing the parameters to be normally distributed.

The econometric equation [5.9], [5.10], [5.11], and [5.12] are used to estimate for the rural location of schools, conditions of classrooms, non-teaching jobs, and indirect monetary incentives, respectively.

$$[5.9] \quad P(\text{select})=f(\text{Salary}, \text{Travel-time}, \text{No-electricity}, \text{No-water}, \text{No-hospital}, \\ \text{No- market})$$

$$[5.10] \quad P(\text{select})=f(\text{Salary}, \text{Dirt-floor}, \text{Class-size}, \text{Ethnic-pupils})$$

$$[5.11] \quad P(\text{select})=f(\text{Salary}, \text{Government}, \text{State-enterprise}, \text{Private-company})$$

$$[5.12] \quad P(\text{select})=f(\text{Salary}, \text{Training}, \text{Education}, \text{Dormitory}, \text{Motorbike}, \\ \text{Select-school})$$

where *select* is a dependent variable which is equal to one if a respondent selects the alternative from the choice set and zero for otherwise. *Salary* variable is the salary level and is used as the fixed variable in the mixed logit estimation. In equation [5.9], *Travel-time* variable shows the used hours for traveling to closest town. *No-electricity*, *No-water*, *No-hospital*, and *No-market* is a binary variable which indicates if the location of school does not have an electricity, mains water, hospital, and regular market, respectively. In equation [5.10], *Dirt-floor* variable is equal to one if a material of classroom's floor is dirt and zero if the material is concrete. *Class-size* variable shows a number of pupils in classroom, and *Ethnic-pupils* variable is equal to one if pupils are not ethnic majority. For equation [5.11], there are three variables which are non-teaching jobs. *Government*, *State-enterprise*, and *Private-company* equal to one if an offered job is government job, state enterprise job, and private company job, respectively; and it is equal to zero for otherwise. The teaching job is used as a referent group. In equation [5.12], variable of *Training*, *Education*, *Dormitory*, *Motorbike*, and *Select-school* equal to one if the government provide incentive program of an annual in-service training, continuing education in university,

provision of dormitory, providing of motorbike, and being able to select school to teach.

The monetary value of willingness to accept the job (WTA) is calculated by dividing a coefficient of given job's attribute to a coefficient of salary in negative form as:

$$[5.13] \quad WTA_c = - \frac{\beta_c}{\beta_{salary}}$$

For simple interpretation and comparison between WTA values in Cambodia and Laos, the WTA value is transformed to a percentage different from the regular salary of teaching profession, which is 0.5 million Riel in Cambodia and 2 million Kip in Laos.

5.5. Results

5.5.1. Estimation of equations

The estimation results from the rural location of school, classroom conditions, preference on non-teaching jobs, and indirect monetary incentives are shown in Table 5.3, 5.4, 5.5, and 5.6, respectively. In each table, there are two columns which illustrates results of Cambodian and Lao cases. The results consist of a mean coefficient of each attribute and a standard deviation coefficient of random attributes.

Table 5.3 – Results for Rural Location of School

Variables	Cambodia	Laos
<i>Mean</i>		
<i>Salary</i>	5.249*** (8.414)	0.719*** (7.600)
<i>Travel-time</i>	-0.285*** (-5.824)	-0.147*** (-4.675)
<i>No-electricity</i>	-1.925*** (-6.549)	-2.273*** (-9.092)
<i>No-main water</i>	-1.249*** (-5.710)	-0.724*** (-4.548)
<i>No-hospital</i>	-3.074*** (-8.801)	-2.947*** (-9.196)
<i>No-regular market</i>	-1.156*** (-5.327)	-0.956*** (-6.051)
<i>Standard deviation</i>		
<i>Travel-time</i>	0.274*** (3.430)	0.194*** (3.381)
<i>No-electricity</i>	1.818*** (5.402)	1.459*** (4.690)
<i>No-main water</i>	1.125*** (3.246)	-0.860** (-2.442)
<i>No-hospital</i>	1.678*** (4.276)	2.255*** (6.282)
<i>No-regular market</i>	1.175*** (3.533)	-0.566* (-1.898)
Log-likelihood	-533.5	-667.9
Observations	2,460	2,856
Respondents	205	238

Note: z-statistics are in parentheses and *** p<0.01, ** p<0.05, * p<0.1

Table 5.4 – Results for Classroom Conditions

Variables	Cambodia	Laos
<i>Mean</i>		
<i>Salary</i>	5.704*** (11.294)	0.959*** (10.660)
<i>Dirt-floor</i>	-1.698*** (-7.392)	-0.715*** (-5.401)
<i>Class-size</i>	-0.040*** (-3.609)	-0.073*** (-6.507)
<i>Ethnic-pupils</i>	-1.157*** (-4.493)	-2.918*** (-8.880)
<i>Standard deviation</i>		
<i>Dirt-floor</i>	1.605*** (4.877)	0.727** (2.555)
<i>Class-size</i>	0.067*** (3.267)	0.073*** (3.931)
<i>Ethnic-pupils</i>	2.598*** (7.379)	2.859*** (7.450)
Log-likelihood	-605.2	-692.2
Observations	2,460	2,876
Respondents	205	238

Note: z-statistics are in parentheses and *** p<0.01, ** p<0.05, * p<0.1

Table 5.5 – Results for Non-Teaching Jobs

Variables	Cambodia	Laos
<i>Mean</i>		
<i>Salary</i>	5.001*** (8.950)	1.669*** (6.673)
<i>Government</i>	-3.426*** (-7.752)	-4.458*** (-6.120)
<i>State-enterprise</i>	-2.741*** (-8.275)	-7.493*** (-5.420)
<i>Private-company</i>	-4.344*** (-5.720)	-12.982*** (-3.479)
<i>Standard deviation</i>		
<i>Government</i>	2.665*** (6.405)	5.451*** (6.977)
<i>State-enterprise</i>	2.003*** (5.830)	5.994*** (5.444)
<i>Private-company</i>	0.562 (0.390)	5.435*** (3.420)
Log-likelihood	-447.3	-398.8
Observations	2,372	2,760
Respondents	205	238

Note: z-statistics are in parentheses and *** p<0.01, ** p<0.05, * p<0.1

Table 5.6 – Result for Indirect Monetary Incentives

Variables	Cambodia	Laos
<i>Mean</i>		
<i>Salary</i>	4.499*** (8.631)	0.980*** (9.074)
<i>Training</i>	1.901*** (7.228)	1.148*** (6.453)
<i>Education</i>	3.170*** (8.158)	3.261*** (8.588)
<i>Dormitory</i>	0.980*** (4.395)	0.788*** (4.326)
<i>Motorbike</i>	0.937*** (3.937)	0.577*** (3.383)
<i>Select-school</i>	1.477*** (5.248)	1.433*** (6.512)
<i>Standard deviation</i>		
<i>Travel-time</i>	1.434*** (3.686)	0.974*** (3.204)
<i>No-electricity</i>	-1.455*** (-3.097)	2.276*** (5.553)
<i>No-main water</i>	1.334*** (3.564)	1.168*** (3.859)
<i>No-hospital</i>	1.540*** (4.122)	0.918** (2.265)
<i>No-regular market</i>	2.341*** (5.286)	-1.584*** (-4.772)
Log-likelihood	-529.4	-664.0
Observations	2,420	2,844
Respondents	202	237

Note: z-statistics are in parentheses and *** p<0.01, ** p<0.05, * p<0.1

Overall, all random parameters are statistically significant at the one percent level. The all attributes have the expected sign. The variable *Salary* has a positive sign in every estimation. Other attributes in the rural location of school and conditions of class room have the negative sign. It shows that the potential teachers are less likely to accept the job offer as the difficulties for joining teaching profession increase. Furthermore, all non-teaching jobs have a negative sign which shows that the potential teachers prefer the teaching profession over the government, state enterprise, and private company jobs. For the indirect monetary incentives, every attribute has the positive sign. It shows the possible trade of to the direct incentive pay.

5.5.2. Willingness to accept the job attributes

The value of WTA in local currency and in different percentage to the average salary are shown in Table 5.7. For simplicity, the percentage of WTA is used for interpretation. The attributes in choice experiment of rural location of school, classroom conditions, and non-teaching jobs have a positive percentage; while the attributes of indirect monetary incentives have a negative percentage. The positive WTA percentage measures an additional percentage on top of salary that potential teachers require as compensation and the negative WTA percentage measures the percentage decrease in salary that potential teachers would accept of indirect monetary incentives.

For the rural location of the school, Lao potential teachers require higher compensation than Cambodian potential teachers for most of attribute, except *travel-time* which is very similar. The potential teachers from Cambodia and Laos prefer 10.8 and 10.2 percent increase in salary for one hour increases in traveling time from the location to the town. If the location of the school does not have electricity,

Table 5.7 –WTA for Teaching Profession

	WTA in million Riel for Cambodia and Laos		WAT in different Kip for percentage from average salary	
	Cambodia	Laos	Cambodia	Laos
<i><u>Rural location of school</u></i>				
<i>Time-travel</i>	0.05	0.20	10.8	10.2
<i>No-electricity</i>	0.37	3.16	73.3	158.0
<i>No-water</i>	0.24	1.01	47.6	50.3
<i>No-hospital</i>	0.59	4.10	117.1	204.8
<i>No-market</i>	0.22	1.33	44.1	66.5
<i><u>Classroom</u></i>				
<i>Dirt-floor</i>	0.30	0.75	59.5	37.3
<i>Class-size</i>	0.01	0.08	1.4	3.8
<i>Ethnic-pupils</i>	0.20	3.04	40.6	152.2
<i><u>Non-teaching jobs</u></i>				
<i>Government</i>	0.68	2.67	137.0	133.5
<i>State-enterprise</i>	0.55	4.49	109.6	224.4
<i>Private-company</i>	0.87	7.78	173.7	388.8
<i><u>Indirect monetary incentives</u></i>				
<i>Training</i>	-0.42	-1.17	-84.5	-58.5
<i>Education</i>	-0.70	-3.33	-140.9	-166.4
<i>Dormitory</i>	-0.22	-0.80	-43.6	-40.2
<i>Motorbike</i>	-0.21	-0.59	-41.6	-29.4
<i>Select-school</i>	-0.33	-1.46	-65.6	-73.1

Cambodian potential teachers require 73.3 percent and Lao potential teachers demand for 158.0 percent. These are the second highest requirement for both countries. Then, for main water supply, the potential teachers prefer 47.6 percent in Cambodia and 50.3 percent in Laos. The highest requirement for compensation in both countries is for an absence of hospitals, 117.1 percent for Cambodia and 204.8 percent for Laos. It shows that the health care is the imperative issue that the potential teachers care. The salary up lift required for a regular market is 44.1 percent in Cambodia and 66.5 percent in Laos.

The poor condition of classroom lowers the willingness to accept the teaching jobs of the potential teachers. The Cambodian potential teachers require a 59.5 percent increase if the floor of classroom is made of dirt, while Lao potential teachers want 37.3 percent. For the number of student per class, if a classroom includes one more pupil, Cambodian and Lao potential teachers want about 1.4 and 3.8 percent increase of salary, respectively. For ethnicity of pupils, the result shows that potential teacher in both countries are discouraged to join teaching profession if they are assigned to teach ethnic minority children (non-Khmer for Cambodia and non-Lao for Laos). Lao potential teachers demand a very high 152.2 percent; while Cambodian potential teachers want 40.6.

All positive sign of non-teaching jobs attributes suggests that the teaching profession is the most preferred job among the potential teachers. The least likely job to be selected in both countries is in private companies. The potential teachers require 173.7 percent in Cambodia and 388.3 percent in Laos for moving from teaching to work in private company. The most preferred non-teaching job in Cambodia is the state enterprise job (109.6 percent) and followed by the government job (137.0 percent); while in Laos, the most preferred job is for the government (133.5 percent), followed by the state enterprise (224.4 percent).

For the indirect monetary incentives, the most preferred indirect monetary

incentive in both countries is the continued education in university. The potential teachers will sacrifice more than a hundred percent of average salary (140.9 percent for Cambodia and 166.4 percent for Laos). Over one hundred percentage means that potential teachers would add their own money to obtain this incentive. The second most preferred incentive in Cambodia is the in-service training (84.5 percent); followed by the ability to select school (65.6 percent), a dormitory (43.6 percent), and a motorbike (41.6 percent), respectively. In the Lao case, after the continuing education, the preferences are the ability to select school (73.1 percent), in-service training (58.5 percent), a dormitory (40.2 percent), and a motorbike (29.4 percent), respectively.

5.6. Discussion

In general, the percentage of WTA of attributes appear to be high and too expensive for the government to compensate. However, the importance of the percentage of WTA is in the ranking. A budget to cover incentives to recruit new teachers should be allocated and ranked according to the percentage of WTA, to help the government to invest efficiently.

To observe the possibility of not to joining the teaching profession, the percentage WTA of non-teaching jobs are used to compare with the percentage of WTA of the attributes of rural location and classroom conditions. Although, the percentage of WTA is high, the comparison is not a problem because both percentages are from what potential teachers' preference.

In Table 5.7, the percentage of WTA of most non-teaching jobs are higher than the percentage of attributes of rural location and classroom conditions. This means that where the WTA percentage of each non-teaching type of job is compared to each attributes of rural location and classroom conditions, there is only a small probability

that potential teachers would not join the teaching profession. However, where there is a school which has the combined attributes of *no-hospital*, *no-electricity*, and *ethnic-pupils*; the sum of WTA percentage of the combined attributes can easily exceed the WTA percentage of all types of non-teaching jobs. This suggests the possibility that potential teachers would be willing to move to non-teaching jobs.

5.7. Conclusion

Recruitment of new teachers is an imperative issue that needs to be addressed in order to ensure the number of qualified teachers. An increasing opportunity cost for the teaching profession is the major problem. Many studies suggest solutions such as providing monetary and non-monetary incentives. However, there are few studies that estimate an appropriate value for incentive programs, thus it is worthwhile to estimate the factors that influence potential teachers' decision.

This study applies the discrete choice experiment with trainees from four teacher training colleges in Cambodia and Laos. The experiment in Cambodia was conducted in February 2015; and in Laos in October 2014. There are four experiment sets which are: rural location of the school, classroom conditions, non-teaching jobs, and indirect monetary incentives. The attributes for the rural location of the school are salary, time travel to closest town, electricity, mains water, hospitals, and regular markets. For the classroom conditions, the attributes are salary, material of classroom floor, class size, and ethnicity of students. For the non-teaching jobs attributes are salary, teaching jobs, government jobs, state enterprise jobs, and private company jobs. For the indirect monetary incentives attributes are salary, annual in-service training, continued education in university, provision of a dormitory, provision of a motorbike, and the ability to select the school to teach. The sample from Cambodia consists of 205 teacher trainees and from Laos 240 trainees. The sample are potential teachers for

primary and lower secondary schools. The data from the experiment is used with the conditional logit model.

All attributes are statistically significant at the one percent level. Among the rural location of the school, an existence of hospitals is the most important factor and followed by the supply of electricity, regular market, and mains water. The time to travel to closest town is also important for potential teachers' decision. For the classroom conditions, Cambodian potential teachers care more about the material of floor than Lao potential teachers, and Lao potential teachers care more about the ethnicity of student than Cambodians. Potential teachers in both countries have a lower preference to take non-teaching jobs (government, state enterprise, and private company) compared to the teaching profession. The least preferred job is to work with private companies. The state enterprise job is preferred to the government job in the Cambodian case; while the government job is preferred to state enterprise job in Laos. For the indirect incentives, the most preferred incentive is the continued education in university level and followed by the annual in-service training and the ability to select school.

Overall, the compensated values to the teaching profession are very high and it seems to be difficult for the government to pay. However, the ranking of the value of attributes for teaching profession can benefit the government in setting an appropriate amount of incentive programs. The governments should allocate the budget of each incentive program regarding to the order of attributes which is suggested in this study. This can help the governments to allocate the educational budget effectively.

From comparing the percentage of WTA of non-teaching jobs to the percentage of WTA of the rural location and classroom condition one by one, it shows that there is small possibility for potential teachers not to join teaching profession. However, if the location of school includes several attributes of rural location and

classroom condition, the percentage of WTA of rural location and condition of classroom can easily surpasses the percentage of WTA of non-teaching jobs. This suggests the possibility that potential teachers would not join the teaching profession.

Limitation of this study is to control respondent's characteristics such as the region and ethnicity. By interact some of the respondent's characteristics, it is possible to find the cheaper way to pay for teacher incentives. For example, trainees might prefer to work in some particular place such as hometown, city, or famous schools. Thus, it is encouraged for future study to investigate more respondent's characteristics as well as attributes that can influence a potential teachers' decision.

Appendix 5.1. Combination Result from the D-optimality with Main Effect Design for Lao Case

For rural location of school

Note: F1 = salary, F2 = distance from location to closest town, F3 = electricity, F4 = main water, F5 = hospital, F6 = regular market.

Block	F1	F2	F3	F4	F5	F6	F1	F2	F3	F4	F5	F6	F1	F2	F3	F4	F5	F6	F1	F2	F3	F4	F5	F6
Block 1	3000000	3	yes	yes	yes	yes	1000000	1	no	no	yes	no	1000000	1	no	no	yes	no	3000000	3	no	yes	no	yes
Block 1	2000000	1	no	no	no	no	3000000	5	yes	yes	no	yes	2000000	5	yes	yes	no	yes	1000000	5	yes	no	yes	no
Block 1	2000000	3	yes	no	no	yes	2000000	1	no	no	no	no	3000000	3	no	no	yes	no	3000000	1	yes	no	no	yes
Block 2	1000000	1	no	no	yes	yes	3000000	3	yes	no	yes	no	1000000	3	yes	no	yes	no	2000000	3	no	yes	yes	yes
Block 2	3000000	5	yes	yes	no	no	1000000	1	no	yes	no	yes	2000000	5	no	yes	no	yes	3000000	1	yes	no	no	no
Block 2	2000000	5	no	no	yes	no	2000000	1	yes	no	yes	no	3000000	3	yes	yes	no	yes	1000000	5	yes	no	no	yes
Block 3	1000000	5	yes	yes	yes	yes	2000000	5	yes	yes	yes	yes	3000000	3	yes	no	no	no	3000000	3	yes	no	no	yes
Block 3	3000000	3	no	no	no	no	1000000	1	no	no	no	no	1000000	1	no	yes	yes	yes	2000000	5	no	yes	yes	no
Block 3	2000000	1	no	no	no	no	1000000	1	no	no	no	yes	1000000	1	yes	no	no	no	1000000	1	yes	no	no	no
Block 4	1000000	1	no	no	no	no	3000000	1	no	yes	no	no	2000000	5	no	no	yes	no	2000000	1	yes	no	no	no
Block 4	2000000	1	no	no	no	no	2000000	3	yes	yes	no	no	1000000	3	yes	yes	yes	yes	3000000	5	no	yes	no	yes
Block 4	3000000	5	no	yes	yes	no	3000000	5	yes	no	no	no	3000000	3	no	no	no	no	1000000	3	no	yes	no	yes
Block 5	1000000	1	no	no	yes	no	1000000	5	no	no	no	yes	3000000	1	no	no	yes	no	1000000	1	no	no	yes	yes
Block 5	3000000	3	yes	yes	no	yes	2000000	3	yes	yes	yes	no	1000000	3	yes	yes	no	yes	2000000	5	yes	yes	no	no
Block 5	3000000	3	yes	yes	no	yes	2000000	3	yes	yes	yes	no	1000000	3	yes	yes	no	yes	2000000	5	yes	yes	no	no
Block 6	3000000	1	yes	no	yes	no	1000000	3	yes	yes	yes	yes	3000000	5	no	no	yes	yes	3000000	3	yes	yes	no	no
Block 6	1000000	5	no	yes	no	yes	3000000	5	no	no	no	no	1000000	3	yes	yes	no	no	2000000	1	no	no	yes	yes
Block 6	3000000	1	yes	no	yes	no	1000000	3	yes	yes	yes	yes	3000000	5	no	no	yes	yes	3000000	3	yes	yes	no	no
Block 7	2000000	3	yes	yes	yes	no	1000000	1	yes	no	yes	yes	1000000	3	yes	yes	no	no	1000000	5	yes	no	yes	no
Block 7	1000000	5	no	no	no	yes	2000000	5	no	yes	no	no	2000000	1	no	no	yes	yes	2000000	1	no	yes	no	yes
Block 7	2000000	3	yes	yes	yes	no	1000000	1	yes	no	yes	yes	1000000	3	yes	yes	no	no	1000000	5	yes	no	yes	no
Block 8	3000000	1	yes	no	yes	yes	2000000	1	no	no	no	no	3000000	5	no	yes	no	no	2000000	5	yes	yes	yes	yes
Block 8	1000000	3	no	yes	no	no	1000000	3	yes	yes	yes	yes	1000000	1	yes	no	yes	yes	3000000	1	no	no	no	no
Block 9	3000000	3	yes	no	yes	no	2000000	5	no	yes	no	yes	2000000	3	no	no	no	no	2000000	5	no	no	no	yes
Block 9	2000000	5	no	yes	no	yes	3000000	1	yes	no	yes	no	3000000	5	yes	yes	yes	yes	1000000	1	yes	yes	yes	no
Block 10	3000000	3	no	no	no	yes	2000000	1	yes	no	yes	yes	3000000	5	yes	no	no	yes	3000000	1	no	no	yes	yes

Block 10	2000000	5	yes	yes	yes	no	3000000	3	no	yes	no	no	2000000	1	no	yes	yes	no	1000000	5	yes	yes	no	no
Block 11	1000000	5	yes	no	no	no	3000000	1	yes	no	no	yes	2000000	3	no	no	no	yes	3000000	5	yes	yes	yes	yes
Block 11	3000000	1	no	yes	yes	yes	1000000	5	no	yes	yes	no	3000000	5	yes	yes	yes	no	2000000	1	no	no	no	no
Block 12	3000000	5	no	no	yes	no	2000000	5	yes	no	yes	yes	2000000	3	yes	yes	yes	no	1000000	1	yes	yes	no	no
Block 12	1000000	1	yes	yes	no	yes	3000000	3	no	yes	no	no	3000000	5	no	no	no	yes	3000000	5	no	no	yes	yes
Block 13	2000000	3	yes	no	no	no	3000000	1	no	yes	no	yes	1000000	5	yes	no	yes	no	2000000	3	yes	yes	no	yes
Block 13	3000000	1	no	yes	yes	yes	2000000	3	yes	no	yes	no	2000000	1	no	yes	no	yes	3000000	5	no	no	yes	no
Block 14	3000000	5	yes	no	no	no	3000000	3	no	no	yes	no	3000000	3	yes	no	yes	yes	1000000	5	yes	no	no	yes
Block 14	2000000	1	no	yes	yes	yes	2000000	5	yes	yes	no	yes	1000000	1	no	yes	no	no	3000000	3	no	yes	yes	no
Block 15	1000000	3	no	yes	yes	yes	3000000	3	no	no	no	yes	3000000	3	no	no	no	yes	1000000	1	yes	yes	no	no
Block 15	2000000	5	yes	no	no	no	1000000	1	yes	yes	yes	no	2000000	5	yes	yes	yes	no	3000000	5	no	no	yes	yes
Block 16	2000000	3	no	no	yes	yes	3000000	1	yes	yes	no	no	3000000	1	yes	no	no	no	3000000	1	no	no	no	no
Block 16	1000000	5	yes	yes	no	no	1000000	5	no	no	yes	yes	1000000	5	no	yes	yes	yes	2000000	3	yes	yes	yes	yes
Block 17	3000000	5	yes	no	no	yes	1000000	5	yes	yes	yes	no	3000000	3	no	no	no	yes	1000000	3	no	yes	yes	no
Block 17	1000000	1	no	yes	yes	no	2000000	3	no	no	no	yes	2000000	5	yes	yes	yes	no	3000000	5	yes	no	no	yes
Block 18	2000000	3	no	yes	no	no	2000000	3	no	no	yes	no	3000000	5	no	no	no	no	1000000	3	no	yes	yes	no
Block 18	3000000	1	yes	no	yes	yes	1000000	1	yes	yes	no	yes	1000000	1	yes	yes	yes	yes	2000000	1	yes	no	no	yes
Block 19	2000000	1	no	yes	no	no	3000000	5	yes	no	no	yes	3000000	1	no	yes	yes	yes	3000000	3	no	no	no	yes
Block 19	1000000	3	yes	no	yes	yes	1000000	3	no	yes	yes	no	2000000	5	yes	no	no	no	1000000	1	yes	yes	yes	no
Block 20	1000000	5	no	yes	no	yes	1000000	1	yes	no	no	yes	3000000	3	no	no	yes	no	2000000	5	no	yes	no	no
Block 20	3000000	3	yes	no	yes	no	3000000	5	no	yes	yes	no	1000000	1	yes	yes	no	yes	3000000	3	yes	no	yes	yes
Block 21	1000000	1	no	yes	yes	no	1000000	1	no	yes	no	no	2000000	3	yes	yes	no	yes	1000000	3	no	yes	no	yes
Block 21	2000000	5	yes	no	no	yes	2000000	3	yes	no	yes	yes	1000000	1	no	no	yes	no	2000000	1	yes	no	yes	no
Block 22	1000000	3	yes	yes	no	no	2000000	1	yes	yes	yes	no	3000000	1	no	yes	yes	yes	1000000	1	yes	no	yes	yes
Block 22	3000000	5	no	no	yes	yes	1000000	3	no	no	no	yes	1000000	5	yes	no	no	no	3000000	3	no	yes	no	no
Block 23	3000000	3	yes	yes	no	yes	3000000	3	yes	no	no	yes	2000000	5	no	yes	yes	no	1000000	3	no	no	yes	yes
Block 23	2000000	5	no	no	yes	no	2000000	5	no	yes	yes	no	1000000	1	yes	no	no	yes	3000000	5	yes	yes	no	no
Block 24	2000000	1	no	yes	yes	no	3000000	1	no	yes	yes	yes	2000000	3	no	no	yes	yes	2000000	1	no	no	yes	no
Block 24	1000000	3	yes	no	no	yes	1000000	5	yes	no	no	no	3000000	1	yes	yes	no	no	1000000	5	yes	yes	no	yes
Block 25	2000000	3	yes	yes	yes	no	3000000	5	yes	no	yes	yes	2000000	5	no	yes	no	yes	2000000	1	no	yes	no	yes
Block 25	3000000	1	no	no	no	yes	2000000	1	no	yes	no	no	1000000	3	yes	no	yes	no	1000000	3	yes	no	yes	no
Block 26	2000000	1	yes	no	no	yes	2000000	3	no	yes	yes	yes	1000000	3	no	yes	no	no	1000000	1	no	yes	no	yes

Block 26	1000000	3	no	yes	yes	no	3000000	5	yes	no	no	no	2000000	1	yes	no	yes	yes	2000000	3	yes	no	yes	no
Block 27	3000000	5	yes	yes	yes	no	2000000	3	yes	yes	no	yes	3000000	1	yes	no	no	yes	1000000	5	no	yes	yes	yes
Block 27	1000000	1	no	no	no	yes	1000000	5	no	no	yes	no	2000000	3	no	yes	yes	no	3000000	3	yes	no	no	no
Block 28	2000000	3	no	yes	yes	yes	1000000	5	yes	no	no	no	1000000	5	no	no	yes	yes	1000000	5	yes	no	no	yes
Block 28	1000000	1	yes	no	no	no	3000000	3	no	yes	yes	yes	3000000	1	yes	yes	no	no	2000000	3	no	yes	yes	no
Block 29	1000000	5	yes	no	yes	no	2000000	3	yes	no	no	no	1000000	5	no	yes	no	yes	2000000	3	no	no	no	no
Block 29	3000000	3	no	yes	no	yes	3000000	5	no	yes	yes	yes	2000000	1	yes	no	yes	no	3000000	5	yes	yes	yes	yes
Block 30	3000000	5	no	no	yes	no	1000000	3	yes	yes	no	no	3000000	3	no	yes	yes	no	3000000	1	yes	yes	yes	yes
Block 30	2000000	1	yes	yes	no	yes	2000000	1	no	no	yes	yes	2000000	1	yes	no	no	yes	1000000	3	no	no	no	no
Block 31	2000000	3	yes	no	yes	yes	2000000	5	no	no	no	yes	3000000	3	yes	yes	yes	yes	3000000	5	no	yes	yes	no
Block 31	3000000	1	no	yes	no	no	3000000	1	yes	yes	yes	no	1000000	1	no	no	no	no	2000000	3	yes	no	no	yes
Block 32	1000000	5	no	no	yes	yes	3000000	1	no	yes	yes	yes	1000000	5	no	yes	yes	no	1000000	5	no	no	no	no
Block 32	2000000	1	yes	yes	no	no	1000000	3	yes	no	no	no	2000000	3	yes	no	no	yes	2000000	1	yes	yes	yes	yes
Block 33	2000000	5	no	no	yes	yes	1000000	3	no	yes	yes	yes	2000000	1	no	yes	no	yes	2000000	3	yes	no	yes	yes
Block 33	3000000	1	yes	yes	no	no	3000000	5	yes	no	no	no	1000000	5	yes	no	yes	no	3000000	1	no	yes	no	no

For condition of classroom

Note: F1 = salary, F2 = condition of floor, F3 = number of pupils in class, F4 = pupils' ethnicity.

Block	F1	F2	F3	F4	F1	F2	F3	F4	F1	F2	F3	F4	F1	F2	F3	F4
Block 1	2,000,000	cement	40	hmong	2,000,000	yes	40	hmong	3,000,000	dirt	30	khmur	2,000,000	cement	30	hmong
Block 1	3,000,000	cement	20	lao	3,000,000	no	30	khmur	1,000,000	cement	20	hmong	1,000,000	cement	20	lao
Block 1	1,000,000	dirt	30	hmong	3,000,000	no	20	lao	1,000,000	dirt	20	lao	2,000,000	dirt	20	khmur
Block 2	1,000,000	dirt	40	khmur	1,000,000	no	20	hmong	1,000,000	cement	40	lao	3,000,000	dirt	20	hmong
Block 2	3,000,000	dirt	20	hmong	2,000,000	yes	30	hmong	3,000,000	cement	20	khmur	2,000,000	dirt	30	khmur
Block 2	2,000,000	cement	30	lao	3,000,000	no	40	lao	2,000,000	dirt	30	hmong	3,000,000	cement	40	hmong
Block 3	1,000,000	cement	30	lao	1,000,000	yes	30	lao	3,000,000	cement	30	khmur	3,000,000	dirt	40	khmur
Block 3	3,000,000	dirt	30	khmur	2,000,000	no	40	khmur	2,000,000	dirt	40	lao	2,000,000	cement	20	lao
Block 3	2,000,000	cement	20	hmong	3,000,000	yes	20	hmong	1,000,000	dirt	20	lao	1,000,000	cement	30	hmong
Block 4	1,000,000	dirt	30	hmong	1,000,000	no	30	hmong	2,000,000	dirt	30	hmong	2,000,000	cement	40	hmong
Block 4	3,000,000	dirt	40	lao	2,000,000	yes	20	lao	3,000,000	dirt	40	khmur	1,000,000	dirt	20	lao
Block 4	2,000,000	cement	30	khmur	1,000,000	yes	40	khmur	1,000,000	cement	20	lao	3,000,000	dirt	30	lao
Block 5	2,000,000	dirt	40	hmong	3,000,000	yes	30	khmur	3,000,000	cement	30	khmur	3,000,000	cement	30	lao
Block 5	3,000,000	dirt	40	khmur	1,000,000	yes	40	lao	2,000,000	dirt	20	hmong	1,000,000	dirt	40	khmur
Block 5	1,000,000	cement	20	lao	2,000,000	no	30	hmong	2,000,000	dirt	40	lao	2,000,000	dirt	20	khmur
Block 6	1,000,000	cement	30	khmur	2,000,000	no	20	lao	3,000,000	cement	20	hmong	1,000,000	cement	30	lao
Block 6	3,000,000	dirt	40	lao	3,000,000	yes	40	hmong	1,000,000	cement	30	lao	3,000,000	cement	20	khmur
Block 6	2,000,000	cement	20	hmong	1,000,000	yes	30	khmur	2,000,000	dirt	40	khmur	2,000,000	dirt	40	hmong
Block 7	1,000,000	dirt	40	lao	1,000,000	yes	30	lao	2,000,000	cement	40	hmong	1,000,000	dirt	30	hmong
Block 7	3,000,000	cement	20	hmong	2,000,000	no	40	lao	1,000,000	dirt	20	khmur	3,000,000	cement	40	hmong
Block 7	2,000,000	cement	30	khmur	3,000,000	yes	20	khmur	3,000,000	dirt	30	hmong	2,000,000	dirt	20	khmur
Block 8	3,000,000	cement	30	hmong	3,000,000	no	30	lao	3,000,000	cement	40	lao	1,000,000	dirt	40	khmur
Block 8	3,000,000	cement	20	lao	1,000,000	yes	40	hmong	2,000,000	dirt	30	hmong	3,000,000	dirt	30	lao
Block 8	1,000,000	dirt	40	lao	2,000,000	yes	20	khmur	1,000,000	cement	20	khmur	2,000,000	cement	40	khmur
Block 9	1,000,000	dirt	20	hmong	2,000,000	no	40	khmur	3,000,000	cement	30	hmong	1,000,000	dirt	20	hmong
Block 9	2,000,000	dirt	30	lao	2,000,000	yes	30	hmong	2,000,000	cement	40	lao	1,000,000	cement	40	lao
Block 9	3,000,000	cement	40	lao	1,000,000	no	20	lao	1,000,000	dirt	20	lao	2,000,000	cement	30	lao

Block 10	3,000,000	cement	20	hmong	1,000,000	yes	20	khmur	2,000,000	cement	30	lao	1,000,000	cement	30	khmur
Block 10	2,000,000	dirt	40	hmong	2,000,000	no	30	hmong	2,000,000	dirt	20	hmong	3,000,000	dirt	20	lao
Block 10	1,000,000	dirt	30	khmur	3,000,000	yes	40	hmong	1,000,000	dirt	40	khmur	2,000,000	dirt	30	hmong
Block 11	1,000,000	dirt	30	hmong	1,000,000	yes	40	hmong	3,000,000	dirt	20	khmur	1,000,000	cement	20	lao
Block 11	3,000,000	cement	40	khmur	2,000,000	no	30	khmur	1,000,000	cement	30	hmong	2,000,000	dirt	40	hmong
Block 11	1,000,000	dirt	20	khmur	3,000,000	yes	20	lao	2,000,000	dirt	30	lao	3,000,000	dirt	40	lao
Block 12	2,000,000	dirt	20	lao	1,000,000	no	40	hmong	3,000,000	cement	20	lao	2,000,000	dirt	40	lao
Block 12	3,000,000	cement	30	hmong	2,000,000	yes	20	khmur	2,000,000	dirt	40	khmur	3,000,000	cement	20	khmur
Block 12	2,000,000	dirt	20	khmur	3,000,000	yes	30	hmong	1,000,000	dirt	40	lao	2,000,000	cement	20	lao
Block 13	3,000,000	cement	40	lao	3,000,000	yes	20	hmong	3,000,000	cement	40	hmong	3,000,000	dirt	40	hmong
Block 13	1,000,000	dirt	20	lao	2,000,000	yes	30	hmong	1,000,000	cement	20	lao	1,000,000	dirt	20	hmong
Block 13	2,000,000	dirt	20	khmur	1,000,000	no	30	lao	1,000,000	dirt	30	khmur	1,000,000	cement	30	khmur
Block 14	3,000,000	cement	20	khmur	1,000,000	no	20	hmong	1,000,000	cement	30	khmur	1,000,000	cement	40	lao
Block 14	2,000,000	dirt	20	hmong	3,000,000	no	40	lao	2,000,000	cement	40	hmong	2,000,000	cement	30	khmur
Block 14	3,000,000	cement	30	lao	2,000,000	yes	30	khmur	3,000,000	dirt	30	lao	1,000,000	dirt	40	hmong
Block 15	1,000,000	cement	40	hmong	3,000,000	no	40	khmur	2,000,000	dirt	30	khmur	1,000,000	dirt	30	lao
Block 15	2,000,000	dirt	20	khmur	1,000,000	yes	30	lao	3,000,000	cement	40	hmong	3,000,000	cement	20	hmong
Block 15	1,000,000	dirt	20	khmur	1,000,000	no	20	hmong	2,000,000	dirt	20	lao	1,000,000	cement	30	lao
Block 16	1,000,000	cement	40	hmong	2,000,000	yes	40	lao	1,000,000	dirt	40	hmong	2,000,000	cement	40	lao
Block 16	1,000,000	cement	40	hmong	2,000,000	yes	40	lao	1,000,000	dirt	40	hmong	2,000,000	cement	40	lao
Block 16	3,000,000	dirt	30	lao	3,000,000	no	20	hmong	2,000,000	cement	20	khmur	3,000,000	dirt	30	hmong
Block 17	2,000,000	dirt	30	lao	1,000,000	no	20	khmur	1,000,000	dirt	40	hmong	3,000,000	dirt	30	khmur
Block 17	2,000,000	dirt	30	lao	1,000,000	no	20	khmur	1,000,000	dirt	40	hmong	3,000,000	dirt	30	khmur
Block 17	1,000,000	cement	40	khmur	3,000,000	yes	30	lao	2,000,000	cement	20	khmur	2,000,000	cement	20	hmong
Block 18	1,000,000	dirt	40	khmur	3,000,000	no	30	khmur	3,000,000	dirt	20	lao	3,000,000	cement	30	khmur
Block 18	1,000,000	cement	20	lao	1,000,000	yes	20	hmong	1,000,000	dirt	20	khmur	2,000,000	dirt	20	lao

For teaching and non-teaching jobs

Note: F1 = teacher, F2 = government officer, F3 = state-enterprise employee, F4 = private company employee.

Block	F1	F2	F3	F4
Block 1	500000	500000	750000	750000
Block 1	750000	750000	500000	250000
Block 1	250000	250000	250000	500000
Block 1	500000	500000	750000	750000
Block 2	250000	250000	500000	250000
Block 2	750000	500000	250000	750000
Block 2	250000	750000	750000	500000
Block 3	250000	250000	250000	250000
Block 3	250000	500000	250000	250000
Block 3	500000	750000	500000	500000
Block 4	500000	250000	500000	250000
Block 4	750000	750000	250000	500000
Block 4	250000	250000	500000	750000
Block 5	500000	250000	250000	250000
Block 5	750000	250000	750000	750000
Block 5	250000	500000	500000	500000
Block 6	250000	500000	750000	250000
Block 6	500000	250000	250000	500000
Block 6	750000	500000	500000	750000
Block 7	250000	750000	250000	750000
Block 7	250000	750000	250000	750000
Block 7	750000	250000	750000	500000

For teaching and non-teaching jobs

Note: F1 = teacher, F2 = government officer, F3 = state-enterprise employee, F4 = private company employee.

Block	F1	F2	F3	F4	F5	F6	F1	F2	F3	F4	F5	F6	F1	F2	F3	F4	F5	F6	F1	F2	F3	F4	F5	F6
Block 1	1,000,000	yes	yes	yes	no	no	3,000,000	yes	yes	no	no	yes	2,000,000	yes	yes	yes	yes	yes	1,000,000	yes	yes	yes	yes	yes
Block 1	2,000,000	no	no	yes	yes	yes	1,000,000	no	no	no	no	no	3,000,000	no	no	yes	yes	no	3,000,000	no	no	no	no	yes
Block 1	2,000,000	no	no	yes	no	yes	3,000,000	no	yes	yes	yes	yes	1,000,000	no	yes	no	no	yes	3,000,000	no	yes	yes	yes	yes
Block 2	1,000,000	yes	yes	no	yes	yes	1,000,000	no	no	yes	no	no	2,000,000	yes	yes	yes	yes	no	2,000,000	yes	yes	yes	no	no
Block 2	2,000,000	no	yes	yes	no	no	1,000,000	yes	no	no	yes	yes	1,000,000	yes	yes	no	yes	yes	1,000,000	no	no	no	yes	no
Block 2	3,000,000	no	no	no	no	yes	3,000,000	yes	yes	yes	yes	yes	3,000,000	no	no	yes	no	yes	3,000,000	yes	yes	no	no	yes
Block 3	3,000,000	yes	yes	yes	yes	no	2,000,000	yes	yes	yes	no	yes	1,000,000	yes	no	no	yes	yes	3,000,000	yes	no	yes	no	yes
Block 3	2,000,000	yes	no	yes	no	yes	2,000,000	yes	yes	no	no	yes	2,000,000	no	yes	yes	no	no	2,000,000	yes	yes	no	yes	no
Block 3	1,000,000	no	yes	no	no	yes	1,000,000	no	no	no	yes	no	3,000,000	no	no	no	no	yes	1,000,000	no	no	yes	no	no
Block 4	1,000,000	no	yes	yes	yes	no	2,000,000	yes	no	no	yes	yes	2,000,000	no	no	yes	no	yes	1,000,000	yes	yes	no	no	yes
Block 4	2,000,000	yes	no	no	no	yes	1,000,000	yes	yes	no	yes	yes	1,000,000	no	yes	yes	yes	no	3,000,000	yes	no	yes	no	no
Block 4	3,000,000	no	no	yes	no	yes	2,000,000	no	no	yes	no	no	3,000,000	yes	no	no	yes	no	2,000,000	no	yes	no	yes	no
Block 5	3,000,000	yes	yes	no	yes	yes	2,000,000	yes	yes	no	no	no	2,000,000	yes	no	yes	no	yes	3,000,000	no	no	yes	yes	no
Block 5	1,000,000	yes	no	yes	no	no	1,000,000	no	yes	yes	yes	no	3,000,000	no	yes	no	yes	no	3,000,000	yes	yes	yes	yes	yes
Block 5	2,000,000	no	no	no	yes	no	3,000,000	no	no	yes	yes	yes	1,000,000	yes	no	yes	no	no	2,000,000	yes	yes	no	no	yes
Block 6	3,000,000	yes	no	no	yes	yes	1,000,000	no	yes	yes	no	yes	2,000,000	no	no	no	no	no	1,000,000	yes	no	no	yes	no
Block 6	1,000,000	no	yes	no	no	no	2,000,000	yes	yes	no	no	no	1,000,000	no	yes	yes	yes	no	2,000,000	no	no	no	no	yes
Block 6	2,000,000	yes	yes	yes	no	yes	3,000,000	yes	no	yes	yes	no	3,000,000	yes	no	yes	yes	yes	3,000,000	yes	yes	yes	yes	no
Block 7	3,000,000	yes	yes	no	no	yes	1,000,000	yes	no	yes	no	yes	1,000,000	no	yes	no	no	yes	2,000,000	yes	yes	no	no	yes
Block 7	2,000,000	no	no	yes	yes	no	2,000,000	yes	no	yes	yes	no	2,000,000	no	no	yes	no	no	3,000,000	yes	no	yes	yes	no
Block 7	1,000,000	no	no	no	yes	no	3,000,000	no	yes	no	no	yes	3,000,000	yes	yes	no	yes	yes	3,000,000	no	yes	yes	no	no
Block 8	2,000,000	yes	yes	yes	yes	yes	1,000,000	no	yes	no	yes	no	1,000,000	yes	yes	yes	no	yes	3,000,000	no	yes	no	no	yes
Block 8	1,000,000	no	yes	no	no	yes	1,000,000	yes	no	no	no	yes	3,000,000	yes	no	yes	yes	no	1,000,000	yes	no	yes	yes	yes
Block 8	3,000,000	yes	no	no	no	no	3,000,000	yes	no	yes	yes	no	2,000,000	no	yes	no	no	yes	2,000,000	no	no	yes	no	no
Block 9	2,000,000	no	yes	yes	yes	yes	3,000,000	yes	yes	yes	no	yes	2,000,000	no	no	no	yes	no	2,000,000	no	yes	yes	yes	yes
Block 9	1,000,000	yes	no	yes	yes	yes	2,000,000	yes	no	yes	yes	yes	3,000,000	yes	yes	no	no	no	3,000,000	yes	no	no	no	no
Block 9	3,000,000	yes	no	no	no	no	2,000,000	no	yes	no	yes	no	1,000,000	yes	no	yes	yes	yes	1,000,000	yes	yes	yes	yes	yes
Block 10	1,000,000	yes	yes	yes	yes	yes	3,000,000	no	yes	no	no	no	1,000,000	no	no	no	yes	yes	2,000,000	yes	no	no	yes	no
Block 10	3,000,000	no	no	yes	no	no	1,000,000	no	no	yes	no	yes	2,000,000	yes	yes	yes	no	yes	3,000,000	no	yes	yes	no	no
Block 10	2,000,000	yes	yes	no	yes	yes	2,000,000	yes	yes	yes	yes	yes	3,000,000	yes	yes	no	yes	no	1,000,000	no	yes	yes	yes	yes
Block 11	3,000,000	yes	yes	yes	yes	no	3,000,000	no	no	no	yes	yes	3,000,000	yes	yes	yes	no	no	2,000,000	no	no	yes	yes	yes
Block 11	1,000,000	no	yes	no	no	no	1,000,000	yes	yes	yes	yes	no	1,000,000	no	no	yes	no	no	3,000,000	no	yes	no	yes	no
Block 11	2,000,000	no	no	no	no	yes	2,000,000	yes	yes	yes	no	no	2,000,000	no	no	no	yes	yes	1,000,000	yes	yes	no	no	no
Block 12	1,000,000	no	no	yes	yes	yes	3,000,000	yes	yes	yes	no	no	1,000,000	yes	yes	yes	no	yes	1,000,000	no	no	yes	yes	yes
Block 12	3,000,000	yes	yes	no	no	no	2,000,000	no	no	no	yes	yes	2,000,000	no	no	no	yes	no	3,000,000	yes	yes	no	no	no

Block 12	1,000,000	yes	no	yes	no	no	1,000,000	yes	yes	yes	yes	yes	2,000,000	yes	no	yes	yes	yes	2,000,000	no	yes	no	no	no
Block 13	2,000,000	yes	no	no	yes	no	1,000,000	yes	no	no	no	no	3,000,000	no	no	no	no	yes	2,000,000	no	yes	yes	yes	yes
Block 13	3,000,000	no	yes	yes	no	yes	3,000,000	no	yes	yes	yes	yes	2,000,000	yes	yes	yes	yes	no	1,000,000	yes	no	no	no	no
Block 13	1,000,000	yes	yes	no	no	yes	1,000,000	yes	yes	yes	yes	no	1,000,000	yes	yes	no	yes	yes	1,000,000	yes	yes	no	yes	no
Block 14	1,000,000	yes	no	no	no	yes	2,000,000	no	no	yes	no	yes	2,000,000	no	no	yes	yes	yes	3,000,000	no	no	no	yes	yes
Block 14	3,000,000	no	yes	yes	yes	no	1,000,000	yes	yes	no	yes	no	3,000,000	yes	yes	no	no	no	2,000,000	yes	yes	yes	no	no
Block 14	2,000,000	yes	yes	yes	yes	no	3,000,000	yes	yes	no	yes	no	1,000,000	yes	no	no	yes	no	1,000,000	no	no	yes	no	no
Block 15	3,000,000	no	no	yes	yes	yes	2,000,000	yes	no	no	yes	yes	1,000,000	no	no	yes	yes	yes	2,000,000	no	yes	yes	no	no
Block 15	2,000,000	yes	yes	no	no	no	3,000,000	no	yes	yes	no	no	2,000,000	yes	yes	no	no	no	3,000,000	yes	no	no	yes	yes
Block 15	1,000,000	no	no	yes	yes	no	1,000,000	no	yes	yes	yes	no	1,000,000	yes	no	yes	yes	yes	1,000,000	yes	no	yes	no	no
Block 16	2,000,000	no	yes	no	yes	no	1,000,000	no	yes	yes	yes	yes	3,000,000	no	yes	yes	yes	yes	2,000,000	yes	no	no	yes	no
Block 16	1,000,000	yes	no	yes	no	yes	3,000,000	yes	no	no	no	no	1,000,000	yes	no	no	no	no	1,000,000	no	yes	yes	no	yes
Block 16	1,000,000	yes	no	yes	no	yes	3,000,000	yes	no	no	no	no	1,000,000	yes	no	no	no	no	1,000,000	no	yes	yes	no	yes
Block 17	3,000,000	no	no	no	yes	yes	1,000,000	yes	no	no	yes	no	2,000,000	yes	yes	no	yes	yes	3,000,000	yes	yes	no	yes	yes
Block 17	2,000,000	yes	yes	yes	no	no	2,000,000	no	yes	yes	no	yes	3,000,000	no	no	yes	no	no	1,000,000	no	no	yes	no	no
Block 17	2,000,000	yes	yes	yes	no	no	2,000,000	no	yes	yes	no	yes	3,000,000	no	no	yes	no	no	1,000,000	no	no	yes	no	no
Block 18	3,000,000	yes	no	yes	yes	no	3,000,000	yes	no	no	no	no	3,000,000	no	yes	yes	yes	yes	1,000,000	yes	yes	no	no	no
Block 18	2,000,000	no	no	yes	no	yes	2,000,000	no	yes	no	yes	yes	2,000,000	yes	no	no	no	yes	2,000,000	yes	no	yes	no	yes

Appendix 5.2. Questionnaire and Example of Choice Sets in Lao`

<p>To respondent, this survey is to examine teacher trainees' preference on teaching difficulty and possible incentive program. Your answer will be keep in secrete and will not be used in the way that may trouble you. So, please provide a completed and real answer. Thank you for your cooperation.</p>		
Question	How to answer	Answer
Name of school	Note	
Sex	Male = 1, female =2	
Ethnicity	Lao = 1, other = 2,	
Marriage status	Single = 1, married = 2	
Weekly general expenditure	Note	
Study performance	Poor = 1, normal = 2, good = 3, excellent = 4	
For those who will secondary teacher, please indicate your subject	Note	

An example for a choice set of the rural location of school

If you are assigned to teach in a school which is located in the rural locations such as in the choice set below. Which is the most satisfied alternative that you are willing to accept?

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Time spent to travel to closest town (hours)	5	3	5	5
Electricity supply in village	Yes	Yes	Yes	No
Mains water supply in village	Yes	No	No	Yes
Hospital in village	No	No	No	Yes
Regular market in village	No	No	No	No
Salary (Kip)	3,000,000	3,000,000	2,000,000	1,000,000
Please select the most stratified alternative				

An example for a choice set of the condition of classrooms

If you are assigned to teach in a school with classroom condition such as in the choice set below. Which is the most satisfied alternative that you are willing to accept?

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Material of classroom floor	Concrete	Concrete	Dirt	Concrete
Number of pupils per class	40	40	30	30
Ethnicity of pupils	Non-Lao	Non-Lao	Non-Lao	Lao
Salary (Kip)	2,000,000	2,000,000	3,000,000	2,000,000
Please select the most stratified alternative				

An example for a choice set of the non-teaching jobs

If you are able to select occupation such as in the choice set below. Which is the most satisfied alternative that you are willing to accept?

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Type of job	Teacher	Government	State enterprise	Private company
Salary	3,000,000	3,000,000	3,000,000	2,000,000
Please select the most stratified alternative				

An example for a choice set of the indirect monetary incentive

If the government is willing to improve teaching profession by providing a set of incentive programs such as in the choice set below. Which is the most satisfied alternative that you are willing to accept?

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Motorbike	Yes	Yes	Yes	Yes
Teacher dormitory	Yes	Yes	Yes	Yes
Being able to select school to teach	Yes	No	Yes	Yes
Continuing education in University	No	No	Yes	Yes
Annual in-service training	No	Yes	Yes	Yes
Salary (Kip)	3,000,000	3,000,000	2,000,000	1,000,000
Please select the most stratified alternative				

CHAPTER SIX

CONCLUSION AND POLICY IMPLICATIONS

6.1. Conclusion

Education plays a very important role in economic development. Human capital increases labor productivity and generates several benefits to society. Therefore, ensuring children to complete basic education is an imperative issue to be addressed. An out-of-school problem is a major issue. One of the factors that influence the out-of-school problem is an expansion of employment. Generally, the growth of employment increases wage levels and provides employment opportunities. Thus, it increases the opportunity cost for not working which effects the decision of households, students, and teachers. This dissertation analyzes the effect of the growth of un-skilled labor demand on the out-of-school children in Chapter three, the characteristics of employment on the possibility of secondary school students dropping out in Chapter four, and the probability of teacher trainees not to join a teaching profession and move to non-teaching professions in Chapter five.

To investigate the effect of the un-skilled labor demand on the out-of-school children, this study apply an econometric equation with the data of Cambodian and Lao household surveys in 2012. The dependent variables indicate whether the school age children are in school or not. The interested independent variables are the growth of labor demand in agriculture and service sectors. The rice production and number of buildings in service business are proxy for the agriculture and service sectors, respectively. To analyze the effect of job' characteristics on the possibility of secondary school students to drop out for work, the choice experiment is employed. The experiment was conducted at the Laongarm Complete Secondary

school in October 2013. The secondary school students were offered the hypothetical jobs and were asked their preference of the jobs. They were also informed that they would have a possibility to be recruited, if they accepted the job offer. The answer of students is used in an econometric equation with the characteristics of students and jobs as independent variables. For the possibility of not joining the teaching profession of teacher trainees, the discrete choice experiment is used with trainees from two teacher training schools in Cambodia and two teacher training schools in Laos. There are four experiments which are the rural location of school, conditions of classroom, preference on non-teaching professions, and indirect monetary incentives.

The results from the effect of the growth of un-skilled labor demand on out-of-school suggest that the expansion of agricultural and service sectors increase number of out-of-school children. The effect of the sectors between male and female children is similar, while the effect between major ethnicity and non-major ethnicity children is different in each country. The results from the experiment of secondary school students show that an increasing wage increases the possibility of the students to drop out and take the offered jobs. The students are less likely to take the jobs if the location is farther. Also, the findings show that the students who have a higher probability to take the jobs are non-Lao ethnicity students, come from poor household, have friends working outside of the Laongarm district, and have a difficulty travel to school. For the discrete choice experiment with teacher trainees, the results suggests that the potential teachers are less likely to take the teaching profession if they are assign to teach in school that locates in rural village without several support infrastructures and has poor condition of classroom. The potential teachers prefer the teaching profession over the non-teaching jobs such as the government staff, state-enterprise employee, and private company employee. However, the preference of the non-teaching jobs easily exceeds the preference of the teaching job if the potential teachers need to teach in difficult situation.

Cambodia and Laos have adopted the international legislation relating to child labor such as the C138 of the International Labour Organization as shown in Table 6.1. Cambodia implemented the C138 in 1999 and has categorized the light work provision and the list hazardous; while Laos established the C138 in 2005 and does not have the light work provision and the list of hazardous. Although both countries have the legislation relating to child labor, the results of this study suggest that there is still a chance of children to be out of school, either for work or not, relate to the growth of economic sectors suggest agriculture and service.

Table 6.1. Legislation Relating to Child Labor

Country	Establishment C138 ratification	Minimum age specified	Light work provision	Hazardous list
Cambodia	1999	15	Yes, from 12 years (MoSALVY, Prakas No.002 of 2008)	Yes (MoSALVY, Prakas No.106 of 2004)
Laos	2005	14	No	No

Source: UCW, 2015.

6.2. Policy implications

This research provides four main policy implications for educational development which are: improving the regulation to stop child labor activities that prevent them from school, informing people knowledge of the risk to dropout from working, providing the education support program, and developing the teacher incentive scheme. The detailed discussion are below.

Firstly, children have a possibility to be out of school for working; thus, the government should be considered strengthen the regulations to prevent the use of child labor that causes them to be out of school, particularly compulsory education.

Secondary, households should also be educated about the important of the basic education and the risk to be out of school because of working.

Thirdly, the particular programs to motivate school enrollment as well as keeping students in school should be considered where there is a high risk for children to be out of school. Also, different characteristics of students and households influence the decision of dropping out; then, the program should be allocated to particular households or children who have a possibility to be out of school.

Fourthly, the difficulty in teaching profession such as the rural location and poor condition of classroom lowers the preference of potential teachers to join teaching profession; therefore, teachers in the particular location should be provided incentive programs. A particular difficulty in teaching profession should be addressed by a particular and appropriate incentive value. Finally, the government should be concerned using the indirect monetary incentives.

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