



Effects of Migration and Remittances on Educational Attainment and Working Hours of Children in Cambodia

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**Effects of Migration and Remittances on Educational Attainment
and Working Hours of Children in Cambodia**

**(労働移動と送金がカンボジアの教育達成と子どもの
労働時間に与える影響)**

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SUMMARY

Cambodian migration is part of the country's modern history and is characterized by a shift, from forced migration due to political instabilities to a voluntary, economic, poverty-driven basis. The latter form, mostly of labor migration, has significantly occurred both internally (within-province and across-province) and internationally in recent years. It is manifested as a pursuit of better opportunities towards utility maximization and economic ends through remittances to households in communities of origin. Corresponding to the rise of migration, the inflows of remittances also drastically increase. These remittances directly contribute to the improvement of households' poverty and are often the only source for poor households in rural areas. To enhance the safe migration and maximize the potential impact of remittances on households' economic well-being as well as the country's development, the Royal Government of Cambodia (RGC) launched the policy on labor migration in 2010 and revised it in 2014.

Amid the growing volume of migration and remittances, an important question arises: how do both migration and remittances affect the children left behind? Many Cambodian migrants leave behind their children in the care of their grandparents or other relatives during their absence. A study carried out on the impact of migration on children in Cambodia points out that the lack of information on children of adult migrants (either internally or internationally), due to either poorly structured information collections or systematically gathered by agencies, thus leads to little knowledge of the effects from migration on those children. Issues surrounding those left-behind children stemmed from migration are then brought about and are far too important to be neglected.

Evidence shows that education is fundamental to the development of human capital and economic growth. In Cambodia, despite a significant improvement in primary enrollment rate, the completion rates at primary and lower secondary schools have been stagnant in the last ten years. As of the academic year 2015-2016, the completion rate at

primary and lower secondary levels in Cambodia is as low as 79.9% and 42.6% respectively. The economic burden, particularly on poor households to finance education and school-related costs, is substantial and greater for poor children continuing on their higher levels of education. In addition, a need to rely on children as laborers to help generate household finances, even at the very early age of five, is also widespread. In the connection between the effects of migration with the tangible benefits through remittances on children left behind, a growing body of research relying on household data reveals how these remittances can help relax households' financial constraints and improve the well-being of children in the long run. Studies show that migration and remittances help boost households' financial capacity to invest in human capital formation, raise schooling levels by increasing the ability of households to pay and keep children longer in school, and such that children are less likely to work or more likely to work fewer hours. However along with the benefits, the absence of household members owing to migration could actually force left-behind children to get involved in economic activities and work long hours to substitute the loss of workforce, instead of spending time on their schooling activities. The relationship between migration and remittances is closely linked and complicated. Coupled with the methodological problems, their countervailing effects can be confusing and thus resulting in misleading conclusions. Findings on the effects of migration and remittances have been to date inconsistent. It is still a debate whether migration and remittances help or harm the affected children.

The objectives of the study are twofold: i) to provide empirical evidence on the effects of migration by destination and remittances on children's human capital accumulation measured by the completed grade of education; and ii) to investigate the influences of migration by destination and remittances on children's working incidence and working hours. After examining the overall effects of migration by destination and remittances, the study also assesses their effects by rural and urban areas. In addition, to better understand the impact of remittances, the study further examines the net remittance

effect (among non-migrant households) and the fixed remittance effect (among migrant households by migration destination).

This study can contribute to the existing literature in the context of Cambodia in the following aspects. First, since labor migration is relatively a new topic in Cambodia, this study sheds more light on the empirical evidence of the impact of migration and remittances. Second, unlike previous literature treating migration equally or focusing on only international migration, this study distinguishes migration into three types by destination: within-province, across-province, and international migration. Third, this study is the first attempt to disentangle the remittance impact from the effects of migration by destination in both rural and urban areas. Fourth, in addition to the common use of household survey to investigate the effects of migration and remittances, this study uses the Education Management Information System (EMIS) data to capture supply-side factors at the district level to control for the unobserved covariates.

In response to the study's objectives, the study first utilizes the Ordinary Least Squares (OLS) to see the associations between migration by destination and the completed grade of education. To capture the causal effect of remittances on children's grade completion, the Two-Stage Least Squares (2SLS) is applied to tackle the endogeneity nature of remittances. A set of instrument variables, namely disaster, distance to provincial town, and remittance norm, is used to instrument remittance in the first-stage regression. Second, to assess the effects of migration and remittances on children's working incidence and working hours, the study uses the Two-Step Heckman model to correct the sample selectivity issues, as a large proportion of children is not engaged in economic activities. For this empirical analysis of the migration and remittance effects, the study jointly uses the nationally representative Cambodia Socio-Economic Survey (CSES) 2009 and Education Management Information System (EMIS) 2008-2009.

Regarding the effects of migration by destination and remittances on children's schooling outcome, the study finds that within-province migration in both urban and rural

areas has an adverse effect on the completed grade of education of children left behind; however, the study does not see any significant relationship between either across-province or international migration and grade completion in Cambodia. Consistent with previous studies, the aggregate effect of remittances on the completed grade of education is found to be positive. In the sub-sample analysis by migration destination, the net effect of remittances (among non-migrant) is even larger than the aggregate effect. The study detects some remaining positive effects of remittances among across-province migration households, but not among the within-province households. Since the instrument variables cannot reject the exogeneity of remittance, the study cannot confirm any impact of remittances on the grade completion among children of the international migration households. However, it also does not rule out a possibility of the positive impact of remittances among the international migration group. In addition, both Akaike Information Criteria (AIC) and the likelihood ratio tests suggest that by adding supply-side factors in the model, it improves the goodness of fit of the models. The strong correlations between the supply-side factors and the completed grade of education, in particular in rural areas, indicate that the supply-side factors still play a vital role in children's learning in Cambodia.

Results from the Two-Step Heckman analysis indicate that while internal migration (both within-province and across-province) leads to an increase in working probability or working hours of children left behind, international migration, in contrast, helps reduce the working incidence and working hours of children. Remittances are found to have a negative effect on working incidence and working hours of children. In other words, remittances alleviate household's economic constraints such that children are less likely to get involved in economic activities and thus shorten working hours of working children. The remittance effect is large in urban areas; however, its effect in rural areas is statically insignificant. Further analysis of remittance effects by migration destination shows that the impact of remittances is diminished among children of the across-province

and international migration households and is totally canceled out among the within-province migration group.

Findings from the study reveal that the effects of migration on children's educational outcome and working hours are heterogeneous. While within-province migration seems to adversely affect children's schooling and extend their working hours, there is no evidence of any relationship between other types of migration (across-province and international migration) and the completed grade of education. The different results of the migration effect by destination could be explained by the smaller amount of remittances generated from within-province migrant households, in comparison to across-province and international migrant households. The remittance effects are positive in terms of both increasing children's grade completion and reducing children's working hours. However, the positive impact of remittances is totally wiped out by the absence of family member owing to within-province migration and partly diminished among children of across-province and international migration. The results from this study suggest that, for children left behind, remittances generated from across-province and international migration outweigh the losses of absent household members. Therefore, it suggests the necessity of further promoting low-skilled migration that can generate higher wages instead of unskilled migration within the same province. The statement has also been put forward by the government's policy on harnessing the migration to meet the standard labor market demand in the ASEAN Economic Community (AEC). At the same time, it is also important to facilitate the processes and means for migrants, so that they can channel their remittances to their families in rural and remote areas in a cheaper and more efficient manner. Remittances have also been recognized at the global agenda of SDGs through an emphasis on reducing the transaction costs of migrant remittances and eliminate remittance corridors with high costs, and such that families can invest more in education.

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TABLE OF CONTENTS

EXECUTIVE SUMMARY	i
ACKNOWLEDGMENTS.....	vi
LIST OF ACRONYMS	xii
LIST OF TABLES	xiv
LIST OF FIGURES.....	xvi
TERMINOLOGY	xvii
 CHAPTER 1: INTRODUCTION.....	1
1.1. BACKGROUND	1
1.2. PROBLEM STATEMENT.....	9
1.3. RESEARCH QUESTIONS	13
1.4. OBJECTIVES OF THE STUDY.....	14
1.5. SIGNIFICANCE OF THE STUDY.....	15
1.6. ORGANIZATION OF DISSERTATION	19
 CHAPTER 2: OVERVIEW OF EDUCATION, CHILD WORK, MIGRATION AND REMITTANCES IN CAMBODIA	21
2.1. OVERVIEW OF EDUCATIONAL SITUATION IN CAMBODIA	21
2.1.1. History of the Cambodian Education, Policies and Reforms.....	22
2.1.2. Cambodian Education System.....	24
2.1.3. Achievements and Challenges in Education Sector	29
2.2. OVERVIEW OF CHILD WORK IN CAMBODIA	33
2.2.1. Characteristic of Working Children.....	35
2.2.2. Child Work and Child Labor.....	40
2.2.3. Laws and Regulations on Child Labor.....	42
2.3. OVERVIEW OF MIGRATION IN CAMBODIA	43
2.3.1. Internal Migration.....	44
2.3.2. International Migration	49

2.3.3. Laws and Regulations on Migration in Cambodia	52
2.4. OVERVIEW OF REMITTANCES IN CAMBODIA.....	53
CHAPTER 3: LITERATURE REVIEW	58
3.1. EFFECTS OF MIGRATION AND REMITTANCES ON CHILDREN’S EDUCATION	58
3.1.1. Effects of Migration on Children’s Education	58
3.1.2. Effects of Remittances on Children’s Education	68
3.1.3. Countervailing Effects of Migration and Remittances on Child’s Schooling.....	75
3.2. EFFECTS OF MIGRATION AND REMITTANCES ON THE INCIDENCE OF CHILDREN WORKING.....	80
3.2.1. Effects of Migration on the Incidence of Children Working	81
3.2.2. Effects of Remittances on the Incidence of Children Working	86
3.2.3. Countervailing Effects of Migration and Remittances on the Incidence of Children Working.....	91
3.3. CASE STUDIES IN THE CAMBODIAN CONTEXT	94
3.4. ROLES OF SUPPLY SIDE FACTORS ON CHILDREN’S EDUCATION AND CHILD WORK.....	98
CHAPTER 4: METHODOLOGY	101
4.1. ANALYTICAL FRAMEWORK.....	101
4.1.1. Theoretical Framework	101
4.1.2. Conceptual Framework	104
4.2. HYPOTHESES	107
4.3. MODELS	112
4.3.1. Ordinary Least Squares (OLS) and 2-Stage Least Squares (2SLS)	112
4.3.2. Two-Step Heckman.....	118
4.4. DATA	121
4.4.1. Overview of Data.....	121
4.4.2. Variables	122

4.4.3. Descriptive Analysis	129
CHAPTER 5: RESULTS.....	139
5.1. EFFECTS OF MIGRATION AND REMITTANCES ON COMPLETED GRADE OF EDUCATION	140
5.1.1. Overall Effects of Migration and Remittances on Completed Grade of Education	140
5.1.2. Effects of Migration and Remittances on Completed Grade of Education in Rural and Urban Areas	148
5.1.3. Effects of Remittances on Completed Grade of Education by Migration Destination	152
5.2. EFFECTS OF MIGRATION AND REMITTANCES ON WORKING HOURS OF CHILDREN	158
5.2.1. Overall Effects of Migration and Remittances on Working Hours	159
5.2.2. Effects of Migration and Remittances on Working Hours in Rural and Urban Areas	167
5.2.3. Effects of Remittances on Working Hours by Migration Destinations	170
CHAPTER 6: DISCUSSION AND CONCLUSION	173
6.1. DISCUSSION	173
6.1.1. Effects of Migration and Remittances on Completed Grade of Education..	173
6.1.2. Effect of Migration and Remittances on Children's Working Hours.....	180
6.2. LIMITATION OF THE STUDY	183
6.3. CONCLUSION	185
REFERENCES.....	191
APPENDICES	208

LIST OF ACRONYMS

2SLS	2-Stage Least Squares
ADB	Asian Development Bank
AIC	Akaike Information Criteria
ASEAN	Association of Southeast Asian Nations
BIC	Bayes Information Criteria
CDRI	Cambodia Development Resource Institute
CNCC	Cambodia National Council for Children
CRUMP	Cambodian Rural-Urban Migration Project
CSES	Cambodia Socio-Economic Survey
ECE	Early Childhood Education
EFA	Education for All
EMIS	Education Management Information System
FDI	Foreign Direct Investment
GDP	Gross Domestic Product
GPE	Global Partnership for Education
ILO	International Labor Organization
MoEYS	Ministry of Education Youth and Sports
MoLVT	Ministry of Labor and Vocational Training
MoP	Ministry of Planning
MoU	Memorandum of Understanding
NELM	New Economics of Labor Migration
NIE	National Institute of Education
NIS	National Institute of Statistics
ODA	Official Developing Assistance
OLS	Ordinary Least Square

PSTTC	Pre-School Teacher Training Center
PTTC	Provincial Teacher Training Center
RGC	Royal Government of Cambodia
RTTC	Regional Teacher Trainee Colleges
SDGs	Sustainable Development Goals
SIDA	Swedish International Development Cooperation Agency
TVET	Technical and Vocational Education and Training
UNCRC	United Nations Convention on the Rights of the Child
UNESCAP	United Nations Economic and Social Commission for Asia and the Pacific
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNICEF	United Nations International Children's Emergency Fund
UPE	Universal Primary Education
WCEFA	World Conference on Education for All
USAID	United States Agency for International Development

LIST OF TABLES

Table 1-1. Out-of-School Children, Child Labor Incidence and Annual Remittances in Cambodia.....	9
Table 2-1. The Census Population of Children (5 -17) by Gender, Age, and Area.....	34
Table 2-2. Children's School Attendance Rate by Age Group, Sex, and Region	35
Table 2-3. Number of Migrants (in thousand) by Region and Gender in 2008 and 2013.....	45
Table 4-1. Name and Definition of Variables	124
Table 4-2. Summary Statistics of Variables	127
Table 4-3. Average Completed Grade of Education by Age Cohort and Migration Status.....	130
Table 4-4. Average Completed Grade of Education by Age Cohort, Gender, and Area.....	131
Table 4-5. Percentage of Working Children and Working Hours by Children Aged 6-17	132
Table 4-6. Children by Household Member's Migration Status	134
Table 4-7. Remittance Recipient Households and Remittance Amount by Migration Destinations.....	137
Table 5-1. OLS Results on Completed Grade of Education.....	142
Table 5-2. 2SLS Results on Completed Grade of Education	147
Table 5-3. OLS Results on Completed Grade of Education by Region	149
Table 5-4. 2SLS Results on the Completed Grade of Education by Region.....	152
Table 5-5. OLS Results on Completed Grade of Education by Migration Type.....	154
Table 5-6. 2SLS Results on Completed Grade of Education by Migration Types	156
Table 5-7. Children's Working Participation by Age, Gender, and Area	159
Table 5-8. 2-Step Heckman Results on Children's Working Hours	162

Table 5-9. 2-Step Heckman Results on Children’s Working Hours in Rural and Urban Areas.....	169
Table 5-10. Two-Step Heckman Results on Children’s Working Hours (Non-Migrant and Within-province).....	171
Table 5-11. Two-Step Heckman Results on Children’s Working Hours (Across-province and International).....	172

LIST OF FIGURES

Figure 2.1. Cambodian Formal Education System	25
Figure 2.2. Cambodia Education Budget 2000-2013 (in USD Million)	30
Figure 2.3. Enrollment and Completion Rates at Primary and Lower Secondary	31
Figure 2.4. Children's Schooling and Working Status by Age	37
Figure 2.5. Percentage of Children Aged 5-17 Participating in Work by Hours	39
Figure 2.6. Internal Migrants by Migration Stream and Sex in 2008 and 2013	46
Figure 2.7. Occupations of Employed Migrants in Phnom Penh by Gender	47
Figure 2.8. Reasons of Migration in Cambodia by Gender	48
Figure 2.9. Inflows of Remittances in Cambodia by Year	55
Figure 4.1. Conceptual Framework.....	105
Figure 4.2. Average Working Hours of Children by Area and Consumption Quintiles (All Children)	133
Figure 4.3. Average Working Hours of Children by Areas and Consumption Quintiles (Working Children Only)	134
Figure 4.4. Number of Households with and Without Remittances	136
Figure 4.5. Number of Remittance Recipient Households by Consumption Quintile.....	137

TERMINOLOGY

Migration: is defined as an incidence of individuals aged between 15 and 65 who have previously been members of households but who have now been absent from households for more than 12 months. The study only includes migration that has occurred within the last five years (since 2004) to avoid the impacts of migration which Cambodia experienced during the internal turmoil.

Remittance: is the amount of remittances households received either in cash or in kind from relatives and others in Cambodia and abroad in the past 12 months taken in the logarithm form. The transfer can be either from migrant household members or non-migrant household members.

Completed Grade of Education: is the highest grade of education a child has completed, not the total years a child spent at school. For example, if the duration of a child spends six years in school, but s/he repeats one year and completes only five grades, the completed grade of education is five, not six. If a 16 years-old boy completed grade 5 at the age of 13 and dropped out, his completed grade of education is 5. For those who have never enrolled in school, the completed grade of education is 0.

Working Hours: is the sum of working hours in the primary and secondary jobs during the last seven days at the time of interview. Only jobs related to economic activities are considered at work. Time children spent on the domestic chore, looking after siblings and so on are not counted as work in this study. However, work such as helping the family on a farm, taking care of cattle, making palm sugar, etc. are considered as economic activities.

CHAPTER 1 :

INTRODUCTION

1.1. Background

Education was explicitly endorsed as a human right in the Universal Declaration in 1948, yet it was not until 1990 that the right to education has been internationally embraced, ensuring the equal access to education for every child. Three important events are responsible for this momentum. First, the global initiatives of the Education for All (EFA) movement, known as the World Conference on Education for All (WCEFA) in 1990 in Jomtien, which pioneered what has become the universal goals in education with a specific vision on meeting the basic learning needs of every citizen in every society. Second, in 2000, the initiative was further discussed at the World Education Forum (WEF) in Dakar to adopt a Framework for Action to strengthen the commitment made regarding the EFA. The year 2000 also embarked on a significant framework, known as the Millennium Development Goals (MDGs). The MDGs committed nations to a new global partnership to collectively achieve eight-defined goals by 2015, one of which echoed an emphasis on achieving Universal Primary Education (UPE).

Thanks to global action works, remarkable progress has been made towards achieving the UPE, through a particular significant progress in enrollment. Amid the increase in enrollment, schooling is different from learning (UNESCO, 2015a). The report reviewing the MDGs' 2015 concludes that the goals are not achievable. Although there has been an increase in enrollment, the report shows that around 100 million children drop out of schools and one in every three students cannot proceed to the final grade of primary education (UNESCO, 2015a). Coupled with the problem, in the same report, it also draws on the inequality issue which is still

pronounced among children from rural and urban areas. Rural children are five times less likely to finish their primary school (UNESCO, 2015a). Therefore, targeted and concerted efforts will be more required to reach those people.

The current Sustainable Development Goals (SDGs), adopted in September 2015 in Incheon entitled “Transforming Our World”, have been set to be achieved by 2030. SDGs are a result of previous efforts to continue what the MDGs had left. Of all the seventeen SDGs, education is still one of their priority goals, with a wider focus on an inclusive and equitable quality education (SDGs’ number four). The report on the progress of SDGs shows that despite the significant improvement, an average increase in the participation rate in primary education is uneven, where Sub-Saharan Africa has the slowest improvement rate at 41% and Northern Africa and Western Asia at 52% (United Nations, 2018). Furthermore, the quality education still remains a challenge. In the same report, it also further stresses that around 58% of school-aged children could not achieve minimum proficiency in reading and mathematics, and disparities in education among urban-rural location are still pronounced (United Nations, 2018). Although the SDGs has just implemented and maybe still a long way to remove from realities on the ground, refocused efforts are necessary to meet its quality educational goal.

The Royal Government of Cambodia also recognizes education as the integral feature for the inclusive and sustainable development. The government has been vigorously active in joining the global EFA movement, striving to increase equitable access to education with quality. One of the policies from the government’s intervention is reflected in equipping primary schools in all villages and at least one lower secondary school per commune (RGC, 2015). In addition, to bring about all children to education, the government adopted a school fee abolition in 2001 to relieve household burden for educational expenditure (Bray & Seng, 2005). This has marked a turning point of the significant increase in educational

access. The primary education has jumped from about 78% in 1997 to 95% in 2016 and lower secondary education enrollment rate surged nearly three times in less than ten years from 22.9% in 1997 to 63.6% in 2017 (MoEYS's Education Management Information System's Indicator from 1997 to 2016). However, the enrollment rate is still offset by the low completion rate of education in all both primary and secondary educational levels. As of the academic year 2015-2016, the completion rate at primary and lower secondary levels in Cambodia is as low as 79.9% and 42.6% respectively. Despite the fact that the government has been making efforts to retain students in schools longer, it is still far short of the target due to a lack of teachers and the budget required to build sufficient buildings to accommodate students.

Education is fundamental to achieving other development outcomes and to enhancing an individual's social and economic status through income prospects and improving standards of living. Specific evidence also supports how an additional year of schooling accumulation yields the average of global returns to education of about 10% (Psacharopoulos & Patrinos, 2004). This number is very large when considering the future earnings of an individual, and this does not include far-reaching spillover effects and the externalities that education bestows on society. Concerted efforts have been put to collectively achieve universal access with a quality education. Nonetheless, there have been few frameworks to discuss how to prevent children from any impediments to their educational access. Children's involvement in work is one of the many factors hindering children's human capital acquisition (UNESCO, 2015a). The incidence of children working early even at the age of five is widespread in many low developing countries (LDCs). The number of children working aged between 5 to 17 is estimated to be no less than 264 million in 2012 in particularly developing regions namely Sub-Saharan Africa, Asia, and the Pacific regions (UNESCO, 2015a). The prevalence and the amount of work

performed by children exacerbate the opportunities of children to fully exercise their right to education. Therefore, investigating factors compelling children to engage in work should not be overlooked.

Despite the widespread acceptance of the plan “Roadmap for Achieving the Elimination of the Worst Forms of Child Labor¹” at the Global Child Labor Conference 2010, Among the developing nations, the incidence of child work in Cambodia is also prevalent. It has been confirmed that around 70% of children between the age of 5 to 17 work in the agricultural sector (Edmun & Pavcnik, 2005) – a sector on which many Cambodian households rely on. A research conducted by the National Institute of Statistics (NIS) on the combined Cambodia Labour Force and Child Labor Survey in 2012, also confirmed that the proportion rate of children participating in work is largely unchanged from that in the 2001 statistics (NIS & ILO, 2013).

Household economic conditions² play a crucial role in determining a child’s education prospects as well as the amount of the child’s economic work (Basu & Van, 1998; Edmonds & Pavcnik, 2005; Glewwe & Jacoby, 2004). The economic burden on poor households to finance education and school-related costs is substantial and greater for poor children continuing on their higher levels of education. In addition, a need to rely on children as laborers to help generate household finances is also an impediment to children’s opportunity of receiving their education. This has major implications for economics and inequality, considering children’s low earning potentials and the difficulty in generating

¹ Not all kinds of child work are considered child labor. Only child work that is considered as harmful to children’s physical, mental or moral well-being. The details of child work will also be discussed in Chapter 2.

² Studies on the effect of a household’s land holding on child labor in rural households found that child work increases in tandem with the size of land possessed by households (Bhalotra, 2003; Kambhampati & Rajan, 2006). This means that working hours that children engage in work is not restricted to merely household’s poverty, but also because of household’s wealth.

technical skills to meet the demand of a fast-changing market economy. The inverse relationship between the probability of human capital accumulation and the amount of work children are engaged in can be rebalanced only when households have sufficient sources of income and can meet substantial needs (Basu & Van, 1998). In this connection, the practice of migration is commonly cited as one of the strategies where households resort to in response to the lack of income.

Migration within and across a country is a phenomenon in all parts of the world. It is certainly not a new phenomenon and has been recognized as having a reciprocal relationship³ with economic development (De Haas, 2005). In 2015, it was estimated that there were around 244 million people migrating internationally, accounting about 3.3% of the world's population, and internal migration within own countries was even more predominant, tripling the size of the international migration, standing at 740 million people (IOM, 2018). In the Cambodian context, migration is part of Cambodia's modern history. There was the notorious force-migration during the genocide era, followed by the escape from political insecurity during the civil war. Current migration, having taken place for over the last two decades, is seen as voluntary migration in the pursuit of economic ends (Chan, 2009a; Godfrey et al., 2001; Maltoni, 2010). The volume of outward migration has grown significantly both internally – within-province and across-province – and internationally to other countries, with the vast majority of outward migrants going to Thailand (ADB, 2014; MoLVT & ILO, 2014; MoP, 2012). In addition to the integration of the ASEAN Economic Community (AEC)⁴, which came into effect

³ According to De Haas (2005), migration is both a cause and consequence of development. It is documented to be one of the components attributed to development, and conversely it is a by-product of development.

⁴ AEC provides free movement of skilled labors. It only covers skilled workers and does not cover unskilled workers. Since the majority of Cambodian migrants are low-skilled laborers, government needs to harness their people's knowledge and skills in order to catch up with its ASEAN communities and leverage this policy.

in 2015, international migration is predicted to increase further. Irrespective of the difference in destinations, labor migration is found to be the main reason (MoP, 2012).

Migration is broadly perceived positively because of its potential income through the remittance channel. As delineated in the New Economics of Labor Migration (NELM) theory regarding the systematic links between migration and household members left behind, migration is viewed as a collective decision made within households with the benefits through remittances as a strategy to increase and diversify sources of income (Stark & Bloom, 1985). The substantial amount of remittances has attracted policymakers and scholars' attention due to its size and impact on a country's economy. The remittances flowing to developing countries is estimated to be more than three times the size of the Official Development Assistance (ODA) and exceed the amount of Foreign Development Investment (FDI) (Ratha, 2013; World Bank, 2016).

Migration, particularly international outflow, entails considerable risks and costs to a migrant; however, the needs for survival and increased incomes have pushed them to continue with the decision (Chan, 2009b). With that explain significantly increased household incomes as in remittances in Cambodia from 25% between 2004 and 2009 to 43% in 2011 (ADB, 2014). This volume, however, does not include unrecorded remittances made through informal channels, which are believed to be considerably larger (ADB, 2014; Maltoni, 2010). The Royal Government of Cambodia (RGC) also recognizes the positive effects of migration and remittances to the development of the country. To ensure the safe migration and maximize the potential impact of remittances on households' economic well-being and the country's development, the RGC launched the policy on labor migration in 2010 and revised it in 2014.

Migration and remittances are cited to bring about a direct improvement to the remaining households' well-being, on the one hand, and the country's economic development, on the other hand. Studies relying on household data have revealed how migration and remittances, at the household level, can increase income sources, reduce household poverty, smooth consumption, and cope with income shocks (Adams & Cuecuecha, 2013; Adams & Page, 2005; De Haas, 2008; Gupta et al., 2009; Ratha, 2013; Yang, 2008). Within the level of poverty, Adams and Page (2005) found that international migration and remittances can ease the depth and severity of poverty⁵ in the developing world, even after addressing the endogeneity between migration-remittance and poverty. A study carried out on examining the effects of remittances, at the macro level, in 24 Asian and Pacific countries also revealed that remittances have a significantly positive effect on economic growth through their direct effect on poverty reduction (Imai et al., 2014). In Cambodia, empirical evidence of the direct effect on household poverty alleviation has been found, although international migration presents relatively larger effects than internal migration (Roth & Tiberti, 2016; Tong, 2013). Simply put, migration and remittances are the components complementing broad-based development efforts with positive effects at both macro and micro levels.

Furthermore, research on migration and remittances in developing countries also claims positive effects on a number of long-term outcomes in the well-being of children: boosting households' tendency to invest in human capital formation; raising schooling levels by increasing the ability of households to pay; and keep children longer in school, which in turn, helps decrease the incidence of child labor and delays the likelihood of a child's entry into the labor force. There is evidence

⁵ Gupta et al. (2009) explored the effects of remittances on poverty in Sub Saharan Africa and found that remittances had an effect in mitigating poverty and helped ease the immediate budget constraint of recipient households.

of this in El Salvador (Acosta, 2006; 2011; Edwards & Ureta, 2003), Pakistan (Mansuri, 2006), Ecuador (Calero et al., 2009), Guatemala (Adams & Cuecuecha, 2010), South Africa (Lu & Treiman, 2011), Nepal (Acharya & Gonzalez, 2014) and Cambodia (Hing et al., 2014; Iwasawa et. al., 2014; Roth & Tiberti, 2016; Fukui & Luch, 2017) and other developing world. These studies provide empirical findings on the expenditure patterns of remittance beneficiaries, which add to an understanding of the costs and benefits of this type of income source, especially among income constrained households. Therefore, migration and remittances can be considered as fundamental constituents through their indirect contribution to economic development if they are channeled into productive investments, in this context, the acquisition of human capital by future generations.

In the Cambodian context, outward migrants mobilize internally (within-province and across-province) and, to a lesser extent, internationally. This study suspects that the remittance receipts, when measured by the types of migrant households, also play a distinctive role for children left behind. The proportion of the out-of-school children and the proportion of child labor is somewhat correlated, inferring that those out-of-school children may be on the verge of entering into child labor. As illustrated in Table 1.1, when remittance receipts are disaggregated by types of migrant households, the size of remittances among the international migrant household category stands out compared to the within-province and across-province counterparts.

Although international migration implies longer duration of family disruption, this remitted amount might play an important role in increasing the likelihood of keeping their children in schools instead of engaging in work, as the out-of-school children and the child labor incidence in the international household type account for about 24% and 21% respectively (Table 1.1). This proportion is almost similar to that of children in non-migrant households, both standing at 24%. The within-

province migratory households, in contrast, remit the least amount and have the highest portion of out-of-school children and of children performing work. In regard to the across-province migrant household category, the remittance size is between that of within-province and international migrant households. In this household type, 28% are out of school and 29% are working children.

Table 1.1. Out-of-School Children, Child Labor Incidence and Annual Remittances in Cambodia

	Non-Migrant	Within-province	Across-province	International	All
Out of School (Age 7-18)	23.9%	33.9%	28.2%	24.4%	25.3%
Child Labor Incidence	23.5%	30.3%	29.4%	21.0%	24.5
Remitted Recipient Households	18.2%	69.8%	77.5%	84.9%	29.8%
Average Remittance (Riels) (Including non-recipient HH)	185,059 (\$46.3)	333,938 (\$83.5)	690,096 (\$172.5)	3,090,377 (\$772.6)	335,450 (\$83.9)
Average Remittance (Riels) (Excluding non-recipient HH)	1024,239 (\$256.1)	541,416 (\$135.4)	900,422 (\$225.1)	3,514,452 (\$878.6)	1,032,328 (\$258.1)

Source: Estimated by the author using CSES (2009).

In short, owing to different patterns of migration by destinations (within-province, across-province and international) in tandem with amounts of remittance receipts, the different characteristics of migration by destinations and remittances are also likely to have different effects on children's schooling as well as on the degree of the hours they engage in economic activities in Cambodia. Therefore, this study intends to investigate the impact of discrepancies in migration by destinations and remittances on the schooling outcomes and working of the left-behind children.

1.2. Problem Statement

The driving motivation for internal and international migration is conspicuously manifested as a pursuit of better opportunities for utility maximization and

economic ends (De Haas, 2008). Pertaining to that, the incidence of migration in Cambodia is huge and is seemingly one of the integral features for the country's development (MoLVT & ILO, 2014; MoP, 2012). The proportion of rural households fell from 80.5% in 2008 to 78.6% in 2013, the main reason for which is migration (MoP, 2015; NIS, 2013). The number of Cambodian people migrating internationally is also immense. Along with a growing incidence of migration in households, an important question is who stays behind and how these people are affected (Knowdel et al., 2010; Nguyen & Nguyen, 2013). According to a report by the Ministry of Planning (2012; 2015) and a similar study result by UNICEF (2017), the majority of Cambodian migrants leave their children behind with their grandparents or other relatives to take care of. Issues around the left-behind children have thus become too important to go unnoticed. The question is whether migration helps or harms the left-behind household members.

Adams (2011) reviewed comprehensive empirical literature of 50 case studies in developing countries that are based on household survey data. He examined the impact of international migration and remittances on various economic outcomes and suggested that cross-border movements and remittances could lift households out of poverty and could improve the health condition of left-behind household members. However, the impact of migration and remittances on children's human capital formation and the incidence of children working remain ambiguous. This assumption could be due to the nature of the complex relationship between migration and remittances on left-behind household members. In the Cambodian context, the confounding relationship between migration and remittances are not dissimilar. A study carried out on the impact of migration on children in Cambodia points out that the lack of information on children of adult migrants (either internally or internationally), due to either poorly structured information collections or no one paying the attention to those data. This leads to

little knowledge regarding the effects from migration on those children (UNICEF, 2017). Moreover, a recent study on the lower secondary school students' dropout incidence by Cambodia National Council for Children (CNCC) (2015) reveals that migration was one of the causes of children dropping out of schools. In addition, the likelihood of stay-behind children engaging in economic activities and of their working hours is higher compared with children in non-migrant households (Hing et al., 2014).

The nature of the impact of migration and remittances can go in the opposite direction. While the absence of household members can negate the benefits through remittances (Acosta, 2006; Bansak & Chezum, 2009; Cortes, 2015), the loss of family members owing to migration is expected to be negatively correlated with the likelihood of left-behind children continuing their schooling and is positively associated with the increase in working hours of children (Hanson & Woodruff, 2003; Lu, 2015; McKenzie & Rapoport, 2006; Sama & Parinduri, 2016). Correspondingly, while there is clear evidence that migration and remittances are closely linked, and their complex relationship has contemporaneous effects, there is still insufficient understanding of the true impact of migration and remittances on children's education and hours worked, as previous literature has yielded mixed and inconsistent findings (Adams & Cuecuecha, 2010; Bansak & Chezum, 2009; Edwards & Ureta, 2003; Giannelli & Mangiavacchi, 2010; Kandel & Massey, 2002; Lu & Treiman, 2011; McKenzie & Rapoport, 2011).

In Cambodia, there are few empirical studies, if any, carried out on the association between migration and remittance effects on the education of migrants' left-behind children (Fukui & Luch, 2017; Hing et al., 2014) and the prevalence of hours children engage in work (CDRI, 2014; Iwasawa et al., 2014; Hing et al., 2014; Roth & Tiberti, 2016). The study by Iwasawa et al. (2014) in Cambodia conclude that there is a positive effect of remittances on increasing households' tendencies to

allocate resources to children's education and reducing the probability of children engaging in work as their main activities, even after correcting for the endogeneity problem of remittances using the two-stage least squared approach. The result corroborated with the findings of Fukui and Luch (2017), but was inconsistent when investigating whether remittances could compensate for the family disruption. They concluded that remittance effects were completely canceled out by the disruptive effect of parental migration, and the propensity of forcing children into the labor force was high. In contrast, Fukui and Luch (2017) claimed that remittances could compensate for the absence of migrant household members by improving the educational attainment of children in rural Cambodia, especially among female students. Overall, their results undeniably contribute to the small body of literature by shedding light on the impacts of migration and remittances on children's education and child labor in Cambodia; nonetheless, they overlooked the effects of remittances and migration by destination. This aspect, therefore, remains a gap that needs to be filled.

Considering that migration is inevitable and brings about a considerable amount in remittances to households, it is worthwhile to examine their effects on the likelihood of furthering a child's completed years of education and on the hours of work performed by children at the household level. Such research is especially important if it can unveil the true impact of the two covariates, appropriate steps and policies can be taken into consideration from the ground level to help smooth the flow of migration and remittances. This, in turn, can help improve the education situation of children as well as the likelihood to reduce the burden of child work, especially among poor households in Cambodia. A substantial reduction in child's time allocation to working means that children's human capital accumulation could be enhanced, thereby raising the country's growth potential. This is a directly

effective way to break out of the cycle of poverty, which results from underinvestment in education and a low skilled labor force.

In addition, as described earlier, while the relationship between migration and remittances, jointly affecting a child's human capital acquisition and reduction in hours worked performed by children, has been studied in other countries, the effects of the two variables have not been clearly disentangled, particularly in Cambodia, where labor migration has only become prevalent in the last two decades (Chan, 2009b; CDRI, 2007). Understanding this is especially important to avoid underestimating or overestimating the remittance effect.

1.3. Research Questions

As discussed above, despite the increasing volume of migration bringing about increased remittance income, the effect of migration and remittance is still not fully comprehended. Without disentangling effects of remittances from migration by destination, its effects, respective to migrant households, can lead to biased conclusion. This study investigates these problems with the research questions as follows:

Research Question 1. What are the effects of migration and remittances on children's learning outcome (completed grade of education) in Cambodia?

1.1. How do migration (by destination: within-province, across-province and international) and remittances have an influence on the completed grade of education in general?

1.2. How do migration (by destination: within-province, across-province and international) and remittances affect the completed grade of education differently by region (rural vs urban)?

1.3. How differently do remittances influence the completed grade of education of children by type of migrant households (non-migration, within-province, across-province, and international migration)?

Research Question 2. How do migration and remittances affect children's working hours in Cambodia?

2.1. How do migration (by destination: within-province, across-province and international) and remittances have an influence on children's working hours?

2.2. How do migration (by destination: within-province, across-province and international) and remittances affect children's working hours differently by region (rural vs urban)?

2.3. How do remittances affect children's working hours differently by their household characteristics (non-migration, within-province, across-province, and international migration)?

1.4. Objectives of the Study

The study objective is twofold. It first aims to empirically measure the effects of migration by destination and remittances on children's schooling outcomes, taking the completed grade of education as a proxy. To understand the different effects of migration by destination, migration by destination is decomposed into three types: within-province; across-province; and international migration. The study does not only investigate the effect of migration by destination and remittances in general but also their effects in rural and urban areas. In addition, the study further attempts to disentangle remittance effects from migration effects by destination, which could help understand how remittances affect children's human capital acquisition differently among migration by destination. Second, due to the strong correlation between migration and child work, this study extends the analysis to unveil how

migration and remittances have influences on left-behind children's working. In the same vein as in the first research question, after examining the overall effects of migration and remittances on children's working hours, the study assesses these effects by rural and urban areas. In the end, this study extends the detailed analysis of remittance effect on the sub-group of working children in respect to their migrant household by destinations. That is to see the different role of remittances considering the different type of migrant households.

1.5. Significance of the Study

Due to the scale and impact on social and economic changes, migration and remittances are the components complementing a country's development, both at the macro and micro level. More importantly, their effects can be multifaceted if migration and remittances are channeled into productive investment, taking into account children's education instead of children actively being involved in economic activities. This has stirred the attention of policymaker and researcher on the understanding of how migration and remittances facilitate human capital investment and reduce the working incidence of children left behind.

In terms of their effects on education, a number of studies have explored the effects of migration and remittances with different motives and methodology approaches. Those studies look at various aspects of children's educational outcomes, enrollment, school attendance, school-aged grade enrollment, dropout, grade progression and completed years of education. Regarding the impacts of migration and remittances on children working, it is relatively scarce, compared to studies on the effects on the human capital formation. In addition, the previous research carried out on the effects of migration and remittances on the extensiveness of children working primarily concentrates on Latin America such as Mexico and El Salvador. Some studies focus specifically on the impact of migration and

remittances on the prevalence and extensiveness of children working, taking into account the average working hours in domestic work and labor outside the home.

Irrespective of the growing body of literature on migration and remittances, this study makes four significant contributions. First, this study sheds more light on the empirical evidence of the impact of migration and remittances in the context of Cambodia. Migration is a relatively new topic in the country. Before 2004, migration-related research concentrated on human trafficking and the condition of migrants (Maltoni, 2007). Recently, migration and remittances have become a key area of the researcher's interests, but the focus has been on the scale and impact of migration and remittances on macroeconomic development. In 2012 and 2015, comprehensive surveys were conducted to explore the impact of migration on the economic situation of left-behind household members (MoP, 2012; 2015). The surveys, however, do not cover children's issues in terms of their education and working situations.

Second, the current labor migration in Cambodia has been growing for the last two decades, both internally – within-province and across-province – and internationally. This study suspects that the nature and the level of family disruptive effect on left-behind children also plays a distinctive role. Therefore, it is practical to decompose migration by type rather than to treat it equally or to look merely from international or internal perspectives per se. Against this backdrop, the previous literature examined the effects of migration mostly focusing on who migrants are; the relationship between migrants and children (parental; non-parental; paternal; maternal migrants), and how long household members have migrated. Among those studies, migration by destination is treated equally, or it is mostly examined from the perspective of international migration (Acosta, 2011; Antman, 2011; Boucher et al., 2005; Booth & Tamura, 2009; Chen, 2006; Cuecuecha et al., 2010; Hanson & Woodruff, 2003; Kandel & Massey, 2002; Koska et al., 2013; Mansuri, 2006). It

cannot be denied that scrutinizing the migration effects through these aspects is rational. Nonetheless, equally important, different effects of migration by destination is also too important to be ruled out (Dorantes & Pozo, 2010; Iwasawa et al., 2014; Lu, 2015).

To the best understanding of the author, few studies considered distinctive effects of migration by type, embracing both internal and international migration, except Lu (2015) (comparing between Mexico and Indonesia); Roth and Tiberti (2016) (Cambodia). Few studies scrutinized the impact of internal migration from the perspectives of rural-urban migration, Lu and Treiman (2011) (South Africa); Fukui and Luch (2017) (Cambodia); De Brauw and Giles (2017) (China). Since there is a variety of type of migration, the effects can also vary by respective migrant characteristics. This study is therefore inclined to fill this gap by analyzing and decomposing the effects of migration by destination into three sub-groups: within-province, across-province, and international migration.

Third, as the level of migration effects varied by destination, correspondingly the effects of remittances can also vary by migrant household characteristics. Theoretically, net remittances are expected to have positive effects on the fostering the likelihood of children's schooling and on reducing working hours of children, as they can increase the household's income and consumption, including spending on education. In addition, remittances can improve households' economic condition and in turn, may lead to a decrease in labor supply provided by children. However, the mixed effects of remittances (that is when children are left behind by their household members due to migration) is inconclusive.

Some studies investigate separately the effects of migration on human capital formation of children and on the incidence of children working (Antman, 2011; Booth & Tamura, 2009; Boucher et al., 2005; Chen, 2006; De Brauw & Giles, 2017; Givaudan & Pick, 2013; Hanson & Woodruff, 2003; Kandel & Massey, 2002;

Mansuri, 2006; McKenzie & Rapoport, 2006) and the effects of remittances (Acosta et al., 2007; Adams & Cuecuecha, 2010; Alcaraz et al., 2012; Bansak & Chezum, 2009; Calero et al., 2009; Coon, 2016; Dimova et al., 2015; Ebeke, 2010; Edwards & Ureta, 2003; Ratha, 2013; Yang, 2008). This separated analysis of migration and remittances could possibly lead to biased results and spurious conclusions (Dorantes & Pozo, 2012; McKenzie & Sasins, 2007; Lu & Treiman, 2011; Bargain & Boutin, 2014). In other words, this is because migration and remittances are inextricably linked. Without disentangling the impact of remittances from that of migration, it could obscure remittance impact among different households, possibly either overestimated or underestimated. It is not well understood to what extent children benefit or suffer from household migration and how much remittances can compensate for the absence of family members.

Several related studies are worth mentioning. Dorantes and Pozo (2010) tried to examine the countervailing effects of migration and remittance on children's schooling in the Dominican Republic focusing on the remittance effect in non-migrant households and expanding the sample to children with household members migrating abroad. In a similar study, Bargain and Boutin (2014), employing the widely-used two-stage least squared (2SLS) approach, investigated remittance impacts on extensiveness of children working among three subsamples of households in terms of migration status: (1) permanent migrant households (migrants more than five years), (2) current migrant household (migrants less than five years), and (3) non-migrant households. However, these studies failed to take into consideration the remittance effects in migrant households by destination (for example, international or internal).

Moreover, Iwasawa et al. (2014) did a similar study examining impacts of remittances on the left-behind children's education among non-migrant households, and migrant households with respect to the difference between parental and non-

parental migration in Cambodia. They examined the net effect and mixed effect of remittances by treating all migration destinations equally while admitting that the different destinations may have a different effect on children's education. To fill the literature gap, this study aims to extend previous studies by looking concurrently at the impact of remittances among migrant households by destination (within-province, across-province, and international migration) in the analysis.

Fourth, supply-side factors are very likely to be associated with children's education as well as the incidence of children working. Yet, studies on the effects of migration and remittance mentioned earlier failed to control for the supply side factors due to the fact that commonly household surveys do not provide information on the supply side. In this study, in addition to the household survey, the questionnaire on village level is employed and school information at the district level is estimated using the Education Management Information System (EMIS). The supply-side factors can then be controlled for to minimize the biased estimation.

1.6. Organization of Dissertation

This study proceeds as follows. Chapter 2 provides an overview of Cambodia's educational situation regarding its education history, policies, system, achievements, and challenges, as well as the prevailing working children and laws and regulations concerning children's working conditions. This chapter also provides an overview of migration and remittances in Cambodia in order to provide a broad understanding of the scale and volume of migration and remittances flowing in the country. Chapter 3 reviews previous studies carried out on the impact of migration and remittances on children's education and on the incidence of children working, followed by the review on the countervailing effects of remittances among distinctive migrant households. The chapter then moves on to discuss empirical studies in the Cambodian context, and the chapter concludes by reviewing the

effects of supply-side factors. Chapter 4 begins with the theories related to migration as a roadmap to draw a theoretical framework. The chapter also discusses methodological problems and solutions. The next part posits six hypotheses corresponding to the six sub-research questions. Following the hypotheses are the empirical models, data and descriptive statistics. Chapter 5 presents the study's results based on the analytical models. The chapter explains the findings in detail corresponding to the respective research questions. Finally, Chapter 6 discusses the findings delineated in Chapter 5, followed by limitations of the study, and ends with the dissertation conclusion.

CHAPTER 2 :

OVERVIEW OF EDUCATION, CHILD WORK, MIGRATION AND REMITTANCES IN CAMBODIA

This chapter highlights the context in which the study is conducted. It is divided into 3 sub-sections: educational situation, incidence of working children, and migration and remittances in Cambodia. First, the sub-section focuses on the educational reform and educational system, financing, performance, and challenges. Sub-section 2.2 provides an overview of the incidence of children working, highlighting the abundant young population endowment and characteristics of working children. It is then followed by a brief discussion about the laws and regulations considering child work and child labor. The following sub-section 2.3 presents the overall information on migration, including the patterns of migration, reasons, and the trends and characteristics of migration. It concludes with the discussion on laws and regulations of migration in Cambodia. Finally, sub-section 2.4 touches on the global trends of remittance flows and how remittances contribute to economic development both at macro and micro level.

2.1. Overview of Educational Situation in Cambodia

The economic growth in Cambodia has grown steadily at around 7% between 2011 and 2016 (ADB, 2014). On par with the growth, to ensure that everyone can reap the benefits and to lift the country from lower-middle income country to upper-middle income country by 2030, the Cambodian government has put a strong emphasis on enhancing human resources as a fundamental and key priority for inclusive and sustainable growth in a knowledge and skilled-based economy. In the long-term, the country emphasizes the expanding and strengthening Education for

All (EFA) in both primary and secondary education with quality and improving curriculum in accordance with the ASEAN quality standards (MoEYS, 2014b).

2.1.1. History of the Cambodian Education, Policies and Reforms

Prior to the establishment of the modern educational reforms, the Cambodian education evolved through different phases. The first phase of the evolution of education in the country before the 1800s was known as the so-called traditional role of education. Cambodia education at that time took place in Buddhist temples and was exclusively available for men. The teaching was centered around basic literature, maintenance of the good relations between members of society, religious foundation, and life skills such as carpentry, artistry, and craftwork. (Ayres, 2000)

Cambodia was under France's colonization from 1863 for almost a hundred years. During the first half of the colonial period, French did very little to modernize Cambodian education system, as French had less interests in Cambodia than in Vietnam (Chandler, 2007; Clayton, 1995). Rather than educating Cambodians, the French encouraged educated Vietnamese to migrate to and work in Cambodia. The first French-language school was established in the capital city of Phnom Penh in 1873, and in 1902 there were four French-language schools, in which less than 300 students in total were enrolled (Clayton, 1995). The modern formal education system was gradually introduced at schools by the French government initially aiming only to train the Cambodia elites to serve the French authorities on their work of the colonization (Ayres, 2000a; Chandler, 2007; Clayton, 1998). Instead of learning in the Buddhist temples, schools were built to accommodate students. However, since school buildings were still few and mostly available in the capital city, many students in rural areas could not afford to go to schools (Ayres, 2000a). By 1939, there were 107 primary schools in Cambodia and both Khmer and French

languages were used as languages of instruction in the primary education (Bilodeau, 1955, cited from Clayton, 1998).

After gaining the independence from France in 1953, during the Sangkum Reastr Niyum (People's Socialist Community) period under the leadership of Prince Sihanouk, the modern education system was further developed and expanded, and only in two year period from 1955 to 1957 the number of public schools (primary and secondary) increased from 1,352 to 1,653 (Ayres, 2000a). Even though public schools were more widely accessible during that time, Duggan (1996) suggested that the education expansion was concentrated in urban areas, and this made rural population much less beneficial from this policy expansion.

Cambodia is one of the unfortunate countries to have suffered from consecutive chronic civil wars, the coup d'état in 1970 and later the civil war in 1975-1979, rendering the educational situation unstable. During the infamous genocidal Khmer Rouge ⁶ regime (1975-1979), ideology indoctrination was embraced and the education system was completely destroyed (Chandler, 2007). After the downfall of the Khmer Rouge in 1979, most of the educated and teachers were slaughtered, and Cambodia needed to gradually reconstruct its education system from zero. Cambodia under Vietnamese guidelines implemented the 10-year education system (4+3+3), which consisted of 4 years of primary education, 3 years of lower secondary education, and 3 years of upper secondary education (Dy, 2004). It was not until 1997 that the 12-year (6+3+3) education system was introduced.

In 2001, MoEYS abolished the school fees in basic education to ensure that all children including those from marginalized backgrounds have access to free

⁶ During the period, people were barred from having private possessions and the only prevailing activity that everyone performed was the collective farming. Despite the tough and long-hour of work and disease, food was provided with limited amount, causing hunger and starvation. The civil war witnessed as one of the world-most brutal massacres, causing the death of approximately two million people, albeit no exact or accurate data (Clayton, 1998; Heuveline, 1998).

compulsory education (UNESCO, 2006b). It was also the year that the first five-year education plan namely the Education Strategy Plan 2001-2005 was embarked. Later, the Educational Sector Support Programme 2001-2005 and the National Education for All Action Plan 2003 were also established as additional reinforcement mechanisms to ensure the effectiveness of strategies and policy goals of the education (Dy, 2004; RGC, 2015). Currently, Cambodian education policy is guided by the Education Strategy Plan 2014-2018, highlighting the three pillars of objectives: “i) ensuring equitable access for all to education services; ii) enhancing the quality and relevance of learning; and iii) ensuring effective leadership and management of education staff at all levels” (MoEYS, 2014a, p. 13).

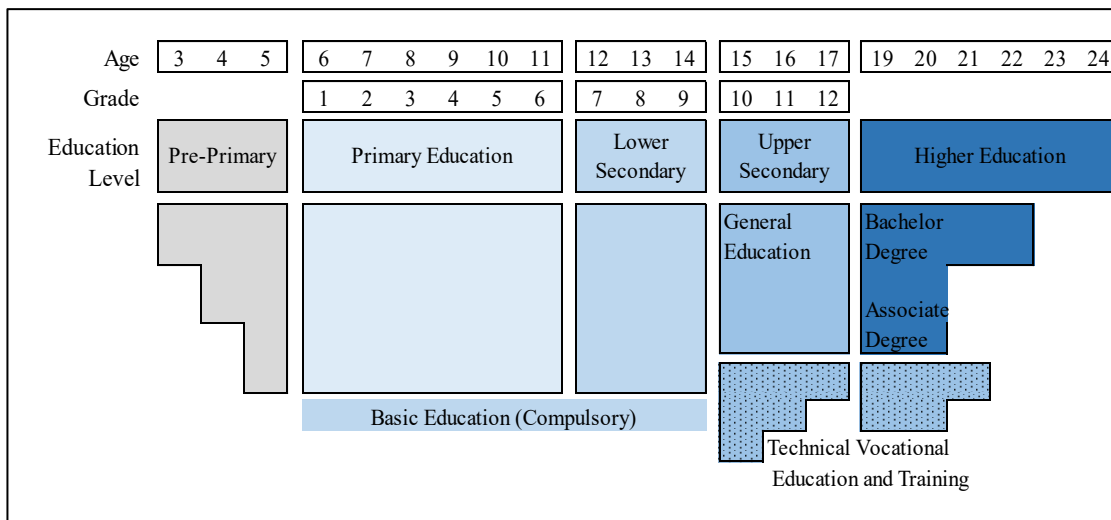
2.1.2. Cambodian Education System

Cambodian general education is primarily based on a public school curriculum under the education system categorized into a series of cycles: (i) pre-school education mostly designed for children aged three to five; (ii) six years of primary education; (iii) three years of lower secondary education; (iv) three years of upper secondary education; and (v) two/four years of college/university respectively. The general education is mostly centrally regulated by the MoEYS, a sole ministry entity responsible for overarching national education, monitoring quality and access at all levels. Under the MoEYS, 25 Provincial Education Offices (PEOs) and 165 District Education Offices (DEOs) are structured to deliver education service in all public pre-primary schools (3,184), public primary schools (6,993), and public secondary schools (2,103) (MoEYS 2014b).

The early childhood education (ECE) is not a compulsory education in Cambodia, although from the national vision, all young children from conception to less than six years of age, regardless of their backgrounds, shall have access to early childcare and development (NC-ECCD, 2014). In recent years, ECE has

attracted more attention of policymakers and stakeholders and received recognition for its far-reaching and multifaceted outcomes. Preschool enrollment rate has increased notably, and as of 2015-16 academic year, 64.1% of five-year-old children are reported to be enrolled in some form of ECE programs (MoEYS, 2016). In response to the growing demands of the ECE service, four distinctive types of ECE institutions are established in Cambodia: state preschools (or formal preschool), private preschools; community-based preschools, and home-based program.

Figure 2.1. Cambodian Formal Education System



Source: Created by the author based on UNESCO (2011).

The state preschools are under the full supervision of the MoEYS, and teachers in public state preschool are officially trained by the MoEYS. Pre-school classes mostly take place either in detached preschools or preschools attached to primary schools. Private preschools are normally located in urban areas and managed by the private sector for profits to provide early education programs according to their own curriculum and standards. Teachers in private schools are not required to receive professional training at the Pre-School Teacher Training Center (PSTTC), although many private schools hire teachers from state schools as part-time teachers. Community preschool program was initiated by UNICEF and

MoEYS in the early 2000s (UNICEF, 2016). Most schools are situated in rural and remote areas where state preschools are not available. The class-setting can be taken place either at private homes, shelters provided by communities, or rooms located in primary schools or pagodas. Teachers, albeit not taking pre-service training, are those who have attended in-service training provided by the MoEYS, and they are paid by the Commune Council. Home-based programs are operated by trained mothers to provide early childhood care and education at homes for children aged zero to five.

As illustrated in Figure 2.1, in Cambodia the formal school-age to start primary education is from six years old. As stipulated in the constitution and Education Laws, compulsory education encompasses both primary and lower secondary school. Education service in public primary and lower secondary schools are provided free of charge to all children regardless of their backgrounds and inclusive of marginalized groups. At the end of the last grade of the basic education (Grade 9), students are required to sit for a national examination to exit the lower secondary school.

Given the lack of teachers and financial resources to construct additional school buildings, most of the public schools in Cambodia operate under the double-shift system. The system caters for two entirely separate groups of pupils, one in the morning (from 7:00 to 11:00) and one in the afternoon (from 13:00 to 17:00) and each group uses the same classroom, equipment and school facilities (Bray & Seng, 2005). Although in general the two groups of students are taught by different teachers, there are cases that students are taught by the same teachers. Although it is rare, there are schools operating triple shifts, when it is not possible to accommodate students with two shifts. Under the budget constraints, this multi-shift operation serves as a strategy to expand access to basic education to more children, so that universal basic education can be achieved. On average, students at primary

and secondary schools spend only 3 hours and 20 minutes a day (or approximately 630 hours per school year) learning in the classroom, a much lower figure than the UNESCO standard of annual 950 study hours (NGO Education Partnership, 2015; UNESCO, 2006).

Although education at the upper secondary level is not compulsory, it is also free of charge. Similar to the practice in lower secondary school, at the end of the cycle at grade 12, students are required to take the national examination conducted by the MoEYS. Upon the completion of the twelve-year general education and passing the examination, students are eligible to further their higher education either at public or private universities. In the former setting, students are required to undertake an entrance exam regulated differently by the university entity. Owing to the very competitive of the entrance examination to be admitted to public universities, a large number of students choose to go to private universities.

Aside from the choice to further higher education at college/universities, students can opt for a technical vocation training program at the secondary level. There are principally four formal TVET levels provided by the government, and certificates are issued in accordance with the leaving levels of general education. After the completion of the compulsory education (at grade nine), students can decide to go for the TVET program and a certificate I/II/III will be awarded based upon the duration of course types undertaken (year 1/2/3) correspondingly (UNESCO, 2011). For those who complete high school, they have two choices, either embarking on a two-year or a four-year respective program and will receive a Higher Diploma or Bachelor's Degree. The last type of qualification does not specify the level of education, but certificates are issued to those who have undertaken short course lasting from a few weeks to less than a year. Those TVET programs are believed to play an important role in boosting labor force with skills for Cambodia to promote country's growth as well as to strengthen the country's

labor force to compete with other ASEAN countries under the platform of AEC integration, which came into effect in 2015.

Among the alternative options of tertiary institutions providing distinctive skills and subjects, there are also public Regional Teacher Trainee Colleges (RTTC) and Provincial Teacher Training Center (PTTC) mostly available in all cities and provinces. Teacher trainees are provided a two-year teacher training programs and will be issued a certificate to qualify as teachers in either public primary or lower secondary schools in respective cities or provinces. For those Bachelor's Degree holders, limited to only those graduating from the Royal University of Phnom Penh (RUPP), they are obliged to further another year of education at National Institute of Education (NIE). Upon completing a course, graduates are granted a certificate qualifying them as public high school teachers.

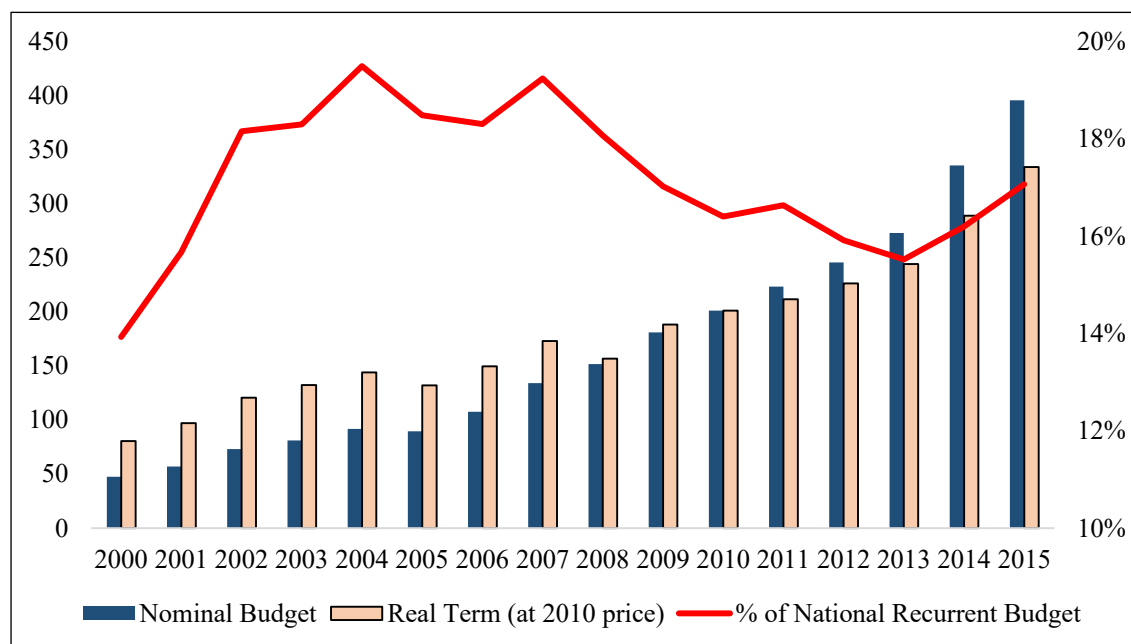
Besides the formal education depicted in the table, non-formal education is also provided to give people an opportunity for lifelong education, specifically disadvantaged groups (women and girls, disabled, minorities and migrant workers). This type of education helps build a learning society with equity and justice towards collective social development. The Non-Formal Education (NFE) programs are planned and implemented by a wide range of governmental institutions and non-governmental organizations, which is also a means that can help create more human capital formation to achieve sustainable poverty reduction, economic growth and social equality (RGC, 2002). Through NFE, a number of programs are provided including literacy classes targeting specifically towards the poor and women, continuation education program, complementary education program. Although NFE is seen to play an important role in helping to lift up the situations of the disadvantaged and marginalized groups, there is a rigid challenge of inadequate financial resources to actually meet the learning needs of the population.

2.1.3. Achievements and Challenges in Education Sector

Thanks to the strong commitments from the Cambodian government and international communities, educational access to basic education has greatly improved in the early 2000s. The Cambodian government has put a strong emphasis on enhancing human resources as a fundamental priority. To lay a foundation for a skilled and knowledge-based economy, the country has increased the total government budget allocation on education from around 14% in 2000 to almost 18% in 2015. Education budget as the share of GDP has nearly doubled from 0.9% in 1997 to 1.5% in 2006 (Benveniste et al., 2008). In order to strengthen school-based management (SBM) at the grass-root level, MoEYS started to provide capitation grants to schools in 2001. During the ten-year period between 2005 and 2015, the government has increased the budget allocation for the education sector more than four folds from US\$ 90 million to 395 million (Ogawa et al., 2017). In absolute term, there has been a significant increase in the national budget allocated to MoEYS; however, as a share of the national recurrent budget it has dropped since 2007 and as of 2013, only about 15 percent of the total national budget was allocated to the education sector (see Figure 2. 2).

The Swedish International Development Cooperation Agency (SIDA) is one of the bilateral donors who is very supportive in the education sector. In 2017 alone, SIDA provided US\$ 17.2 in aid to the Cambodian education sector. Other major developing partners include the World Bank, Global Partnership for Education (GPE), European Union, Asian Development Bank (ADB), and UNICEF (MoEYS, 2015a).

Figure 2.2. Cambodia Education Budget 2000-2013 (in USD Million)

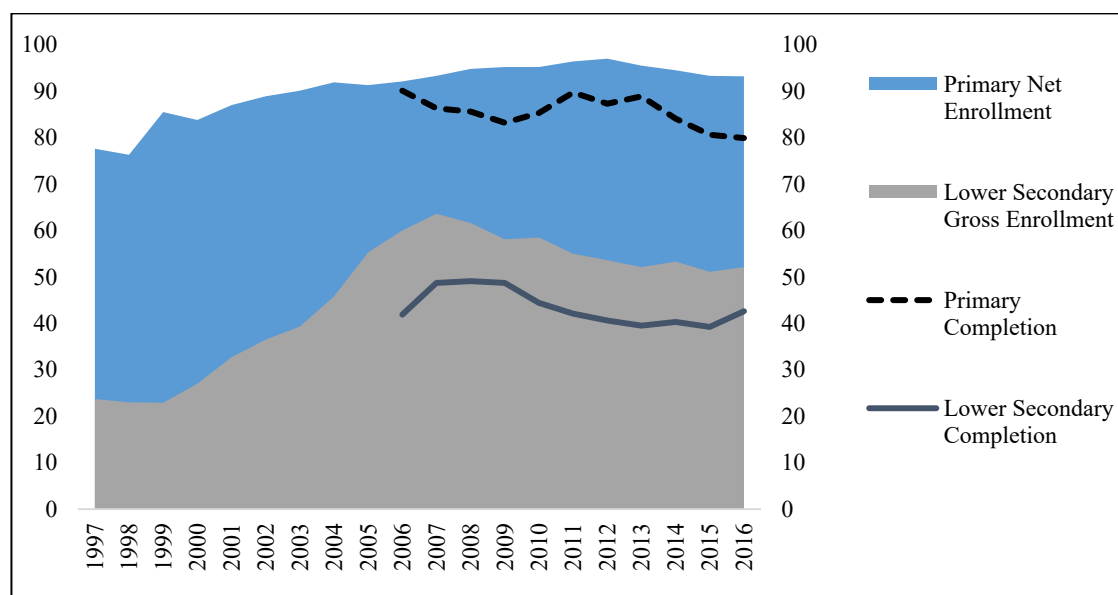


Source: Created by the author adopting from Ogawa et al. (2017).

Evidence shows that education is fundamental to the development of human capital and economic growth. In Cambodia, the enforcement of at least completing the compulsory education is rather weak. Although education has been improved for the last decades, and education has become more accessible to more people in rural and remote areas, dropout rate and grade completion rate have still remained stubbornly a stumbling block, disrupting educational improvement of the country (MoEYS, 2015b; UNESCO, 2015a). According to the statistics from MoEYS, the lower secondary education enrollment rate surged nearly three times in less than ten years from 22.9% in 1999 to 63.6% in 2016 (Figure 2.3). Nevertheless, both the gross enrollment rate and completion rate at lower secondary school began to stagnate after 2007. The primary school enrollment and lower secondary school enrollment have been stagnant at around 95% and 60% respectively. The problem of student retention through the mandatory years of general education still remains a challenge.

Even though the dropout rate in the primary level fell by almost half to about 6% in 2015, there has been very little improvement in the lower secondary school level (MoEYS, 2016). The dropout rate is still high in Cambodia, stubbornly fixed at almost 20% in 2015. Among those, it has been found that children with at least one adult migrant member are worse off. They are currently not in schools or are susceptible to early dropout even after they are enrolled and are more likely to participate in economic activities compared to children in non-migrant households, (Hing et al., 2014; USAID, 2014)

Figure 2.3. Enrollment and Completion Rates at Primary and Lower Secondary



Source: Created by the author based on MoEYS's Education Management Information System's Indicator from (1997 to 2016).

Not only have enrollment and completion rates stagnated, but there are also challenging issues of poor quality of education and inequality in the country. The quality and effectiveness of students' learning achievement are still on-going issues. Short learning hours are considered one of the reasons behind the poor learning performance. Most of the elementary schools in Cambodia are operated under the two-shift system, meaning students either study in the morning or in the afternoon for no more than four hours a day (UNESCO, 2011). This may be explained as one

of the reasons why about half of working children aged 5-17 in Cambodia are reported to be able to combine schooling and working at the same time (World Bank, 2005). MoEYS in 2005 has increased the yearly teaching hours to 950 to meet the UNESCO standards of 850-1,000 study hour per school year (MoEYS, 2014c). However, since one study of hour consists of only 40 minutes, the actual instruction hours are only 633 per school year (NGO Education Partnership, 2015).

The results from Early Grade Reading Assessment (EGRA) conducted in 2010 disappointedly show that about a third of grade two students could not read even a single word, and among children who could read, about half of them could not comprehend contents (Tandon & Fukao, 2014). This learning crisis can be one of the key reasons for high repetition and dropout rates at both primary and secondary levels. In the MoEYS's national review on EFA 2015 goals, it concludes that the quality of basic education is still low (MoEYS, 2014b). The results of Grade 6 national assessment Khmer⁷ (reading and writing) and mathematics conducted in 2013 and 2016 show that student performance was under the desired level and there was no progress in reading, although there was a slight improvement in mathematics (UNESCO, 2017).

Disparities are also an issue that needs to be addressed. Even though in recent years, males and females nearly have an equal opportunity to access education, children in rural areas and children of impoverished or disadvantaged backgrounds remain less likely to receive quality education, in comparison to children from well-off families in urban areas. Field surveys conducted by the MoEYS found that the annual actual teaching time in provincial schools on an average is only around 720 hours, 230 hours less than the 950 hours set in the curriculum revised in 2005 (MoEYS, 2014c). Based on site visits to nearly 100 schools, NGO Education

⁷ Khmer is the mother tongue of Cambodia.

Partnership in 2015 estimated that rural schools in Cambodia loss around 24% of teaching hours due to teacher absenteeism and lessened contact hours. Not only that teaching hours in rural schools are shorter, but there are also great regional disparities in teacher deployment. The urban-rural disparities in teacher distribution as captured by the Student-teacher ratios (STR) appears to be a big challenge for Cambodia (Ogawa et al., 2017). At the school level, teacher allocation is even more unequal. The STR at school level greatly varies from 5.25 to 743 in the academic year (AY) 2015-16 and about 25% of the primary schools most of which located in rural areas have the STR of more than 70. Not only that children in remote and mountainous areas and children from disadvantaged backgrounds still have limited educational opportunities, the national assessments at Grade 6 indicates that the performance of rural students, especially those from the low socio-economic background, performed worse and was below basic proficiency levels (MoEYS, 2014c; UNESCO, 2017). For instance, rural students at Grade 6 still had problems in reading comprehension and composing apology letters or filling permission forms.

2.2. Overview of Child Work in Cambodia

The Inter-Censal Population Survey conducted by the National Institute of Statistics (NIS) in 2013 estimates that the total population of Cambodia is about 14.7 million people (NIS, 2013). With an average of the annual population growth rate of 1.4%, the growth rate is fairly high among the countries in Southeast Asia (Jones, 2013; UNESCAP, 2016). The median age is about 25 in 2013, and about 30% of the population is under 15 years old. Due to a decline in fertility rates, there was a drop in the proportion of children aged under 15 years old from 42.8% in 1998 to 33.7% in 2008, and then a further drop to 29.4% in 2013 (NIS, 2013). As illustrated in Table 2.1, the number of children aged 5 to 11 constitutes about half of the children

aged 5-17. Those aged 12 to 14 and 15 to 17 is about one quarter each of the total. The ratio of boys to girls is 52 to 48. In terms of child population by region, a large proportion of children, more than 80%, reside in rural areas where the majority of households are poor and do the farming for a living (ADB, 2014; UNESCAP, 2016).

Table 2.1. The Census Population of Children (5 -17) by Gender, Age, and Area

		Population	Percentage
Sex	Boys	2,122,599	52%
	Girls	1,992,494	48%
Age groups	5 – 11 years	2,078,079	50%
	12 - 14 years	1,063,098	26%
	15 - 17 years	973,916	24%
Area	Urban	644,064	16%
	Rural	3,471,029	84%
Child Total Population (5-17 years)		4,115,093	

Source: Created by the author based on Cambodia Population Census (2008).

Even though young children are expected to acquire their human capital with quality education, ILO (2013) reports that a large proportion of the Cambodian children of more than 20% were out of school and about 10% of them had never enrolled in school at all. Some of those out-of-school children engage in labor activities as early as at the age of five (Kim, 2011; World Bank, 2005). They participate in either economic activities to generate some extra income or helping their families on farms, family business or with other forms of domestic activities. The report of ILO (2013) also highlights that the rate of labor participation is largely unchanged when compared with the 2001 statistics. The participation rate increases among older children (particularly when they reach the age of 14), among girls and children in rural areas (ILO, 2013). There were only 52.5% of female children aged between 15-17 years old in rural areas attending schools and 43.2 of them were reported to drop out from schools in 2012 (Table 2.2).

Table 2.2. Children's School Attendance Rate by Age Group, Sex, and Region

	Currently Attending		Dropped		Never Attend	
	Males	Females	Males	Females	Males	Females
Total						
5–17 Years	78.54%	79.39%	10.30%	11.76%	11.16%	8.84%
5–11 Years	81.41%	84.28%	0.49%	0.48%	18.10%	15.24%
12–14 Years	89.75%	91.51%	6.82%	6.46%	3.43%	2.03%
15–17 Years	62.18%	58.49%	32.59%	38.10%	5.23%	3.41%
Urban						
5–17 Years	88.56%	89.13%	5.58%	6.36%	5.86%	4.51%
5–11 Years	87.54%	91.82%	0.07%	0.00%	12.39%	8.18%
12–14 Years	98.00%	93.12%	2.00%	5.82%	0.00%	1.06%
15–17 Years	81.72%	80.93%	18.28%	18.61%	0.00%	0.46%
Rural						
5–17 Years	75.95%	76.95%	11.52%	13.12%	12.53%	9.93%
5–11 Years	79.92%	82.29%	0.60%	0.60%	19.49%	17.11%
12–14 Years	87.59%	91.17%	8.08%	6.60%	4.33%	2.24%
15–17 Years	56.65%	52.51%	36.64%	43.29%	6.71%	4.20%

Source: Created by the author based on ILO's Cambodia Labour Force Survey and Child Labour Survey (2012).

2.2.1. Characteristic of Working Children

The incidence of children working is common and widespread in Cambodia. This perhaps can be partly explained by a lack of teachers, insufficient buildings to accommodate students, leading to the practice of the multi-shift system (as mentioned earlier) across the nation. Since students in public schools are in principle required to attend school either only in the morning session from 07:00 to 11:00 or the afternoon session from 13:00 to 17:00, there are plenty of free time for children to work after or before class (MoEYS, 2014; UNESCO, 2016). In particular, out-of-school children from poor households are very likely to be involved in economic activities to help their families on farms, a family business or some other form of paid jobs to generate some extra income. About one out of five children who start primary schools drop out before completing it, and according to the ILO's

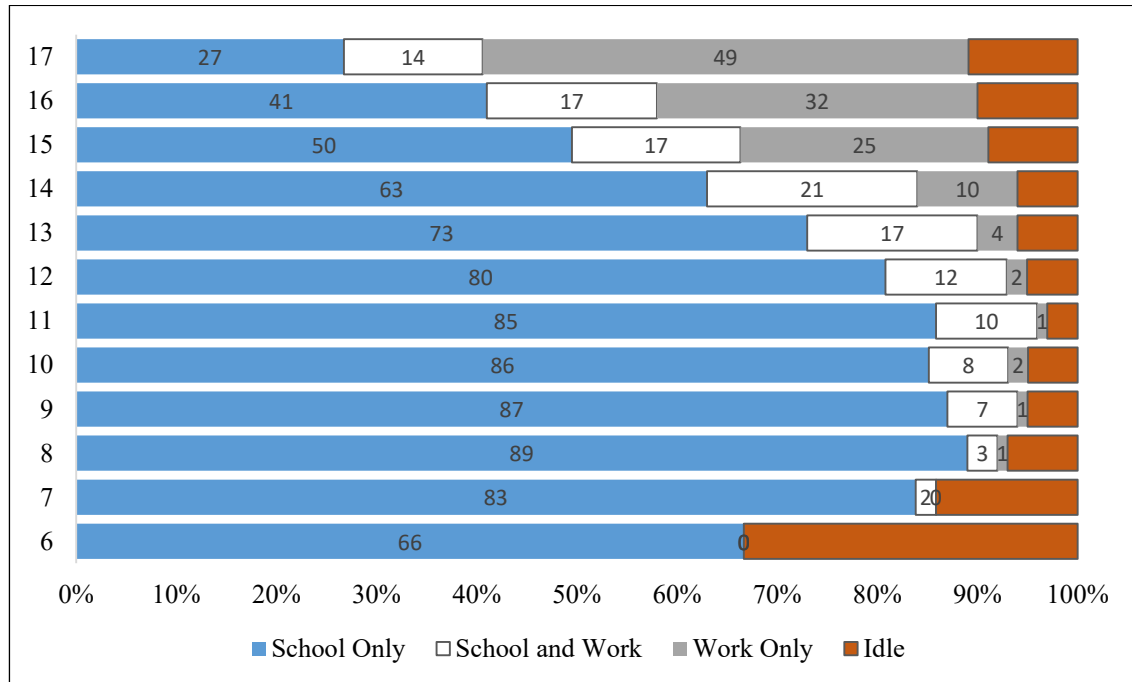
report in 2013, the main reasons of dropping out are poor performance (18.5%) and a lack of interest and money (16.3%).

The patterns of children's conditions are categorized by children in school only, children combining school and work, children in work only, and idle children who neither go to school nor work. The official school age for primary school enrollment in Cambodia is six years old; however, at the age of six only around 66% of children were reported to be in school (Figure 2.4). The school attendance reached its peaks at about 89% at the age of eight. However, from the age of eight onwards, the trend is downward with increasing age. Students combine school and work (paid or unpaid) from a very young age. As shown in Figure 2.4, the number of children going to school only without involvement in economic activities starts to drop from 8 years old and by the age of 17, the number of children being in school only drops to only around 27%. At the age of nine, about 7% of children go to school and work at the same time, and the rates climb to around 21% at the age of 14. From age 15, children are more likely to quit school and turn to work exclusively. As Figure 2 shows, from that age, the number of children combining schools and work starts to decline and the number of work-only children surges sharply around this age. In short, as children get older, they tend to get involved in economic activities by combining work with school activities, or completely drop out of schools and dedicate their time to work. This incidence also indirectly indicates a negative relationship between child work and school enrollment in Cambodia.

In countries where UNICEF's Multiple Indicator Cluster Surveys (MICS) data is available, boys are more likely to be engaged in paid jobs but spend less time on domestic jobs (Edmonds, 2007). However, based on the Child Labor Survey conducted in 2001, Ray and Lancaster (2004) conclude that boys and girls are engaged in economic activities in similar patterns, suggesting that gender has a

minimal impact on child labor in Cambodia. Compared with other countries in the same region, Cambodian working children spend a relatively greater amount of time on domestic chores (Ray & Lancaster, 2004).

Figure 2.4. Children's Schooling and Working Status by Age



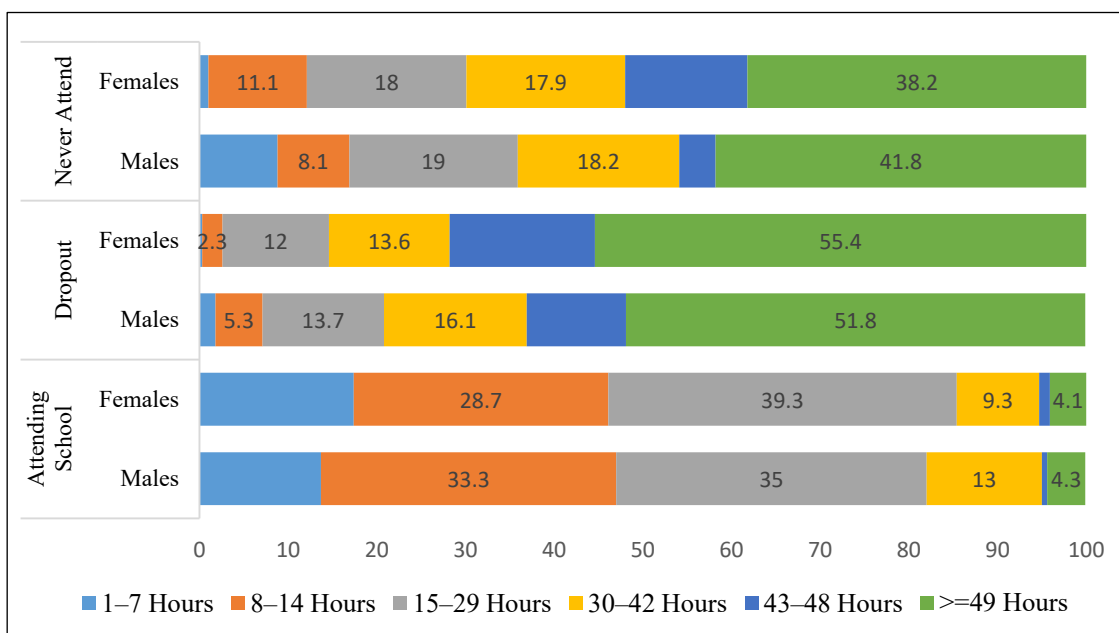
Source: Created by the author based on ILO's Cambodia Labour Force Survey and Child Labour Survey (2012).

From the Cambodia Labor Force and Child Labor Survey 2012, the hours of children spending on domestic work or household chores also increase with age, although it is less than the time they spend on economic activities. Children aged 15-17 spend about seven hours a week on domestic chores. Regarding working children by areas, since the majority of the Cambodian children reside in rural areas (where most of households engaged in farming), it has been found that about 73% of economically active children are in agriculture and work for families in 2001 (Edmonds & Pavcnik, 2005). Albeit at the very young ages, they can be effective in caring for animals and in tasks such as weeding that does not require a developed physical stature.

By employment types, more than half (57.5%) of working children aged 5-17 were unpaid family workers, 39.1% were employees, 3.3% were self-employed, and 0.2% were employers (NIS & ILO, 2013). Children working is common and widespread in all sectors in Cambodia from primary to tertiary sectors. National of Institute of Statistics (NIS) and International Labor Organization (ILO) (2013) estimates that about half of the economically active children worked in the primary industry (agriculture, forestry, and fishing), around 20% were engaged in the manufacturing sector and the remaining worked in the service sectors such as wholesale and retail business, hotels and restaurants.

The long working hours performed by children can lead to a child labor incidence. This can pose a threat to the child's welfare and development. An estimate of 28% of economically active children worked 49 hours or more per week (NIS & ILO, 2013). This is more than 8 hours a day, given the working days are 6 days a week. 38% of children age 15-17 were reported to work more than 48 hours per week. Not surprisingly, most of the long-hours working children are those who dropped out of schools or have never enrolled in schools. Only about 4% of the long-hours working children were currently enrolling in schools at the time of the survey in 2012, while more 50% and 40% of dropout students and never-enrolled children respectively worked more than 48 hours per week. When children get older, they tend to work longer hours outside the households for wages. Children working in domestic work (including helping family farming) also spend considerable time working, at 16 hours per week.

Figure 2.5. Percentage of Children Aged 5-17 Participating in Work by Hours



Source: Created by the author based on NIS & ILO (2013).

The majority of those children achieved their primary education or partially attended their primary schooling, with just 4.6% having lower secondary education (NIS& ILO, 2013). Children participating in long hours of work, which could lead to the incidence of child labor, is still an ongoing concern in Cambodia. As shown in figure 2.5, it describes three patterns of working children and their working hours by age and gender. For children who combine schooling and working, the majority of working children falls within a range of 8-29 hours a week, of which females worked more hours. While about 39% of females engaged in labor for 15-29 hours, boys accounted 35%. Working children can be a hindrance to their educational interruption. This means that the longer hours a child work, the more likely they drop out of schools to completely participate in work. In the same figure, it also shows that those dropouts worked the longest hours, 55% for females and 52% for males. Surprisingly, this is even higher than the working children who never attended schools at all.

Although working children may help benefit families in the short-run, it may disrupt their acquisition of human capital and has adverse effects on their well-being in the long run, as pointed out by a myriad of earlier studies on the negative effect of the number of hours worked children on child educational attainment (Akabayashi & Psacharopoulos, 1999; Rosati & Rossi, 2003). In other words, the more hours a child accumulates in work, the more likely they will be trapped in blue-collar jobs. This could result in low lifetime earnings and job security (Gleason, 2018). In addition, with the emergence of the fourth industrial revolution⁸, it is predicted that many unskilled jobs will be replaced that innovative technologies and automation using robots and machines (World Bank, 2009). Young workers are more affected by automation than older workers. Those who engage in the labor force early, instead of acquiring proper education and skills to boost future knowledge and productivity, could face reduced lifetime earnings or employment prospects.

2.2.2. Child Work and Child Labor

Child work does not always negatively affect children's health, education, physical and mental development. What matters more is of a concern as to what kind of work/work condition that children are involved in and to how many hours a child allocates to working than whether a child works or not. Children who work just a few hours can contribute to household income, which in turns allows them to continue their schooling (Kim, 2009; Miwa et al., 2010; Rossi, 2001). Some works including assisting their family domestic household work or business also help contribute to the development of children and prepare them to be active citizens in

⁸ The concept of the fourth industrial revolution concentrates on the rapid growth of machines, so-called automation, which could perform certain manual tasks. It is found that automation is on the brink of wiping out labor-intensive work currently performed by mankind, and therefore likely to replace the need of humankind to perform such tasks (Gleason, 2018).

the societies. In other words, provided a child works at the threshold⁹ that does no harm to their health and psychological and educational development, working children can improve not only the situation of their households but also themselves. On the contrary, the excessive number of hours worked by children should be labeled as child labor, which is considered an issue of human right and a menace to both an individual and a country's development.

Not all child work is considered child labor. Whether or not a child work can be classified as “child labor” depends on characteristics such as the child's age, hours worked, type and conditions of the work. Children's work which could potentially lead to child labor is a barrier to achieving the universal basic education. The necessity to understand the situation and how to curb with the matter is thus too important to be overlooked. According to its laws, child labor is divided into three forms; (i) being the worst one is slavery; (ii) trafficking and any hints of forced labor; (iii) any forms of labor carried out by an underaged child, all of which in their nature damages a child physically, psychologically, mentally and morally and is known as “hazardous work”¹⁰.

Child labor is defined differently depending on how the laws and regulations of the age group set in each country. Most of the national statistics around the world on child work or child labor are derived from the International Labor Organization (ILO)'s definition. Cambodia Labor Law (1997) and the survey report on Cambodia Labor Force and Child Labor Survey (2012) define child laborer as:

- “Children aged 5–11 years and engaged in any economic activities for one hour or more in the reference week;

⁹ The detailed discussion of the policy regarding the number of hours corresponding with age of children is discussed in page 41.

¹⁰ ILO (2012) defined hazards as overworking a child with high workload, high physical demand and long working hours though the activity is considered "safe".

- Children aged 12–14 years and engaged in permissible (non-hazardous) economic activities for more than 12 hours in the reference week;
- Children aged 12–14 years and engaged in work for fewer than 12 hours in the reference week but working in designated hazardous industries and occupations;
- Children aged 15–17 years and engaged in economic activities for more than 48 hours in the reference week; and
- Children aged 15–17 years and engaged in economic activities for 48 or fewer hours in the reference week but engaged in designated hazardous industries and occupation.” (NIS & ILO, 2013, p. 7)

2.2.3. Laws and Regulations on Child Labor

Child labor is an economic and social issue posing a barrier to sustainable development for a country. Acknowledging this issue, the Cambodian government has been striving swiftly to fight against the prevalence of child labor. The commitment is reflected in ratifying and adopting international conventions as well as national legislation and policies namely the United Nations Convention on the Rights of the Child (UNCRC) in 1992, the Minimum Age Convention (No. 138) in 1999, and the Worst Form of Child Labor Convention (No. 182) in 2005 (ILO, 2007). Aligning with the UNCRC, article 48 of the Constitution of Cambodia also recognizes children’s right to life, education, and freedom from economic or sexual exploitation. Furthermore, two years after the adoption of the Convention on the Rights of the Child, the Cambodia National Council for Children (CNCC) was established in 1995 to develop child protection system and coordinate the implementation, monitoring, and evaluation of all policies and programs related to Cambodian child issues (MoP, 2001). These have provided a roadmap in tackling the mainstreaming child labor problem.

In 1997, the labor law in Cambodia sets the minimum age for wage employment at the age of 15. Nonetheless, under the age of 18, it is considered against the Cambodia Labor Law on Child Labor, provided children perform excessive working hours and involve in any work that is hazardous to their mental or physical development. To reinforce the law, in 2015, the Ministry of Labor and Vocational Training (MOLVT) issued a regulation and labelled children between the ages of 15 and 18 as young workers, and they must not be required to work in harsh working environments. The rule also stipulates certain criteria for employers to check before they recruit children for work, by checking their identity, providing them with work documents and necessary job training.

Cambodia's government has shown its willingness through putting in place regulations and legislations in the area of curbing the incidence of children working which could potentially lead to child labor. However, there still remains loopholes and gray areas to be discussed and properly defined. For instance, Cambodia's labor law on Child Labor has not covered informal sectors where most of child labor incidence is prevalent, in other words, family based economic activities and services are not included in the legislation, which leaves children vulnerable to these types of occupation.

2.3. Overview of Migration in Cambodia

The demographic movement of the Cambodian people has been predominant, and it would not be complete without tracing its root back to the history. The phenomenon of migration in Cambodia could be classified into two key patterns, pushing by political and economic motivations. The modern history of cross-border migration in Cambodia dated back to the period between 1975 and 1979, during which the country suffered from the genocide under the Khmer Rouge regime (Chan

& So, 1999). During the time, migration was in the forms of diaspora, and resettlement. All city dwellers were forced to flee to rural areas, while some villagers were forced to move around, but limited to only countryside. During the 1980s, after the downfalls of the regime, those who were near the borders of Thailand and Vietnam fled the country for safety from ongoing civil wars, between the government and the remaining strongholds of the Khmer Rouge, to the third country via their neighboring countries (Zlotnik, 1998).

Since the 1990s, there has witnessed a starting point of shifting towards labor migration. It is a voluntary basis, basically motivated by financial benefits, in search of better wages to improve household economic well-being. Although labor migration is relatively a new topic in the country, the volume of migration is huge and has been increasing rapidly (Chan, 2009a; CDRI, 2009; Maltoni, 2007, 2010). The increase is on average at a rate of 1.3% per year (MoLVT & ILO, 2014). It serves as an important mechanism, specifically amongst rural households to cope with their income constraints, as they do not have social safety net protection provided by the government. The government also acknowledges its potential impacts, as this current trend of migration partly shapes the country's economic growth in terms of poverty reduction and rural livelihood improvement (Chan, 2009b; Godfrey et al., 2001; Maltoni, 2010)

2.3.1. Internal Migration

Existing evidence suggests that internal migration in less developed countries harnesses social changes and has a “reciprocal relationship¹¹” with development” (De Haas, 2005). For Cambodians, it is worth emphasizing that migration is one of

¹¹ de Haas (2005) claims that migration is the by-product of development, but in the meantime is one of the constituent attributed to development.

the short-term households' survival options in response to income constraints and economic and idiosyncratic shocks. In other words, migration is not a means in long-term to increase families' socio-economic condition (Maltoni, 2007). Cambodia's labor migration has been documented to be triggered of by so-called push-and-pull factors, and the push factors are arguably claimed to play a more important role, alluring households to opt for the decision to migrate (Maltoni, 2010). Migrants are motivated by a combined push factors which specifically include poverty, unemployment, landlessness (which can be due to land grabbing), limited access to markets, debt and natural shocks, such as droughts and floods (Chan, 2009a; Maltoni, 2010).

Table 2.3. Number of Migrants (in thousand) by Region and Gender in 2008 and 2013

	All			Males			Females		
	Total	Migrants	%	Total	Migrants	%	Total	Migrants	%
2013									
All	14,677	4,242	29%	7,122	2,137	30%	7,555	2,104	28%
Urban	3,146	1,554	49%	1,527	743	49%	1,619	811	50%
Rural	11,530	2,687	23%	5,594	1,394	25%	5,936	1,293	22%
2008									
All	13,396	3,552	27%	6,516	1,793	28%	6,880	1,760	26%
Urban	2,614	1,514	58%	1,256	718	57%	1,358	796	59%
Rural	10,782	2,038	19%	5,260	1,075	20%	5,521	963	17%

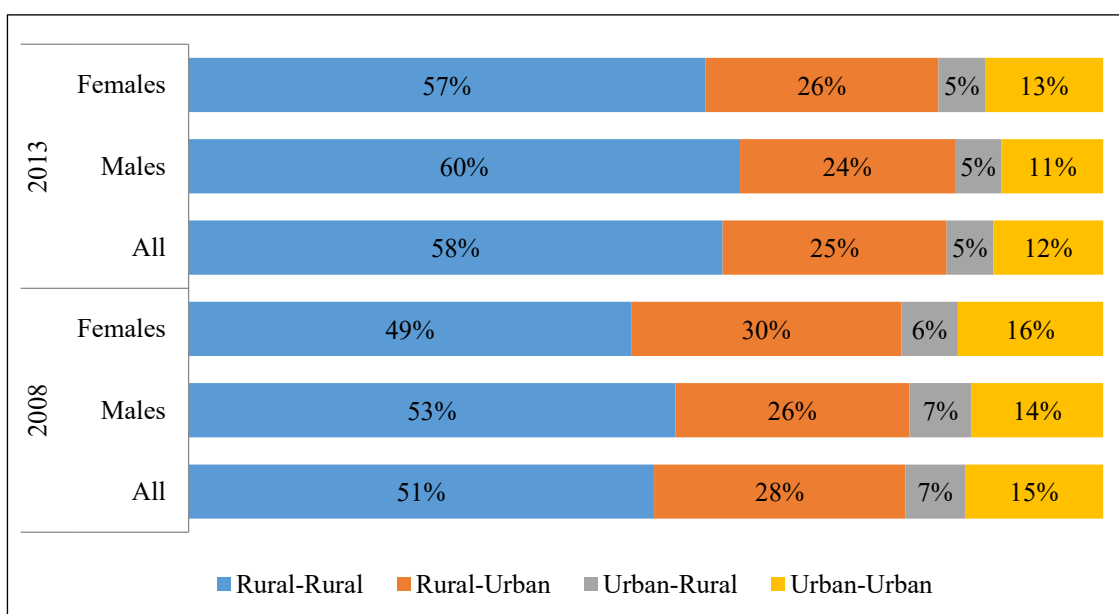
Source: Created by the author based on Cambodia Inter-Censal Population Survey (2013)

*** Note: 2008 data is from the Cambodia Population Census collected every 10 years, while the 2013 data is from the mid-population census survey conducted every 5 years.

In comparison to international migrants, the proportion of internal migrants is much larger in scale (Maltoni, 2007; MoP, 2012; 2015). Only 2.5% of Cambodian migrants to countries outside the counties in 2013 (NIS, 2013). Based on the National Census conducted in 2013, the National Institute of Statistics (NIS) estimates that 4.2 million out of 14.7 Cambodian population (nearly a third of the population) are migrants. In the survey, migration is defined “as the process of

changing residence from one geographical location to another” (NIS, 2013, p. 84). In the period of five years from 2008 to 2013, the number of Cambodian migrants has increased nearly 20% from 3.5 million to 4.2 million. Among urban inhabitants, almost half (49%) of the total population are consisted of migrants, although the ratio has slightly declined from 58% in 2008 (Table 2.3). There is little difference in regional patterns between genders regarding the migration destinations.

Figure 2.6. Internal Migrants by Migration Stream and Sex in 2008 and 2013



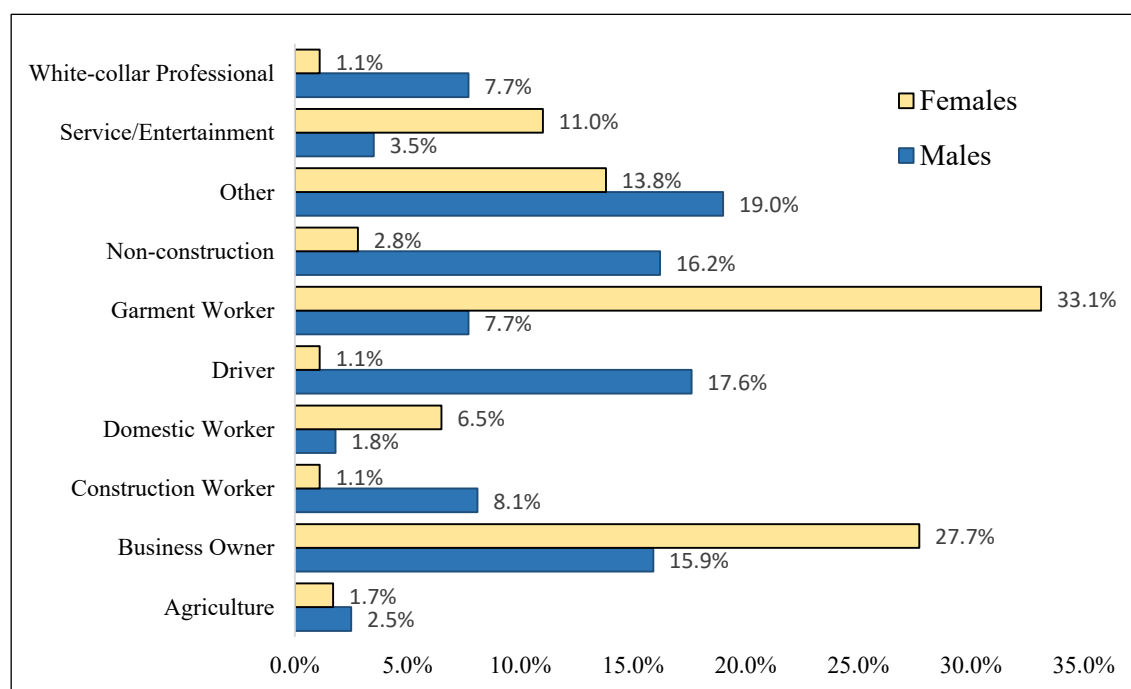
Source: Created by the author based on Cambodia Inter-Censal Population Survey (2013).

Cambodia is still a developing country characterizing by a large proportion of people residing in rural areas. For this reason, in 2013, a significant total proportion of internal migration was rural-rural (58%), followed by rural-urban (25%) and urban-urban (12%). Only around 5% of migrants moved from urban to rural (Figure 2.6). The increasing number of people changing their residence to cities has led to rapid urban growth. The most popular migration destinations are Phnom Penh, attracting about half of the rural migrants, followed by Battambang, Kampong Cham and Siem Reap (NIS, 2013). A poverty study in Mesang District in

Prey Veng Province finds that 62% of the total households have at least one member migrating within the country (Samreth, 2016). Most of those migrants (89% of them) moved to Phnom Penh primarily for work in the construction and garment sectors.

Current situation necessitates rural people to migrate to urban for a better life. Most of the jobs in rural areas are mostly limited to family-based agricultural farming, although there are not enough agricultural lands for younger generations. The land has to be divided among many children, making individual plots of land too small to support their living by farming alone. In addition to these push factors, there are also increasing demand for cheap labors in the garment, construction, tourism, transportation and service industries in urban areas (MoP, 2012).

Figure 2.7. Occupations of Employed Migrants in Phnom Penh by Gender

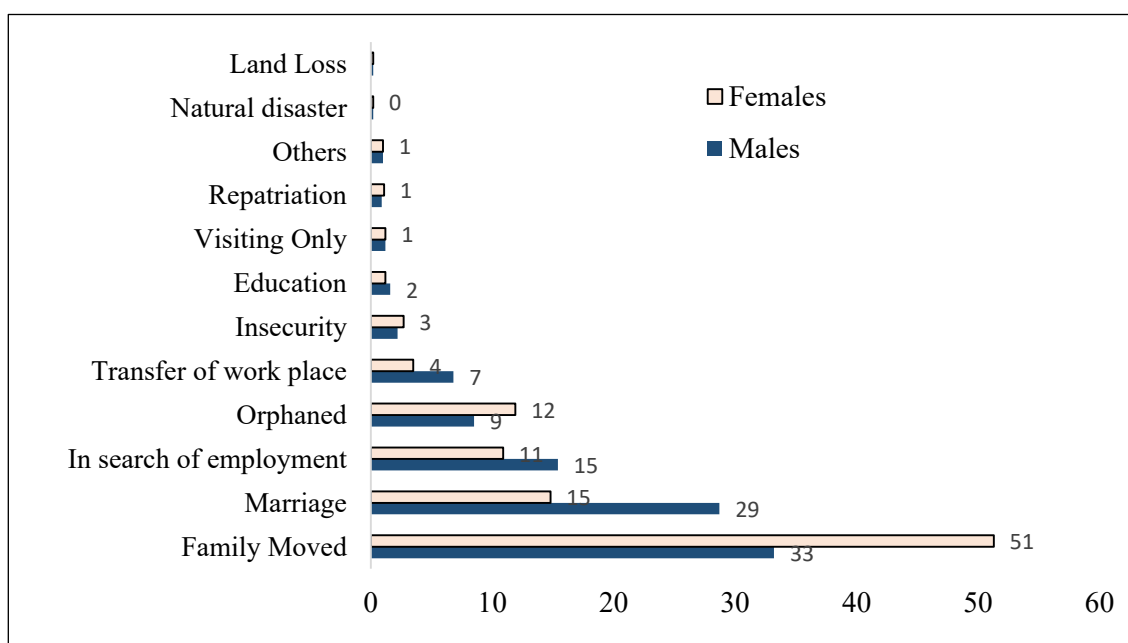


Source: Created by the author based on MoP (2012).

The rural-urban migration as reported from the Ministry of Planning (MoP) shows that migrants' occupations greatly vary by gender. Among the interviewed migrants, more than 60% are currently employed at the time of interview (MoP,

2012). Drivers (motor-taxi and tuk-tuk, a type of three-wheel drive motorbike), non-construction workers, and running their own business appear to be the most frequently sought jobs among male migrants in Phnom Penh. For employed female migrants, the jobs are much more concentrated in the garment industry, accounting for nearly one-third of all the occupations. The second popular job for women is owning a business.

Figure 2.8. Reasons of Migration in Cambodia by Gender



Source: Created by the author based on Cambodia Inter-Censal Population Survey (2013)

The driven motivations of migration are conspicuously manifested as a survival strategy, pursuit of better opportunities, education. Figure 2.8 shows the distribution of reasons behind the migration by gender in Cambodia. The most common reasons for changing residence are moving along family, marriage, job seeking and being orphaned. A significant number of Cambodian people move when their entire families or some of their family members decide to migrate. Females who move with families are much higher than their male peers. Marriage is also a major reason for migration. Traditionally, males are supposed to move to their wife families. For this reason, males (29%) are more likely to migrate after marriage than

females do (15%). Males are also slightly more active in seeking jobs far away from their residence.

2.3.2. International Migration

The patterns of international migration characteristics in Cambodia have shifted from forced migration as refugees escaping from political instability and insecurity during the turmoil and civil war in the home country to voluntary immigration as labor migration aiming to look for jobs to improve economic status. The latter type of migration has gained a momentum attracting social attention. The United Nations Department of Economic and Social Affairs (UN DESA) estimates that as of 2017, there are more than 1 million Cambodians living abroad. Among many countries of destination, Thailand is the most popular destination among Cambodian labor migrants. According to Thailand's statistics, there are 243,465 migrant workers in Thailand registered under the Memorandum of Understanding (MoU) between Cambodia and Thailand (ILO, 2018). The majority of them are irregular cross-border migrants¹² and it is predicted to continue to increase for seeable future (Maltoni, 2010).

This surprising number of Cambodian labor migrants makes up Thailand's the second largest labor migrant population after the Burmese (Chan, 2009a). This cross-bordered migration of Cambodian workers in Thailand, therefore, deserve special attention. The reason that Thailand has been the most popular destination since 1994 for Cambodian migrants is due to the ease of access and plenty of job opportunities (Chan, 2009a) for Cambodian workers seeking better-paid opportunities. Nonetheless, most of them cross the border without proper legal

¹² As discussed, the outflow of Cambodian migrating to Thailand accounts the largest proportion. Because the legal process takes times and is costly in addition to the favorable geographical conditions between the two countries, many Cambodian people opt for the irregular or a so-called illegal migration. (Chan, 2009b)

documents. As a result, governments of the two countries signed the Memorandum of Understanding (MoU) on Bilateral Cooperation in the Employment of Workers in 2003, specifically aiming to create: (i) a joined administrative process and well-structured migration procedure; (ii) an organized process for migrants' repatriation; (iii) instructions for labor protection; and (iv) tools for hindering and intervening illegal migration (MoLVT & ILO, 2014). The official recruitment of Cambodian workers under this MoU, however, only started to legalize the migrant process in 2006. According to the statistics obtained from the Ministry of Labor and Vocational Training, as of February 2015, a total of 101,547 Cambodia workers have been legally dispatched to Thailand through 35 recruitment agencies registered at the ministry.

Besides neighboring Thailand, Cambodian people also seek working opportunities in the Republic of Korea, Japan, Malaysia, and other countries. The Cambodian government also signed the MoU with Kuwait in 2009, with the Republic of Korea and Japan in 2010, with Qatar in 2011 to dispatching workers from Cambodia (ILO, 2018). Based on the Ministry of Labour and Vocational Training's statistics, there are 43,571 Cambodian workers in the Republic of Korea and 2,383 Cambodian migrants in Japan. Qatar and Kuwait have received far fewer Cambodia migrants for work.

Reasons for International Migration

After emerging from the Pol Pot regime, during which millions of the Cambodian people were a homicide, Cambodia experienced a baby boom in the 1980s and the population has again started to grow. According to the 2008 census, the total population in Cambodia was 13.4 million, 51% (6.9 million) of which is females with an annual population growth rate of 3.1 between 1998 and 2008. This number

marked relatively higher than the average growth rate in Southeast Asia, which accounts for 2.2. By 2020, the Cambodian population is projected to reach 19 million, and as of 2013 more than 70% of Cambodia population aged 15 years old and older (MoLVT & ILO, 2014). The surge of young people entering the labor force is growing, which requires decent employment opportunities to be correspondingly responded. In addition, the 2008 census indicates an increase in the labor force participation rate or economic activity rate from 55 percent in 1998 to 62 percent in 2009.

Against this backdrop, more Cambodians are considering leaving the country to find work in neighboring countries, particularly Thailand. The increase in cross-border or international labor migration is cited to be a combination of push and pull factors (Maltoni, 2010). Several factors that push people from places of origin include poverty, unexpected shocks, a lack of employment opportunities, natural disasters or dissatisfaction with the social life, while better job and education opportunities are amongst the common pull factors (MoP, 2012). Most of the migrants suffer from chronic poverty and deprivation, landlessness or land-grabbing resulted from land concessions to private companies, job shortage, debt or natural disasters (Chan, 2009a; Hing, et al., 2011). The difference in the wage gap between Cambodia and Thailand is also one the main factors motivating Cambodian migrants to cross-border seeking better-paid works. In other words, typical Cambodian labor immigrants to Thailand are pushed by the low incomes and pulled by the better-paid job offered in Thailand.

Thailand's economic boom beginning in the 1990s is another factor attracting an influx of foreign workers across the borders, including those from Myanmar, Cambodia, and Laos. This has led to an increase in labor demand for low-skilled workers, especially in the factories and agricultural sectors. In addition, as the wages were also relatively higher, it was attracted both the unemployed and

poor Cambodians to migrating to work in the host country. Regardless of potential risks either in the forms of labor exploitation or human trafficking, those migrant workers are lured by the higher earnings they could make in Thailand. (MoLVT & ILO, 2014). Since the outflows of labor emigration are to continually increase as a result of both the internal and external reasons, it is of a challenge and a necessity for the Cambodian government to address issues related to risks of migrants and in the meantime to develop and strengthen its legal frameworks to manage and safeguard the migration process.

2.3.3. Laws and Regulations on Migration in Cambodia

Cambodia has made continuous efforts in protecting Cambodian migrant workers. The country has apparently recognized the contribution of migration to the country's economic development since the emerging of labor migration in Cambodia in the last two decades. As for the example, a sub-decree 57 was circulated, with a special attention on the safe process of international migration. In addition, to further strengthen the policy, in 2004, the government ratified the most significant Conventions on labor migration known as the "Convention on the Protection of All Migrant Workers and Members of Their Families" (United Nations, 2016). Migration has gained momentum which resulted in progressively establishing laws. There are also Prakas 108, issued in 2006, highlighting "Education on HIV/AIDS, Safe Migration and Labor Rights for Cambodian Workers Abroad." On the same note, in 2006, Sub-decree 70 echoed an emphasis on "The Creation of the Manpower Training and Overseas Sending Board. Due to the fact that labor migration is a cross-cutting sector issue, four government bodies – namely the Ministry of Labour and Vocational Training, Ministry of Interior, Ministry of Foreign Affairs and International Cooperation, and the Council of Ministers – are working in cooperation to manage labor migration by making and

strengthening the labor migration policies. For domestic economic and labor market developments and national development goals, overseas migration has to be strategically promoted and harnessed as labor migration can contribute significantly to poverty alleviation by providing employment and income needed in the short and medium terms. Strategically, Cambodia needs to have its national employment policy on migration, which would persuade and help return migrants transitioning into the domestic labor market. To do that, institutional mechanisms and systems holding information on return migrants and recognizing experiences and skills gained overseas need to be in place first and foremost.

In recent years, the Policy on Labor Migration has been comprehensively designed and developed, and it appears that the Ministry of Labour and Vocational Training (MLVT) is the core ministry for this work. The Policy on Labor Migration was enacted in 2010 and was more thoroughly revised in 2014. The International Labour Organization (ILO) also worked collaboratively and closely with the Ministry during the policy designing process. In the Policy on Labor Migration of Cambodia, it emphasizes on three areas: (1) governance of labor migration; (2) safeguard and empowerment labor migrants, and enhancing labor migration for the economic well-being of their remaining households in local communities and on the country's development as a whole. On par with the more attention paid to benefits brought about labor migration, there are also challenges and key issues, especially during the migration process and exploitation of employers on migrants that needs to be more addressed.

2.4. Overview of Remittances in Cambodia

Since the late 1990s, remittances have played a very important role in economic development. With a sharp decline in other private capital flows during the crisis, remittances are relatively predictable and stable compared to the financial flows of

foreign direct investment (FDI) and the official development assistance (ODA) (World Bank, 2016). It is estimated that the flows of remittances are three times higher than the amount of ODA and have recently surpassed the volumes of FDI (World Bank, 2018). Increased research studies on remittances find that remittances relieve household income constraints such that households have more purchasing power (Ratha et al., 2010). Studies also show that their impact has gone beyond economic development and frequently entails the improvement in other dimensions of human development that are education and health. On the same note, remittances are also found to reduce household income constraint and a need to rely on children as laborers to contribute to households' finance. This means remittances could help prevent children extensively working and therefore being unable to spend more time on schooling.

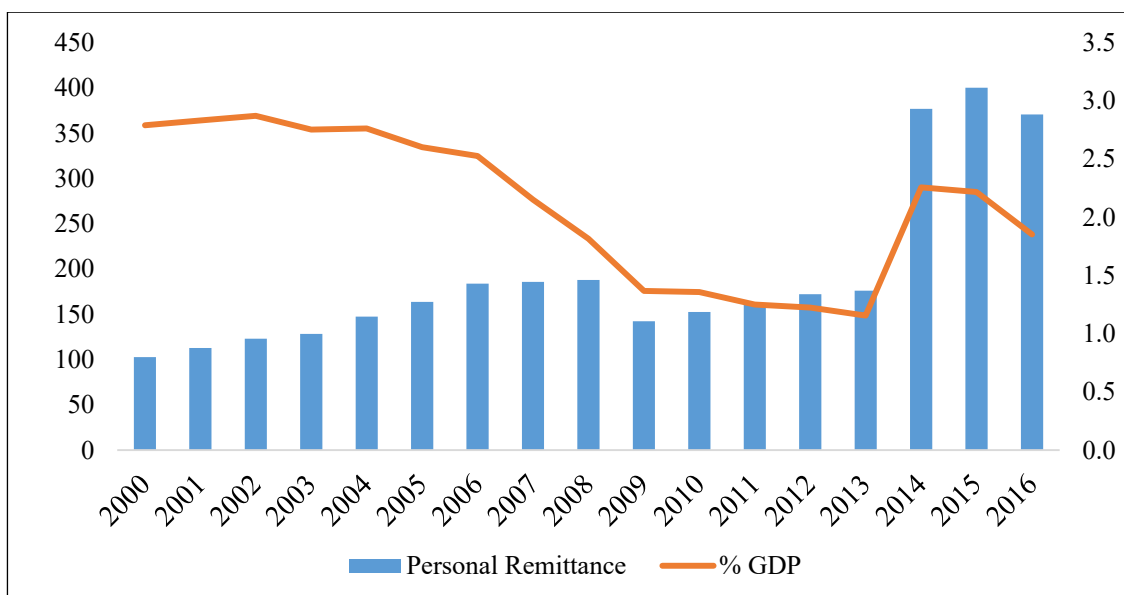
Remittance in Cambodia at Macro-level

Even though Cambodia has a relatively long history of migration, legal frameworks regulating and managing the remittance transfers from internal or international migrants are nonexistent. Coupled with the problem, the data on the amount of remittances and the media that are used to send through is unreliable (Maltoni, 2010). Maltoni (2010) points out that statistics on remittances in Cambodia are less reliable due to the facts different sources provide inconsistency different figures and estimations. The World Bank estimates the inflow of remittance to Cambodia in 2016 at around US\$ 370 million (approximately 2% of the GDP)¹³. The remittance inflow to Cambodia slightly declined in 2009 after the global financial decline and sharply increase in 2014 (Figure 2.9). Based on the World Bank's estimation, although the remittance in absolute term has increased, its ratio to the

¹³ In comparison, the net FDI and ODA in 2013 are estimated to be around US\$ 1.35 billion and US\$ 800 million respectively.

GDP has fluctuated fluctuating between 1.2% and 2.9% in the period of 2000-2016, as Cambodian economics has grown faster. Compared with the neighboring countries, Vietnam, Thailand, and Laos and other Southeast Asian and East Asia and Pacific countries, Cambodian remittances contributing to GDP represent the second top country behind Vietnam. According to the World Bank's migration and remittances factbook 2016, Cambodia is considered as a top 10 remittance senders (US\$ 200 million) in 2014.

Figure 2.9. Inflows of Remittances in Cambodia by Year



Source: Created by the author based on the World Bank's Migration and Remittances Data.

Remittance in Cambodia at Micro-level

At the micro-level, remittance from migrants is proved to be beneficial to the home country in various socio-economic indicators, including increasing consumptions, providing extra income sources to protect left-behind families from negative shocks such natural disasters, debts, and unexpected sickness. Remittance from migrants has also contributed to the poverty alleviation in Cambodia (ADB, 2014).

In 2011, Ministry of Planning conducted the Cambodian Rural-Urban Migration Project (CRUMP) to examine the characteristic of rural migrants moving

to the capital city of Phnom Penh. The project found that migrants in the city remitted around USD 10 per month on average to their left-behind families in rural communities. Female migrants are more likely to remit and more frequently than their males (MoP, 2012). The average amount of remittances received monthly by household members is around 75,000 Riel (almost \$20 USD). Despite the fact that the remaining households in their local communities receive a rather small remittances, this small amount could have a significant influence on the lives of poor households. On the other hand, although remittances may be enough to help increase the well-being of households, it is likely not enough to help, at a substantial degree, lift out the severity of households' poverty, as alleviating poverty likely requires larger remittances (World Bank, 2015)

Since most migrants are from rural areas, remittances also play a vital role in raising up living standards of those rural population and reduce socioeconomic inequalities between urban and rural areas. For some poor households in rural areas, remittances are the only source of income (ADB, 2014). In a country where national social protection is barely functioned and the social safety net is almost non-existent, remittance plays an important role directed to a drastic improvement for those households. The decline in remittance flow to the rural areas in Cambodia was partly explained by the global financial crisis in 2008, causing job losses and decreasing remittance flows to rural areas negatively affect 30% of the population living under the national poverty line (ADB, 2014). Using Cambodian Socio-Economic Survey (CSES) data to examine the impact of remittance, Roth and Tiberti (2016) found that migrants' remittances help reduce the poverty headcounts and increase the consumption level among rural Cambodian population.

Jampaklay and Kittisuksathi (2009) conducted a survey on remittance-sending behaviors of Cambodian, Myanmar, and Lao migrants working in construction, manufacturing, domestic and fishing sectors in Thailand. Their study

results showed that more or less migrant workers send money to support their families back home, and in most cases, all migrants remit through informal channels such as brokers, relatives, friends or bring the money home themselves. In average, Cambodian workers transfer around 34,000 Baht (approximately US\$ 1,000) in the period of 24 months to their families; however, only 16.8% of Cambodian workers transfer their money through banking systems.

CHAPTER 3 :

LITERATURE REVIEW

Corresponding to the research questions, this chapter divides into two sections. The first section of this chapter discusses previous empirical literature on migration and remittance effects on a child's schooling, followed by a review of the countervailing effects of migration and remittances on investment in human capital formation. In the same vein, the second section describes how migration and remittance affect the incidence of child work and child labor as well as studies that try to disentangle the effects of remittances from those of migration. The next section reviews empirical studies on migration and remittance effects on a child's educational accumulation and working children incidence carried out in the Cambodian context. Finally, the effects of supply-side factors on a child's educational attainment and working children are reviewed to conclude the chapter.

3.1. Effects of Migration and Remittances on Children's Education

3.1.1. Effects of Migration on Children's Education

The effects of migration on origin communities have received a lot of attention from policy makers and scholars, in this context, on the educational attainment of children left behind. This effect could have multifaceted implications on children's future well-being as well as a country's development as a whole. Nonetheless, regardless of the fact that migration patterns are different in terms of destination, most literature on this topic is more concentrated on the effect of international migration, or migration by destination is treated equally. Furthermore, the findings from the existing studies on the causal effect of the migration process on human capital investment (measured by the different nature of motivation for migration,

the relationship between migrants and left-behind children including school-aged cohorts and gender), are mixed and inconsistent across studies.

Among the prior literature that focus on the impact of international migration, in a comprehensive study in Pakistan by Mansuri (2006), he asserts the positive effects of migration on children's educational outcomes. In the study, he employed a 2-Stage-Least-Squared (2SLS) model to deal with the endogeneity problem of migration. By doing so, he used the prevalence of migration rate in the village as a proxy of the migration network, which is a strong predictor of migration. Migration is particularly alluring for adult males in the household. Bearing this idea in mind, Mansuri employed the interaction term of the proportion of migrants in the village with the number of adult males in each household. Migration effect is revealed to be overall positive and significant in children's schooling outcomes. The results indicated that children in migrant households were not only more likely to attend school but also more likely to stay in school (even when the age range has a high rate of dropout), and to reach a higher completed grade of education at a rate that is significantly better than their counterparts in non-migrant households in the same village. The author also further found evidence that the spillover effects of migration could lessen gender differentials in enrollment rates, school retention, and school progression. The decline in dropout rates is also substantially larger for girls. This study could shed light on the crucial role of migration in the Pakistan context, where girls access to education is still found to be rigid.

Hanson and Woodruff (2003) proposed that the migration practice is utilized as a means by poor households to ease budget constraint and thereby increase their tendency to purchase the educational service for their children. Their results showed that migration improved human capital formation of children in rural Mexico, and this positive effect was substantial, particularly for girls whose mothers were uneducated. The results held, even addressing the issues of omitted variables and

endogeneity as a result of a nature in migration. In contrast, migration was not significantly correlated with schooling of children (both boys and girls) whose mothers were educated. A similar study was extended by Borraz (2005), who found no significant impact of migration on education of girls with uneducated mothers. He then concluded that the study by the previous authors might be applicable to small rural communities in Mexico. To confirm the results, Boucher et al. (2005) further investigate a similar research employing different data. Partly supporting the study of Borraz (2005), they could not detect a statistical significance of the migration effect on enrollment in rural Mexico.

Notwithstanding the positive effect of migration, using data of National Survey of Demographic Dynamics to examine the effect of Mexicans migrating to the United States on educational attainment in rural Mexico, McKenzie and Rapoport (2006) exploit the Instrument Variable-Two-Stage Least Squared (IV-2SLS) model, which is found to be commonly used in the study to deal with the problems of simultaneity, reverse causality, selection bias, and omitted variables triggered by migration and remittances. By employing the historical migration rate by states as an instrument for current migration, they found that international Mexican migrants were negatively associated with lowering the chance of boys aged 12-18 completing their junior and high school education and of girls aged 16-18 completing their high school. Furthering their analysis, they also further examined the reasons behind why those boys and girls did not go to school. Astonishingly, those older boys living in migrant households were more attracted to migrating themselves, while girls were more likely to remain in the home country, performing housework.

The above results support the perception of “culture of migration” coined by Kandel and Massey (2002). They posit that although migrant households provided financial benefits which allow children to be able to continue their schooling, the

benefit is a double-edged sword. Recognizing the prevalence of Mexicans moving to the USA, Kandal and Massey (2002) examined the aspiration of intergeneration to follow their family members' footprints. Combining with a primary special dataset with data from the Mexican Migration Project, they proved that the prevalence of migration in Mexican communities prompted children in migrant households to migrate to the USA. This means that education in the home country has been undermined and that left-behind children were discouraged to stay and continue in schools, instead susceptible to out-migration. The benefit brought about by migration lead to households to devalue the returns to education in their home countries and reduced children's motivation to perform well and to reach a higher level of education. Instead, those children turned to the possibility of migration when they reach a certain age.

When one or more household members migrate, the family function is no longer normal and the left-behind members, particularly children, also face a lot of problems. For instance, these children have been cognitively affected, one of which is the reduction in adult time spent with children, which plays a significant and irreplaceable role to help them accelerate their learning. These adverse effects are even larger when the migrants are parents. Studies have shown that parental involvement can improve students' academic performance, cognitive competence and reading test scores. These assumptions hold, even after controlling for children's ability, socio-economic status, and ethnicity (Topor et al., 2010; Zellman & Waterman, 1998). In this regard, the presence of parents in households is too important to be ruled out.

Migration is clearly a cause triggering the disruption of family life structure and undermines the involvement of parental inputs to boost the learning achievements of children. Koska et al. (2013) investigated separately how international migration and remittance play a role in the human capital formation of

children in Egypt. To deal with the problem of endogeneity, they used 2SLS model by employing the instrument variables namely migration network and the average oil supply during the period between 2002 and 2006, instrumenting for migration and remittances respectively in two separate models. In both the models to control for migration/remittances and the interaction model between migration and remittance, they found that the absence of parents in migrant households cannot be neglected. Parental migration was strongly correlated with lowering the probabilities of students being enrolled in schools.

The result is confirmed in the study by Lu and Treiman (2011) in South Africa. Using the random effect logit model to analyze the effects of parental absence owing to migration, they found that the presence of parents in households is important and is associated with an increase in the likelihood of children being enrolled in schools, while the absence of parents is deleterious on investment in children's education. In addition, by decomposing the effect of parental migration on children's education by age, (Lu & Treiman, 2011) concluded that age is a curvilinear effect. This means that parental migration does not cause much harm to children's enrollment at the early stage, but as children get older, they are likely to be adversely affected by parental migration. The postulation is on par with McKenzie and Rapoport (2006) and López (2005), who found the negative effects of parental migration on school attendance of 15 to 17-year-old students. It can be implied that when parents migrate, household responsibilities fall to older children, and thus the school enrollment and school attainment of those student groups is seen graphically as a hump-shaped curve.

On the contrary, when taking into the account of different psychological needs between young and old children, another explanation arises. While monetary benefits might be of great help for older children to retain their education, it might not be the case for younger children who might need more care and attention from

their parents. Cortes (2015) uncovered that younger children, who conceivably require more attention from parents, suffered more from parental absence than their older counterparts. The findings corroborate the study of Lu (2015), who showed that the disruptive effect of parental migration was greater for young children than old children. Similarly, in a study by (Antman, 2011), she found that having a father migrating to the US bore an opposite impact by decreasing the study hours of secondary school children within the age of 12-15-year-old boys; however, she did not find statistical significance among older children between 16-18 years of age. This is in contrast with a study in the Dominican Republic, highlighting the positive impact of parental migration on secondary-school-aged children, but no impacts on primary-school-aged children (Dorantes & Pozo, 2010).

Further scrutinizing parental migration by gender, there is a distinctive pattern in raising children dependent on the gender of migrant and by country context. In this regard, it is of a question whether paternal or maternal migration has more benefits or harmful effects upon children's education. While in some studies find father has more influence in the choice of children educational investment and of their school attainments (Antman, 2011; Giannelli & Mangiavacchi, 2010), the role of mother in bringing up children through providing warmth, care and through the educational provision perception is more important and has a stronger determinant on children's education (Cortes, 2015; Sarma & Parinduri, 2016). Research in this regard is of an interesting study, yet it yields mixed and inconsistent findings upon country case studies. Consequently, the impact of parental migration by gender on children's education remains empirically uncertain.

The study in Sri Lanka by Sarma and Parinduri (2016) is one of the examples to be discussed. To tackle the problem of endogeneity of migration, the authors used instrument variables of migration network, taking into account foreign employment

agencies, which were established 5 years before the survey was conducted. Upon the analysis on the effect of parental migration, there was no evidence that parental migration affects children's educational outcomes namely, enrollment, class-age gap¹⁴, receiving private tutoring or spending on education. Nonetheless, when the analysis was divided by sub-groups of parental migrants' gender, the results show a different picture. On average, when a mother migrates to work abroad, children educational attainment was worse, while father's migration improved children's educational opportunities. Despite the efforts to disentangle the impact of parental migration by gender, this study does not explain its sample selection. The authors did not explain how they handle migrant households where both mother and father migrate. If there were a lot of observations in these categories, the results could be biased and thereby conclusion unreliable.

The aforesaid study can be, to some extent, similar to the discussion by Cortes (2015) considering and investigating the different effects of paternal and maternal international migration on the progress of children's schooling in the Philippines. Owing to the nature of the endogenous problem of migration, she employed two instrument variables, the ratio of migrants in the provinces going to top destination countries and their interaction with year dummies corresponding to demands for foreign workers and the expected salary for migrants in destination countries. She found that children who had mothers migrating internationally lagged behind school compared to those who had paternal absence owing to migration. And the case was even worse among children who have highly-educated mothers. The result suggests that the presence of mothers, especially educated mothers, has a more important effect on the schooling input of children in the home country. These

¹⁴ Followed Psacharopoulos and Yang (1991) and Patrinos and Psacharopoulos (1995), class-age-gap is measured by the years of schooling students attain in comparison with their ages. If the class-age-gap is equal one, it means students are enrolled at their school entry age, less than 1 is either students are enrolled late or students repeat.

findings are also confirmed, to an extent that when migrant parents are better informed about the returns to education, their left-behind children fare worse off (Acharya & Gonzalez, 2014). Simply put, children who had low-educated mothers and those who were from poor, rural and landless households benefit from parental migration (Acharya & Gonzalez, 2014).

Observing the short-run effects of father's migration from Mexico to the USA by using a rich data source of panel data of Encuesta Nacional de Empleo Urbano 1990-2001 (ENEU) with the combination of the Mexican Migration Project (1987-2004), Antman (2011) claimed a negative effect of father's migration on children's education. She found that father migrating¹⁵ to the US was associated with the reduction in study hours by approximately 35.6h/week. In a similar finding, Giannelli and Mangiavacchi (2010) employed Ordered Logistic Regression (OLR) to investigate the impact of paternal international migration in Albania. They also found that the absence of father migrating internationally increased the likelihood of children's dropping out of schools.

Paternal and maternal migration also have a different effect depending upon the gender of children. In most cases, girls are found to be more vulnerable to the loss of household members, particularly of parents owing to migration. In the case of the family disruption due to migration, girls are expected to shoulder household responsibilities instead of focusing on their studies. As a result, boys tend to have better educational opportunities and better outcomes compared to girls. In the same study by Sarma and Parinduri (2016), girls were less likely to be enrolled regardless of the occurrence of paternal or maternal migration. The older the girls were, the less likely they were to be in schools. Similarly, Giannelli and Mangiavacchi (2010)

¹⁵ The author also attempted to compare the different effects between paternal and maternal international migration on children's schooling attainment. However, due to the nature of the small observations of having mother migrating to the US, and there was no significant result detected, the samples were dropped.

further found that the impact of paternal migration on female students on dropping out of schools and on delaying the likelihood to delay their school progression is worse than their male counterparts.

In contrast, there are studies which conclude that sons suffer more from the absence of parents. Using Panel data in Vietnam, Booth and Tamura (2009) scrutinized how temporary paternal migration affects child's school attendance, expenditure on education and non-housework labor. The results showed that paternal absence increased the probability that sons would be involved in non-housework activities instead of spending time in schools. The longer the absence of the father, the larger the impact is. However, they did not find any significant impact on girls. In a similar finding, Cortes (2015) showed that boys are more negatively affected by mother's migration on their school performance than girls. At the same time, she also pointed out that when households face income change/shocks, educational expenditure on girls seems to be elastic.

The results are also corroborated by the study of Lee and Park (2010). In their study, they used the two waves of a longitudinal data in Gansu, one of the poorest provinces in China. They employed demand shocks in migration destination locations and interacted with father's years of schooling as instrument variables to study the impacts of paternal migration on left-behind children in rural villages in China. They reached similar findings that paternal migration was associated with increasing the probabilities of lower-secondary and upper secondary school-aged boys dropping out of schools. In the sub-sample of gender in terms of school progression, however, they found that girls benefit more, which suggests the positive effects of father's migration on improving the likelihood for girls to stay longer in schools. Similarly, Mansuri (2006) also found that international migration from Pakistan could potentially boost students to reach the higher grade of

education, and girls in those international migrant households gained the benefits of being able to finish more years of schooling.

In some circumstances, both boys and girls are also more likely to be comparably affected or have no significant relationship between parental migration and child's human capital formation for both genders. Against the above-mentioned, conclusions of the contrasting effects of parental migration on children's heterogeneous age and gender, it is fair to conclude that the separation between children and parents impairs the emotional and learning growth of children left behind, irrespective of old or young children; boys or girls (Giannelli & Mangiavacchi, 2010; Lee & Park, 2010).

Regarding the effect of migration, taking into the account internal migration, a few studies have examined the internal migration effect from the perspective of rural to urban migration, and to the best understanding of the author, very few have investigated the effects of migration by destination (internally or internationally). In the context of China, De Brauw and Giles (2017) employing a rich data source with an advanced estimation model of Instrument Variable- Generalized Method of Moments (IV-GMM), found the negative effect of rural-urban migration on children's school attendance back in rural villages in China. They affirmed that the massive size of migration networks reduces the likelihood of students progressing to their high-school enrollment and encourages those students to seek an opportunity to migrate to urban areas within China.

In the same contexts study of China, Hu (2012) investigated the joint impact of internal migration within China (rural-urban) and remittances on high school attendance of children left behind in rural areas. He employed the two-stage-least-squared approach to deal with the endogeneity problem of both migration and remittances. First, regarding the endogeneity of migration, the study employed the instrument variable of the ratio of migrant households in the village before 2000 as

a proxy for the historical migration network. This migration network has also been used by many previous studies (Mckenzie & Rapoport, 2006). Second, to control for the endogeneity of remittances, he used the village norm to remit by taking the average remittances received by households in the village. His study's results showed that children's school attendance was negatively affected by the absence of household members. However, this negative effect could be partially cushioned by the inflows of remittances by lifting households' liquidity constraints. And these effects are prominent for particularly girls and children from poor households.

In addition to the effects of internal migration, few studies focus concurrently on the impact of migration by decomposing migration into the type of destination. One of the few studies, Lu (2015), examined the effects of internal migration and international migration in two countries, Mexico and Indonesia. He suggested that international out-migration in both countries showed a more harmful or less positive impact on improving the education of children back home than internal migrant households did. His study's result further pointed out that even with the positive monetary benefits generated from remittances, the benefit mostly conspicuously appears in children among internal migrant parents. This difference is presumably due to the longer duration of family disruption and fluctuation in remittances from the practice of international migration.

3.1.2. Effects of Remittances on Children's Education

The tangible impact of migration is associated with the potential income through remittances sent to households, especially to the neediest groups. This remittance income plays an important role in, to a large degree, removing income constraints faced by households and thus directly contributing to poverty reduction and allowing more consumption and investment (Pablo Acosta et al., 2007; Adams & Cuecuecha, 2010; Adams & Page, 2005; Ratha, 2013). The role of remittances

whether it can have a big impact on the economy in the long run or not depends on the decision of how remittance-recipient households spend the remittance extra income. In this regard, it is argued that remittances can contribute more extensively to economic growth, provided they are channeled into productive investment in the human capital accumulation of households' children (Acosta, 2006). Although there are some skeptical studies showing how households receiving remittances overwhelmingly spend on consumption or non-productive investment rather than productive investment including educational expenses, some studies try to prove the opposite. Rapoport and Docquier (2005) challenged this argument (tendency to spend remittances on consumption) by reviewing a number of studies. Those studies confirmed that households receiving either internal or international remittances have a higher propensity to invest than non-migrant households even after controlling for income and other relevant household variables.

Citing one specific study in the review of Rapoport and Docquier (2006), Adams and Cuecuecha (2010) examined the remittance-receiving household's spending behaviors in Guatemala on three groups: (i) no remittance-receiving households; (ii) internal remittance-receiving households; and (iii) international remittance-receiving households. To address the endogeneity problem resulting from the different characteristics of those receiving no remittances and of those receiving remittances, they employed a two-stage multinomial logit model to control for selection bias and estimated the marginal spending behavior of households. Through this model, the distance to the railroad, historical migration rates and natural disaster measured by rainfall patterns, which are likely to affect the tendency to remit, were all used to instrument for remittances. They found that regardless of remittance types, households spent less on consumption, but spent more on investment goods – education – than they would have done without receiving remittances.

These results are similar to those of a comprehensive study in the Philippines by Yang (2008), who investigated the direct impact of remittances (influenced by an exogenous variable taking into account exchange rate shocks) on household's spending patterns and child's education. Analyzing by employing a natural experimental approach and a rich data source of a panel household data, the author reported that the exchange devaluation rate shocks led to an increase in remittances sent to households. This increased value of remittance had a negligible effect on consumption but had a significantly large impact on children's educational investment. The author also showed that that the more the value of remittances increased, the more likely the students' attendance could be enhanced.

Similarly, remittances are believed to significantly relax income constraints, which strongly corresponds with positive educational investment in children. Borraz (2005) confirmed this belief and revealed that children who lived in remittance-receiving households were more likely to complete more years of schooling than children from non-remittance-receiving households. Furthermore, Lu and Treiman (2011) suggested that remittances substantially increased school attendance of children among internal black migrant households compared to other groups (non-migrant households and non-remittance-receiving households) but has no effects for white groups, who are on average better off. This can be inferred how significantly important remittances are, in particular, poor households, who are bound by economically disadvantaged circumstances, let alone being capable of funding myriad direct costs of their children's educational investment.

In a balanced panel survey of the Nepal Living Standard Survey analysis, (Acharya & Leon-Gonzalez, 2014) investigated the impact of remittance effects, both in the effect of remittance as dummy model and the remittance amount model. They showed that remittance-receiving households are more likely to invest in a child's education than non-remittance-receiving households. Remittance effects

positively helped lower the probabilities for children to be out of school, and the results held in both models. They further showed that the increased income from remittances motivated households to opt for a better quality of education for their children, in particular, the secondary school-aged cohorts, by transferring from public to private schools.

The positive impact of remittances to prevent children from dropping out is also confirmed by a study of Edwards and Ureta (2003) in El Salvador. In their study, they used a Cox proportional hazard model to compare how the two types of income – income from remittances and income from other sources – differently affect children's school attendance. They found that an increase in income from remittances potentially improve household economic conditions and encourage households to have a higher propensity to spend on education across all ages and genders. This remittance income had positively larger effects on lowering the likelihood of children dropping out of schools in particular children in poor households in rural areas. These results shed light on the importance of remittances, serving essentially as a safety net for easing household income constraints. Along with the attempt to prove the remittance capacity power, the study has been criticized for failing to address the potential sample selection bias and the endogeneity problem of remittances. These shortcomings could lead to spurious conclusions (McKenzie & Sasin, 2007; Mckenzie & Rapoport, 2006).

Calero et al. (2009) looked at the effect of remittances on human capital investments in Ecuador and confirmed the positive impact. By trying to show the causal effects on educational outcomes (taking school enrollment as a proxy), they used exogenous variation in transaction costs of international financial transfers across provinces to instrument for the tendency to remit. These instrument variables could determine the volume and frequency of remittances sent to left-behind households but have no relation to the outcome variables of school enrollment. They

showed that remittances played an important role in increasing enrollment among disadvantaged groups of the poor, but the effect was not statistically significant among the non-poor. Although the authors suggested the small magnitude of the remittance effects, this demonstrates how important remittances are for poor households, who are bound by a shortage of income to fund their child's schooling. They broadened the analysis and claimed that remittances acted as insurance to protect children from being taken out of schools even during household income shocks.

Contrary to the common findings of the positive effects of remittances, there are also studies which claim that remittances have different effects on children's schooling when measured by children's age and gender. López (2005) revealed this by examining the impact of remittances on both health and education, by using municipal-level data from Mexico. The author employed a two-stage least squared (2SLS) approach to tackle the endogeneity problem of remittances, by using rainfall patterns and distance to central Mexico to instrument for remittances¹⁶. The results showed that remittances have mixed effects on a child's education. While remittances could reduce illiteracy among children aged 6-14, remittances have a negative effect on literacy and an ambiguous effect on school attendance of children aged 15-17. López (2005) pointed out the negative effect of remittances on older children for the reason that remittance-receiving households are allured by the potential remittance income, which encourages older children to migrate. This assumption is closely associated with the culture of migration framework, through which migration compels older children toward migration, as discussed in the

¹⁶ Adam and Cuecuecha (2010) also employed the instrument variable approach by using rainfall patterns and distance from village to railroad to instrument for remittances sent from the USA to Guatemala.

previous section in the study by De Brauw and Giles (2017); Kandel and Massey (2002); McKenzie and Rapoport (2006).

This result of the remittance effects on left-behind children's education is in line with those by Dorantes and Pozo (2010) in Guatemala; Yang (2008) in the Philippines. Dorantes and Pozo (2010) found that young siblings and secondary school cohorts gain the most benefit from remittances compared to their older counterparts, and Yang (2008) revealed that there was weak evidence of remittances to increase the attendance of children aged 10-17.

Similarly, Bansak and Chezum (2009) did a study on the impact of migration and remittances on human capital investment in Nepal. The authors performed the analysis on the variation of the remittance impact on children's school enrollment depending on their age and gender characteristics, as put forward as being important by Calero et al. (2009) and Emerson and Souza (2008). They used the 2SLS and generated instrument variables namely past literacy rate and political unrest by the district as a proxy for network effect of migration. They found that remittances had a positive effect on the education of younger children (aged 5 to 10), but the effect was insignificant for older children (aged 11 to 16). The results still held even after the absenteeism of household members owing to migration were controlled for.

In contrast, the remittance effects on age cohorts appear differently in the study by Elbadawy and Roushdy (2010) in Egypt. In their study, they examined a sample of children who lived in remittance-receiving households. Following the widely used approach of 2SLS to overcome the issue of migration and remittance endogeneity, they selected migration history, taking into the account the percentage of households with migrants (mostly low-skilled labor migration) in the locality, to instrument for migration and remittances. Contrary to the majority of the literature on the topic, they found that remittances had a stronger positive effect on school attendance among teenagers, in comparison to young boys. They argue that the weak

impact of remittance on school attendance among young boys is due to the fact that financial constraints are not a major problem in school attendance at low levels of education. Nonetheless, remittances play an important role in increasing the odds that high school graduates pursue higher education, which is very costly.

Measured by gender heterogeneity, remittances are also found to have distinctive effects on educational investment in boys and girls. In the same study by Elbadawy and Roushdy (2010), they further showed that remittances had a significantly positive effect on the probability of being enrolled at the university for boys. However, the effect was only mild for university age girls. Furthermore, in the same study by Bansak and Chezum (2009) confirmed these findings, showing that boys benefited more than girls from remittances. They justified this result by the social norm in Nepal that households value the importance of education for boys more than for girls. Therefore, with a marginal increase in remittance income, households are more willing to pay for boy's education. Their results regarding the disruption effect of household absence across gender were, however, intriguing. They further found that the disruptive household effects were almost double harmful on young boys than on girls. On the contrary, the magnitude of remittance effects on boys was three times greater than that on girls. This means that although female children benefitted relatively less from remittances, they suffered less harm from the household disruptive effects.

Some studies, however, demonstrated the opposite. Acosta (2006) carried out a study on the impact of remittances on school attendance in the case of El Salvador. They used the El Salvador Household data and several model approaches – propensity score matching (PSM) and 2SLS – in order to verify the robustness of the study's results. To tackle the selection and endogeneity problem of remittances, the author used two sets of instrument variables, namely migration networks at the village levels and household migration history. These instrument variables are

believed to have no direct correlation with the schooling outcomes but only through migration and remittances. Through the empirically robust results, the author claimed that girls aged 11-17 in remittance-recipient households were more likely to gain the benefits from remittance compared to their peers in non-remittance-recipient households. Simply put, remittances were more likely to keep those age-cohort girls in schools, whereby this same remittance amount was not significantly found in older boys aged 15-17.

In addition, in the same study scrutinizing the effect of remittances on educational investment in Ecuador, Calero et al. (2009) posited that the existence of remittances is very important among poor households in rural areas. More importantly, an increase in remittance income may have the spillover effects of improving girls' school attendance. In a similar aspect of the remittance impact, Lu and Treiman (2011) concluded in their study that remittances could reduce not only household socioeconomic status inequalities (among the black households and white households) but also gender equality in terms of households' educational spending behaviors among boys and girls in South Africa.

3.1.3. Countervailing Effects of Migration and Remittances on Child's Schooling

The migration and remittance phenomena are inextricably linked, presenting contemporaneous effects on left-behind household members. On one hand, migration is a household's survival strategies to increase and cope with income shortage (material resources). On the other hand, the practice of migration is followed by the disruptive effects on family life (parental care and input), which could potentially have negative consequences on children's schooling. In other words, separating migration and remittance effects could possibly lead to biased results and spurious conclusions (Dorantes & Pozo, 2010; Bargain & Boutin, 2014;

Lu & Treiman, 2011; McKenzie & Sasin, 2007). By failing to disentangle the countervailing remittances from migration effects, remittance effects could be over or underestimated.

Due to the intertwined and complex relationship between migration and remittances, only a few studies have been carried out, looking at both the family disruption effect of migration and the income effects of remittances simultaneously. However, even though those studies attempted to separate out the remittance effects from the migration effects, they yield mixed and inconsistent results. While some studies found that remittances can cancel out the negative effect of migration, some showed that remittances were partially canceled out by the family disruption effects, and some claimed that remittance effects cannot compensate for the loss of household members owing to migration.

In a study by Davis and Brazil (2016) examining the short-term effect of father's outward migration to the USA, they challenged the analysis considering the combined effects of international migration and remittances. By doing so, they attempted to disentangle father's absence from remittances on student enrollment and grade progression (proxied by schooling for age) in Guatemala. To address the endogeneity and simultaneity problem of migration, the authors employed the probit-2SLS model, using migration networks as the instrument variable. In their study, the migration network is measured by the percentage of past migrant households in the municipality. In the same vein, as for remittances' as an instrument variable, they used the average wage rate for non-skilled workers in the destination in the USA, the destination country. In addition, because there could be an exogenous factor that motivated households to migrate and remit, the authors also controlled for the rainfall shocks by interacting it with migration and remittances throughout the equations. Their results showed as expected that father's international migration was significantly associated with lowering the likelihood of

children's enrollment as well as of grade progression. However, the presence of remittances was likely to compensate for the negative effects of absent father migrating internationally, increasing the likelihood of keeping the children in schools to complete their higher grade of education.

Further evidence on the countervailing effect of migration and remittances on the human capital formation of children has been provided comprehensively by Lu and Treiman (2011). In their analysis, to derive robust results, they employed fixed effect and random effect models. The authors combined two sets of data sources, cross-sectional data and panel data to investigate the effects of migration and remittances on left behind children in three mechanisms¹⁷. One of the mechanisms was to examine the remittance effects in five groups of households: (i) non-migrant households (no remittances); (ii) non-parental-migrant households (with remittances); (iii) parental migrant households (with remittances); (iv) non-parental-migrant households (no remittance); and (v) parental-migrant households (no remittances). By first comparing, groups of households who received remittances with those who did not receive remittances, they postulated that children in remittance-receiving households were more likely to be enrolled, and the last group of households (parental migration without remittances) fare worst off. However, they showed that although remittances were significantly associated with the likelihood of improving the enrollment of children in non-parental migrant households, the remittances were still positive and had a strong effect on the likelihood of enrollment for children in parental migration households. They concluded the results that remittances had an important role in relaxing the black households' income constraints, without which (without income compensation) children would have been more likely to be out of schools, as found in the case of

¹⁷ Educational expenditure, child schooling and the role of remittances in deleterious effects of parental absence owing to migration.

both non-parental migration and parental migration households (no remittance-receiving households).

The findings are partly corroborated in a study by Cuecuecha (2009), who asserted that his study was the first to disentangle the positive effects of remittances from the negative effect of migration on left-behind children's education. To obtain unbiased and efficient results, the author generated three instrument variables (the USA state migration rate; the municipality migration rate in the home country, Mexico; and the proportion of remittance-receiving households in the municipality) from different sources. The uniqueness of his study was how he related the remittance income effect with the time that migrants were away from home, by performing the interaction term of migration and remittances with the duration of absence of household migrant members. They found that remittance effects were stronger and could cushion the negative effect of migration only to an extent that migrant household members were away from the households for less than five years. Conversely, if household members migrated for more than five years, remittances no longer presented a significantly positive effect on children's education. He also pointed out that remittances were still positively associated with increasing years of education of children among migrant households which had migrants with at least 4.47 years of education.

In contrast to the above results, Koska et al. (2013) found the opposite in Egypt. In their study, to tackle the selection bias and endogeneity problems of migration and remittances, they constructed an instrument variable, taking average oil supply in hosting Arab countries where the majority of households migrated to. This approach is commonly used by researchers when investigating the related topic. This approach is also expected to yield unbiased and efficient results. Although the authors confirmed the positive effects of remittances on the human capital behind of left-behind children, this positive effect of remittance income did not hold when

parents were absent from the households. In other words, remittance effects were not strong enough to offset the disruptive effect of parental migration. The presence of an adult, especially parents, is thus too important to be ruled out. From these results, they came to a conclusion that the learning of children was not merely associated with financial aid provided by remittances, but parental input and time spent with children to motivate and assist in their schooling.

This assumption is somewhat supported by Mansoor and Quillin (2007). They pinpointed that children in migration households, especially with parental absence, tend to receive less supervision. The lack of this parental supervision could affect their school performance which caused them to lag behind in their education. They also further claimed that extended family members may not be able to adequately fill the role of the absent parent. Similarly, this argument is also, to some extent, put forward by Castaneda and Buck (2011). They assert that left-behind children can benefit from migration through remittance transfers; however, in the meantime, migration also adversely renders children vulnerability in terms of physical and psychological well-being, which could have a long-term implication for the development of the child.

In addition, Dorantes and Pozo (2010) investigated the contemporaneous impact of migration and remittances on children's school attendance in the Dominican Republic. They provided evidence on the mixed and net effects of remittances among non-migrant-receiving households and international migrant-receiving households on children's school attendance. In their study, they highlighted that migrant household received a greater amount in remittances than non-migrant households, yet they invested less in their children's education. Their results confirmed that the net effects of remittance were found to be significantly positive. Nonetheless, these effects were completely canceled out by the negative effects of migration and became insignificant, when restricting the sample to

children in migrant households. This suggests that the disruption caused by losing household members owing to migration diminishes any benefits gained from receiving remittances. From these results, they claimed that remittance effects on children's schooling could lead to spurious conclusions if the estimation fails to properly separate the disruptive migration effects from the remittance effects.

3.2. Effects of Migration and Remittance on the Incidence of Children Working

In developing countries, to a much larger extent than developed countries, the incidence of children working instead of/or at the same time as attending school, is prevalent. They are engaged in many kinds of work, not limited to domestic chores, including family businesses, farming, and other labor-intensive jobs. The activities, while apparently beneficial in the short run for families to obtain higher income streams, could disrupt the acquisition of human capital and pose long-term consequences on child development. Instead of spending more time acquiring their proper education, the more hours a child works extensively, the more likely he/she could be trapped in child labor and in low-skilled jobs. In addition, with the emergence of the fourth industrial revolution, those children could encounter with low-lifetime earnings and, low job security (Gleason, 2018).

The practice of migration and remittances affecting working children is, thus, of too much importance to be overlooked. Nonetheless, existing evidence on the impact of migration and remittances on working children is relatively scarce compared to that on children's human capital formation. Even though there are available, those existing studies mostly concentrate on case studies in Latin America. In addition, not dissimilar from a discussion on the migration and remittance effect on the education of children in the previous section, studies on the effects of migration and remittance effects on working children provide inconsistent and

inconclusive findings, in particular in the context of boys/girls; school-aged cohorts; and types of child's work.

3.2.1. Effects of Migration on the Incidence of Children Working

Migration is one of the reasons behind child labor. As mentioned at the Global Child Labor Conference 2010, it put an emphasis on the potential threats rendering children susceptible to child labor, and one among those was related to migration (ILO, 2010). It also stressed on the necessity to curb child labor, echoing article 5 of the Roadmap for Achieving the Elimination of the Worst Forms of Child Labor stating: "Governments should consider ways to address the potential vulnerability of children to, in particular, the worst forms of child labor, in the context of migratory flows" (ILO, 2013, p. 8). In this regard, the impact of migration on this related issue should be fully comprehended in order to combat against child labor.

A growing body of the literature showed that the loss of adult members owing to increasing internal and international migration significantly reduces the probability of children being in schools. In some cases, children extensively work to compensate for the income which otherwise would be generated by migrant household members. However, similar to the case of the effects of migration on human capital formation, most literature has scrutinized the effects of migration on child work, at a great extent, from the perspective of international migration or simply overlook different effects of migration by destination. McKenzie and Rapoport (2006) argue that parents who internationally migrate for work to the United States of America often do so as a survival strategy and may not be able to send remittances. Their research in Mexico confirmed this by showing that parental migration negatively affects school attendance among lower-secondary and high-school boys and among high-school girls. By further analyzing what those children were doing instead of going to schools, they found that parental migration was

associated with an increase of likelihood of those boys migrating themselves and was significantly correlated with an increase in the burden of housework for 16-18-year-old girls. Furthermore, Acosta (2006) investigated the impact of parental international migration on child labor in El Salvador. They empirically proved that the loss of manpower caused children to pay less attention to their schooling, and to substitute the income loss owing to household migration.

Similarly, Antman (2011) examined the effects of paternal short-term migration on not only schooling but also work of boys and girls in Mexico. In regard to its effect on children working, she argued not only for the importance of looking at the prevalence of children working per se but also the intensity of children working. To control for any possible variables that could potentially have an impact on the outcome variable, he combined two data sets: a panel data and a Mexican Migration Project data. These rich data sources also enabled the author to operate valid instrument variables so as to deal with the endogeneity problem of migration. She found that having a father migrating from Mexico to the US put pressure on girls to perform more domestic work (non-paid), and on boys to work elsewhere (economic activities outside the home).

The above results were partly corroborated by those of Chen (2006) and Dorantes and Pozo (2010). Chen (2006) carried out a sophisticated study in China, examining how the father's migration affects working hours between male and female children aged 6-16. This study focused on the counterfactual analysis on the cooperative model and non-cooperative model of how mothers made decisions in allocating household chores (doing laundry and preparing food) between male and female children. Chen (2006) assumed that in a cooperative model, left-behind mothers were predicted to substitute work which otherwise is done by migrant fathers. However, in the meantime, father migration induced a shift in bargaining power that mothers can decide to allocate which children to contribute to some kinds

of work. Non-cooperative model, on the other hand, viewed that the mother decided to decrease their household labor when father migrates, as the paternal migration compensated with the increased income through remittance channels. The author found that the propensity of girls doing laundry and preparing food for households increased in tandem with the duration of paternal absence. For the sub-sample of boys, this was found to be the opposite. This could imply that when there is an abrupt change of family circumstances like the loss of members owing to migration, the substitution effect of performing domestic chores falls on girls. Similarly, Dorantes and Pozo (2010) found that a father's migration positively correlated with increasing the likelihood of girls performing housework and paid work instead of attending schools in Mexico.

Booth and Tamura (2009) also looked at the effects of father's outward migration on the number of hours that children were involved in economic activities in Vietnam. To obtain efficient and unbiased results, they used the number of rainy days as a proxy for disaster to instrument for migration. Their results indicated that father's short-term migration intensified the working hours of 12-15 and 16-18 aged boys in economic activities but had no significant impact on girls. They were also attempting to analyze how an additional month of father's absence was associated with the number of hours worked by children per week. However, they ran into a problem of weak instrument variables and they concluded that the results from the 2SLS model could not be trusted. Therefore, they could only show the correlation between father's migration and the extent of work that children perform but not causality.

While the abovementioned studies looked specifically at the impact on the incidence of children working from the perspective of paternal migration, Ngyuen and Purnamasari (2011) proposed that the impact of migration is likely to vary depending on the gender of migrants. Investigating how international migration,

particularly female migration, affected child labor incidence in Indonesia, the authors employed the Indonesia Family Life Survey dataset and applied an instrument variable estimation method. By so doing, they generated the percentage of households in the village with migrants in the past to instrument for migration, in addition to controlling for local development variables¹⁸. On average, the working hours of children in international migrant households could be reduced a lesser amount than those of children in non-migrant households. However, measured by gender of migrants, they could not observe the effects in female migrant households, whereby the negative effects of migration on children working hours still remained in male migrant households. The results could partly be explained by the different amount of remittances sent by males and females, and by different decisions made by males and females on allocating work to children, as discussed earlier by Cortes (2015) in the context of distinctive effects of male and female migration on children lagged-behind schools

In contrast, Acosta (2011) looked at the consequences of migration in terms of child labor using a rich data source of rural panel dataset for El Salvador. To understand the discrepancies of child's characteristics, the author analyzed separately taking into account of child's gender contingent with their ages. The results indicated that while male migration tended to reduce child labor in domestic and non-domestic activities for children aged 6-11, and non-domestic activities for teenagers aged 12-18, female migration seemed to stimulate it, in particular in terms of domestic labor. The results did not seem to be driven by female migrants remitting more than males, but rather to alternative competing explanations, either the differences in the use of remittances by gender of the

¹⁸ Local development variables included number of elementary schools per capita in village, number of junior high schools per capital in village, and farming as the village's major economic enterprise.

recipient person, or limited ability to monitor funds when remitted by female migrants.

Extending the estimation to the impact of migration on child labor, Mansuri (2006) examined its impact on child labor in two mechanisms: the prevalence of child labor and the number of days worked by children over the survey year. His results revealed that migration was significantly associated with lowering the incidence of child labor. In addition, in terms of the number of days worked by children, migration showed no different effect on the gender of children, almost equally dampening the hours of work performed by children both boys and girls.

Elbadawy and Roushdy (2010) examined remittance effects on children working not only the number of working hours but also the type of work in Egypt. They categorized 2 main types of work – market, and domestic¹⁹. The authors argued that children spend a relatively considerable amount of time on domestic stores. Failing to separately estimate the effects of remittances by types of work, the effects of remittances on child work could be underestimated. Moreover, in terms of a number of hours worked by children, they employed a binary variable of children working at least one-hour cut-off and 14-hour cut-off in a week for each of the kind of work and performed separate regressions for the restricted samples of boys and girls aged 6-14 and 15-17 respectively. To address the endogeneity problem of remittances, they employed a 2SLS model and selected an instrument variable namely the percentage of households with migrants (mostly low-skilled labor migration) in the locality. The results clearly indicated discrepancies in work responsibilities between boys and girls. Migration was likely to mitigate the

¹⁹ In the study by Elbadawy and Roushdy (2010), following Levison & Zibani (2008), they defined each type of work separately. Market work was defined as economically productive activities that children were engaged in, limited to only economic activities. Inclusive work, as the name suggests, was a combination of market and domestic work (cooking, house cleaning, collecting water, laundry, and childcare/ taking care of elderly members).

likelihood of both boys and girls aged 6-14 engaging in market work (in both cut-off hours). In contrast, migration was positively associated with the inclusive work performed by boys aged 15-17. This suggests that older boys suffered from the absence of household members and perform long-hours (14-hour cut-off) in domestic work. However, interestingly, the results could not detect the significant effects of migration on girls aged 6-14 involving in either market work or inclusive work.

3.2.2. Effects of Remittances on the Incidence of Children Working

The economic literature has suggested a number of explanations, mostly highlighting poverty and household economic shocks as the main causes of children working (Basu & Van, 1998; Bhat & Rather, 2009; Guarcello et al., 2003). In this manner, the role of remittances is essential, acting as a medium to relax household income constraints. This remittance income could potentially reduce or remove households' demand not only for child work to generate extra income for their families but also for adult household members. This was proven in a study by Epstein and Kahana (2008), focusing on remittances sent by temporary migrants²⁰.

Several studies also suggest that remittances reach out directly to households which help improve their economic condition, and in turn may lead to a decrease in labor supply provided by children. For instance, in a cross-study using a sample of 82 developing countries (of which 31 are African countries), Ebeke (2010), examined the relationship between remittances and the prevalence of child labor. The study unveiled that on average remittances significantly lower the prevalence of child labor in developing countries, and the results held even after controlling for the endogeneity issue arising from remittances.

²⁰ Temporary migrants refer to those who move to new destination for a fixed-period of time for a particular occupation without intention to reside there permanently

In addition, in the same study by Acosta (2006), the analysis of remittances was extended to its impact on working children aged between 11 and 17 in El Salvador. He found that on average, remittances significantly contributed to reducing the incidence of children engaging in work, in the forms of both economic activities and family farms. These results still held, even with and without controlling for household wealth. Furthermore, Yang (2008) found that remittances were significantly and negatively correlated with working hours of children aged 10-17 in the Philippines. In a similar finding in a case study in Tanzania, Dimova et al. (2015) also showed that migrant remittance transfers minimize the supply of child labor. The results provided evidence that remittances can accrue household income and can potentially substitute extra income contributed by children and be used to help reduce the prevalence and extent of children working.

Other findings indicate that remittances can differently influence children working when considering the size of remittances, children's characteristics and the type of work children are engaged in. First, the amount and regular flows of remittances sent to households matter enormously, especially for poor households. Alcaraz et al. (2012) investigated how the changes of remittance sizes (comparing before and after the financial crisis during 2008-2009 in the US) affects child labor aged 12-16 in Mexico. To obtain robust results, they employed a method of difference in difference which compares households that were remittance recipients before the crisis with never recipient households and remittance recipients before the crisis with the recipients after the crisis. Furthermore, to control for the selection bias and endogeneity of remittances, they generated a widely-used instrument variable namely migration networks, taking into account distance of each municipality to the railroad and to the US border, plus relative costs between rail and land transportation. They found that a decrease in remittances during the crisis caused a significant increase in child labor incidence in home countries.

Similarly, Bansak and Chezum (2009) showed that an increase in net remittance income increases the tendency of households to invest in children's education in Nepal. However, they also pointed out that when the flows of remittances fluctuated or declined, this could put high pressure on poor families who may have to withdraw their secondary-aged children from schools. That is to say, secondary-aged students were more elastic to remittance income compared to younger children, as they are more likely to be involved in both domestic chores and labor market work.

The results are partly confirmed in a case study in Burkina Faso. Bargain and Boutin (2014) examined the effects of remittances on the proportion of child labor in migrant households, analyzing a survey on migrants and their left-behind families in rural areas. Given the nature of endogeneity problem resulting from remittances, they estimated the effects of remittances on child labor aged 5 to 14 using the 2SLS approach and generated labor market conditions at the destination. The results indicated that the effects of remittances had no distinctive effects on gender heterogeneity. However, when measured by age of children, remittance effects showed differently. Although the effects of remittances were found to be negatively associated with lowering the extensiveness of child labor aged 5 to 9, the effects became insignificant when restricting the sample to children aged 10 to 14. This suggests that the effects of remittances were not strong enough to prevent children from falling into child labor because a financial contribution by older children was necessary. This result is not surprising, as this age has also been found a critical age at which many students start to attend school less and are more actively engaged in economic work (NIS & ILO, 2013; UNESCO, 2015b).

The above results seem to suggest that how much the positive effects of remittances can manifest depends on children's aged cohorts. Not dissimilar, in terms of locations, urban or rural areas, the magnitude of the effects of remittances

might also vary by location. In a study in Bolivia by Coon, (2016), the author explored the effects of remittances on working children in two mechanisms – at the extensive margin (whether a child works or not) and intensive margin (number of hours worked by children) of 7-13-year-old children working on a weekly basis. He argued in his study that, first, remittance effects cannot be captured in depth when examining their effects simply on the propensity of whether a child works or not. Second, the size of remittances received by households is different, and how much this can make an impact on reducing the intensity of hours worked by children is even more significant. To address the endogeneity issues stemming from remittances potentially leading to biased results, he employed a probit-2SLS and Tobit-2SLS strategy to predict the incidence and size of remittances received by households for the first and second empirical questions respectively. By so doing, the proportion of households receiving remittances was generated to instrument for remittances and analyzed by using Bolivian household data. The results revealed that remittances could not only lessen the prevalence of working children (both labor market work and household farming activities) but also decrease the number of hours worked by children. Analyzing the remittance effects by location, it was intriguing that although working children were more prevalent in rural areas, children in urban areas worked longer hours than their rural counterparts (24.7 hours vis-à-vis 18.8 hours per week). The results indicated that remittance effects were more effective at lowering the prevalence of working children in urban areas, but the marginal impact of remittances in reducing the number of hours worked by children was stronger in rural areas. Finally, he further showed that remittances could offset the labor burden on children, even during household economic shocks.

On the contrary, Calero et al. (2009) found the opposite. To show the causal impact of remittances on child labor in Ecuador, Calero et al., (2009) employed 2SLS and generated instrument variables namely variation in transaction costs of

international financial transfers across provinces to instrument for remittances. They found that remittances could, to some degree, lessen the intensity of child paid work in rural areas. However, when households were faced with economic shocks, remittances could not prevent the child labor incidence and could not decrease the number of hours worked by children (both non-domestic and domestic work). In other words, during household economic shocks, remittances were not high enough to substitute the household's demand for extra income contributed by children. In this regard, it suggests that the incidence of child labor was sensitive to shocks.

When considering the type of work children perform, the effects of remittances appear differently. Acosta (2011) estimated the effects of remittances on two types of work (wage labor and unpaid family labor activities, excluding domestic care or help). To confirm the robustness of his results, he used several methods namely propensity score matching (PSM) and IV-2SLS. The result revealed that remittances increased household income and could, to a large degree, relax household income constraints. This means that the extra income generated by children working was, thus, negligible. Measuring the effects of remittances on the type of work, remittances were found to be negatively associated with children engaging in paid work on average. However, at the same time, he also noted that labor contributed by children was reallocated to unpaid family work. This means that instead of spending their time (which, without remittances, would have been used in paid work) accumulating their human capital, they used this time for family unpaid activities. Remittances simply cause a reallocation of child labor from paid to unpaid work.

The findings of Acosta (2011), to some extent, support the argument put forward by Stark (1993) and McKenzie and Sasin (2007). They claimed that remittances were not useful in stopping children from working but instead brought about a detrimental impact in the condition that: (i) when those

remittances are set aside for the future purpose of preparing children for migration (this argument has also been proved in the studies of De Brauw and Giles (2017), Kandel and Massey (2002), and McKenzie and Rapoport (2006) as discussed earlier on the effects of migration on children's education; (ii) when remittances are used to invest in a family's business, which actually means labor from young household members is needed.

3.2.3. Countervailing Effects of Migration and Remittances on the Incidence of Children Working

The relationship between migration and remittances on children working is not so different from their impact on left-behind children's education, as explained in the aforementioned section. Migration is a household's survival strategy to increase and cope with income shortage through the remittance channels. Remittances are generally expected to raise household income, which may lead to a decrease in the need for additional income generated by young household members. This, in turn, releases time for children to spend on their learning. However, at the same time, the practice of migration has undesirable consequences. For instance, the family disruption that is caused by the loss of manpower and of working-aged household members to migration. This may have a negative impact on left-behind children who would have to substitute domestic work in families and/or generate extra income to compensate for the loss of income, that otherwise would be provided by the missing household members. The complexity of this relationship is obscure and to what extent remittances can compensate for the family disruptive effects still remains to be explored.

For some recipient households, remittances are an important source of income. If the loss of income due to the migration of a household member – typically the main breadwinner – is to be offset through remittance channels, then

migration can alleviate resource constraints and improve social-economic conditions of the migrant households (Stark, 1993; McKenzie & Sasin, 2007). Lu and Treiman (2011) supported this argument. In addition to the investigation of migration and remittances simultaneously affecting children's school attendance in South Africa, Lu and Treiman (2011) extended a similar analysis on the demand for child labor. In their study, they confirmed that remittances were important sources of income for black households in particular. The remittance flows brought about by migrants helped alleviate resource constraints and enhanced the likelihood of investing in children's education (as discussed earlier). In addition, the proportion of child labor was the lowest in remittance-receiving migrant households compared to the other type of households (non-migrant households; non-remittances-receiving migrant households). They empirically revealed that the negative effects of remittances still held in the sub-sample of child labor in migrant households. This suggests that with the remittance flows, they could offset the loss of adult household members owing to migration, and children were more likely to be exempt from work.

The above findings partly corroborate those of Koska et al. (2013). They found that remittances were negatively associated with the likelihood of a child's participation in wage labor. This was due to the fact that an increase in households' income leads to a decrease in the demand for additional income generated by children. However, when considering domestic work, the loss of manpower owing to migration put more burden of household responsibilities on children. For this reason, they further confirmed that an increased income substituted paid work by domestic work (unpaid). This finding was also supported by Calero et al. (2009). They showed that while remittances were able to lessen the incidence of paid child labor among migrant households in rural areas, remittances increased the incidence of domestic labor in urban households. Simply put, these results supported that remittance effects were able to partially assist left-behind households in monetary

terms, but at the same time, children were reallocated to shoulder more domestic work, which otherwise would have been done by migrant members.

How much remittances can outweigh the negative impact of migration may incur on the incidence of children working is partly dependent on the duration that migrant household members are away from home. For instance, if household members migrate for a longer period, the disruptive effects of migration might be less felt by left-behind household members. As explained previously in the study by Cuecuecha (2009), remittances could wipe out the negative effects of the family disruptive effects and still persisted a significantly positive impact on child's school attendance only where household members had migrated for less than five years. The impact turned negative, otherwise.

In the context of their countervailing effects on children working, similar to the analysis of Cuecuecha (2009), Bargain and Boutin (2014) extended their analysis to disentangle the remittance effect from the family disruptive effect on the incidence of child labor aged 5 to 14 in Burkina Faso. They looked at the countervailing effects in three types of households – permanent migrant households (migrating for more than five years), current migrant households and non-migrant households. To yield efficient and unbiased results, they selected labor market conditions at the destination as an instrument variable for remittances. In contrast to the findings of Cuecuecha (2009), they found that remittances could eliminate the family disruptive effects in permanent migrant households on children aged five to nine, but, no significant effects of remittances could be detected among current migrant households and non-migrant households. They justified their findings that in permanent migrant households, they could have already settled down and thus could send slightly larger amounts. This argument was also put forward by Antman, (2011). In addition, the absence of permanent migrant households could be so long that the disruptive effect of migration was no longer felt by left-behind household

members. In recent migration, they pointed to the fact that there were relatively older children present in the households that these children were more likely to substitute the work which would have otherwise been performed by migrants. For non-migrant households, two main reasons could be behind the results. First, most non-migrant households were poorer compared to migrant households, and they relied extensively on child labor to contribute extra income. Second, it might have been because of the lower amount and the purpose of the remittance receipts which were directed to more urgent needs (for example household economic shocks) rather than alleviating the workload of children. In addition, in terms of the child's gender and the sub-group of children aged 10-14, remittance effects become insignificant in all types of households, suggesting that there are no different effects among these groups. Regardless of the remittance flows, child labor in Burkina Faso, especially of older siblings, cannot be prevented. They further explained that child labor might be so deep-rooted that measure to moderate would not be so effective through remittances per se. Instead, to curb the child labor issue, it might require deeper and long-term social changes, and in line with economic transformation.

3.3. Case Studies in the Cambodian Context

The incidence of migration has been recognized widely as one of the important constituents attributed to economic growth (de Hass, 2007), and there is no exception for Cambodia. The past decades have been a witness to increasing flows of migration significantly, both internally (within-province and across-province) and, to a lesser extent, internationally. This growth, however, has raised the question of whether it helps or hurts left-behind household members, especially children. As discussed earlier, while there is an extensive body of empirical literature on this migration and remittance issue on human capital formation and the extensiveness of children working, it is not, as far as can be ascertained, widely explored in

Cambodia, except Hing et al. (2014); Iwasawa et al. (2014); Roth and Tiberti (2016); and Fukui and Luch (2017). Astoundingly, these studies all used the same data source, the Cambodia Socio-Economic (CSES) 2009²¹.

Migration and Remittance Effects on Education

An empirical study in Cambodia by Hing et al. (2014) looked at the effect of migration on school attendance and completed grade of education. The authors employed the widely-adopted model of instrument variable approach to deal with the endogeneity of migration. By so doing, they selected the proportion of adult migrant household members to the total households at the village level as a proxy for the migration network. They found that migration, as expected, was negatively associated with school attendance. Analyzing the school attendance by the subgroups of educational level, they found no significant relationship between migration and school attendance of children at primary and lower secondary schools. However, migration was more likely to decrease the chance of students enrolling at upper secondary schools, and the impact was stronger among girls. Regarding the educational attainment of children, their study could not detect a significant association between migration and completed grade of education of children and the results held among both boys and girls. It could not deny the fact that their study does shed light on the evidence that migration does not contribute to helping children's education in communities of origin. Nonetheless, since migration is associated with the tangible benefits through remittances, the results could be underestimated since they did not consider including remittances in their study (McKenzie & Sasins, 2007; Dorantes & Pozo, 2010).

²¹ Although the latest available CSES was conducted in 2014, after 2012, NIS decided to exclude migration from the survey modules. This was because the Ministry of Planning prepares a sole survey on migration and remittances covering more information ranging from macro to micro level of the both the economic and situation of members left behind.

Fukui and Luch (2017) investigated how migration and remittances have different effects on children's schooling (SAGE) among male and female students aged 6-17 in rural Cambodia. They found that although migration had a significantly negative impact on SAGE of children, remittances could improve the chances of children going to schools. Specifically, remittances could enhance the likelihood of female students' educational attainment greater than males. These findings certainly support the fact put forward by ADB (2014) that remittances are found to be an important source of income and the only source for some households in rural areas in Cambodia. This remittance income could spill over children by investing in their education.

Migration and Remittance Effects on Child Work

Another study in the Cambodian context worth discussing was by Roth and Tiberti (2016), who investigated the impact of migration on the number of hours worked by members left-behind and on the depth of poverty²². To the best understanding of the author, only Roth and Tiberti (2016) performed the separation analysis of the discrepancy impact between internal and international migration. Different from many scholars who used a 2SLS model (except Acosta, 2006; Lu & Treiman, 2011; Bargain & Boutin, 2014), the authors adopted a propensity score matching (PSM) technique for their analysis to control for any selection bias that may arise from the decision made by households to migrate. They utilized a combination of two data sets: CSES (2009) and the 2008 Cambodian census. Their results indicated that internal and international migration decreased the working hours of left-behind household members compared to non-migrant households. The flows of remittances could diminish the incentive to work, which could be related to the discussion

²² To review within the scope of this study, results of the effects of migration on the poverty level will not be reviewed.

earlier about the “dependency on remittance” effect. They further showed that the magnitude of internal remittances affecting working hours of left-behind household members was higher than that of international remittances.

In contrast, Hing et al (2014) also extended their analysis of migration on other outcome variables, taking into account child labor²³ (child labor participation and number of hours worked by children) and child’s health²⁴. In terms of children working, their results showed that migration was positively correlated with both the extensiveness and intensity of child labor. In other words, children in migrant households were more likely to be trapped in child labor, by performing more working hours compared to their peers in non-migrant households. In terms of child’s gender, migration had no significantly different effects on the educational outcomes among boy and girl sub-sample.

Countervailing Effects of Migration and Remittances

In regard to how remittances can counterbalance the negative consequences which might be caused by the absence of household members, Iwasawa et al. (2014) explored this related issue. They focused on the net and mixed effects²⁵ of remittances on various indicators of children’s well-being among three types of households: 1) non-migrant households; 2) non-parental migrant households, and 3) parental migrant households. They found that the net effect of remittances (remittances among non-migrant households) was overall positive. This suggests

²³ To study the impact of migration on child labor, Hing et al. (2014) followed the definition derived from the International Labor Organization, UNICEF and the National Institute of Statistics of Cambodia. This definition has been discussed in Chapter 2.

²⁴ Due to the nature of this study focusing on only the effects of migration and remittances on child’s education and the incidence of children working, the results on child’s health will not be discussed.

²⁵ Net effects of remittances refer to the effect among members of non-migrant households who gains the benefits of remittances without encountering the loss of household members owing to migration, while the mixed effect of remittances refer to the effect found among members of migrant households.

that remittance recipients amongst non-migrant households were more likely to invest in education for their children and the probability of children focusing on their study was higher. However, in the sub-group estimation of parental migration and non-parental migration, the effect of remittances provided a different picture. The remittance effect among the non-parental migration was partially canceled out by the absence of the non-parental family members. Worse than that, in the case of parental migration, the remittance effect was completely wiped out. This implied that the positive impact of remittance no longer remained, and thus could not compensate for the absence of parents. They concluded from the results of mixed effects of remittances that the loss of household members – particularly parents who could motivate children to learn instead of working – could not be compensated for.

3.4. Roles of Supply Side Factors on Children's Education and Child Work

Demand-side and supply-side factors play, if not equally, a comparable role affecting the outcome variable. A series of studies assert that school characteristics are one among other determinants, affecting the likelihood of child's schooling (Harbison & Hanushek, 1992). Cross-countries study conducted by Heyneman and Loxley (1983) indicates that, in developing countries, school and teacher factors play even more important roles in student's learning in primary school. The relevant literature in regard to school resources is extensive. However, due to the nature of the study's focus and the limited variables in the data from the supply side data, the author highlights only factors that are most common problems affecting children's human capital accumulation.

One of the most controversial debates regarding the supply side factors is class size. The findings taking this issue into account are not clear. Some argue that smaller class size reinforces students to learn better by less interruption of teaching

and receiving more attention from teachers. In a study on the meta-analysis by Krueger (2003), he found that the reduction in class size led to the improvement of students' educational outcomes. Similarly, Case and Deaton (1999) investigated the impact of class size on enrollment, literacy and numeracy tests before the end of the apartheid regime in South Africa. They suggest that big class size can have negative effects on educational attainment school enrollment. Reducing the class size can be effective in improving academic outcome, in particular in primary school, but its costs are, in many cases, prohibitive Fuller and Clarke (1994). They also argue that reducing class size has negligible effects on students' achievement in secondary schools. After reviewing student performances in 22 secondary schools, prohibitive (Fuller & Clarke, 1994) only detect the significant impact of small class size on students' learning in two schools out of the 22 secondary schools.

Angrist and Lavy (1999) found mixed results. To examine the relationship between class size and grade test score, they set the class size at a range of not exceeding the threshold of 40 students and applied regression discontinuity design to establish the causal relationship. Their results showed that while small class size helped improve the test score for students at fourth and fifth grade, there was no significant relationship among students at third grade. Harbison and Hanushek (1992) reviewed 30 case studies carried out on the impact of class size on student learning. Out of 16 studies on the effect of the class size, they found significant effects of small class size on educational outcomes, 8 studies found negative effects and another 8 found positive effects. They conclude that it is thus difficult to draw a reliable conclusion whether reducing class size is helpful.

Another supply factor that is widely recognized and practiced, particularly in developing countries, is the school shift²⁶ system. The adoption of this school-

²⁶ School-shift is a system whereby schools provide multiple shifts (double and in some cases triple), normally in morning and afternoon sessions. This system has been very effective especially

shift system is an effective strategy to increase access to schooling and serve the increasing demand for education due to resource constraints and building (Bray & Seng, 2005). Double-shift schooling is effective in reducing the unit costs, as the same school building and facilities can be used for two different cohorts of students. The double-shift system also enables teachers to teach twice per day and earn some extra salaries, and at the same time to solve teacher shortage issue in some areas (Bray, 2008). In addition, according to Linden (2001), double-shift schooling, due to its low unit costs, can serve as a rational solution, in the short or medium term, to expand education access to wider populations in countries with limited education budgets. Sagyndykova (2013) examined whether the difference in academic performance of students is a result of the discrepancy in the morning shift and afternoon shift or if it is a result of differences in the nature of students' characteristics in Mexico. His results suggest that there was no significant difference between morning shift and afternoon shift in students' academic performance. Instead, the double-shift system provided equal opportunities for students to acquire their education.

during the booming of the abolition of school fees in public schools in Africa (Bray & Seng, 2008). Since educational facilities are scarce and education finance is limited, the adoption of school-shift is proved to efficiently cater for the increased demand in enrollment.

CHAPTER 4 :

METHODOLOGY

4.1. Analytical Framework

4.1.1. Theoretical Framework

This chapter begins, first, with a discussion on human capital theory to build as a roadmap for this study. It gives an overview on how the Human Capital Theory, pioneered by Schultz and Becker, makes an impact on children and that how important it is for children to stay in schools instead of working at the very young age. It then, considers how the theory of migration and remittances are linked with the educational investment decision for children as well as with the number of hours worked by children.

The twenty-first century has witnessed a transition from a production economy to a knowledge economy. Much of this owes to the work of Schultz (1961), who emphasizes the significant contribution of human capital to economic development and brings in the human capital theory from a suggestive metaphor to a theoretical and empirical focus of economics and influencing educational policy decision making (Sweetland, 1996). The theory underpins the importance of investment in human resources through which an individual could acquire the stock of knowledge and skills which are conducive to an increase in efficiency in performing tasks and in individual's productivity. The theory was later expanded by Becker (1962) and Mincer (1974), who emphasize the theory by not just an educational investment in an individual, but how education can prepare an individual for entering the workforce and how education can give the returns. It suggests that an investment in people brings about benefits both an individual and society. The accumulation of these benefits of human capital is manifested in how

high the education a child can attend and complete in schools²⁷. A myriad of evidence on the correlation between a higher level of education and a higher level of earnings has been consistently confirmed in my studies (Psacharopoulos, 1994; Psacharopoulos & Patrinos, 2004). The combined positive effects of human capital give incentives for individuals to invest in human capital to maximize their well-being during their life.

Though education is an investment for a better future, there are associated costs to it, the direct costs including school materials and uniforms, school contribution, and transportation. Therefore, to ensure equal access education for all children, many countries, including Cambodia, have tried to encourage poor families to send their children to school by abolishing school fees to reduce the direct costs in 2001. However, there is also the opportunity cost as the family would lose a workforce to help earn an extra income or offer help with the household chores. Thus, even with the global recognition of how important education is, poor households in developing countries cannot afford to implement the perception of such value, due to poverty. (Deaton, 1997; Glewwe & Jacoby, 2004)

A logical decision to invest in a child's education would have been based on the cost-benefit analysis by weighing the upfront costs against the future benefits if extra years in school were to be paid for. In this manner, a household would be naturally willing to keep their children in school longer if they could see more increased benefits than the immediate value costs (Ben-Porath, 1967). However, such an optimal decision can fall through when financial constraints hit. Furthermore, since the income of the poor, disadvantaged households are very sensitive to economic shocks, their children are even much more vulnerable. In a

²⁷ Some scholars argue that education is not limited to being learnt merely at schools, but also taking in the forms of informal education at home and at work (Schultz, 1981), on the job-training and apprenticeship (Mincer, 1974). This study only focuses on the formal education happens at schools.

study by Calero et al. (2009), the author found that the likelihood of child work responds to income change and shocks²⁸. Therefore, when facing income constraints, those households are compelled either to withdraw their children from school or to make them work while studying.

Migration phenomenon has been acknowledged to be one of the coping survival mechanisms for households to diversify and increase their income source. It is also one of the constituents attributed to a country's economic development, as discussed earlier in the background section. The relationship between migration and development is also discussed comprehensively in the basic model of migration in the work by Harris and Todaro (1970) within the theory of "neoclassical migration". According to the theory, it predicts and assumes a linear relationship between "wage differentials and migration flow across the market or countries". In other words, the capital-rich country is attracted to the abundant of labor supply in poor countries, alluring migration decision. The theory coincides with the push-pull factors of migration, and it has been suggested that the earlier plays a more major role in the Cambodian migration context (Chan, 2009a; Maltoni, 2010). Due to the association between migration and the development of households in the local communities and country, it has drawn attention of policymakers and researchers to understand the impact of migration and remittances on left-behind households and communities of origin at both macro and micro. On the same note, it has increasingly caught scholars' attention in scrutinizing the potential effect of migration through remittances on improving children's welfare, particularly the educational attainment and reducing working hours of the children left behind.

A wide range of research studies' results has been in favor of remittance as it has enhanced educational outcomes for the left-behind young household members.

²⁸ The two types of shocks that Calero et al. (2009) clearly defined has been explained in the problem statement sub-section of Chapter 1.

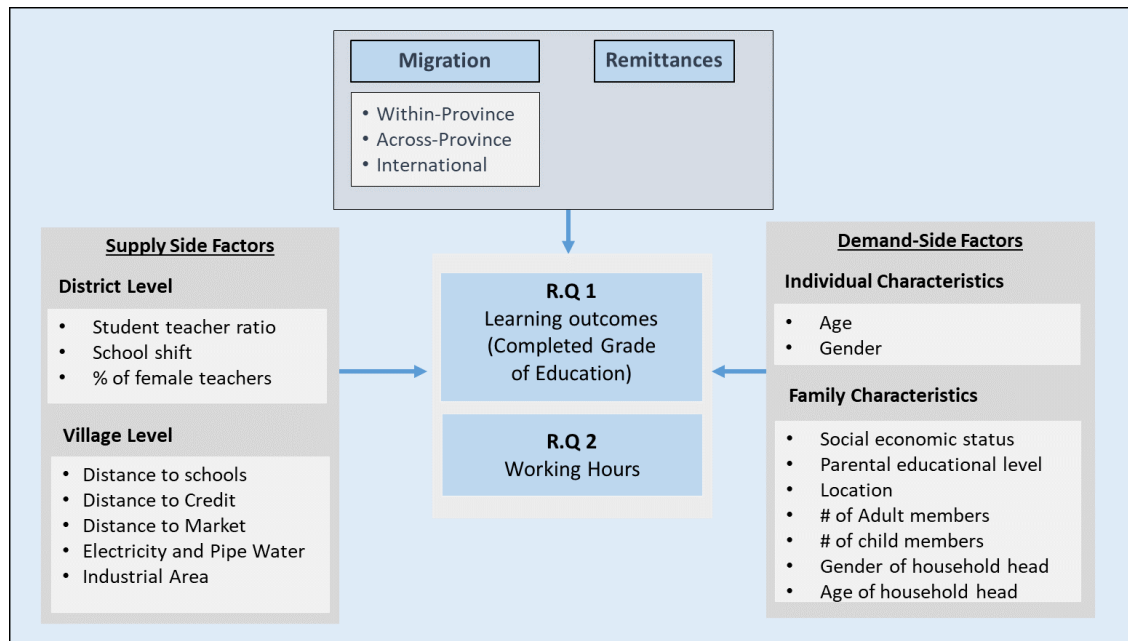
This remittance channel acts as an insurance to mitigate, particularly during households' economic pressure, and reduce the vulnerabilities to shocks (Acosta, 2011; Kapur, 2004). These findings of supporting migration and remittances have a connection with the 'new economics of migration' theory, in which becoming a migrant is a joint decision made by the whole family as migration enables them to access finance as in remittance. This decision is then regarded as a proactive approach in response to the shortage of their local job market, and thereby being able to generate and raise income source for households. Provided households' income has been increased, it can enhance their ability to invest further in education for their children (Stark & Levhari, 1982; Stark & Bloom, 1985). Against this backdrop, the opposing team, while agreeing on the potential for remittance transfers to alleviate credit constraints, argues that the practice of migration of a family member also incurs the loss of workforce and adult role model, particularly the absence of parents, may have negative effects on a child's schooling. This complex relationship between migration and remittances perhaps explain the mixed and inconclusive findings, as discussed in the literature review in Chapter 3.

4.1.2. Conceptual Framework

Previous literature of migration and remittances effects on educational attainment and child work relate individual and family characteristics and village characteristics as key determinants. In the same way, this study will also apply empirical models in which the educational attainment and working hours for a child are functions of the individual, household, and regional characteristics. In addition to those common factors, supply-side factors, which are also considered as important predictors, are added as controlling factors in this study. As illustrated in Figure 4.1, this study encompasses age and gender of a child at the individual level, socio-economic and demographic factors at the household level, geographical and

economic characteristics at the village level, and educational indicators deriving from the Education Management Information System (EMIS) at the district level. A delineation of the reasons to include these factors as controlling variables is as follows.

Figure 4.1. Conceptual Framework



Created by the author adapting from Dorantes and Pozo (2010); Iwasawa et al. (2014); and Davis and Brazil (2016).

First, regarding the socio-economic factors, it is important, not limited to developing countries, in a sense that children from the better-off socioeconomic background are more likely to stay in school as well as to less likely to participate in economic activities. This is because both direct and opportunity costs and the income generated by children for household financial contribution is not considered important for households (Basu, 1999). Furthermore, because migration is associated with costs, some families take loans in order to finance migration process for their household members. In a condition where families take loans, this can likely affect both the education and working hours of children. This is because due to the financial pressure of the loss of income (provided household members would

have not migrated) and paying off debts, children may be withdrawn from schools and engage in working activities in order to help contribute to household finance. As the nature of loans can be correlated with the outcome variables, this study also controls for loans.

The educational level of parents is another important predictor of a decision in sending children to schools and in making children work. It would be commonly perceived that when parents' education level is high, it is more likely they will expect the same achievements from their family members. Ample evidence has shown that educated parents tend to appreciate their children's education, and the higher the level of the parents' education, the more their appreciation is intensified, resulting in a positive effect on keeping their children in schools (Glewwe & Patrinos, 1999; Kanellopoulos & Psacharopoulos, 1997) and reduce child work incidence or working hours (Mukherjee & Das, 2008).

Regarding household demography, studies found that the household structure, the number of the adult or child members in the household, influences both educational attainment and working hours of children. This has also been put forward by Downey (1995) that households with more children cannot afford to devote resources to each individual child. Evidence suggests the negative correlation between the number of siblings and human capital acquisition as well as the positive association between adult members and educational outcomes. In contrast, it is likely that the household structure has the opposite effects on children's working incidence or working hours (Acosta, 2011; Patrinos & Psacharopoulos, 1997). Children living with more adult members are likely to work less, while children with younger siblings appear to have more pressure to engage in economic activities.

4.2. Hypotheses

This section presents hypotheses constructed based on the previous studies in response to the research questions described in Chapter 1 of the study. There are basically two main designs of the hypotheses, each of which is broken down into three sub-hypotheses. First, the hypotheses 1.1 through 1.3 are concentrated on the effects of migration and remittances on the completed grade of education. Secondly, the hypotheses 2.1 to 2.3 focus on the migration and remittance effects on children's working hours. The detailed discussion of these hypotheses is as follows.

Hypothesis 1.1: Completed grade of education is hindered by an absence of household members owing to migration, especially among children of the within-province migrant households. In contrast, remittances have a positive effect on children's completed grade of education. But not across-province or international migration

This hypothesis is created based on the assumption that the migration incidence of one or more household members brings out the loss in adult's time and supervision on children. As mentioned in the reports from the UNICEF (2017) and MoP (2012; 2015), there are a great number of migrant households who leave behind their children for elderly relatives or other relatives to take care of. These children have been found to be never enrolled in schools or drop out very early even at a very young age. Strong evidence has also been found to support the negative impact of migration on the education of children left behind (McKenzie & Rapport, 2006; Kandel & Massey, 2002; Lopez, 2005). In the worst case, children have to help shoulder household chore responsibilities such as cleaning, cooking and taking care of their younger siblings or elderly members. As found in the Cambodian Rural-Urban Migration report in 2012, left-behind children prevalently live with kin

or grandparents back home. Within-province migrants mostly move to other areas within the same province and remit the least amount of remittances. This instance might involve with the migration associated costs that this type of migration cannot afford to move elsewhere rather than within their province.

However, remittances sent back home can increase households' income and mitigate liquidity constraints, and thereby it more likely to have a positive effect on children's learning in schools. Previous empirical studies on remittances also found that remittance can help relieve income constraints which encourage households to invest more in children's human capital by keeping their school-aged children in school longer (Acharya & Gonzalez, 2014; Pablo Acosta, 2006; Dorantes & Pozo, 2010)

Hypothesis 1.2: Children of within-province migration in rural areas suffer the most from the loss of household members. Remittances have a positive impact in both urban and rural areas, but the impact in rural areas is relatively larger.

This hypothesis is based on previous studies in Cambodia and available statistical information. Since economic returns (through remittances) from the international migration is found to be larger than those from the internal migration in Cambodia (Roth & Tiberti, 2016), international migration group is somewhat expected to perform better than within-province and across-province migration groups. Fukui and Luch (2017) examines the impact of migration and remittance on school attainment in rural Cambodia and find that school attainment is adversely affected by the loss of family members due to migration. They also found that remittances can help to offset the negative impact of migration, although their study did not distinguish migration destinations. To date, to the best understanding of the author, there is no study that further separates internal migration into within-province and across-province. This is a unique case in Cambodia and that is why

even in the Cambodian Socio-economic Survey, the information of different types of migration is clearly defined²⁹. Therefore, the statement that children in the rural within-province group suffer the most from the absence of family members is based on the fact that the amount of remittances from within-province migrants are small. Children in rural areas are more likely to work more and study less to contribute and substitute for the loss of labor forces in families. It is also common that children in rural areas are more likely to engage in farming activities, as it is prevalent in rural Cambodia.

Hypothesis 1.3: Non-migrant households do not suffer from any loss of household members. In addition, this type households have additional income from receiving remittances. Therefore, remittances are found to be the strongest among non-migrant households. Nonetheless, its effect on the completed grade of education is partially canceled out among international migrant households and across-province migrant households and totally wiped out among within-province migrant households.

For non-migrant households, remittances come from relatives or friends and in most cases, children are living with their parents and other household members at home. Theoretically, the positive impact of remittances could cushion the negative impact of migration. Iwasawa et al. (2014) also find a positive impact of remittances on education expenditure as well as schooling outcomes of children amongst non-parent migrant households in Cambodia. Nonetheless, the positive impact of remittances is likely not to be offset by the negative impact of migration, in particular among the within-province migration. Since in comparison to the across-province and international migrants, remittance amounts from within-

²⁹ The detail information on the definition of types of migration will be delineated in the variable section in Chapter 4.

province migrants are relatively small. The small amount of money received from within-province migrant members is probably barely enough to satisfy the daily consumption needs of households back home in addition to the loss of manpower in families had household migrant members not migrated, let alone to invest in children's education.

Hypothesis 2.1: The labor shortage among migrant households, regardless of any types of migration, is likely to push children into work and engage in longer working hours. The additional source of income from remittances, however, can relax household financial constraints, and thereby lessening the incidence of child work and working hours.

In Cambodia, when adult members are away from family for employment in other places or other counties, children need to substitute for the loss of working forces such as helping household work and farm work (Hak et al., 2011). Although migration is strongly associated with extra income from remittances to relax household's financial constraint, the positive impact from remittances, in most cases, seems to be insufficient to wipe out the negative effect caused by family member absences (Antman, 2011; Elbadawy & Roushdy, 2010; Hing et al., 2014).

The positive effect of remittances is based on Ebeke (2010)'s cross-country study. He examines the effect of remittance effect on child labor incidences in 82 developing counties and finds that in most case remittances contribute to a reduction of child labor, even after controlling for migration and income shocks. This finding is also supported by many other studies (Acosta, 2006; Dimova et al., 2015; Roth & Tiberti, 2016).

Hypothesis 2.2: The positive relationship between migration and working hours (migration increases working hours) is weaker in urban areas in comparison to rural areas. For remittance effect, it has a larger effect in reducing the working hours among children in rural Cambodia in comparison to the urban children.

There are studies on impact of migration and remittances on child labor or children's working hours focusing on children in rural areas (Acharya & Gonzalez, 2014; De Brauw & Giles, 2017; Dimova et al., 2015; Fukui & Luch, 2017); however, very few of them provide rural-urban comparisons. Since children in Cambodian rural areas are more likely to engage in economic activities (NIS & ILO, 2013), this study expects the absence of household members in rural areas to have a more adverse effect on the left-behind children's working hours. Similarly, it is expected that the same size of remittances can reduce more working hours in rural areas, as these remittances are found to be an important source of income for particularly rural households and directly contribute to rural household improvement (ADB, 2014). In addition, remittance effect is also found to be slightly stronger in rural areas in Tanzania (Coon, 2016).

Hypothesis 2.3: When the effect of remittances is examined by destinations of migration, remittances have no effect on children's working hours among children of within-province, can reduce some working hours among children from across-province and international migrant households, and have the strongest effect among children of non-migrant households.

Theoretically, the net effect of remittance (among the non-migrant households) should be the strongest, as children of those families do not have to compensate the loss of workforces. It is also empirically proved in the case of Cambodia (Iwasawa et al., 2014). Previous studies suggest that the mixed effect of

remittance on child work among migration is heterogeneous as it depends on the left-behind groups (such as rural-urban, male-female, and age group) and the nature of migrations (Dorantes & Pozo, 2010; Karki, 2016; Trang Nguyen & Purnamasari, 2011). In Cambodia, Iwasawa et al. (2014) also find that remittances cannot compensate the absence of father or mother due from migration, and confirm that remittances help reduce the probability of working without going to schools among children of non-parental migration group. Remittances associated with international migration appear to have a larger impact on reducing working hours of the left-behind members (Roth & Tiberti, 2016).

4.3. Models

4.3.1. Ordinary Least Squares (OLS) and 2-Stage Least Squares (2SLS)

Ordinary Least Squares (OLS)

The first objective of this study is to assess the effects of migration and remittances on the completed grade of education in Cambodia. To assess these effects, this study first utilizes the Ordinary Least Squares (OLS) to see the correlation between remittances and the completed grade of education as well as between migration by destination and the completed grade of education. Following the analytical framework mentioned earlier, the completed grade of education is modeled as a function of remittances, migration by destination, individual characteristics, household characteristics, village characteristics, and supply-side factors at the district level. The econometric equation for the estimation can be expressed as follows.

$$Y_{ijvd} = \beta_0 + \beta_1 M_{ij} + \beta_2 R_{ij} + \beta_3 Child_i + \beta_4 HH_{ij} + \beta_5 Village_{iv} + \beta_6 SS_{id} + \mu_{ijvd} \quad (4.1)$$

where the Y_{ijvd} denotes the completed grade of education of a child i living in household j , village v , and district d ; M_{ij} is a vector of migration households of child i in household j ; R_{ij} is a vector of logarithm of remittances in Cambodian Riels that household j of child i received during the past 12 months; $Child_i$ is vector of child characteristics; HH_{ij} is a vector of household characteristics of child i living in household j ; $Village_{ijv}$ is a vector of village characteristics of child i ; SS_{ijvd} is a vector of supply-side factor at district d where child i live; and μ_{ijvd} is the error terms.

In this study, remittances are the average monthly amount of remittances in Cambodian Riels households received in cash and kind. Remittances can be either from migrant members or others such as friends and relatives in the past 12 months. Therefore, remittance recipients are not limited to households with migrant members. To smooth the distribution, remittances are transformed into the logarithm form. Migrants are referred to household members who are currently absent and have been away from the household for more than 12 months but less than 5 years. In this study, migration type by destination is characterized as: i) non-migrant, ii) within-province migrant, iii) across-province migrant, and iv) international migrant.

Besides the individual and family characteristics commonly used in other studies, this study also incorporates the supply-side factors as controlling variables. Supply-side factors, such as teacher and school facilities, play a very important role in increasing access to education in developing countries like Cambodia. Although there is evidence showing that supply-side factors are influential to student's learning (Case & Deaton, 1999; Coleman, 1987), most of the household surveys normally only provide the demand-side information, but not the supply-side information. Considering the importance of the supply-side factors, this study constructs the supply-side factors at the district level by using the EMIS dataset maintained by the MoEYS. This study uses the average district-level student-

teacher ratio, percentage of female teachers, and school-shifts to capture the supply-side factors. The teacher is one of the key resources to the success of students' learning, and the student-teacher ratio can capture the level of teacher shortage or surplus at the district level (World Bank, 2014). In Cambodia, female teachers are unwilling to work in rural or remote areas due to safety and proper accommodation issues, therefore the share of female teachers can be used as a proxy to measure the district educational situation. Due to the shortage of school buildings and facilities, some schools are forced to operate in two or three shifts. In this sense, the school shift is a good proxy for school resources. In addition to these district level, this study also includes the village-level factors obtained from the CSES 2009's village survey. The village factors are: distance from the village to the nearest primary school and the distance from the village to the nearest lower secondary school.

This study uses both models with and without the supply-side factors to estimate the effects of migration and remittances on children's completed grade of education and child work. To predict which econometric model (with or without supply-side factors) can provide better goodness of fit, the study uses the Akaike's Information Criterion (AIC) as a model selection tool. AIC can provide an estimation indicating if there is any loss of information when supply-side factors are added in the model. The lowest value of AIC among all models is considered the best model.

The last part of the Research Question 1 is to further examine the effects of remittances by migration type. To do so, the study conducts the analysis by sub-sample of migration types by destination. In this sub-section, children are divided into four groups: i) children of non-migrant households, ii) children of within-province migrant households, iii) children of across-province migrant households, and iv) children of international migrant households. In this sub-sample analysis, the migration factor is dropped from the equation as seen in Equation 4.2.

$$Y_{ijvd} = \lambda_0 + \lambda_1 R_{ij} + \lambda_2 Child_i + \lambda_3 HH_{ij} + \lambda_4 Village_{iv} + \lambda_5 SS_{id} + \mu_{ijvd} \quad (4.2)$$

2-Stage Least Squares (2SLS)

The weakness of OLS estimation is that this approach can only establish the correlation, but not the causality between remittances and the completed grade of education. In order to assess the effects of remittances on the completed grade of education, this study needs to address some econometric issues, namely the omitted bias, measurement errors, and reversal causalities (Angrist & Pischke, 2008; Khandker et al., 2009). Although the study tries to incorporate many factors that are likely to influence the completed grade of education, there are still many unobserved factors that also affect the outcome variable. When these unobserved factors are correlated with remittances, the estimated remittance coefficient is likely to be biased. The concern of the reverse causality is that in the opposite direction, educational performance can also affect the size of remittances a household receives. For example, a household member may decide to remit money to help young members at home after learning that they have poor performance at school due to financial constraints.

To tackle this endogeneity issue caused by omitted variable bias and reversal causality, the study utilizes the Two-Stage Least Squared (2SLS) approach with a set of instrument variables. Based on previous studies on similar topics related to remittance and educational attainment, the variables used as instruments in this study are i). disaster (Iwasawa et al., 2014), distance from provincial town (Antman, 2011; López, 2005) and village remittance norm, which is the ratio of numbers of remittance recipient households to total households in the village (Roth & Tiberti, 2016; Wang et al., 2013). The second stage of Two-Stage Least Squares (2SLS), also known as reduced form equation, predicts the value of the endogenous variable (remittances in this study), and can be expressed as follows:

$$R_{ij} = \sigma_0 + \sigma_1 Z_{ijv} + \sigma_2 M_{ij} + \sigma_3 Child_i + \sigma_4 HH_{ij} + \sigma_5 Village_{iv} + \sigma_6 SS_{id} + \varepsilon_{ijvd} \quad (4.3)$$

where the R_{ij} denotes remittances household j of child i received; M_{ij} is a vector of migration households of child i in household j ; $Child_i$ is vector of child characteristics; HH_{ij} is a vector of household characteristics of child i living in household j ; $Village_{iv}$ is a vector of village characteristics of child i ; SS_{id} is a vector of supply-side factor at district d where child i live; and ε_{ijvd} is the error terms. Z_{ijv} is the set of instrument variables namely disaster, distance to provincial town and remittance norm. A valid or appropriate instrument variable has to satisfy two conditions that it needs to be correlated with the endogenous variable (remittances), but must not be associated with the outcome variable (completed grade of education). In other words, the instrument Z_{ijv} should not be correlated with the error term μ_{ijvd} of the first-stage regression.

$$R_{ij} = \varphi_0 + \varphi_1 Z_{ijv} + \varphi_2 Child_i + \varphi_3 HH_{ij} + \varphi_4 Village_{iv} + \varphi_5 SS_{id} + \varepsilon_{ijvd} \quad (4.4)$$

The validity of Instrument Variables

Disaster, distance to provincial town and the remittance norm are used as instrument variables in this study. A strong and valid instrument variable (z) for the endogenous variable (x) must satisfy two important conditions: $Cov(x, z) \neq 0$ and $Cov(z, u) = 0$. In the other words, instrument variable (z) has to be strongly correlated with the endogenous variable (x), but is uncorrelated with the error terms (or unobserved factors of the completed grade of education). The rationale for using the three variables as a set of instruments as follows.

Disaster, the first instrument variable, is represented by a dummy variable taking the value 1 if the village where household j of child i reside is affected by disaster (such as flood, drought, crop damage, and fire) in the previous year in 2008. In many cases, a household's economic is adversely influenced by disasters. It may

induce migrants to remit more money to help families back home to alleviate the negative economic shock caused by disasters. Since disaster occurs without prediction, it is unlikely to be correlated with error terms or unobservable factors of the completed grade of education. It is true that disaster such as floods might interrupt school attendances of students and possibly shorten the schooling period, it is unlikely to influence the grade completion or repetition of the children. Previous studies in Cambodia also use the disaster as an instrument for remittances (Fukui & Luch, 2017; Iwasawa et al., 2014; Mong, 2015).

This study uses distance to provincial town as the second instrument variable for remittances. Access to the banking system in Cambodia is still limited to Phnom Penh and some provincial areas, and in most case, remittances to families in Cambodia are sent through informal channels (Jampaklay & Kittisuksathi, 2009). Therefore, the distance to provincial town is likely to be negatively associated with remittances. The more remote the village, the less likely or less frequent migrant members send remittances to their families. The distance to provincial town (remoteness) may also be related to completed grade of education. In this case, it will violate the second condition that the instrument variable should not be correlated with the error terms of the completed grade of education. To solve this issue, the study controls for the distance from the village to the closest primary and lower secondary schools.

Remittance norm, the third instrument variable, is defined as the proportion of remittance recipient households to total households in the village. The rationale behind the use of remittance norm as the instrument is that individuals are influenced by surrounding peers. Migrants may feel under pressure to send home remittances if they know that their neighboring families are receiving remittances. As family bonds are found to be strong in Cambodian, it makes migrants feel comparatively less gratitude if they do not send home remittances. Similar

instruments also used as instruments in studies on the impact of remittances using this instrument variable approach (Hu, 2012; Mong, 2015). The remittance norm in the village is also uncorrelated with the unobservable factors of the completed grade of education.

4.3.2. Two-Step Heckman

Approximately 60% of children aged between 6 and 17 in the sample do not take part in economic activities, meaning that there is a large proportion of zero value observations in the sample. In such a case, a commonly used linear regression model would lead to biased and inconsistent estimation (Maddala, 1986). Restricting the sample to only working children would also lead to the bias because by ignoring the non-working children, it disproportionally represents children involving in economic activities. One of the solutions to address this problem is to use the Tobit model to censor the zero hours worked on the left-hand side. Nevertheless, the Tobit model has some limitation because it cannot capture the individual's sequential decision-making process.

To answer the research question 2, the study employs the Heckman selection model (Heckman, 1979) to correct for potential sample selection bias that cannot be tackled with normal regression and Tobit model. To correct the self-selection issues, the Heckman selection model performs simultaneous estimations of two multiple regression models – a selection equation (first step) and an outcome equation (second step). The selection equation predicts the probabilities that children participate in economic activities, while the outcome equation models estimate children's working hours using data of those who are involved in economic activities. In the first step, a Probit model is employed to estimate the probabilities of children's working participation, based on which correction of sample selectivity (the inverse Mills ratio or Lambda) is obtained for estimation of outcome equation

in the second step. In the second step estimation, the inverse Mills ratio is included as an additional explanatory variable in the equation. Whether a simple regression would cause sample selection bias can be confirmed by the statistical significance of the inverse Mills ratio's coefficient in the second step. However, it is also worth mentioning that the two-step Heckman cannot deal with the endogeneity issues of remittances.

This study applies the Heckman model to account for the potential correlation between the decision to whether to work or not and the decision of a number of hours to work. In the first step, a Probit model is used to estimate the binary decision z_i . An individual decides to work only if the net utility gain from working is greater than zero.

Selection Equation (Stage 1)

$$z_i^* = X_{1i} \beta_{1i} + \varepsilon_i \quad (4.5)$$

$$z_i = \begin{cases} 1, & \text{if } z_i^* > 0 \\ 0, & \text{if } z_i^* \leq 0 \end{cases} \quad (4.6)$$

$$P(z_i = 1|X_{1i}) = E(z_i|X_{1i}) = \Phi(X_{1i} \beta_{1i}) \quad (4.7)$$

Where z_i^* is the unobservable latent variable for the working decision and z_i is the observed value denoting the participation in economic activities of the child i ($z = 1$ if a child is employed and $z = 0$ otherwise). X_{1i} is a set of explanatory variables that affect the outcome in the first-step selection model. Φ is the cumulative distribution function of the standard normal distribution. The selection equation predicts the working probability for each individual child. Inverse Mill

ratio, a ratio of standard normal probability density function over standard normal cumulative distribution function, can be expressed as following:

$$\lambda = \frac{\phi(X_{1i}'\hat{\lambda})}{\Phi(X_{1i}'\hat{\lambda})} \quad (4.8)$$

Let y be the working hours of children in Cambodia. In the two-step Heckman model, the errors of the two equations ε_i (Stage 1) and μ_i (Stage 2) are assumed to be correlated and have a normal distribution. The outcome equations can be expressed as follows:

Outcome Equation (Stage 2)

$$y_i^* = X_{2i} \beta_{2i} + \mu_i \quad (4.9)$$

$$y_i = \begin{cases} y_i^*, & \text{if } z_i = 1 \\ 0, & \text{if } z_i = 0 \end{cases} \quad (4.10)$$

$$E[y|X_2, z = 1] = X_{2i} \beta_{2i} + \rho \sigma_\mu \lambda(X_{1i}) \quad (4.11)$$

where y_i^* is the unobservable latent variable of working hours and y_i is the observed value denoting the participation in economic activities and working hours of the child i . X_{2i} is a set of explanatory variables for the second-step outcome model. ρ is the correlation between unobserved determinants of selection equation equations (ε_i) and the unobserved determinants of the outcome equation (μ_i), σ_μ is the standard deviation of μ_i , and λ is the inverse Mills ratio.

4.4. Data

4.4.1. Overview of Data

To answer the research questions, this study employs the Cambodia Socio-Economic Survey (CSES) 2009. CSES is a nationally representative household survey conducted by the National Institute of Statistics (NIS) under the technical and financial support from the Swedish International Development Agency (SIDA). By 2009, eleven rounds of the CSES have been conducted intermittently during the period between 1993 and 2004, and annually from 2007 onwards. A large-size sample survey is conducted every five years, in 2004, 2009 and 2014. This study uses the CSES 2009 dataset instead of the CSES 2014 because the information related to migration is not available in the CSES since 2012.

The CSES 2009 data consists of 12,000 households, among which 1,000 households were interviewed monthly from January to December 2009. Focusing on poverty issues, the survey covers a wide range of information on demographic characteristics, housing, agriculture, education, labor force, health and nutrition, victimization and household income and consumption. Using the 2008 Population Census of Cambodia as the sampling frame, 720 primary sampling units (villages) were selected with a three-stage cluster sampling method for the 2009 survey. Villages, Enumeration Area (EA) and then households were selected in stage one, two and three respectively. The sampling is also designed for the estimation by urban and rural areas as well as by four other ecological zones, namely the Plain, Tonle Sap, Coastal and Plateau/Mountain Regions. With some minor revisions from the previous surveys, there are four types of the questionnaire in the CSES 2009: i). household listing questionnaire, ii). village questionnaire, iii). the household questionnaire, and iv). diaries questionnaire

In addition to the CSES 2009 dataset, information on the supply side factors is derived from MoEYS's Education Management Information System (EMIS) 2008-2009. Basic information about public schools covering from pre-school, primary to secondary education in Cambodia is collected annually at the beginning of the school year under the financial and technical support from UNICEF and SIDA. In this study, to control for the supply side factors, average district-level student-teacher ratio, the number of school shifts and percentage of female teachers are estimated using the EMIS 2008-2009 and later combined with the CSES 2009.

There are 57,105 observations aged between zero and 96 years of age, but the study focuses only on children aged between 7 and 18 years old. The restricted sub-sample of the interested population is 15,725. After dropping observations with missing values used in this study, there are 15,306 remaining observations for the analysis in this study. Out of these observations, 12,361 children are from non-migrant families and 2,945 are from families with migrant members.

4.4.2. Variables

Table 4.1 lists the dependent and independent variables with definitions used in this study. The dependent variables for the first and second research questions are the completed grade of education³⁰ and weekly hours worked by children respectively. The completed grade of education is created based on the highest grade of education a child has completed. It is not measured years a child spent at school. For example, if the duration of a child spends six years in school, but s/he repeats one year and completes only five grades, thus the completed grade of education is five, not six. Students who dropped out from school system are also included in the estimation.

³⁰ From the Organization for Economic Cooperation and Development (OECD)'s statistical terms, it uses the term as educational attainment equally the same as the completed grade of education. Several authors also used the term of completed grade of education in their study analyses (Hing et al., 2014; Mansuri, 2006)

For those dropouts, the highest grade she/he completed before the dropout is used. For instance, if a 16 years-old boy completed grade 5 at the age of 13 and dropped out, his completed grade of education is 5. For those who have never enrolled in school, the completed grade of education is 0.

The weekly hours worked by children is calculated by the sum of working hours in the primary and secondary jobs during the last seven days at the time of interview. Only jobs related to economic activities are considered at work, therefore time children spent on the domestic chore, looking after siblings and so on are not counted as work in this study. However, work such as helping the family on a farm, taking care of cattle, making palm sugar, etc. are considered as economic activities.

The key explanatory variables of interest in this study are migration by destination and amount of remittances a household received in the last 12 months. In the Cambodia Socio-Economic Survey (CSES), migration is defined as an incidence of those (aged between 15 and 65 years old) who have previously been members of households but who have now been absent from households for more than 12 months (NIS, 2009). Following Luch (2012) and Mong (2015), the study only includes migration that has occurred within the last five years (since 2004) to avoid the impacts of migration which Cambodia experienced during the internal turmoil. This study categorizes migration into three types: i). within-province migration, referring to those who migrate within the same province; ii). across-province migration for those migrate to other provinces, outside of their provinces of residence but within Cambodia; and iii). international migration limited to those migrating to other countries. For the remittances, it is the amount of remittances households received either in cash or in kind from relatives and others in Cambodia and abroad in the past 12 months taken in the logarithm form. The remittances in this study are not limited to the transfer from internal and international migrant

members but also the transfer from non-migrant members such as friends or relatives.

Beside the key independent variables, individual characteristics (namely gender, age, and age squared), family characteristics (namely region, household head's age, household head's gender, number of adult members, number of child members, father education level, mother education level, and household consumption level) are also included and controlled for. Different from the previous studies, this study also includes the observable supply-side factors in the estimation to minimize the bias due to unobservable factors in the residuals. These supply-side factors are a district-level student-teacher ratio, the percentage of female teachers in the district, distance from the village to the nearest primary school, and distance from the village to the nearest lower secondary school. The definitions of variables are explained in details in Table 4.1.

Table 4.1. Name and Definition of Variables

Variable	Definition
Completed Grade of Education	The highest grade a child has successfully completed.
Working Hours	A number of hours a child works during the past seven days at the time of interview. Hours spent on household chores are not counted as working hours.
Migration Type	
- Within-province	A dummy variable for household member's migration by destination, taking the value 1 if the destination is within the same province, otherwise 0.
- Across-province	A dummy variable for household member's migration by destination, taking the value 1 if the destination is outside the resident province, otherwise 0.
- International	A dummy variable for household member's migration by destination, taking the value 1 if the destination is overseas, otherwise 0.
Remittance (Ln form)	Continuous variable in the logarithm form of the amount of remittances households received in the past 12 months
Individual Characteristics	
Male	A dummy variable for child's gender taking the value 1 if for male and 0 for female.

Variable	Definition
Age	Continuous variable for the child's age.
Age Squared	A continuous variable of the square of child's age
Family Characteristics	
Urban	A dummy variable for child's residence taking the value 1 if for urban resident and 0 for rural residents.
HH Head Age	A continuous variable of household head's age
HH Head is Male	Dummy variable of household head's gender taking the value 1 for male and 0 for female.
# of the Adult members	Number of households' adult members (aged 18 years old and over)
# of the Child members	Number of household's child member (aged 17 years old and below)
Loans (Ln form)	Continuous variable in the logarithm form of the total amount of outstanding loans at the time of interview
After July	Dummy variable taking the value 1 in the household is interviewed after July. After July, students are promoted to next the grade if they obtain passing scores.
Father Education (Base group: No education)	
- Primary	A dummy variable for father education level, taking the value 1 if it is primary, otherwise 0.
- Lower Secondary School	A dummy variable for father education level, taking the value 1 if it is lower secondary, otherwise 0.
- Upper Secondary School or Higher	A dummy variable for father education level, taking the value 1 if it is upper secondary or higher, otherwise 0.
Mother Education (Base group: No education)	
- Primary	A dummy variable for mother education level, taking the value 1 if it is primary, otherwise 0.
- Lower Secondary School	A dummy variable for mother education level, taking the value 1 if it is lower secondary, otherwise 0.
- Upper Secondary School and Higher	A dummy variable for mother education level, taking the value 1 if it is upper secondary or higher, otherwise 0.
HH Consumption Level (Base group: Quintile 1 and Quintile 5 is the richest group)	
- Quintile 2	A dummy variable for household consumption level, taking the value 1 if the second consumption quintile, otherwise 0.
- Quintile 3	A dummy variable for household consumption level, taking the value 1 if the third consumption quintile, otherwise 0.
- Quintile 4	A dummy variable for household consumption level, taking the value 1 if the fourth consumption quintile, otherwise 0.
- Quintile 5	A dummy variable for household consumption level, taking the value 1 if the highest consumption quintile, otherwise 0.

Variable	Definition
Village Characteristics and Supply Side (Village and District Level)	
Student-Teacher Ratio	Average student-teacher ratio at the district level
School Shift	Average number of school shift at the district level
Female Teacher Ratio	Average female male teacher ratio at the district level
Distance to Primary School	Distance from village to the nearest primary school
Distance to Lower Secondary School	Distance from village to the nearest lower secondary school
Electricity	The percentage of household with access to electricity in the village
Pipe Water	The percentage of household with access to piped water in the village
Industrial Area	Dummy variable taking the value 1 if the village is located in an industrial area, otherwise 0.
Distance to Credit	Distance in kilometer from village to the nearest credit institute
Distance to Ago Farm	Distance in kilometer from village to the nearest agricultural farm
Distance to Market	Distance in kilometer from village to the nearest market
Ln Local Wage	Natural logarithms of mean local unskilled wage
2SLS Instrument Variables	
Disaster in 2008	Dummy variable taking the value 1 if there is any disaster happening in the previous year (2008) in the village, otherwise 0.
Distance to Provincial Town	Distance in kilometer from the village to the provincial town.
Remittance Norm	The share of remittance-recipient households to the number of total households in the village.

Source: Created by the author using CSES (2009).

In the Research Question 1, to solve the endogeneity issue of remittances, the study applies a set of instrument variables namely disaster, distance to provincial town, and remittance norm. The disaster in 2008 is represented by a dummy variable which takes the value 1 if the village where household j of child i resides is affected by any unexpected shocks of disasters (such as flood, draught, crop damage, fire) in the past 12 months before the survey. Distance to provincial town is a continuous variable simply measured by the distance in kilometer from the village where child i resides to the provincial town. In this study, the remittance norm is proxied by the share of remittance recipient households to the total number of households in the

village where a child i resides. Table 4.2 shows the descriptive statistics for all the variables used for the analysis in both Research Question 1 and Research Question 2, this study, including the instrument variables used in the 2SLS analysis. In the descriptive statistics, mean, standard deviation, minimum value, and maximum value is reported for each variable.

Table 4.2. Summary Statistics of Variables

Variable	Obs	Mean	Std. Dev.	Min	Max
Dependent Variables					
Completed Grade of Education	15,306	3.58	2.91	0	11
Working Hours	15,306	12.13	18.92	0	70
Independent Variables					
Migration Type					
- Within-province	15,306	0.09	0.29	0	1
- Across-province	15,306	0.07	0.26	0	1
- International	15,306	0.02	0.15	0	1
Remittance (Ln form)	15,306	3.51	5.63	0	18
Individual Characteristics					
Male	15,306	0.52	0.50	0	1
Age	15,306	11.62	3.47	6	17
Age Squared	15,306	147.07	80.61	36	289
Family Characteristics					
Urban	15,306	0.17	0.38	0	1
HH Head Age	15,306	44.57	10.68	12	94
HH Head is Male	15,306	0.83	0.37	0	1
# of Adult member	15,306	2.91	1.30	0	10
# of Child member	15,306	3.03	1.36	1	9
Loans (Ln form)	15,306	5.79	6.74	0	18
After July	15,306	0.41	0.49	0	1
Father Education					
- Primary	15,306	0.38	0.49	0	1
- Lower Secondary School	15,306	0.19	0.39	0	1

Variable	Obs	Mean	Std. Dev.	Min	Max
- Upper Secondary School and Higher	15,306	0.09	0.28	0	1
Mother Education					
- Primary	15,306	0.44	0.50	0	1
- Lower Secondary School	15,306	0.12	0.33	0	1
- Upper Secondary School and Higher	15,306	0.04	0.20	0	1
HH Consumption Level					
- Quintile 2	15,306	0.22	0.41	0	1
- Quintile 3	15,306	0.19	0.40	0	1
- Quintile 4	15,306	0.16	0.37	0	1
- Quintile 5	15,306	0.13	0.34	0	1
Village Characteristics and Supply Side (District Level)					
Student Teacher Ratio	15,306	44.00	13.73	19.72	98
School Shift	15,306	1.42	0.18	1.06	2
Female Teacher Ratio	15,306	37.24	12.19	8.79	68
Distance to Primary School	15,306	0.58	1.09	0	12
Distance to Lower Secondary School	15,306	3.47	4.94	0	50
Electricity	15,306	23.96	37.12	0	100
Pipe Water	15,306	15.28	32.13	0	100
Industrial Area	15,306	0.46	0.50	0	1
Distance to Credit	15,306	7.06	10.01	0	80
Distance to Ago Farm	15,306	8.63	10.08	0	100
Distance to Market	15,306	17.63	22.35	0	400
Ln Local Wage	15,306	8.16	10.53	0	90
2SLS Instrument Variables					
Disaster in 2008	15,306	0.36	0.48	0	1
Distance Provincial Town	15,306	38.08	28.20	0	150
Remittance Norm	15,306	32.63	22.32	0	100

Source: Created by the author using CSES (2009).

4.4.3. Descriptive Analysis

This sub-section presents the descriptive statistics derived from the CSES 2009 so as to provide a broad understanding around the topics of the completed grade of education and working hours of children as well as about the migration and remittances.

Completed Grade of Education

The first objective of this study is to examine the impact of migration and remittances on the completed grade of education in Cambodia. Table 4.3 and Table 4.4 provide a glimpse of the situation about the completed grade of education by children's age cohorts. Table 4.3 indicates that there are no noticeable differences in the completed grade of education between children of different types of migrant households. Nevertheless, children of within-province migrant households appear to have a slightly lower average completed grade of education. The official age to enroll in the first grade of primary school in Cambodia is six years old. Children enter the first grade at the age of six and should complete grade 6 (the end of primary school cycle) at the age of 12 and grade 9 (the end of lower secondary school cycle) at the age of 15, provided they do not drop out of school and are promoted every year without grade repetition. However, the descriptive data analysis reveals that by the ages of 12 and 15, children, on average, only complete 3.89 and 5.79 years of education. This low performance of grade completion can be the result of the late entrance to the primary school, grade repetition, and dropout.

Table 4.3. Average Completed Grade of Education by Age Cohort and Migration Status

Migration Status / Age	6	7	8	9	10	11	12	13	14	15	16	17
Non-Migrants	0.17	0.62	1.20	1.84	2.48	3.29	3.94	4.67	5.30	5.84	6.39	6.79
Within-Province Migrants	0.09	0.45	0.96	1.63	2.14	2.87	3.45	4.33	5.01	5.32	5.65	6.40
Across-Province Migrants	0.16	0.58	1.28	1.89	2.45	3.05	4.02	4.74	5.33	5.98	6.24	6.56
International Migrants	0.10	0.52	0.91	2.30	2.24	3.18	3.95	3.89	5.00	5.76	6.12	7.24
Total	0.16	0.60	1.18	1.84	2.45	3.23	3.89	4.62	5.26	5.79	6.26	6.73

Source: Created by the author using CSES (2009)

When the samples are categorized by gender and residency, the descriptive statistics show noticeable gaps between children living in rural and urban areas, but little difference between male and female children. The average completed grade of education among rural and urban children at the age of 12 is 3.69 and 4.96 respectively. The difference in average completed grade of education between these two groups is 1.28 years of education. By the age of 17, the difference increases to 2.20 years of education. The difference in an educational performance captured by the completed grade of education between male and female is much less apparent, in particular among children in urban areas. In rural areas, surprisingly girls seem to have a slightly higher average of the completed grade of education.

Table 4.4. Average Completed Grade of Education by Age Cohort, Gender, and Area

Gender and Area	6	7	8	9	10	11	12	13	14	15	16	17
Female Rural	0.15	0.60	1.21	1.84	2.41	3.27	3.86	4.50	5.21	5.72	5.89	6.32
Male Rural	0.15	0.52	1.00	1.60	2.25	2.96	3.51	4.32	4.85	5.31	5.96	6.28
All Rural	0.15	0.56	1.11	1.72	2.33	3.11	3.69	4.41	5.02	5.49	5.93	6.30
Female Urban	0.27	0.89	1.56	2.62	3.18	3.92	5.17	5.50	6.54	7.12	7.87	8.44
Male Urban	0.17	0.83	1.63	2.19	3.15	3.94	4.80	5.72	6.27	6.94	7.66	8.56
All Urban	0.22	0.86	1.59	2.40	3.16	3.93	4.96	5.62	6.41	7.03	7.77	8.50

Source: Created by the author using CSES (2009)

Working Hours of Children

Based on the CSES 2009, around 40% of children age between 6 and 17 years old are engaged in economic activities. The working ratios of males and females are almost similar, although males have a slightly higher working percentage. As shown in Table 4.5, children begin to involve in economic activities as early at the age of six years old (6.88%), and by the age of 13, around half of them are reported to work at least one hour a week. The average hours worked by children at the age of six is 1.25 hours per week. This small amount of average working hours is due to the fact that most of the children at this age do not work. If we restrict the sample to working children only, the average weekly hours worked of children at the age of six is 14.28 hours (about 2 hours per day) for girls and 21.24 hours (about 3 hours a day) for boys. Among working children, the average hours worked for children aged 14 and 17 are approximately 30 hours and 40 hours per week respectively. At the older age, there is very little difference in a number of hours worked between males and females.

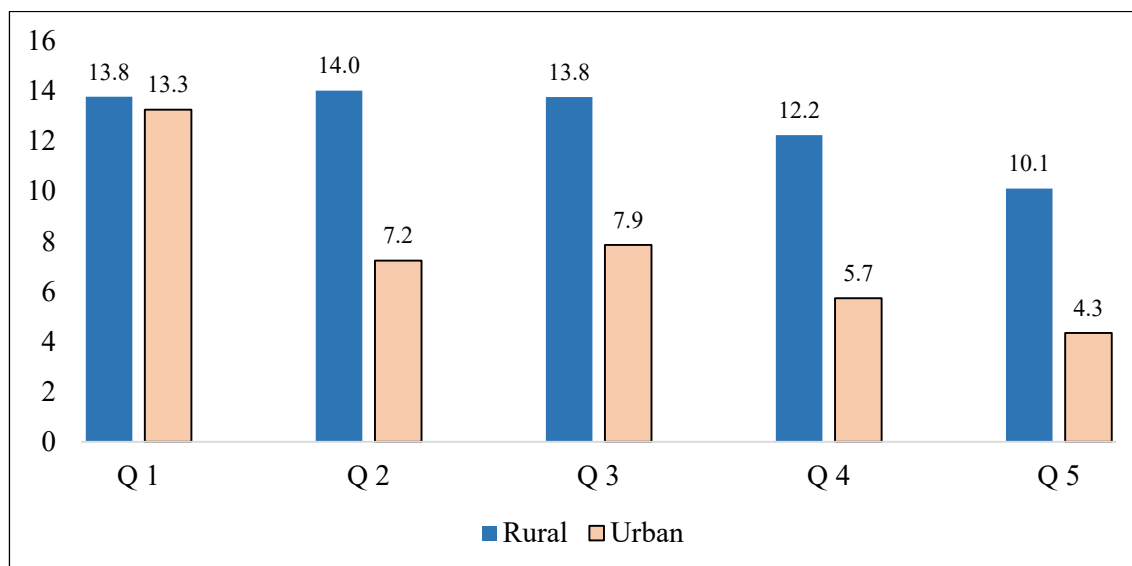
Table 4.5. Percentage of Working Children and Working Hours by Children Aged 6-17

Age	Percentage of			Average Hours Worked					
	Working Children			All Children			Working Children Only		
	F	M	All	F	M	All	F	M	All
6	6.43%	7.29%	6.88%	0.92	1.55	1.25	14.28	21.24	18.16
7	11.55%	10.86%	11.19%	1.92	1.87	1.89	16.61	17.24	16.93
8	16.26%	18.78%	17.54%	3.04	4.00	3.53	18.68	21.32	20.11
9	22.71%	22.12%	22.41%	4.63	4.47	4.55	20.40	20.19	20.30
10	31.65%	30.99%	31.31%	6.82	7.01	6.92	21.56	22.63	22.11
11	35.41%	38.01%	36.72%	8.45	8.96	8.71	23.87	23.56	23.71
12	41.46%	44.84%	43.20%	9.89	11.92	10.93	23.85	26.59	25.31
13	50.00%	50.87%	50.45%	13.91	13.96	13.93	27.81	27.44	27.62
14	53.31%	56.18%	54.81%	16.92	16.02	16.45	31.75	28.51	30.01
15	63.68%	60.53%	61.95%	20.86	20.28	20.54	32.76	33.51	33.16
16	64.12%	69.37%	66.86%	24.25	25.41	24.85	37.81	36.63	37.17
17	69.69%	70.80%	70.25%	28.03	28.28	28.16	40.23	39.94	40.08
All	39.44%	40.93%	40.21%	11.90	12.35	12.13	30.17	30.16	30.16

Source: Created by the author using CSES (2009).

On an average of the sampling, children work 12.13 hours a week, but poor children in the lowest consumption quintile (13.74 hours per week) are likely to work twice longer than affluent children of top consumption quintile (7.09 hours per week). As illustrated in Figure 4.2, indicating average hours worked by area and consumption quintiles (Q1 is the lowest consumption group), it suggests some interesting patterns of working hours of children. In the lowest consumption group, urban and rural children work about the same hours around 13 to 14 hours per week. However, in the top consumption quintile, there is a huge gap in working hours between rural and urban children. Furthermore, there is little difference in hours worked among children from consumption Q1, Q2, and Q3 in rural areas.

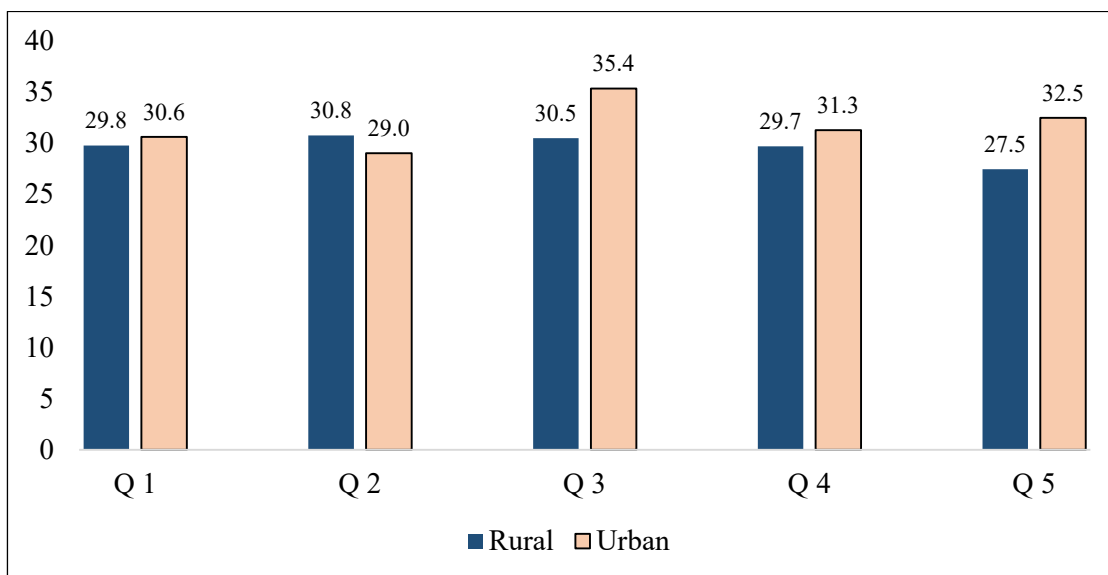
Figure 4.2. Average Working Hours of Children by Area and Consumption Quintiles (All Children)



Source: Created by the author using CSES (2009).

Since the proportion of non-working children greatly vary by consumption level, it is also important to look into the hours worked by children among the sub-sample restricted to working children only (Figure 4.3). Once the sample is restricted to working children, the average weekly hours worked increases noticeably from 12.13 hours to 30.16 hours. Surprisingly, in contrast to the unrestricted sample, in the restricted working children's sub-sample the average hours worked of urban children is now slightly higher than their rural peers: 31.82 hours and 30.01 hours respectively. In addition, Figure 4.3 indicates that working hours of children among different consumption quintile groups are roughly the same, ranging between around 29 hours to 30 hours per week.

Figure 4.3. Average Working Hours of Children by Areas and Consumption Quintiles (Working Children Only)



Source: Created by the author using CSES (2009).

Migration by Destination

Table 4.6. Children by Household Member's Migration Status

	Migrant Children	Non-Migrant Children	Total	Migration by Destination			Total
				Within-province	Across-province	International	
Total	2,945 19.24%	12,361 80.76%	15,306 100%	1,446 49.1%	1,134 38.51%	365 12.39%	2,945 100%
Rural	2,618 20.61%	10,082 79.39%	12,700 100%	1,314 50.19%	997 38.08%	307 11.73%	2,618 100%
Urban	327 12.55%	2,279 87.45%	2,606 100%	132 40.37%	137 41.9%	58 17.74%	327 100%

Source: Created by the author using CSES (2009).

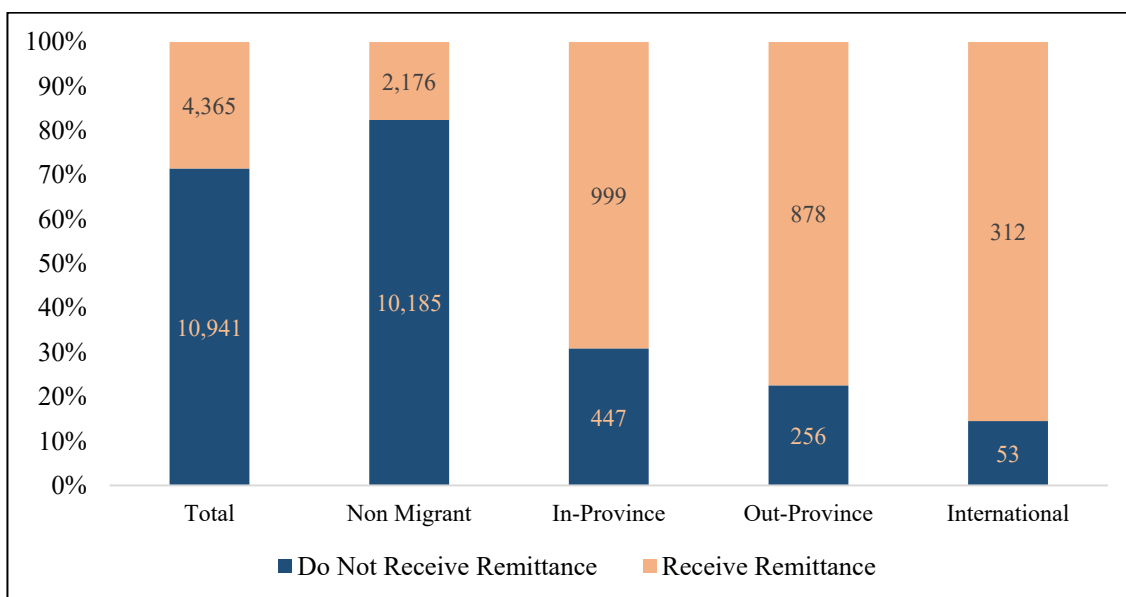
Table 4.6 shows the number of observations used in this study by destinations of household migrant members as the corresponding percentage. Nearly 20% of children in the sample are living in households with at least one

migrant member in 2009. However, if children are grouped by the region, only about 12% of the children in urban areas have migrant members. When the sub-sample of migrant-household children is further divided by migration destinations, almost half of them are from households whose migrant members are those migrating within the same province or municipality. In comparison to rural areas, individuals in urban areas are more likely to migrate outside their provinces or municipalities. Urban migrants are, in particular, more likely to opt for the international destination than their rural counterparts. International migration ratios for rural and urban are 11.73% and 17.74% respectively.

Remittances

Figure 4.4 shows that about 30% of households (or 4,365 out of 15,306 households) received remittance from relatives or others living in Cambodia or abroad in the last 12 months. Even among households without migrant members, around 18% of the households received remittances. Although not all households with migrant members receive remittance, a majority of them rely on remittance as an additional source of income. It is especially true among households of international migration which around 85% (312 out of 365) of the households have transferred incomes.

Figure 4.4. Number of Households with and Without Remittances



Source: Estimated by the author using CSES (2009).

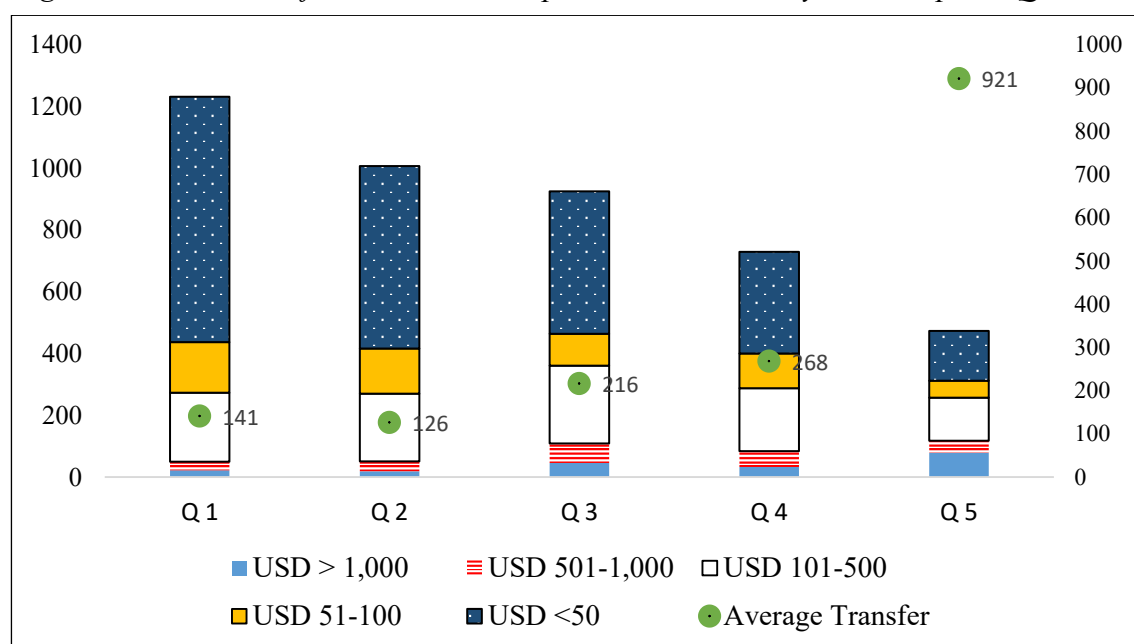
Less than a third (29%) of the sample children are in remittance recipient households. Table 4.7 displays the percentage of recipient households by migration destination. As expected, households without migrant members are the least likely to receive any transfer incomes (17.06%). In contrast, 85.48% of households with international migrant members received remittances in the past 12 months. For households whose members domestically migrated within the same provinces and away from their provinces, the remittance recipient rate is 69.09% and 77.43% respectively. Among the remittance recipient households, both non-migrant and within-province groups are likely to receive a small amount of transfer. More than 60% of these groups received less than USD 50 of transfer during the last 12 months. For the households with international migrant members, the remittance amount is noticeably high, as approximately a third of those group received more than USD 500 in the past 12 months.

Table 4.7. Remittance Recipient Households and Remittance Amount by Migration Destinations

	Remittance		Among Remittance Recipients				
	Non-Recipient	Recipient	USD > 1,000	USD 501-1,000	USD 101-500	USD 51-100	USD <50
Non-Migrant	82.40%	17.60%	4.60%	4.00%	18.93%	12.22%	60.25%
Within-province	30.91%	69.09%	1.80%	2.00%	15.72%	10.51%	69.97%
Across-province	22.57%	77.43%	3.19%	6.38%	37.59%	19.02%	33.83%
International	14.52%	85.48%	16.99%	16.03%	44.23%	13.46%	9.29%

Source: Estimated by the author using CSES (2009).

Figure 4.5. Number of Remittance Recipient Households by Consumption Quintile



Source: Estimated by the author using CSES (2009).

Figure 4.5 shows there are more remittance recipient households in absolute term among the poorest group (Quintile 1). However, the majority of them (794 out of 1,231) receive less than USD 50 in the past 12 months and only a small proportion of them collect annual transfer with the amount of USD 500 or more. Among the

remittance receipts in this group, the average transfer is USD 141. The average amount of remittance among the second poorest consumption quintile is the lowest, at USD 126. On the other hand, the richest group (Quintile 5) in average receive remittance with the much higher amount (USD 921) during the past 12 months, and around 17% of the transfers is over USD 1,000.

CHAPTER 5 :

RESULTS

This chapter of the dissertation presents both some basic descriptive analysis and findings from the empirical estimations mentioned in the previous chapter to examine the impact of migration and remittances on children's completed grade of education as well as the effect of migration and remittance on the left-behind children's working hours. There are two key outcomes of interests (dependent variables), namely the completed grade of education and hours worked by children aged between 6 and 17 years old. The main explanatory variables in the study are remittances and migration.

This chapter is further divided into two sections in correspondence to the two main research questions. The first section initially examines the overall effects of remittances and migration by destination on the completed grade of education of the targeted children. Furthermore, the study also explores their effects by urban and rural areas. Different from previous studies including the study in Cambodia by Iwasawa et al. (2014); Hing et al. (2014); Roth and Tiberti (2016), the study then further investigates the impact of remittances on the completed grade of education by the sub-samples of migration by destination. Following the similar format, the second and last section first explores the effect of remittances and migration by destination on children's working hours and then scrutinizes remittance effects on hours worked by children by migration destination. All the results reported in the empirical analysis are estimated with robust standard adjustment.

5.1. Effects of Migration and Remittances on Completed Grade of Education

This sub-section presents the findings in response to the Research Question 1, regarding the effect of migration by destination and remittances on the completed grade of education. It first presents the findings on the overall effects of migration by destination and remittances, and then further reveals their effects in rural and urban areas. The last part of this sub-section presents the impact of remittances on the completed grade of education by the sub-samples of migration by destination.

5.1.1. Overall Effects of Migration and Remittances on Completed Grade of Education

First, the study begins with the simple OLS estimation to examine the relationship between migration by destination and completed grade of education, as well as between remittances and completed grade of education. In the estimation results reported in Table 5.1 in Models (1) and (4), remittances are excluded from the estimations, while migration by destination, in turn, is excluded in Models (2) and (5). In the end, both migration and remittances are incorporated in Model (3) and (6). In all models, individual (gender, age and age square) and household characteristics (residency, household head's gender, household head's age, number of adult members, number of child members, household's outstanding loans, month of survey, parents' education level and household consumption level) are included as controlling variables. Only the key findings related to migration and remittances are reported in Table 5.1. The full estimation results can be found in Appendix Table A.1.

In the study, migration is categorized as dummy variables and is grouped by migration destinations: within-province; across-province; and international migration. The base or comparison group is the children of non-migrant households;

therefore, the interpretation of the migration effect by destination is the comparison to the children of non-migrant households. Without controlling for the remittance factor, only within-province migration indicates a significant negative relationship with the completed grade of education (Model 1), while across-province and international migration do not show any significant relationship with the completed grade of education. Even when supply-side factors (school shift, female teacher ratio, distance to primary school and distance to lower secondary school) are controlled for, the results are very similar (Model 4). In theories, migration has a negative effect on children's learning attainments, but in the meantime, migration brings about the tangible benefits through remittances, which are commonly found to have positive effects on children's learning attainment. Hence, a plausible reason why there is no significant relationship between migration (across-province and international) and the completed grade of education, could be because the negative effects of migration are canceled out by remittances sent from migrant members. Different from the across-province and international migration, it seems that the positive impact generated from relatively small remittances on children of within-province migrant households is not sufficient enough to cancel out the negative effect of migration. In addition, as clearly shown in the descriptive analysis in Chapter 4, it indicated that the remittance amount received by the within-province group is very small in comparison to the across-province and international groups. Nearly 70% of the remittances received by within-province migrant households in the last 12 months is less than USD 50 (Table 4.7)

On the other hand, when migration is not controlled for in the model, the results from Model (2) suggest that remittances are positively associated with the completed grade of education, with a statistical significance at the 5% level; however, the significant positive relationship disappears when the supply side factors are added to the model (Model 5). In other words, although, in general, there

is a positive relationship between remittances and the completed grade of education, this relationship is wiped out when the supply side factors are added to the models.

Table 5.1. OLS Results on Completed Grade of Education

VARIABLES	Without Supply-side Factors			With Supply-side Factors		
	(1)	(2)	(3)	(4)	(5)	(6)
Within-province	-0.253*** (0.055)		-0.295*** (0.057)	-0.208*** (0.055)		-0.227*** (0.056)
Across-province	0.069 (0.057)		0.012 (0.060)	0.029 (0.056)		0.003 (0.059)
International	0.122 (0.097)		0.047 (0.100)	0.095 (0.096)		0.062 (0.099)
Ln Remittances		0.006** (0.003)	0.008*** (0.003)		0.002 (0.003)	0.004 (0.003)
Individual Characteristic	Yes	Yes	Yes	Yes	Yes	Yes
Family Characteristic	Yes	Yes	Yes	Yes	Yes	Yes
Supply-side Factors	No	No	No	Yes	Yes	Yes
AIC	60,160	60,184	60,154	59,738	59,754	59,738
BIC	60,343	60,352	60,345	59,959	59,960	59,967
Likelihood Ratio Test						
LR chi2 (5)				432.38	439.83	426.06
Prob > chi2				(0.000)	(0.000)	(0.000)
Observations	15,306	15,306	15,306	15,306	15,306	15,306
R-squared	0.649	0.648	0.649	0.659	0.658	0.659

Source: Estimated by the author using CSES (2009) and EMIS (2008/2009).

Standard errors in parentheses.

*** p<0.01, ** p<0.05, and * p<0.10 indicates significance at the 1%, the 5%, and 10% level.

In the Model (3), migration by destination and remittances are included in the estimations model. By including them together in the same model, it is possible to partial out the remittance effects that is associated with the migration, as well as

partial out migration effect that is associated with the remittance. The results are similar: children of households with within-province migrant members are found to be associated with lowering the levels of the completed grade of education, while children whose families received more remittances are likely to have a higher completed grade of education. However, there is a slight increase in the coefficient's magnitudes of both explanatory variables. This suggests that if children lose member(s) owing to migrating within the same province, but their families do not obtain any financial support through remittances, the negative effect of within-province migration can be worse. Similarly, children in families receiving remittances without having to send members away from home would benefit more from remittances.

Besides the migration by destination and remittances, children's and families' characteristics are added as controlling variables (See the Appendix's Table A.1). Males seem to be outperformed by their female peers and children in urban areas are likely to have a higher completed grade of education. Number of children in the household and the amount of outstanding loans are found to be negatively associated with the completed grade of education as well. In Cambodia, the school academic year is ended in July; therefore, if the interview is conducted after July, children who are in the school system at the time of interview are promoted to the next grade, defined by the results of the examinations. To control for this issue, the study adds a dummy variable (After July 2009), to capture if a household is interviewed before or after July 31. As expected, the results suggest that if children's information is collected after July, they are likely to have a higher level of grade completion.

A uniqueness of this study is the inclusion of the supply-side factors as controlling variables in the estimation. To test whether adding supply-side factors into the model makes the model more fit, the study uses the Akaike Information Criteria (AIC) and Bayes Information Criteria (BIC) for the model comparison. A

smaller value of AIC and BIC indicates a better fit, and normally more preferable. As an extension from Model (1), Model (2), and Model (3), the supply-side factors are added in the Model (4), Model (5), and Model (6) respectively. In the models with the supply-side factors controlled for, Model (4) has a slightly higher value of AIC, while Model (5) and (6) have a slightly lower value of AIC. Although the results are rather inconclusive, it seems that it is more efficient to include the supply-side factors in the estimation and migration and remittances at the same time. In addition, since the models without supply-side factors are nested in the models with supply-side factors, the study also use the likelihood ratio tests for comparing the goodness of fit between the models. With five degrees of freedom, the chi-squared value of the likelihood tests between model (1) and (4) is 432.38, between model (2) and (5) is 439.83, and between model (3) and (6) is 426.06. All are significant at the 1% level, indicating that adding the supply-side factor results in significant improvement in the fitness of models. The full results that include supply-side factors are available in Appendix Table A.1.

Even after controlling for the supply-side factors, the negative effects of within-province migration on the completed grade of education is still statistically significant at the 1% level, although its coefficient's magnitude slightly declines from -0.253. to -0.208, Model (1) and (4). The coefficients of across-province and international migration remain statistically insignificant. However, the coefficient of remittances turns to be insignificant when the supply-side factors are added in the model (5) and (6). The unstable coefficient of remittances is probably due to the correlation between the unobservable factors (or error terms) and the dependent variable (the completed grade of education). For this reason, the 2SLS approach is applied for the analysis in the latter part of this subsection.

Regarding the supply-side factors, holding other factors constant at means, the results suggest that the student-teacher ratio is negatively associated with

children's completed grade of education. In other words, students in districts with the high student-teacher ratio (teacher shortage in this regard) are likely to complete a lower grade of education. Female teacher ratio is found to have a significant and positive correlation with completed grade of education. Distance from the nearest primary school and lower secondary school also appears to negatively affect children's completed grade of education: the further the distance is, the lower grade of education of a child completes.

2SLS Approach

To address the endogeneity problem of remittances and the correlation between the error terms and the completed grade of education, the 2SLS approach is applied in this study in addition to the conventional OLS. Since there are three types of migration by destination in this study, it is technically challenging to address the endogenous issues of migration by type. Therefore, the 2SLS in this study addresses the endogenous issue of remittances only³¹. For the relevance of the instruments, the F-statistics, the post-estimation after the first-stage regression are performed. In addition, tests to determine whether endogenous regressor (remittances) in the model are in fact exogenous. Normally, without adjusted error-terms, it can be performed using the Durbin and Wu-Hausman test to reject the null hypothesis that remittances are exogenous. However, since the 2SLS estimation in this study is done with adjusted the robust standard-errors using the vce (robust) command, it uses the Woodridge (1995)'s robust score test and the robust regression-based test to check the validity of the instruments. In most cases, the results from the two tests are very

³¹ In contrast to remittances, with or without adding the supply-side factors, the OLS's estimations provide similar results related to the migration. These findings suggest that the endogenous issues of migration are less problematic or server in comparison to remittances.

similar. If the endogenous tests report a statistical significance, the variables being tested (remittances in this study) is treated as endogenous.

In all specifications reported in Table 5.2, the F-statistics suggest that the set of instruments are jointly and statistically significant at the 1% level, rejecting the null hypothesis that the instruments are weak. This implies that the instruments are strongly correlated with remittances and can be reliable for the 2SLS estimators. In the validity tests, the robust score and robust regression-based tests also report a statistic significant at the 1% level, suggesting that remittances in each specification is endogenous and needs to be corrected with the instrument variables, as commonly employed by many previous studies mentioned in Chapter 3.

Because the instruments of the 2SLS are only applied for remittances, this sub-section only interprets the results related to remittances. For the interpretation of the effects of migration by destination on the completed grade of education, it is more appropriate to use the results from the OLS estimations. In the OLS estimations, the effect of remittances on completed grade education is inconsistent as it changes from significantly positive to statistically insignificance after the supply-side factors are added in the model (Table 5.1). However, in the 2SLS, remittances are consistently found to have a positive impact on the completed grade of education at the 1% level in both types of the model (with or without supply-side factors). In addition, the coefficients of remittances are much larger in the 2SLS models. Similar to the OLS findings, the coefficient of remittances increases from 0.052 (Model 1) to 0.061 (Model 2), after migration factors are added into the model. In other words, the positive mixed effect of remittances is bigger than the aggregate effect of remittances, because its impact is partially canceled out by the negative effect of migration.

Table 5.2. 2SLS Results on Completed Grade of Education

VARIABLES	Without Supply-side Factors		With Supply-side Factors	
	(1)	(2)	(3)	(4)
Within-province		-0.552*** (0.066)		-0.384*** (0.066)
Across-province		-0.342*** (0.075)		-0.209*** (0.074)
International		-0.411*** (0.116)		-0.212* (0.114)
Ln Remittances	0.052*** (0.006)	0.061*** (0.007)	0.030*** (0.006)	0.035*** (0.007)
Individual Characteristic	Yes	Yes	Yes	Yes
Family Characteristic	Yes	Yes	Yes	Yes
Supply-side Factors	No	No	Yes	Yes
Weak Instruments				
F statistics	1347.69***	1223.76***	1063.31***	968.10***
(p-value)	(0.000)	(0.000)	(0.000)	(0.000)
Endogeneity				
Robust score chi2	71.85***	25.96***	68.34***	23.25***
(p-value)	(0.000)	(0.000)	(0.000)	(0.000)
Robust regression F	71.84***	25.92***	68.25***	23.19***
(p-value)	(0.000)	(0.000)	(0.000)	(0.000)
Observations	15,306	15,306	15,306	15,306
R-squared	0.649	0.648	0.659	0.658

Source: Estimated by the author using CSES (2009) and EMIS (2008/2009).

Standard errors in parentheses.

*** p<0.01, ** p<0.05, and * p<0.10 indicates significance at the 1%, the 5%, and 10% level.

In the Model (3) and (4), the supply-side factors are included in addition to the estimations. In both models, remittance effects become slightly weaker when the supply-side factors are controlled for; however, it remains positively significant at the 1% level. Specifically, by controlling for the supply-side factors, the aggregate effects of remittances drop from 0.052 to 0.030, as seen in columns (1) and (3), while the mixed effects of remittances decline from 0.061 to 0.035 in

columns (2) and (4). Yet, all remittance coefficients reported in all the 2SLS estimations are significant at the 1% level.

5.1.2. Effects of Migration and Remittances on Completed Grade of Education in Rural and Urban Areas

Due to the differences in nature of the regional characteristics between rural and urban areas, the study also examines if the effects of migration and remittances vary by regions where children reside. Table 5.3 summarizes the OLS results of the effects of migration by destination and remittances on the completed grade of education of children by rural and urban areas with and without supply-side factors. Columns (1) and (2) show the results from the rural and urban sub-sample respectively without controlling for the supply-side factors, while the results with the supply-side factors are reported in column (3) and (4). The same individual and family characteristics used in the earlier sub-section are included in all the estimation; however, for the sake of simplicity, its results are omitted in the table. The full OLS estimation results can be found in Appendix's Table A.3.

Table 5.3. OLS Results on Completed Grade of Education by Region

VARIABLES	(1)	(2)	(3)	(4)
	Without Supply-side Factors		With Supply-side Factors	
	Rural	Urban	Rural	Urban
Within-province	-0.276*** (0.061)	-0.286** (0.144)	-0.195*** (0.060)	-0.282* (0.144)
Across-province	0.012 (0.065)	0.019 (0.152)	0.008 (0.064)	-0.017 (0.151)
International	0.104 (0.109)	-0.321 (0.242)	0.121 (0.108)	-0.337 (0.243)
Ln Remittances	0.009*** (0.003)	0.011* (0.006)	0.003 (0.003)	0.010 (0.006)
Individual Characteristic	Yes	Yes	Yes	Yes
Family Characteristic	Yes	Yes	Yes	Yes
Supply-side Factors	No	No	Yes	Yes
AIC	50,003	9,787	49,606	9,770
BIC	50,181	9,928	49,822	9,940
Likelihood Ratio Test				
LR chi2 (5)			406.55	26.51
Prob > chi2			(0.000)	(0.000)
Observations	12,700	2,606	12,700	2,606
R-squared	0.617	0.762	0.629	0.764

Source: Estimated by the author using CSES (2009) and EMIS (2008/2009).

Standard errors in parentheses.

*** p<0.01, ** p<0.05, and * p<0.10 indicates significance at the 1%, the 5%, and 10% level.

In the results, the migration effects in the urban-rural sub-sample analysis are similar to the overall effects of migration by destination reported earlier: only the within-province migration has negative association with the completed grade of education, while across-province and international migration have no significant correlation with the completed grade of education. It is worth noting that the

migration effects are measured in comparison to non-migrant households. The urban-rural analysis also suggests a slight difference in magnitude of the within-province migration effects and that of the other two groups, especially when the supply-side factors are controlled for.

In the models without the inclusion of the supply-side factors, the within-province migration's negative effects among the rural and urban children are roughly the same. The coefficient of the within-province migration is -0.276 for the rural and -0.286 for urban children. The gap is more noticeable when the supply-side factors are added to the specification in Models (3) and (4). For the rural sub-sample, the negative effects of the within-province migration decline from -0.276 to -0.195, but in the urban sub-sample, there is a little change in the size of the coefficient. In other words, the effects of the within-province migration among urban children are not sensitive to the supply-side factors. Regarding the issue of whether the inclusion of the supply side factors make the models more fit, the AIC values suggest that for both urban and rural models, it is better to include the supply-side factors in the specification. The likelihood ratio tests produce the same results, although the value of the chi-squared for the urban sample is much lower in comparison to the rural sample.

The OLS estimations by the regional sub-samples only confirm the positive relationship between remittances and the completed grade of education among rural children in Model (1) and urban children in Model (2) when the supply-side factors are not controlled for. These positive correlations turn statistically insignificant when the supply-side factors are added in Model (3) and Model (4). Due to the endogeneity nature of remittances, the interpretation of the remittance effects is based on the 2SLS results reported below.

The same set of instrument variables are used for the 2SLS estimations by region. The large values of F-statistics from the first-stage regression in all

specifications suggest that the set of instruments used are good and strong enough. The test of endogeneity confirms that the remittance variable is endogenous, and therefore, it is more appropriate to use the 2SLS approach to correct the endogenous issue. The summarized results from the 2SLS estimation are presented in Table 5.4. Columns (1) and (2) show the estimation results without controlling for the supply-side factors for the rural and urban sub-samples respectively, while the results with the supply-side factors are in columns (3) and (4). The full results of the 2SLS estimations by urban-rural sub-samples can be found in Appendix's Table A.4.

The findings from the 2SLS results consistently indicate that remittances have a significant and positive impact on the completed grade of education in both rural and urban areas. In the models without the supply-side factors, the impact of remittances on the completed grade of education is stronger among children living in rural areas in terms of coefficient magnitude. However, the remittance impact among rural children is relatively sensitive to the supply-side factors. When the supply-side factors are added to the specification in Model (3), the impact of remittances drops about half from 0.062 to 0.031. In contrast, among the urban sub-sample, both models (with and without controlling the supply-side factors) yield very similar results. In the models with supply-side factors, the remittance impact on the completed grade of education is roughly the same at 0.048 in Model (2) and at 0.044 in Model (4). All the coefficients of remittances in all models are statistically significant at the 1% level.

Table 5.4. 2SLS Results on the Completed Grade of Education by Region

VARIABLES	(1)	(2)	(3)	(4)
	Without Supply-side Factors		With Supply-side Factors	
	Rural	Urban	Rural	Urban
Within-province	-0.530*** (0.071)	-0.494*** (0.168)	-0.332*** (0.071)	-0.470*** (0.167)
Across-province	-0.352*** (0.081)	-0.198 (0.178)	-0.182** (0.080)	-0.214 (0.176)
International	-0.354*** (0.126)	-0.657** (0.271)	-0.119 (0.125)	-0.636** (0.272)
Ln Remittances	0.062*** (0.008)	0.048*** (0.017)	0.031*** (0.008)	0.044*** (0.017)
Individual Characteristic	Yes	Yes	Yes	Yes
Family Characteristic	Yes	Yes	Yes	Yes
Supply-side Factors	No	No	Yes	Yes
Weak Instruments				
F statistics	904.91***	144.30***	822.62***	143.10***
(p-value)	(0.000)	(0.001)	(0.000)	(0.000)
Endogeneity				
Robust score chi2	58.43***	6.18**	15.00***	5.33**
(p-value)	(0.000)	(0.012)	(0.000)	(0.020)
Robust regression F	58.39***	6.11**	14.96***	5.24**
(p-value)	(0.000)	(0.013)	(0.000)	(0.022)
Observations	12,700	2,606	12,700	2,606
R-squared	0.600	0.756	0.622	0.758

Source: Estimated by the author using CSES (2009) and EMIS (2008/2009).

Standard errors in parentheses.

*** p<0.01, ** p<0.05, and * p<0.10 indicates significance at the 1%, the 5%, and 10% level.

5.1.3. Effects of Remittances on Completed Grade of Education by Migration Destination

To investigate whether remittances influence differently on the children's completed grade of education by different types of migration by destination, the

study further estimates the remittance effects by the sub-sample of migration groups. The study begins with the OLS analysis to examine the correlation between remittances and the completed grade of education, and columns (1), (2), (3) and (4) of Table 5.5 present the OLS results among the sub-samples of non-migrant households, within-province, across-province, and international migrant households respectively. The results without the supply-side factors are shown in the Panel A, while the results with the supply-side factors are shown in the Panel B. The full OLS results of the relationships between remittances and the completed grade of education by migration destination are available in Appendix's Table A.5 and Table A.6.

In the OLS estimations, in the model without supply-side factors, remittances are found to have a positive relationship with the completed grade of education only among non-migrant households (with the magnitude at 0.008 and statistically significant at the 5% level) and international migration households (at 0.017 and statistically significant at the 10% level). However, when supply-side factors are controlled for in the estimation, the positive relationships among the two groups become statistically insignificant. For the within-province and across-province migrant households, the OLS results suggest that there is no correlation between remittances and the completed grade of education both with and without controlling for the supply-side factors. The likelihood ratio tests suggest that models with supply-side factor is better in terms of goodness of fit.

It is also worth noting that the relationship between supply-side factors and the completed grade of education are relatively weak among the within-province and international migrant households (See Appendix Table A.6). For instance, only the student-teacher ratio and distance to lower secondary school are found to have significant relationships with the completed grade of education among the children of within-province migrant households. Only distance to lower secondary schools

is the only factor that is statistically associated with the completed grade of education among children of international migrant households.

Table 5.5. OLS Results on Completed Grade of Education by Migration Type

VARIABLES	(1)	(2)	(3)	(4)
	Non-Migrant	Within-province	Across-province	International
A. Without Supply-side Factors				
Ln Remittances	0.008** (0.004)	-0.002 (0.009)	0.019 (0.019)	0.017* (0.009)
AIC	48,106	5,994	4,552	1,488
BIC	48,269	6,110	4,662	1,574
Observations	12,361	1,446	1,134	365
R-squared	0.660	0.548	0.605	0.630
B. With Supply-side Factors				
Ln Remittances	0.005 (0.003)	-0.007 (0.009)	-0.000 (0.010)	0.010 (0.019)
AIC	47,773	5,964	4,514	1,482
BIC	47,973	6,106	4,650	1,588
Observations	12,361	1,446	1,134	365
R-squared	0.670	0.562	0.623	0.646
Likelihood Ratio Test				
LR chi2 (5)	343.31	39.80	47.29	16.00
Prob > chi2	(0.000)	(0.000)	(0.000)	(0.007)

Source: Estimated by the author using CSES (2009) and EMIS (2008/2009).

Standard errors in parentheses.

*** p<0.01, ** p<0.05, and * p<0.10 indicates significance at the 1%, the 5%, and 10% level.

As discussed earlier, the OLS results only indicate the correlation but not the causal effect of remittances. Therefore, the interpretation of the remittance effect is made based on the 2SLS results. Like the whole sample estimation, the same set of variables are used as instruments to deal with the endogeneity issue of remittances. Again, the test of F-statistics from the first-stage regression and test of endogeneity are conducted in the sub-group estimations to ensure that instruments are strong and

valid to confirm the endogeneity of the remittance variable. The 2SLS results of remittance effect by the sub-samples are reported in Table 5.6. For the relevance of instruments, the F-statistic results indicate that it is significant enough to reject the null hypothesis of weak instruments. However, the endogeneity tests only confirm the validity of the instruments for the non-migration sub-sample and, to some extent, among across-province migrant households ³². For the within-province and international migrant households, the endogeneity tests suggest that the instruments are unable to capture the relationship between remittances and the uncorrelated part in the error terms.

For children living in households without a loss of any members through migration, the results suggest that remittances have a strong impact on the completed grade of education. This group of children benefit from the remittances but do not suffer from the loss of households due to migration. Following Iwasawa et al. (2014), this study considers the remittance effects among this group as the “net effect of remittances.” The net effects of remittances are found to be strong and positive, although their coefficient decrease from 0.065 to 0.043 when the supply-side factors are controlled for. The remittance coefficient in the 2SLS (0.065) is much larger than of the OLS (0.008) and statically significant at the 1% level. It is worth mentioning that only among the non-migration sub-sample that the instruments remain relevant and valid in both models (with and without supply-side factors). Therefore, the positive net effect of remittance among non-migrant households is confirmed in both OLS and 2SLS approaches.

³² The endogeneity tests indicate the validity of the instrument variables in the models without the supply-side factors, while in the models with the supply-side factors, they are not statistically significant.

Table 5.6. 2SLS Results on Completed Grade of Education by Migration Types

VARIABLES	(1) Non-Migrant	(2) Within- province	(3) Across- province	(4) International
A. Without Supply-side Factors				
Ln Remittances	0.065*** (0.008)	0.028 (0.021)	0.063*** (0.019)	0.006 (0.062)
Weak Instruments				
F statistics (p-value)	814.16*** (0.000)	152.66*** (0.000)	97.70*** (0.000)	12.72*** (0.000)
Endogeneity				
Robust score chi2 (p-value)	63.32*** (0.000)	2.598 (0.107)	6.61*** (0.010)	0.050 (0.823)
Robust regression F (p-value)	63.32*** (0.000)	2.560 (0.109)	6.47*** (0.011)	0.046 (0.828)
Observations	12,361	1,446	1,134	365
R-squared	0.657	0.549	0.606	0.630
B. With Supply-side Factors				
Ln Remittance	0.043*** (0.008)	0.016 (0.022)	-0.002 (0.023)	-0.096 (0.074)
Weak Instruments				
F statistics (p-value)	753.97*** (0.000)	127.88*** (0.000)	68.25*** (0.000)	10.17*** (0.000)
Endogeneity				
Robust score chi2 (p-value)	26.748*** (0.000)	1.363 (0.242)	0.011 (0.915)	2.452 (0.117)
Robust regression F (p-value)	26.715*** (0.000)	1.341 (0.246)	0.010 (0.917)	2.269 (0.132)
Observations	12,361	1,446	1,134	365
R-squared	0.671	0.562	0.629	0.619

Source: Estimated by the author using CSES (2009) and EMIS (2008/2009).

Standard errors in parentheses.

*** p<0.01, ** p<0.05, and * p<0.10 indicates significance at the 1%, the 5%, and 10% level.

Again, following Iwasawa et al. (2014), the remittance effects among children of migrant households are called “mixed effect of remittance.” Different from their study, this study decomposes migrant households into three types of migration by destination (not by who the migrants are). Basically, for children living in migrant households, the positive effects of remittances seem to be partially or totally wiped out by the negative effects resulting from the loss of household members. If the positive effects of remittances are stronger than the negative effect of migration, the mixed effect of remittance should remain positive and smaller.

Among the within-province migrant households, the OLS estimations cannot confirm any association between remittances and the completed grade of education, either with or without controlling for the supply-side factors. In the 2SLS approach, the weak instrument test for this sub-group confirms the validity and relevance of the instruments, but the endogeneity test fails to reject the exogeneity of remittances in both models of with and without supply-side factors. Therefore, this study can confirm the impact of remittances among children of the within-province migrant households in both models with and without the supply-side factors.

For the children of across-province migrant households, the OLS estimation detects the association between remittances and the completed grade of education in the model without supply-side factors. This positive effect of remittances is partially confirmed in the 2SLS results, suggesting that remittances are likely to help increase the completed grade of education among this group of children as well. The mixed effects of remittances on children of across-province migrant households (0.063) are slightly lower than the net effects of remittances among children of non-migrant households (0.065). These mixed effects of remittances turn insignificant when the supply-side is added to the model; however, the instruments in the model with supply-side factor are unable to reject the null-hypothesis that remittances are exogenous. Overall, this study can only confirm the positive impact of remittances

among children of the across-province migrant household when the supply-side factors are not controlled for.

For the international migration sub-group, neither the coefficients are statistically significant in both models, nor the robust score chi2 and robust regression tests could reject the exogeneity of remittances. For this reason, this study cannot conclude the impact of remittances among children of international migrant households. Nevertheless, this cannot be ruled out that remittances have no effect on grade completion of education of children among this group either, since the OLS results indicate the positive relationship between remittances and the completed grade of education among this group of children.

5.2. Effects of Migration and Remittances on Working Hours of Children

Before going to the main analysis of the research question 2, the sub-section presents the basic descriptive statistics related to working participation and working hours of children in Cambodia. Table 5.7 shows the percentage of children working by age profile, working status by gender (male and female) and residency (urban and rural) of working children. Not surprisingly, the older the children are, the more likely they are involved in economic activities. By the age of 13, more than half of the children are engaged in economic activities at least one hour a week. The working ratio reaches more than 70% among children aged 17. As illustrated in columns (2) and (3), the probabilities of males and females participating in economic activities in Cambodia are very similar. However, in terms of location, it appears that children in rural areas are much more likely to engage in economic activities in comparison to their urban counterparts.

Table 5.7. Children's Working Participation by Age, Gender, and Area

Age	(1) All	(2) Male	(3) Female	(4) Urban	(5) Rural
6	6.88%	7.29%	6.43%	2.69%	7.77%
7	11.19%	10.86%	11.55%	3.89%	12.49%
8	17.54%	18.78%	16.26%	4.32%	20.02%
9	22.41%	22.12%	22.71%	5.29%	26.05%
10	31.31%	30.99%	31.65%	7.07%	35.42%
11	36.72%	38.01%	35.41%	10.84%	41.02%
12	43.20%	44.84%	41.46%	15.76%	48.56%
13	50.45%	50.87%	50.00%	17.32%	57.43%
14	54.81%	56.18%	53.31%	25.54%	61.14%
15	61.95%	60.53%	63.68%	37.36%	67.77%
16	66.86%	69.37%	64.12%	42.46%	72.36%
17	70.25%	70.80%	69.69%	43.63%	76.81%
Total	40%	41%	39%	20%	44%

Source: Estimated by the author using CSES (2009).

5.2.1. Overall Effects of Migration and Remittances on Working Hours

This study uses the two-step Heckman approach to correct the sample selection bias due to the fact that around 60% (or 9,151 out of 15,306) of children aged between 6 and 17 are not involved in economic activities (Table 5.7). Therefore, without the sample correction, the normal regression estimation is likely to suffer from the sample selection bias issue. There are basically two steps in estimating the children's working-hour function: the first step estimation is to predict the probability of children's participation in economic activities by using a Probit model to obtain a sample selectivity correction term, which is also known as an inverse Mills ratio (Lambda). In this study, the same explanatory variables used in the second step equation are used to estimate the probabilities of children

participating in work in the first step. In the second step (working hours of children equation) estimation, Lambda is included as an additional explanatory variable to obtain the results at what degree of the number of hours a child works.

The empirical results are presented in Table 5.8. From the first-step estimation shown in columns (1) and (3), it is found that the inverse Mills ratio (Lambda) is positive and statistically significant at the 1% level. The statistical significance of the Lambda's coefficient suggests that the normal regression estimates without the sample bias correction would suffer from the sample selectivity bias. It is worth noting that the coefficient results from the first-step equation reported in columns (1) and (3) are raw probit coefficients. To be able to interpret the probit results properly, the coefficients have to be computed into the marginal effects. Therefore, the results from the first step estimation only suggest whether the variables of interest positively or negatively associated with the probability of child work.

First-step Heckman Estimation

In the first-step estimations of both models (without and with controlling for supply-side factors), the relationship between remittances and working participation is negative and statistically significant at the 5% level. In other words, an increase in the remittance amount is associated with lowering the probability of child work in Cambodia. The results also indicate that, by holding other factors including remittances constant at means, the within-province migration is positively correlated with the working incidence of children left behind. In contrast, children in households with members migrating overseas (international migration) are less likely to be engaged in economic activities. The relationship between the across-province migration and working incidence is positive but insignificant. It should be noted that migration by destination is categorized as dummy variables, therefore the

above-mentioned interpretation is in comparison to the base group (children from non-migrant households). These results are consistent even after the supply-side factors are incorporated in the estimation models as controlling variables, although the coefficients become slightly smaller.

The results from the first-step selection model also indicate that older children are more likely to participate in economic activities, while children living in urban areas are less prone to engaging in work. Regarding the household structure, household head's gender and age appear to have no relationship with children's working, but the number of adult and child members are good predictors of the working probability. Children are less likely to work if they have more adult members in the households, yet in contrast their working probability increase when they have more child members in their households. In addition, this study also finds that the father's and mother's education level and household consumption levels are conspicuously influential in the decision-making on whether a child should work or not.

Table 5.8. 2-Step Heckman Results on Children's Working Hours

VARIABLES	(1)	(2)	(3)	(4)
	Without Supply-side Factors		With Supply-side Factors	
	1st Step	2nd Step	1st Step	2nd Step
Within-province	3.659*** (1.130)	0.180*** (0.041)	2.521*** (0.962)	0.165*** (0.042)
Across-province	1.185 (1.277)	0.191*** (0.046)	0.192 (1.099)	0.185*** (0.047)
International	-5.352** (2.095)	-0.162** (0.078)	-4.340** (1.839)	-0.157** (0.079)
Ln Remittance	-0.154** (0.063)	-0.004* (0.002)	-0.123** (0.056)	-0.005* (0.002)
Male	0.450 (0.589)	0.035 (0.023)	0.333 (0.515)	0.037 (0.023)
Age	5.710*** (0.624)	0.199*** (0.004)	4.682*** (0.565)	0.203*** (0.004)
Urban	-11.693*** (2.360)	-0.679*** (0.037)	-3.619*** (1.311)	-0.221*** (0.048)
HH Head Age	0.023 (0.035)	-0.003** (0.001)	0.044 (0.030)	-0.002* (0.001)
HH Head (Male)	-0.329 (0.866)	0.000 (0.034)	-0.639 (0.757)	-0.023 (0.034)
Adult Member	-1.514*** (0.349)	-0.080*** (0.010)	-0.946*** (0.285)	-0.068*** (0.010)
Child Member	0.565** (0.228)	0.008 (0.009)	0.504** (0.201)	0.012 (0.009)
Father Education				
- Primary	-1.364* (0.772)	-0.043 (0.030)	-1.096 (0.674)	-0.047 (0.030)
- Lower Secondary	-4.612*** (0.994)	-0.096*** (0.037)	-3.943*** (0.873)	-0.097*** (0.037)
- Upper Secondary or Higher	-6.582*** (1.512)	-0.172*** (0.053)	-4.971*** (1.302)	-0.124** (0.054)
Mother Education				
- Primary	-1.657** (0.684)	-0.045* (0.027)	-1.067* (0.589)	-0.021 (0.027)
- Lower Secondary	-4.385*** (1.148)	-0.122*** (0.041)	-3.007*** (0.977)	-0.069* (0.042)
- Upper Secondary or Higher	-11.509*** (2.320)	-0.313*** (0.075)	-8.157*** (2.007)	-0.229*** (0.077)
Consumption Quintile				

VARIABLES	(1)	(2)	(3)	(4)
	Without Supply-side Factors		With Supply-side Factors	
	1st Step	2nd Step	1st Step	2nd Step
- Quintile 2	0.107 (0.821)	-0.062* (0.032)	0.694 (0.705)	-0.037 (0.032)
- Quintile 3	-0.186 (0.900)	-0.099*** (0.034)	0.701 (0.759)	-0.056 (0.034)
- Quintile 4	-3.836*** (1.221)	-0.259*** (0.037)	-1.968** (0.976)	-0.188*** (0.038)
- Quintile 5	-8.854*** (1.842)	-0.461*** (0.045)	-5.066*** (1.366)	-0.317*** (0.047)
Electricity			-0.007 (0.017)	-0.004*** (0.001)
Piped Water			-0.069*** (0.022)	-0.005*** (0.001)
Industrial Area			-1.650*** (0.576)	0.027 (0.026)
Distance Restaurant			-0.106*** (0.041)	-0.009*** (0.001)
Distance to Credit			0.121*** (0.037)	0.007*** (0.001)
Distance to Agricultural Farm			-0.041*** (0.012)	-0.000 (0.001)
Distance to Market			0.077** (0.034)	0.003** (0.001)
Ln Local Wage			-0.573 (1.097)	-0.050 (0.046)
Inverse mills ratio		27.434***		19.103***
Lambda		(4.846)		(4.411)
Constant	-60.091*** (10.512)	-1.973*** (0.081)	-37.842*** (13.163)	-1.638*** (0.433)
Observations	15,306	15,306	15,306	15,306

Source: Estimated by the author using CSES (2009) and EMIS (2008/2009).

Standard errors in parentheses.

*** p<0.01, ** p<0.05, and * p<0.10 indicates significance at the 1%, the 5%, and 10% level.

In the model controlling for the supply-side factors, village characteristic variables (electricity, piped-water, industrial area, distance to credit, distance to market, distance to agricultural farm and log of unskilled worker wage) are also

included in the equation. The coefficients of electricity, piped water, and distance to the restaurant are found to be negative and significant in the first-step selection equation. These results suggest that children living in the village in which more households are able to access electricity and piped water are less likely to take part in economic activities. The farther the village is distanced from restaurants, the lower probabilities that children are economically active, meaning that the existence of restaurants can be a pulling factor of a child working incidence. Distance from villages to the nearest markets and the nearest credit institutions are positively associated with child work probabilities. This means that if the village is located far away from downtown markets or credit institutions (translating as having less access to loans from the private micro-finance institution), children are more likely to be economically active.

Second-step Heckman Estimation

The results of the second-step Heckman estimations are reported in Table 5.8's columns (2) and (4) for models with and without supply-side factors respectively. The second-step estimations examine the effects of explanatory variables on working hours of children among the working children in the age group brackets. Consistent with the first-step estimations, the second-step results provide evidence that remittances have negative effects on the working hours of children. Simply put, remittances can reduce household's financial constraints and mitigate the family pressure of putting children in labor forces. In the model without controlling for supply-side factor, the coefficient of remittances (in logarithms) is 0.004 and statistically significant at the 10% level. To put in other words, it is confident at the 90% level that an increase of 10% in remittance amount is associated with a reduction of around 0.04 working hours of children per week (Column 2). The effect is rather small because this is the estimation among working children only. As

mentioned earlier, remittances are found to be influential in a child's working probability. When the supply-side variables are added to the model, the remittance coefficient increases from 0.004 to 0.005.

Children in households whose members migrate domestically within the same province or to other provinces are likely to work longer hours in comparison to children of non-migrant households. The coefficients of the within-province and across-province migration groups are 0.18 and 0.19 respectively and are statistically significant at the 1% level in the model without controlling for the supply-side factors. On the other hand, international migration is found to be negatively associated with working hours of children and is significant at the 5% level. In other words, if the children have their household members migrating overseas, their working hours decrease around 0.16 hours per week. Not only that children of international migrant households appear to work fewer hours, but the first-step selection model also suggests they are less susceptible to participating in economic activities.

Similar to the results of the first-step selection model, it seems that there is no significant difference in working hours between females and males. As expected, age is found to be strongly correlated with children's working hours. Concerning the residency of children, by NIS's definition, helping family in the farm or rearing animals such as poultry and cattle are considered as economic activities, children living in rural areas are found to engage in longer hours of work in comparison to their urban counterparts.

Regarding the family characteristics, age of household head, number of adult members, father's and mother's education level are found to be negatively associated with children's working hours. Children living in households headed by older individuals seem to work fewer hours. An increase of adult members (aged 18 and older) in the household is associated with a decrease in 0.08 hour of children

performing economic activities. It is not to mention that an increase in adult members also lead to a lower probability of working as well. In contrast, children in households with more child members appear to be more active in economic activities. Although looking after one's younger siblings is not considered as child work or economic activities, having more young household members seems to put more pressure on children to support their family through labor and financial contribution.

It would be common that when parents' education level is high, it is more likely they will expect the same achievements from their children, instead of making children get involved in work early and extensively. Likewise, in this study's results, in comparison to working children whose fathers have no schooling background, children whose father obtained lower secondary or upper and higher education engage less in economic activities by 0.09 hours or 0.17 hours respectively. Mother's education seems to play even a more important role in reducing children's working hours. In the comparison to the base group of mothers without an education background, by having a mother with primary, lower secondary or upper and higher education, the working hours reduce by 0.045 hours, 0.122 hours and 0.313 hours respectively. Both the effects of father and mother education on working hours become slightly smaller when the supply-side factors are controlled for.

This study finds that working hours can be also explained by the family economic status, as measured by the monthly consumption per capita. All of the coefficients of consumption quintiles (the poorest Quintile 1 is the base group) are negative and statistically significant in the model without supply-side factors (Model 3). The higher the monthly consumption is, the less likely that the children are involved in long-hour work. Interestingly, when the supply-side factors are controlled for in Model (4), only the Quintile 4 and Quintile 5 remain statistically

significant. There is no significant difference in working hours among children living in Quintile 1, Quintile 2, and Quintile 3.

5.2.2. Effects of Migration and Remittances on Working Hours in Rural and Urban Areas

As shown in Table 5.9, there are noticeable differences in working hours between children living in rural and urban areas. This sub-section intends to examine the differences in the effects of migration and remittances on children's working hours in rural and urban areas. Table 5.9 summarizes the 2-step Heckman results of the effects of migration by destination and remittances on children's working hours by rural and urban areas. Columns (1) and (3) show the first-step results from the rural and urban sub-sample respectively, while the second-step results are reported in columns (2) and (4). The individual and family and supply-side characteristics used in earlier sub-section are included in all the estimation; however, as for the simplicity, only the summarized results are presented in the table. The full 2-step Heckman results are available in Appendix's Table A.9.

To justify for the use of 2-step Heckman approach, the inverse Mill ratio statistics for both group are calculated. As illustrated in Table 5.9, the inverse Mill ratio statistics for the rural and urban models were statistically significant at the 1% and 10% level respectively, indicating that there is a sample selectivity issue when the decision to participate in economic activities is excluded from consideration (Heckman, 1979). The significant statistics of inverse Mill ratio, or Lambda (λ), confirm that the two-step Heckman models are suitable and that the Lambda (λ) is important in determining children's amount of work. The results of the second-step truncated regression model estimations are shown in columns (2) and (4) of the table.

By separating the sample into rural and urban sub-samples, it reveals more interesting findings on the effects of migration and remittances on children's

working hours. Among the rural children, within-province migration is positively associated with a working probability and working hours; however, in the case of urban children, there is no relationship between within-province migration and working decision and working hours. Rural children whose members migrated within the same provinces are likely to involve in economic activities and work about 2.8 hours longer than children of non-migrant households. In other words, the within-province migrant households in rural areas face a more severe financial contribution from children than those in urban areas.

In contrast to the within-province migration, across-province migration seems to have a stronger effect on child work in urban areas. In the first-step selection models, the relationship between across-province migration and working incidence is not significant in rural sun-sample, but positive and significant at the 1% level in urban areas (Models 1 and 3). In the second-step model, across-province migration is likely to increase working hours of children in both rural and urban areas. Yet, the magnitude in urban areas (0.328) is much larger than that in rural areas (0.169). By losing household members due to migration to another province far away from home, children in urban areas are likely to be active in economic activities and work 0.32 longer hours than children of non-migrant households. For the across-province migration, urban children are more adversely affected by the absence of household members.

The effects of international migration on child's work and working hours are in favor for rural children. In contrast, to some extent, it adversely affects children in urban areas. For children in rural areas, the international migration type is likely to reduce the working probability and cut down the degree of children's working hours by 0.183 hours per week. However, international migration is found to be positively associated with urban children's working probability and significant at the 10% level (Model 3). Nonetheless, the relationship between international

migration and working hours in the urban sub-sample in the second step is not statistically significant (Model 4).

Table 5.9. 2-Step Heckman Results on Children's Working Hours in Rural and Urban Areas

VARIABLES	(1)	(2)	(3)	(4)
	Rural		Urban	
	Step 1	Step 2	Step 1	Step 2
Within-province	2.801*** -1.039	0.187*** -0.044	-5.934 -4.864	-0.158 -0.154
Across-province	-0.735 -1.153	0.169*** -0.049	13.386*** -5.128	0.328** -0.146
International	-6.574*** -1.987	-0.183** -0.085	11.844* -6.416	0.083 -0.227
Ln Remittance	-0.082 -0.059	-0.004 -0.003	-0.482** -0.225	-0.008 -0.007
Controlling Factors				
- Individual Characteristic	Yes	Yes	Yes	Yes
- Family Characteristic	Yes	Yes	Yes	Yes
- Supply-side Factors	Yes	Yes	Yes	Yes
Inverse mills ratio		20.370***		25.632*
Lambda		(4.936)		(14.906)
Observations	12,700	12,700	2,606	2,606

Source: Estimated by the author using CSES (2009) and EMIS (2008/2009).

Standard errors in parentheses.

*** p<0.01, ** p<0.05, and * p<0.10 indicates significance at the 1%, the 5%, and 10% level.

Children in urban areas are more likely to benefit from remittances in terms of reduction in working probability in comparison to their rural counterparts. In the rural sub-sample, the study cannot confirm either the relationship between remittances and working probability in the first step model or the relationship

between remittances and working hours in the second step model. For the case of urban children, although remittances seem to have no effects on a child's working hours, it is negatively associated with working incidence at the 5% level.

5.2.3. Effects of Remittances on Working Hours by Migration Destinations

To further examine the effects of remittances on children's working hours, the study separates the sample into sub-samples of migration by destinations and then performs the 2-step Heckman by the sub-samples. Table 5.10 shows the results from the non-migration and within-province migration sub-samples, while the results from the across-province and international migration sub-samples can be found in Table 5.11. Full results of the sub-sample estimation can be found in Appendix's Table A.10 and Table A.11

As shown in Table 5.10, the inverse Mill ratio statistics for the non-migrant households is statistically significant at the 1% level, however, the inverse Mill ratio for the within-province sub-sample is not statistically significant. This suggests that the 2-step Heckman method is appropriate for the non-migration sub-sample as it is likely to suffer from the selectivity bias. However, regarding the within-province migration sub-sample, the inverse Mill ratio results suggest that the selectivity issue is not an issue. Therefore, the Tobit model might be sufficient to estimate the effects of remittances on the working hours for the within-province sub-sample.

The results in Column (1) shows that working decision is affected by the size of remittances among children of non-migrant households, and the significant level is at 5% (Table 5.10). However, remittances have no effect in reducing working hours of children among this group (Column 2). According to the results reported in the sample table, children of the within-province migration sub-sample do not benefit from remittances in terms of lowering working probability or shortening working hours. In both the first and second steps, the results between remittances

and working incidence as well as between remittances and working hours are statistically insignificant.

Table 5.10. Two-Step Heckman Results on Children's Working Hours (Non-Migrant and Within-province)

VARIABLES	(1)	(2)	(3)	(4)
	Non-Migrant		Within-Province	
	Step 1	Step 2	Step 1	Step 2
Ln Remittance	-0.130** (0.065)	-0.001 (0.003)	0.139 (0.134)	-0.012 (0.007)
Individual Characteristics	Yes	Yes	Yes	Yes
Family Characteristics	Yes	Yes	Yes	Yes
Supply Side Factors	Yes	Yes	Yes	Yes
Inverse mills ratio		19.195***		-1.896
Lambda		(5.031)		(9.981)
Observations	12,361	12,361	1,446	1,446

Source: Estimated by the author using CSES (2009) and EMIS (2008/2009).

Standard errors in parentheses.

*** p<0.01, ** p<0.05, and * p<0.10 indicates significance at the 1%, the 5%, and 10% level.

The results for the across-province and international migration sub-samples are reported in Table 5.11. Similar to the within-province migration, the results of inverse Mill ratio are not statistically significant in both across-province and international sub-samples. The results from the first-step selection model suggest that remittances are not associated with the working probability in both across-province and international migration sub-samples. However, the second-step outcome models indicate that an increase in remittance size can reduce working hours of children in both across and international migration groups. The effect of remittances on working children among international migration group is more than twice larger than the across-province migrant households.

Table 5.11. Two-Step Heckman Results on Children's Working Hours (Across-province and International)

VARIABLES	(1)	(2)	(3)	(4)
	Across-Province		International	
	Step 1	Step 2	Step 1	Step 2
Ln Remittance	-0.18	-0.014*	-0.777	-0.034*
	-0.211	-0.008	-0.534	-0.018
Individual Characteristics	Yes	Yes	Yes	Yes
Family Characteristics	Yes	Yes	Yes	Yes
Supply Side Factors	Yes	Yes	Yes	Yes
Inverse mills ratio		23.648		20.279
Lambda		(15.063)		(19.104)
Observations	1,134	1,134	365	365

Source: Estimated by the author using CSES (2009) and EMIS (2008/2009).

Standard errors in parentheses.

*** p<0.01, ** p<0.05, and * p<0.10 indicates significance at the 1%, the 5%, and 10% level.

CHAPTER 6 :

DISCUSSION AND CONCLUSION

This Chapter first begins with the discussion on the findings in Chapter 5 in relation to the hypotheses as well as the previous studies carried out on the effects of migration and remittances on children's human capital formation and on the incidence of children working, as delineated in the literature review part in Chapter 3. Following the discussion is the limitation of the study, discussing the shortfalls and some challenging issues that could not be addressed and solved in this study. At the end of the Chapter is the conclusion of the dissertation drawn from the key findings in this study as well the implications from the findings.

6.1. Discussion

This part discusses the results from Chapter 5 in response to the six hypotheses proposed in Chapter 4. Guided by theoretical framework and previous studies, the study suggests implication mainly based on the results reported in Chapter 5 and Cambodian education and socioeconomic situation reviewed in Chapter 2. In parallel to the research questions, the discussion is split into two parts. The first part discusses the findings related to the effects of migration and remittances on the completed grade of education, while the second touches on the findings of the migration and remittance effects on child's work incidence and working hours.

6.1.1. Effects of Migration and Remittances on Completed Grade of Education

The first research question explores the effects of migration and remittances on the completed grade of education, starting with the Research Question 1.1 to examine the overall effects of migration by destinations and remittances on children's human capital formation, measured by the completed grade of education. In response to the

R.Q. 1.1, the study tests the hypothesis 1.1 stating that “completed grade of education is hindered by an absence of household members owing to migration, especially among children of the within-province migrant households. In contrast, remittances have a positive effect on children’s completed grade of education.”

To test this hypothesis related to the effects of migration by destination, the study relies on the OLS estimation, because it is extremely challenging to apply the 2SLS approach when there are several destinations. The hypothesis of the negative effect of migration is partly confirmed in the study. For instance, the OLS results indicate the negative association between the within-province migration and the completed grade of education; however, it cannot confirm a significant relationship between the other two types of migration (across-province and international migration) and the completed grade of education. Plenty of studies investigate the effect of migration (both internal and international) on educational outcomes; however, to the best understanding of the author, this study is the first attempt to further decompose the internal migration into within-province and across-province migration. Previous studies in Cambodia (Fukui & Luch, 2017; Hing et al., 2014) and beyond (Antman, 2011; Lu, 2015; McKenzie & Rapoport, 2006) suggest that migration can be harmful to the human capital accumulation of the left-behind children. On the other hand, outside Cambodia, there are also studies suggesting positive effect of migration on student’s schooling or education expenditure (Hanson & Woodruff, 2003; Mansuri, 2006; Sarma & Parinduri, 2016). A majority of these studies fail to partial out the positive effect of remittances that are strongly associated with migration (Dorantes & Pozo, 2010; McKenzie & Sasin, 2007). To disentangle the effect of migration from the remittance effect, it is important to incorporate remittances into the equations. By doing so and further differentiating migration by destination, this study finds that migration can have either a negative effect or no effect on the completed grade of education, depending on where the

destination of migration is. Not all types of migration have the same effects on children's schooling. In Cambodia, the loss of household members owing to migration seems to have an adverse effect on children's grade completion among only the within-province migration group. This might be explained by the fact that the association between migration and remittances among this group is weak. As shown in the descriptive statistics, in comparison to the across-province and international migration groups, the remittance amounts from within-province migrants are relatively small (see Table 4.7).

Another possible reason to explain this finding could be owing to the concept of the selectivity of migration, which underpins the correlation of how the educational level of migrant members is related to the educational outcomes of children who remain in the place of origin (known as positively selected and negatively selected migrants). For positively selected migrants refer more to high-skilled migrant workers, mostly those who have acquired education at a certain degree and that they seem to understand and value the importance of education. In returns, it is more likely they will expect the same achievements from their family members, and the higher the level of the parents' education, the more their appreciation is intensified, resulting in a positive effect on educational expenditure. Provided migrants care for their children's education, they are more likely to send money in order to improve their children's education in the origin communities. In contrast, the human capital acquisition of children left behind may be harmed from migrant members that are negatively selected. Since within-province migrants in rural Cambodia are likely to work in agriculture sectors and low-educated (negatively selected), remittance size from the migration is too small to have any positive impact on children left behind. The money they could earn and remit is meager which is barely enough to cover daily household expenses, let alone to invest in children's education.

The latter part of the Research Question 1.1 is to assess the impact of remittances on the completed grade of education. The hypothesis that remittances have a positive impact on the completed grade of education is confirmed in the 2SLS models (both with and without supply-side factors). Although the impact becomes slightly smaller after controlling for the supply-side factors, the statistical significance still holds, strongly remaining at the 1% level. This finding is in line with previous studies, both in Cambodia and other countries (Adams & Cuecuecha, 2013; Calero et al., 2009; Edwards & Ureta, 2003; Fukui & Luch, 2017; Iwasawa et al., 2014; Lu & Treiman, 2011; Yang, 2008). Although there are some studies indicating the negative impact of remittances on children's education (Alcaraz et al., 2012; Davis & Brazil, 2016), it could be due to the inextricable link between migration and remittances. Davis and Brazil (2016) examines the migration and remittance effects on school enrollment in Guatemalan and concludes that remittances discourage older children to further education and follow their fathers' footsteps of migrating to the United States. It is less controversial that the net effect of remittances on children's education is positive; however, it is debatable whether this positive impact is large enough to cancel out the negative impact of migration.

Research Question 1.2 attempts to look into the differences in the effects of migration and remittances by rural and urban areas. To correspond to this research question, the study hypothesizes that children of within-province migrant households in rural areas suffer the most from the loss of household members and that the remittances impact in rural areas is larger than in urban areas. After the sample is divided into the rural and urban sub-samples, the results reported in Table 5.3 show that within-province migration is negatively associated with the completed grade of education both in rural and urban areas. The negative effects of within-migration in the model without supply-side factors are roughly the same for both groups. However, against the hypothesis, in the model with supply-side factors

urban children seems to suffer more from the within-province migration. Similar to the results from the aggregate sample, there is no significant relationship between completed grade of education and migration by across-province or international migration, both in rural and urban areas.

For the impact of remittances in rural and urban areas, the study confirms, to some extent, a stronger impact of remittances on the completed grade of education in rural Cambodia, as in line with the proposed hypothesis. Based on the 2SLS results, the impact of remittances on the completed grade of education is stronger in rural areas when the supply-side factors are not controlled for. However, after the supply-side factors are included in the models, the impact in urban areas become larger than that in rural areas. The impact in urban areas is almost the same in both models with and without supply-side factors. In contrast, in rural areas, the effect of remittances decreases almost half (from 0.062 to 0.031) when the supply-side factors are taken into account. The results partly confirm in those found by Fukui and Luch (2017), who revealed the positive impact of remittances on schooling outcomes in rural areas for both males and females in Cambodia. However, they did not provide any comparison between rural and urban areas.

Research Question 1.3 further explores the differences in the impact of remittances on the completed grade of education by migration destinations. In response to this research question, this study postulates that the positive effect of remittances is found to be the strongest among non-migrant households and partially canceled out among across-province and international migration households, and totally wiped out among within-province migrant households. To answer this research question, the study first categorizes children into four groups: non-migrant households, within-province, across-province, and international migration household. 2SLS approach is applied for each sub-sample to estimate the effect of remittances by migration destinations.

The 2SLS results do confirm that effect of remittances on the completed grade of education among the non-migrant households is significant and slightly larger than the overall effect estimated in the aggregate sample (0.065 vs 0.061). This finding is consistent with the studies of Dorantes and Pozo (2010) in the Dominican Republic and of Iwasawa et al. (2014) in Cambodia. In Cambodia, children of non-migrant households benefit the most from remittances in terms of school attendance and family's investment in children's education. However, unlike this study, Iwasawa et al. (2014) did not divide their sample by migration destinations, but instead, differentiate what the relationship between migrant members (parents or non-parents) and left-behind children is. They find that remittances have the strongest impact on children's educational expenditure among the non-migrant households, a much weaker effect in non-parental migration households, and no effect among the parental migration households. Remittances are commonly found to be positively associated with student's schooling outcomes and beneficial to invest in children's human capital when the negative impact of migration is taken into account. Therefore, the strong net effect of remittances (effect of remittances among the non-migrant households) is very reasonable and on par with the theoretical prediction.

In the analysis of remittance effect by sub-sample using 2SLS method, the study also cannot confirm any effects of remittances with the 2SLS approach because the endogeneity tests cannot reject the exogeneity of remittances in this sub-sample estimations. Therefore, the hypothesis that remittance effect among this group of children is totally wiped out by the negative effect of migration is unconfirmed. Yet, as discussed earlier, within-province migration is found to be negatively associated with the completed grade of education, while remittances have a positive impact on the grade completion. This result suggests that the loss of household members from migration can be compensated by the extra income from

remittances, provided migration can generate additional income and send to their families back home.

Although school fees were abolished and education is free of charge in Cambodia since 2001 (Bray & Seng, 2005; UNESCO, 2006), there are many hidden education expenditures such as learning materials, contribution to schools and teachers, tuition fees and so on. Losing working time by going to school is also a huge opportunity cost for families with a limited source of incomes. For this reason, it is important to get extra income through remittances, although this means some members need to be away from family. This is partly put forward by Iwasawa et al. (2014). In their study, they proved that the impact of remittances on children's schooling is heterogeneous and depends on what is the relationship between migrants and children.

For the across-province migrant households, the study finds a strong and positive impact of remittances on the completed grade of education, although it is slightly smaller than the non-migrant household group (0.063 vs 0.065). Surprisingly, it is even slightly higher than the aggregate remittance effect (among the total sample) estimated at 0.061. Therefore, the hypothesis that the remittance effect among this group is partly canceled out is rejected. In other words, the strong and positive effect of remittances among this group means that, in comparison to the general population, the additional source of income from remittances plays a very important role in children's education investment. Since there is no prior study that further distinguishes internal migration into within-province and across-province migrations, there is no study to support this finding. However, this finding might be explained by the fact that in Cambodia migration households have more difficulty in terms of financial constraints, which is one of the pushing factors of migration. Therefore, the same amount of remittances is more beneficial among the children of across-province migrant households. In addition, as reported in Table

5.1, the study finds that the loss of household members from across-province migration is not harmful to children's schooling. It is also worth mentioning that among this group of children, the positive impact of remittances become insignificant when the supply-side factors are controlled for. This implies that for children of across province migrant households (most of whom reside in rural areas), whether remittances can contribute to children's education or not largely also depend on the supply-side factors. If the schools are too far from children's homes or there are not enough teachers, extra income from household is meaningless.

For the international migration group, the study also cannot confirm any effects of remittances with the 2SLS approach because the endogeneity tests cannot reject the exogeneity of remittances in the international sub-sample estimations. However, the OLS estimation can detect a positive correlation between remittances and completed grade of education in the model without supply-side factors. Nevertheless, we cannot rule out that remittances have no effect on grade completion among children of international migrant households. Future studies can challenge with new sets of instrument variables to tackle endogenous issues among this sub-group.

6.1.2. Effect of Migration and Remittances on Children's Working Hours

The second research question investigates the effects of migration and remittances on children's working hours. Similar to the first question, this begins with the Research Question 2.1 examining the overall effects of migration by destinations and remittances on children's working hours. In response to the R.Q. 2.1, the study tests the hypothesis 2.1 stating, "The labor shortage among migrant households, regardless of any types of migration, is likely to push children into work and engage in longer working hours. The additional source of income from remittances can relax household financial constraints, and thereby lessening the incidence of child

work and working hours.” To answer the second research question, the 2-step Heckman approach was applied to correct the sample selectivity issues.

The results presented in sub-section 5.2 reveal that not all types of migration lead to an increase in children’s working hours. The study does find that children of the within-province and across-province migrant household are more likely to participate in economic activities or work longer hours in comparison to their counterparts from the non-migrant households. Unlike the assumed hypothesis that all types of migration increase children’s working hours, it is found that children of the international migrant households are less likely to work and work for fewer hours. Previous studies on the effect of migration on child work have produced mixed results suggesting that migration either increases child labor/ hours worked by children (Antman, 2011; Elbadawy & Roushdy, 2010; Hing et al., 2014), or the opposite direction (Dimova et al., 2015). The inconsistent findings maybe owing to the difference in migration characteristics (such as destinations and relationship between migrants and children). The study finds the difference in effect of migration by destinations: that international migration is associated with a lower working probability and shortens working hours, while internal migration (within-province and across-province) has the opposite effect on children’s working incidence and working hours. A plausible explanation – that international migration does not only decrease working probability but also reduces the working burden of children – is the size of remittances received by international migrant households. The inflows of remittances can lift up the living standard of the families to a level that children can spend more time focusing on their schooling rather than working to generate income to compensate for the loss of family workforces.

Regarding the overall effect of remittances on children’s working hours, the study finds that an increase in remittance size leads to a decrease in both working incidence and working hours of left-behind children. This finding is consistent with

many other studies in Cambodia and other developing countries (Acosta, 2006; Coon, 2016; Dimova et al., 2015; Ebeke, 2010; Roth & Tiberti, 2016). Albeit with and without controlling for the supply-side factors, the results are very similar.

The Research Question 2.2 attempts to figure out the difference in the effects of migration and remittances on children's working incidence and working hours in rural and urban areas. In response to the research question, the study poses a hypothesis stating, "the relationship between migration and working hours is positive (migration increases working hours) and is weaker in urban areas in comparison to rural areas. For the remittance effect, it has a larger effect in reducing the working hours among children in rural Cambodia compared to urban children." From these results, it is not clear-cut whether the absence of household members from migration contribute to more work in rural or urban areas. The results are different depending on the destinations of migration. An unexpected finding is that international migration has an opposite effect in rural and urban areas. While international migration can help reduce the working probability and working hours of children in rural areas, it seems to increase the working probability in urban areas. Studies and information that distinguish the effects of international migration by rural and urban areas are extremely scarce; therefore, it is rather difficult to justify this finding. Future studies can take this point for consideration and further investigate the reasons behind this phenomenon.

The last research question in this study is to assess the remittance effect on children's working hours differently by migration destinations (non-migration, within-province, across-province, and international migration). The hypothesis for the research question is: remittances have no effects on children's working hours among children of the within-province migrant households, can reduce some working hours among children from the across-province and international migrant households, and have the strongest effect among children of the non-migrant

households. This hypothesis, to a large extent, is partly supported by the study's findings. As postulated in the hypothesis, the effect of remittances among the within-migration group is insignificant. The effect of remittances on children's labor outcomes among the across-province and international migration groups is, to a large extent, canceled out, because it is only significant at the second step not the first step of the estimation. For the non-migration group, remittances can help reduce the working probability, but not working hours. Therefore, it is rather difficult to judge whether the non-migration group or international migration benefit the most from remittances.

6.2. Limitation of the Study

This study is no different from any other individual research study regarding several problems that are of hand to handle. First, the analysis to isolate remittance effects from migration effects is complex and challenging due to its closely-linked and contemporaneous relationship. The nature of migration pattern can greatly vary by type, in the context of this study by destination, and the relationship between the left-behind children and migrant members. Although this study tries to disentangle the remittance impact by estimating its impact among the sub-groups of migration destination, the instrument variables (disaster, distance to provincial town and remittance norm) used in this study could only confirm the endogeneity of remittances in the non-migrant sub-sample and to some extent in the within-province and across-province sub-samples. These instrument variables could not detect the endogeneity of remittance in the international sub-sample at all. Moreover, the data does not distinguish who are the migrants and what is their relationship with left-behind children. This kind of information is important in a sense that provided different members (being parents, siblings or other relatives) can have different impact on the children left-behind (Castaneda & Buck, 2011; Iwasawa et

al., 2014; Koska et al., 2013; Lu & Treiman, 2011; Mansoor & Quillin, 2007). It is known that parents play a more important role in children's education and working, therefore parental migration is likely to have more server negative effect on children's learning and working hours in comparison to relatives or sibling migration. In addition, it is also different in terms of the different role of maternal and paternal absence owing to migration (Antman, 2011; Cortes, 2015; Giannelli & Mangiavacchi, 2010; Sarma & Parinduri, 2016)

Secondly, to capture the supply-side factor in the Research Question 1, this study uses the EMIS data to estimate teaching resources and physical infrastructure at the district level by using indicators such as student-teacher ratio, number of school shifts and the percentage of female teachers. With this district-level factor, it is more suitable to apply multi-level hierarchical linear regression models; however, it is technically challenging to use this model with the two-stage least square regression in order to correct the endogeneity issue of remittances. Similarly, to tackle with the sample selection bias of working children in the Research Question 2, this study uses the two-step Heckman model. This model allows us to correct the sample selectivity bias, nonetheless, difficult to concurrently solve the problem of remittance endogeneity in this model.

Lastly, the study focuses on the migration destination but unable to differentiate the migrant characteristics, such as their gender or their relationship with the left-behind children. Gender of the migrants is also important, as male is found to have higher wages than females, but tend to remit less, at an average 20% less. Future studies can also further investigate the migration and remittance impact on left behind children by further separate them into girls and boys or by age group of children.

6.3. Conclusion

The fundamental positive aspects of education are the emphasis on an increase in both individuals' earnings and provide a good social rate of return, which is also known as educational externalities. In this regard, education is treated as a good human capital investment. Education is also considered a key to intergenerational inequality, empowers individuals to move away from poverty. Recognizing the importance of education and aiming to bring about inclusive development in a knowledge-based economy, Cambodia has been active in joining the global movement such as the EFA declared in Jomtien, Thailand in 1990, and has become a GPE partner since 2006. To ensure all children can equally access education, in 2001, the Royal Government of Cambodia (RGC) adopted the school fee abolishment, which was a turning point of the significant improvement in terms of access to education. The net enrollment rate at primary school has reached 95% in 2009; however, it seems difficult to reach the remaining 5% as the enrollment continues to fluctuate around 95%. The poor performance in readings from the EGRA report also reveals the chronically learning crisis in Cambodia. Under this situation, there are needs for the government and private sectors to figure out more proper interventions to ensure equal access to education of good quality, especially among the disadvantaged groups. At the household level, parental backgrounds and involvement, as well as family structures, are found to be influential on children's enrollment and learning. The flow of out-ward migration inside and outside Cambodia has steadily increased in the past years, meaning many children are losing support from their parents or relatives at home. In the opposite, it is believed that migrant remittances have a positive impact on children's human capital, yet it is still debating if the positive impact is huge enough to eliminate the negative impact of migration due to the absences of parents or adult family members at home.

Against this background, this study attempts to provide empirical evidence on the effects of migration and remittances, first, on the left-behind children's learning, and second, on children working incidence and working hours in Cambodia. Taking migration heterogeneity into consideration, the study also investigates the impact of remittances by migration destination by grouping the sample into: non-migrant households, within-province migrant, across-province migrant, and international migrant households.

For the first research question, the study uses the OLS model to examine the effects of migration by destination on the completed grade of education and apply the 2SLS approach to tackle an endogeneity issue of remittances and assess the effects of remittances on the completed grade of education. In addition, sub-sample estimation enables the study to disentangle the net impact of remittances from that of migration so as the differences in the influence of remittances can be measured by the different characteristics of migration. This is also a means of unveiling the true impact of remittances by providing a clearer picture of the remittance impact among different types of migrant households. To answer the second research question regarding the effects of migration and remittances on children's working hours, the 2-step Heckman model is utilized to address the sample selectivity issue, performing in both the aggregate and sub-sample analysis. This study relies on data from the Cambodia Socio-Economic Survey (CSES) collected in 2009 for the analysis in both research questions. In addition, data from EMIS 2008-2009 is also used to capture the supply-side factors in the first research question.

Regarding the key findings on the effect of migration and remittances on children's schooling outcome, the study reveals that overall remittances have a positive impact on the completed grade of education, and the effects of migration by destination are heterogeneous. The absences of household members from the within-province migration adversely affect the human capital accumulation of left-

behind children. Furthermore, the study also finds that the positive impact of remittances on the completed grade of education is likely to be wiped out among children of the within-province migration. The within-province migration is harmful to children both in rural and urban areas, although the negative effect in urban areas is slightly higher when the supply-side factors are controlled for. Unlike within-province migration, across-province and international migration are found to have neither negative nor positive effect on the completed grade of education. These mixed results of migration effect by destination could explain inconsistent results found in previous studies on the effects of migration on educational outcomes. This study also confirms the positive impact of remittances on the schooling outcome among the children of across-province migrant and non-migrant households. The overall impact of remittances is found to be positive, and the analysis by rural-urban areas indicate that rural children benefit more from an extra source of remittance incomes when supply-side factors are not controlled for. Furthermore, the study also reveals that in Cambodia, supply-side factor still plays a vital role in children's human capital accumulation.

The estimation results from the 2-step Heckman indicate that the within-province the absence of household member due to within-province migration is not only harmful to children's learning, but it also increases the likelihood that children are engaged in economic activities and work longer hours. The effect of migration within the same province is in particular severe in rural areas, while the effect in urban areas is not statically significant. Rural migrants within the same migrants are likely to be unskilled workers and are not well paid. Therefore, remittances from within-province migrants are assumed to be small. The study also shows that remittances have no impact on either working incidence and working hours among children of within-province migrants. Therefore, within-province migration is likely

to lead to a labor shortage in the household, requiring children to be more active in economic activities to help compensate for the loss of labor forces.

Across-province migration is also found to increase children's working hours, but not working incidence. In other words, across-province migration does not increase the probability that children are involved in economic activities, but among those who decided to work, across-province migration is associated with the longer working hours. However, unlike within-province migration remittance effect among this group is not totally eliminated. Remittances are found to decrease working hours of children left behind by across-province migration. Against the hypothesis, the study finds that, in the Cambodian context, international migration can reduce children's working incidence and working hours. Extra income source from remittances can help children of this group to cut down working hours as well. In addition, as mentioned earlier, the study does not find any connection between internal migration and completed grade of education. Previously, international labor migration is limited to nearby Thailand. However, in recent years, international migration destinations have been diversified, and that is attributed to the Memorandum of Understanding (MoU) between the Royal Government of Cambodia and other partner countries. More and more Cambodians migrate to countries such as Malaysia, South Korea, and Japan for much better pay. The size of remittances from international migration is considerably huge and contributes to drastic improvement to households in origin communities, especially households in rural areas. This new trend of international migration must have drastically lifted household economics bank home to a much higher level. That is reflected the reduction of child work through international migration found in this study.

For implication, the results of the positive impact of remittances found in this study suggest that low skilled labor migration internationally migrating to developed counties, in particular, should be further facilitated. In theory, migration

is a consequence of economic disparities between regions. Huge outflow of migration is an indication of social inequality in the countries. On the other hand, policies to increase or promote migration should not be the ultimate goal or what a nation should aim for in the long-run, as discussed earlier in Chapter 2. It is more preferable that decent jobs with better-paid work are created in local areas so that people are discouraged from migration. Provided a current situation of Cambodia, still in the position of low-middle income country, international migration, more or less, is inevitable. In this case, it can be plausible for a short-term solution to alleviate economic disparities. For instance, there is a surge in demand for low skilled migrant workers in developed countries such as South Korea and Japan. Currently, Cambodia has signed MoU with both countries to send labor migrants. As Iwasawa et al. (2014) point out parental migration is much more harmful than non-parental migration, the government can increase the quotas of international migrants targeting mainly young adults without children. It does not only contribute to the improvement of youth employment but also helps their families economically back home as well as their younger siblings' education.

Nevertheless, it is also true that skilled migration required, to a certain extent, some level of education and skills. Individuals without skills are likely to end up with unskilled migration working within the same province that is harmful to children's human capital accumulation and that leads to increasing longer working hours of children (see the detailed result explanation in Chapter 5). Although remittances have a positive impact on the completed grade of education, its size of impact becomes smaller when supply-sides are controlled for. This means that without adequate schools and teachers, the impact of remittances is minimal. Hence, the government should continue to bring schools, especially secondary schools, closer to children, as statistics from MoEYS indicate that enrollment and completion rates at lower secondary schools in Cambodia are still very low.

The positive net effect and the aggregate effect of remittances on both children education and reduction of working hours imply that remittance can help relax the credit constraint for non-migrant and general households. Although the study cannot clearly confirm the positive effect of mixed effect of remittances among migrant household, the study to some extent does confirm its positive impact on the completed grade of education and reduction of children's working hours. Most of Cambodia in rural areas do not have access to a bank account; however, money transfer using mobile phone become popular in both Cambodian urban and rural areas. This kind of technologies has made remittance sending easier and cheaper. Since most of the remittances in Cambodia are still made through unofficial channels, the government should continue working with private sectors to minimize the remitting costs, so that migrants can send transfer more remittances to families back home.

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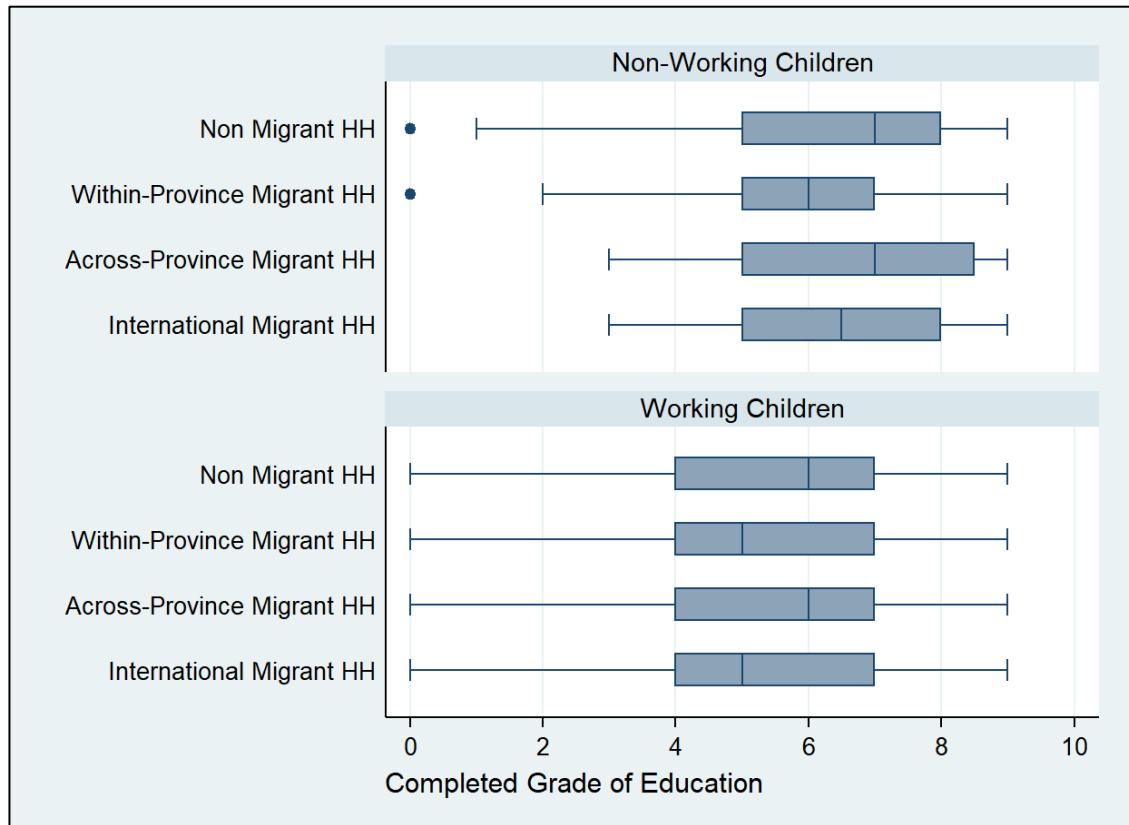
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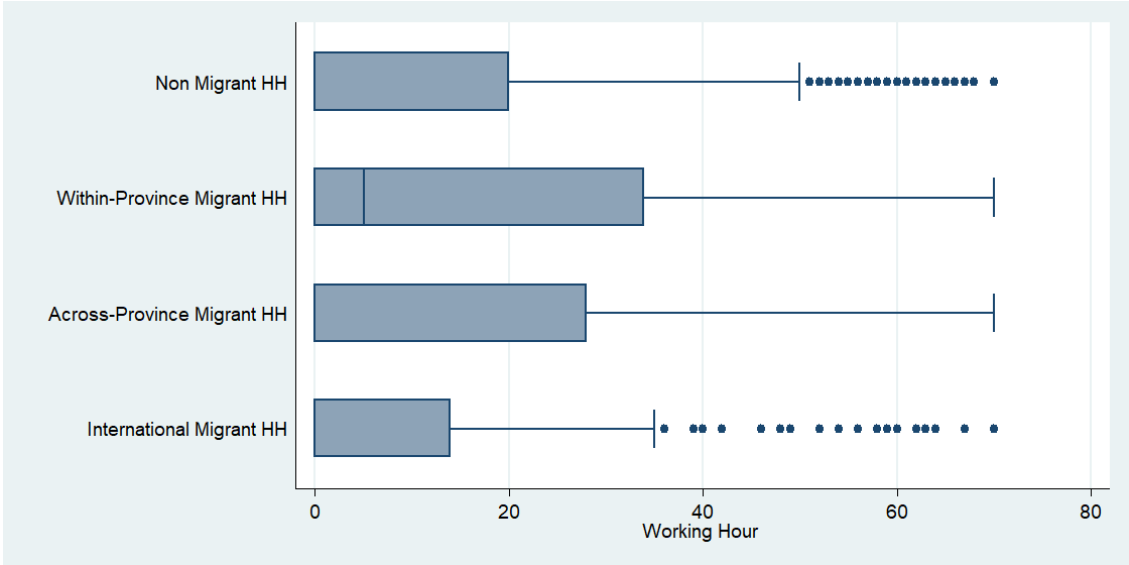
APPENDICES

Figure A.1. Box Plot of Completed Grade of Education by Working



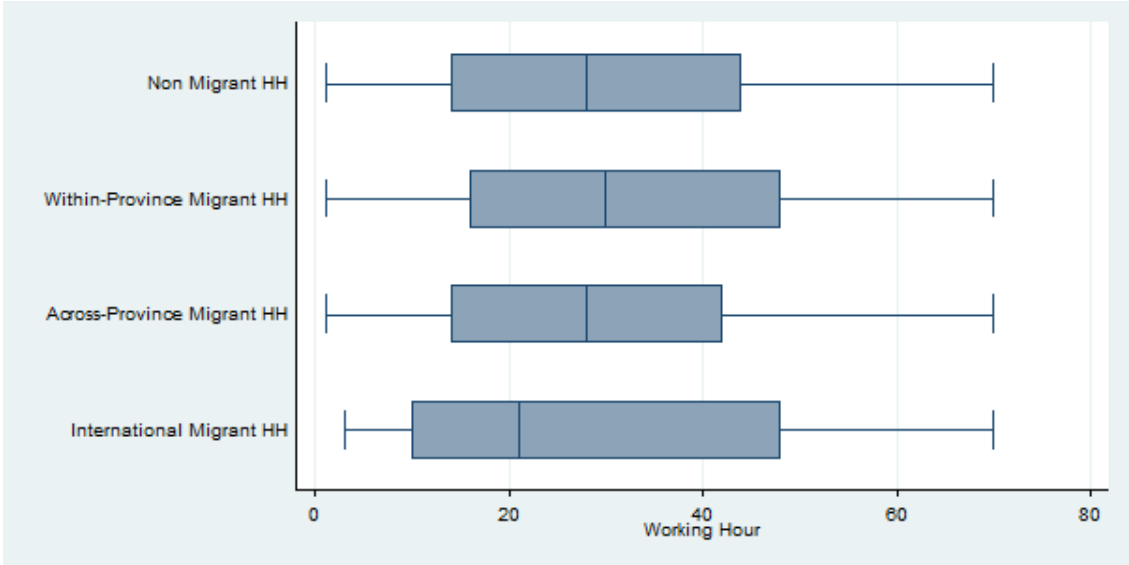
Source: Created by the author using CSES (2009).

Figure A.2. Box Plot of Children's Working Hours (Including Non-working Children)



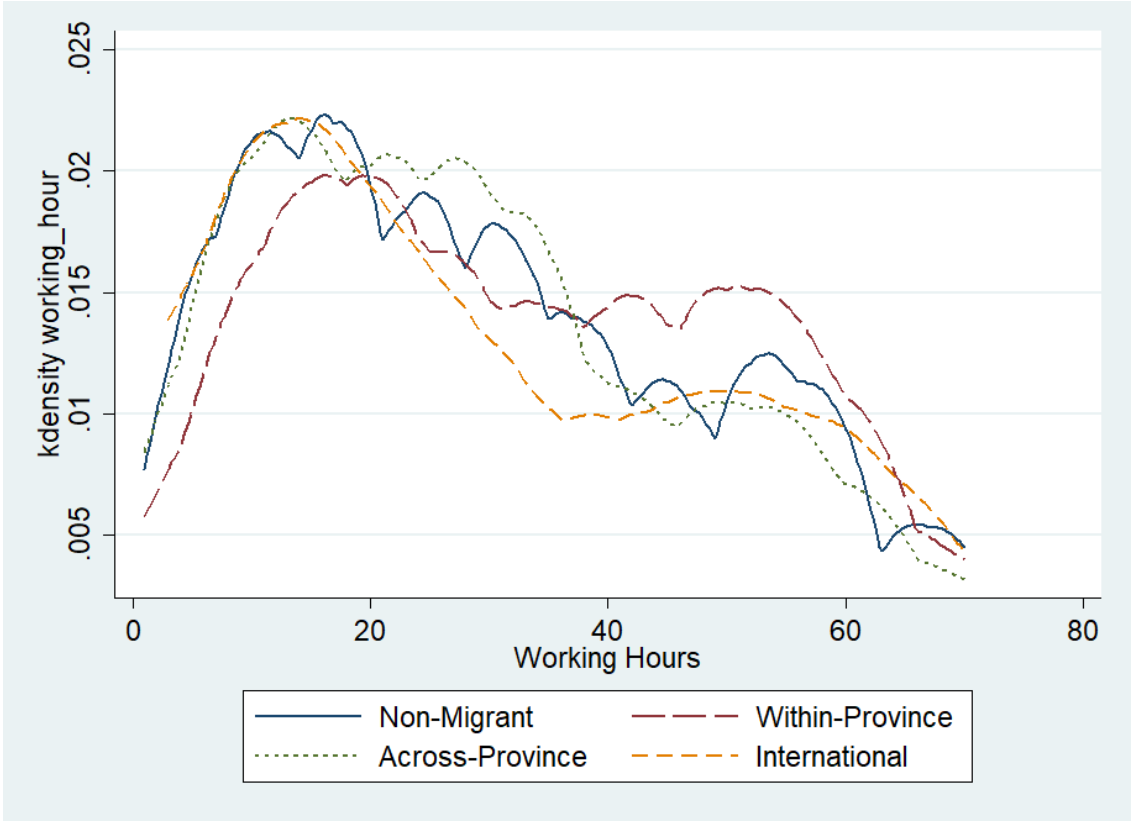
Source: Created by the author using CSES (2009).

Figure A.4. Box Plot of Children's Working Hours (Excluding Non-working Children)



Source: Created by the author using CSES (2009).

Figure A.4. Density Plot of Children’s Working Hours (Excluding Non-working Children)



Source: Created by the author using CSES (2009).

Table A.1. OLS Results of Migration and Remittances on Completed Grade of Education

VARIABLES	Without Supply-side Factors			With Supply-side Factors		
	(1)	(2)	(3)	(4)	(5)	(6)
Within-Province	-0.253*** (0.055)		-0.295*** (0.057)	-0.208*** (0.055)		-0.227*** (0.056)
Across-Province	0.069 (0.057)		0.012 (0.060)	0.029 (0.056)		0.003 (0.059)
International	0.122 (0.097)		0.047 (0.100)	0.095 (0.096)		0.062 (0.099)
Ln Remittances		0.006** (0.003)	0.008*** (0.003)		0.002 (0.003)	0.004 (0.003)
Male	-0.177*** (0.028)	-0.177*** (0.028)	-0.178*** (0.028)	-0.171*** (0.028)	-0.171*** (0.028)	-0.171*** (0.028)
Age	0.767*** (0.030)	0.765*** (0.030)	0.768*** (0.030)	0.764*** (0.030)	0.763*** (0.030)	0.765*** (0.030)
Age Square	-0.007*** (0.001)	-0.006*** (0.001)	-0.007*** (0.001)	-0.006*** (0.001)	-0.006*** (0.001)	-0.006*** (0.001)
Urban	0.342*** (0.041)	0.361*** (0.041)	0.350*** (0.041)	0.136*** (0.050)	0.145*** (0.050)	0.140*** (0.050)
HH Head Age	0.005*** (0.002)	0.004** (0.002)	0.004*** (0.002)	0.003** (0.002)	0.002 (0.002)	0.003* (0.002)
HH Male	-0.068 (0.043)	-0.065 (0.043)	-0.059 (0.043)	-0.009 (0.043)	-0.010 (0.043)	-0.006 (0.043)
Adult Member	0.056*** (0.013)	0.052*** (0.013)	0.056*** (0.013)	0.048*** (0.013)	0.045*** (0.013)	0.048*** (0.013)
Child Member	-0.110*** (0.011)	-0.107*** (0.011)	-0.108*** (0.011)	-0.099*** (0.011)	-0.098*** (0.011)	-0.099*** (0.011)
Loans	-0.010*** (0.002)	-0.010*** (0.002)	-0.010*** (0.002)	-0.012*** (0.002)	-0.012*** (0.002)	-0.012*** (0.002)
After July	0.396*** (0.028)	0.387*** (0.028)	0.393*** (0.028)	0.309*** (0.028)	0.303*** (0.028)	0.309*** (0.028)
Father Education						
- Primary	0.334*** (0.039)	0.331*** (0.039)	0.334*** (0.039)	0.301*** (0.038)	0.298*** (0.038)	0.301*** (0.038)
- Lower Secondary	0.663*** (0.045)	0.667*** (0.045)	0.664*** (0.045)	0.607*** (0.045)	0.609*** (0.045)	0.608*** (0.045)
- Upper or Higher	0.708*** (0.060)	0.709*** (0.060)	0.708*** (0.060)	0.628*** (0.059)	0.628*** (0.059)	0.628*** (0.059)
Mother Education						
- Primary	0.515*** (0.034)	0.519*** (0.034)	0.516*** (0.034)	0.450*** (0.033)	0.452*** (0.033)	0.451*** (0.033)
- Lower Secondary	0.880*** (0.047)	0.895*** (0.047)	0.882*** (0.047)	0.780*** (0.047)	0.789*** (0.047)	0.781*** (0.047)
- Upper or Higher	0.900***	0.910***	0.896***	0.790***	0.799***	0.789***

	(0.075)	(0.075)	(0.075)	(0.075)	(0.075)	(0.075)
Consumption Quintile						
- Quintile 2	0.276*** (0.040)	0.270*** (0.040)	0.275*** (0.040)	0.228*** (0.040)	0.223*** (0.040)	0.228*** (0.040)
- Quintile 3	0.527*** (0.043)	0.526*** (0.043)	0.526*** (0.043)	0.476*** (0.042)	0.475*** (0.042)	0.476*** (0.042)
- Quintile 4	0.776*** (0.047)	0.772*** (0.047)	0.774*** (0.047)	0.713*** (0.046)	0.710*** (0.046)	0.712*** (0.046)
- Quintile 5	1.081*** (0.056)	1.081*** (0.055)	1.081*** (0.056)	1.022*** (0.055)	1.022*** (0.055)	1.021*** (0.055)
STR				-0.011*** (0.001)	-0.012*** (0.001)	-0.011*** (0.001)
School Shift				-0.284*** (0.091)	-0.285*** (0.091)	-0.274*** (0.091)
Female Teacher Ratio				0.003* (0.002)	0.003* (0.002)	0.002 (0.002)
Distance to PS				-0.044*** (0.014)	-0.041*** (0.014)	-0.044*** (0.014)
Distance to LSS				-0.042*** (0.003)	-0.042*** (0.003)	-0.042*** (0.003)
Constant	-5.558*** (0.172)	-5.499*** (0.172)	-5.558*** (0.172)	-4.335*** (0.209)	-4.278*** (0.208)	-4.341*** (0.209)
AIC	60,161	60,184	60,154	59,738	59,755	59,738
BIC	60,344	60,352	60,345	59,960	59,961	59,968
Observations	15,306	15,306	15,306	15,306	15,306	15,306
R-squared	0.649	0.648	0.649	0.659	0.658	0.659

Source: Created by the author using CSES (2009).

Robust standard errors in parentheses.

*** p<0.01 indicates significance at the 1% level. ** p<0.05 indicates significance at the 5% level. * p<0.10 indicates significance at the 10% level.

Table A.2. 2SLS Results of Migration and Remittances on Completed Grade of Education

VARIABLES	(1)	(2)	(3)	(4)
Within-Province		-0.552*** (0.066)		-0.384*** (0.066)
Across-Province		-0.342*** (0.075)		-0.209*** (0.074)
International		-0.411*** (0.116)		-0.212* (0.114)
Ln Remittances	0.052*** (0.006)	0.061*** (0.007)	0.030*** (0.006)	0.035*** (0.007)
Male	-0.180*** (0.028)	-0.180*** (0.028)	-0.173*** (0.028)	-0.173*** (0.028)
Age	0.767*** (0.031)	0.774*** (0.031)	0.764*** (0.030)	0.769*** (0.030)
Age Square	-0.007*** (0.001)	-0.007*** (0.001)	-0.006*** (0.001)	-0.007*** (0.001)
Urban	0.420*** (0.042)	0.397*** (0.042)	0.185*** (0.050)	0.175*** (0.050)
HH Head Age	-0.004** (0.002)	-0.001 (0.002)	-0.002 (0.002)	-0.000 (0.002)
HH Male	-0.013 (0.044)	-0.008 (0.044)	0.022 (0.043)	0.024 (0.043)
Adult Member	0.052*** (0.013)	0.054*** (0.013)	0.046*** (0.013)	0.048*** (0.013)
Child Member	-0.093*** (0.012)	-0.096*** (0.012)	-0.089*** (0.011)	-0.092*** (0.011)
Loans	-0.011*** (0.002)	-0.009*** (0.002)	-0.012*** (0.002)	-0.012*** (0.002)
After July	0.371*** (0.029)	0.379*** (0.029)	0.298*** (0.029)	0.306*** (0.029)
Father Education				
- Primary	0.337*** (0.039)	0.337*** (0.039)	0.302*** (0.038)	0.303*** (0.038)
- Lower Secondary	0.686*** (0.045)	0.666*** (0.045)	0.621*** (0.045)	0.610*** (0.045)
- Upper Secondary or Higher	0.721*** (0.061)	0.707*** (0.061)	0.635*** (0.060)	0.628*** (0.060)
Mother Education				
- Primary	0.525*** (0.034)	0.522*** (0.034)	0.457*** (0.033)	0.456*** (0.033)
- Lower Secondary	0.921*** (0.047)	0.888*** (0.047)	0.812*** (0.047)	0.791*** (0.047)
- Upper Secondary or Higher	0.900***	0.871***	0.796***	0.778***

VARIABLES	(1)	(2)	(3)	(4)
	(0.077)	(0.077)	(0.076)	(0.076)
Consumption Quintile				
	0.258***	0.268***	0.218***	0.225***
- Quintile 2	(0.041)	(0.041)	(0.040)	(0.040)
	0.507***	0.521***	0.465***	0.474***
- Quintile 3	(0.043)	(0.043)	(0.042)	(0.042)
	0.759***	0.762***	0.704***	0.707***
- Quintile 4	(0.047)	(0.047)	(0.046)	(0.046)
	1.079***	1.078***	1.019***	1.019***
- Quintile 5	(0.056)	(0.056)	(0.055)	(0.055)
Supply Side Factors				
- STR			-0.012***	-0.012***
			(0.001)	(0.001)
- School Shift			-0.198**	-0.192**
			(0.094)	(0.094)
- Female Teacher Ratio				0.001
			(0.002)	(0.002)
- Distance to PS			-0.035**	-0.039***
			(0.014)	(0.015)
- Distance to LSS			-0.041***	-0.040***
			(0.003)	(0.003)
Constant	-5.418***	-5.557***	-4.281***	-4.393***
	(0.173)	(0.174)	(0.209)	(0.211)
Weak Instruments				
F statistics	1347.69***	1223.76***	1063.31***	968.10***
(p-value)	(0.000)	(0.000)	(0.000)	(0.000)
Endogeneity				
Robust score chi2	71.85***	25.96***	68.34***	23.25***
(p-value)	(0.000)	(0.000)	(0.000)	(0.000)
Robust regression F	71.84***	25.92***	68.25***	23.19***
(p-value)	(0.000)	(0.000)	(0.000)	(0.000)
Observations	15,306	15,306	15,306	15,306
R-squared	0.649	0.648	0.659	0.658

Source: Created by the author using CSES (2009).

Robust standard errors in parentheses.

*** p<0.01 indicates significance at the 1% level. ** p<0.05 indicates significance at the 5% level. * p<0.10 indicates significance at the 10% level.

Table A.3. OLS Results of Migration and Remittances on the Completed Grade of Education by Region

VARIABLES	(1)	(2)	(3)	(4)
	Without Supply-side Factor		With Supply-side Factors	
	Rural	Urban	Rural	Urban
In-Province	-0.276*** (0.061)	-0.286** (0.144)	-0.195*** (0.060)	-0.282* (0.144)
Out-Province	0.012 (0.065)	0.019 (0.152)	0.008 (0.064)	-0.017 (0.151)
International	0.104 (0.109)	-0.321 (0.242)	0.121 (0.108)	-0.337 (0.243)
Ln Remittances	0.009*** (0.003)	0.011* (0.006)	0.003 (0.003)	0.010 (0.006)
Male	-0.178*** (0.031)	-0.146** (0.061)	-0.170*** (0.030)	-0.146** (0.061)
Age	0.750*** (0.033)	0.882*** (0.067)	0.749*** (0.033)	0.880*** (0.067)
Age Square	-0.007*** (0.002)	-0.005 (0.003)	-0.007*** (0.002)	-0.005 (0.003)
HH Head Age	0.005*** (0.002)	0.003 (0.004)	0.004** (0.002)	0.002 (0.004)
HH Male	-0.042 (0.047)	-0.026 (0.108)	0.015 (0.046)	0.022 (0.107)
Adult Member	0.054*** (0.015)	0.059** (0.024)	0.045*** (0.015)	0.047** (0.024)
Child Member	-0.111*** (0.012)	-0.091*** (0.027)	-0.099*** (0.012)	-0.090*** (0.027)
Outstanding Loans	-0.010*** (0.002)	-0.013*** (0.005)	-0.013*** (0.002)	-0.012** (0.005)
After July	0.399*** (0.031)	0.355*** (0.062)	0.297*** (0.032)	0.352*** (0.063)
Father Education				
- Primary	0.368*** (0.041)	0.201* (0.117)	0.329*** (0.040)	0.185 (0.116)
- Lower Secondary	0.720*** (0.049)	0.368*** (0.114)	0.651*** (0.049)	0.345*** (0.114)
- Upper or Higher	0.974*** (0.073)	0.323*** (0.119)	0.873*** (0.072)	0.279** (0.119)
Mother Education				
- Primary	0.511*** (0.036)	0.454*** (0.095)	0.438*** (0.036)	0.449*** (0.095)
- Lower Secondary	0.952*** (0.054)	0.727*** (0.101)	0.831*** (0.054)	0.730*** (0.101)
- Upper or Higher	0.913*** (0.104)	0.947*** (0.117)	0.777*** (0.104)	0.903*** (0.116)

Consumption Quintile				
- Quintile 2	0.249*** (0.042)	0.646*** (0.169)	0.206*** (0.041)	0.581*** (0.168)
- Quintile 3	0.517*** (0.045)	0.690*** (0.167)	0.472*** (0.044)	0.618*** (0.166)
- Quintile 4	0.721*** (0.051)	1.057*** (0.163)	0.665*** (0.050)	0.947*** (0.162)
- Quintile 5	1.034*** (0.068)	1.314*** (0.164)	0.987*** (0.067)	1.168*** (0.165)
Supply-side Factors				
- STR			-0.010*** (0.001)	-0.013*** (0.005)
- School Shift			-0.453*** (0.119)	0.286* (0.150)
- Female Teacher Ratio			0.003* (0.002)	-0.004 (0.004)
- Distance to PS			-0.045*** (0.015)	-0.134** (0.055)
- Distance to LSS			-0.041*** (0.003)	-0.008 (0.017)
Constant	-5.329*** (0.186)	-6.782*** (0.433)	-3.955*** (0.235)	-6.355*** (0.578)
AIC	50,003	9,787	49,606	9,770
BIC	50,181	9,928	49,822	9,940
Observations	12,700	2,606	12,700	2,606
R-squared	0.617	0.762	0.629	0.764

Source: Created by the author using CSES (2009).

Robust standard errors in parentheses.

*** p<0.01 indicates significance at the 1% level. ** p<0.05 indicates significance at the 5% level. * p<0.10 indicates significance at the 10% level.

Table A.4. 2SLS Results of Migration and Remittances on the Completed Grade of Education by Region

VARIABLES	(1)	(2)	(3)	(4)
	Without Supply-side Factors		With Supply-side Factors	
	Rural	Urban	Rural	Urban
Within-Province	-0.530*** (0.071)	-0.494*** (0.168)	-0.332*** (0.071)	-0.470*** (0.167)
Across-Province	-0.352*** (0.081)	-0.198 (0.178)	-0.182** (0.080)	-0.214 (0.176)
International	-0.354*** (0.126)	-0.657** (0.271)	-0.119 (0.125)	-0.636** (0.272)
Ln Remittances	0.062*** (0.008)	0.048*** (0.017)	0.031*** (0.008)	0.044*** (0.017)
Male	-0.181*** (0.031)	-0.144** (0.062)	-0.171*** (0.030)	-0.144** (0.061)
Age	0.756*** (0.034)	0.890*** (0.067)	0.752*** (0.033)	0.887*** (0.067)
Age Square	-0.007*** (0.002)	-0.005* (0.003)	-0.007*** (0.002)	-0.005* (0.003)
Urban	-	-	-	-
HH Head Age	0.000 (0.002)	-0.001 (0.004)	0.001 (0.002)	-0.001 (0.004)
HH Male	0.019 (0.048)	-0.023 (0.108)	0.045 (0.047)	0.026 (0.107)
Adult Member	0.051*** (0.015)	0.059** (0.024)	0.045*** (0.015)	0.047* (0.024)
Child Member	-0.098*** (0.013)	-0.088*** (0.027)	-0.092*** (0.012)	-0.088*** (0.027)
Loans	-0.009*** (0.002)	-0.013*** (0.005)	-0.012*** (0.002)	-0.012** (0.005)
Father Education				
- Primary	0.366*** (0.041)	0.234** (0.117)	0.328*** (0.040)	0.214* (0.116)
- Lower Secondary	0.712*** (0.050)	0.414*** (0.116)	0.648*** (0.049)	0.385*** (0.115)
- Upper Secondary or Higher	0.970*** (0.074)	0.350*** (0.120)	0.872*** (0.073)	0.301** (0.119)
Mother Education				
- Primary	0.517*** (0.036)	0.459*** (0.095)	0.444*** (0.036)	0.455*** (0.094)
- Lower Secondary	0.955*** (0.055)	0.737*** (0.101)	0.838*** (0.054)	0.743*** (0.101)
- Upper Secondary or Higher	0.896*** (0.106)	0.919*** (0.118)	0.776*** (0.105)	0.879*** (0.117)

Consumption Quintile				
	0.244***	0.636***	0.205***	0.572***
- Quintile 2	(0.042)	(0.169)	(0.041)	(0.167)
	0.519***	0.663***	0.474***	0.588***
- Quintile 3	(0.045)	(0.167)	(0.044)	(0.166)
	0.714***	1.036***	0.664***	0.922***
- Quintile 4	(0.052)	(0.162)	(0.050)	(0.162)
	1.014***	1.318***	0.978***	1.164***
- Quintile 5	(0.068)	(0.162)	(0.067)	(0.163)
Supply-side Factors				
- STR			-0.011***	-0.014***
			(0.002)	(0.005)
- School Shift			-0.371***	0.310**
			(0.122)	(0.151)
- Female Teacher Ratio			0.002	-0.005
			(0.002)	(0.004)
- Distance to PS			-0.042***	-0.123**
			(0.015)	(0.056)
- Distance to LSS			-0.040***	-0.007
			(0.003)	(0.017)
Constant	-5.326***	-6.767***	-4.009***	-6.296***
	(0.188)	(0.433)	(0.237)	(0.579)
Weak Instruments				
F statistics	904.91***	144.30***	822.62***	143.10***
(p-value)	(0.000)	(0.001)	(0.000)	(0.000)
Endogeneity				
Robust score chi2	58.43***	6.18**	15.00***	5.33**
(p-value)	(0.000)	(0.012)	(0.000)	(0.020)
Robust regression F	58.39***	6.11**	14.96***	5.24**
(p-value)	(0.000)	(0.013)	(0.000)	(0.022)
Observations	12,700	2,606	12,700	2,606
R-squared	0.610	0.759	0.627	0.762

Source: Created by the author using CSES (2009).

Robust standard errors in parentheses.

*** p<0.01 indicates significance at the 1% level. ** p<0.05 indicates significance at the 5% level. * p<0.10 indicates significance at the 10% level.

Table A.5. OLS Results of Remittances on Completed Grade of Education by Migration Types (Without Supply-side Factors)

VARIABLES	(1) Non-Migrant	(3) Within- Province	(5) Across- Province	(7) International
Ln Remittances	0.008** (0.004)	-0.002 (0.009)	0.019 (0.019)	0.017* (0.009)
Male	-0.154*** (0.030)	-0.280*** (0.101)	-0.328* (0.190)	-0.248** (0.106)
Age	0.750*** (0.034)	0.810*** (0.112)	0.587*** (0.206)	0.884*** (0.115)
Age Square	-0.005*** (0.002)	-0.010** (0.005)	0.001 (0.009)	-0.012** (0.005)
Urban	0.334*** (0.044)	0.497*** (0.160)	0.308 (0.311)	0.488*** (0.177)
HH Head Age	0.003 (0.002)	0.023*** (0.006)	0.004 (0.010)	0.001 (0.006)
HH Male	-0.060 (0.049)	-0.073 (0.142)	-0.535* (0.280)	-0.011 (0.148)
Adult Member	0.038*** (0.015)	0.128*** (0.040)	0.112 (0.081)	0.135*** (0.044)
Child Member	-0.109*** (0.013)	-0.131*** (0.038)	-0.097 (0.079)	-0.086* (0.046)
Loans	-0.010*** (0.002)	0.001 (0.008)	-0.012 (0.015)	-0.023*** (0.008)
After July	0.409*** (0.031)	0.361*** (0.104)	0.028 (0.218)	0.429*** (0.113)
Father Education				
- Primary	0.323*** (0.043)	0.608*** (0.136)	0.357 (0.308)	0.193 (0.141)
- Lower Secondary	0.671*** (0.049)	0.547*** (0.175)	0.742* (0.407)	0.665*** (0.176)
- Upper or Higher	0.726*** (0.063)	0.747*** (0.288)	0.081 (0.501)	0.522** (0.257)
Mother Education				
- Primary	0.557*** (0.037)	0.352*** (0.117)	0.415* (0.230)	0.263** (0.122)

VARIABLES	(1) Non-Migrant	(3) Within- Province	(5) Across- Province	(7) International
- Lower Secondary	0.909*** (0.050)	1.142*** (0.235)	0.336 (0.496)	0.523** (0.207)
- Upper or Higher	0.959*** (0.080)	0.561 (0.349)	0.844 (0.557)	0.385 (0.315)
Consumption Quintile				
- Quintile 2	0.285*** (0.044)	0.091 (0.137)	0.458 (0.285)	0.285* (0.154)
- Quintile 3	0.535*** (0.047)	0.383** (0.154)	0.489* (0.280)	0.568*** (0.152)
- Quintile 4	0.742*** (0.051)	0.886*** (0.170)	1.092*** (0.406)	0.761*** (0.180)
- Quintile 5	1.043*** (0.060)	1.333*** (0.217)	0.937*** (0.344)	1.262*** (0.240)
Constant	-5.434*** (0.189)	-6.754*** (0.723)	-4.224*** (1.149)	-6.019*** (0.717)
AIC	48,106	5,994	4,552	1,488
BIC	48,269	6,110	4,662	1,574
Observations	12,361	1,446	365	1,134
R-squared	0.665	0.552	0.630	0.613

Source: Created by the author using CSES (2009).

Robust standard errors in parentheses.

*** p<0.01 indicates significance at the 1% level. ** p<0.05 indicates significance at the 5% level. * p<0.10 indicates significance at the 10% level.

Table A.6. OLS Results of Remittances on Completed Grade of Education by Migration Types (With Supply-side Factors)

VARIABLES	(1) Non-Migrant	(2) Within- Province	(3) Across- Province	(4) International
Ln Remittances	0.005 (0.003)	-0.007 (0.009)	-0.000 (0.010)	0.010 (0.019)
Male	-0.147*** (0.030)	-0.296*** (0.100)	-0.255** (0.104)	-0.283 (0.187)
Age	0.745*** (0.033)	0.799*** (0.111)	0.882*** (0.114)	0.664*** (0.204)
Age Square	-0.005*** (0.002)	-0.010** (0.005)	-0.012** (0.005)	-0.002 (0.009)
Urban	0.152*** (0.053)	0.106 (0.196)	0.205 (0.228)	-0.172 (0.326)
HH Head Age	0.001 (0.002)	0.021*** (0.006)	-0.001 (0.006)	0.005 (0.010)
HH Male	-0.001 (0.048)	-0.018 (0.142)	0.004 (0.149)	-0.566** (0.276)
Adult Member	0.031** (0.015)	0.123*** (0.040)	0.137*** (0.044)	0.100 (0.081)
Child Member	-0.097*** (0.012)	-0.131*** (0.038)	-0.089** (0.045)	-0.103 (0.082)
Loans	-0.013*** (0.002)	-0.003 (0.008)	-0.020** (0.008)	-0.001 (0.016)
After July	0.324*** (0.031)	0.254** (0.105)	0.359*** (0.112)	-0.117 (0.224)
Father Education				
- Primary	0.279*** (0.042)	0.634*** (0.135)	0.215 (0.141)	0.233 (0.305)
- Lower Secondary	0.606*** (0.049)	0.506*** (0.174)	0.634*** (0.178)	0.843** (0.399)
- Upper Secondary or Higher	0.640*** (0.063)	0.703** (0.285)	0.473* (0.250)	-0.061 (0.537)
Mother Education				
- Primary	0.490*** (0.037)	0.290** (0.117)	0.224* (0.120)	0.389* (0.228)
- Lower Secondary	0.807*** (0.050)	1.064*** (0.237)	0.466** (0.206)	0.342 (0.492)
- Upper Secondary or Higher	0.852*** (0.080)	0.498 (0.344)	0.229 (0.316)	0.693 (0.592)

VARIABLES	(1) Non-Migrant	(2) Within- Province	(3) Across- Province	(4) International
Consumption Quintile				
- Quintile 2	0.232*** (0.044)	0.098 (0.136)	0.260* (0.151)	0.424 (0.291)
- Quintile 3	0.488*** (0.046)	0.321** (0.152)	0.594*** (0.151)	0.336 (0.290)
- Quintile 4	0.679*** (0.050)	0.849*** (0.166)	0.778*** (0.179)	0.885** (0.404)
- Quintile 5	0.988*** (0.060)	1.246*** (0.217)	1.305*** (0.239)	0.611* (0.354)
Supply Side Factors				
- STR	-0.011*** (0.001)	-0.012** (0.005)	-0.014** (0.006)	-0.014 (0.008)
- School Shift	-0.284*** (0.098)	0.232 (0.364)	-0.697* (0.408)	0.270 (0.777)
- Female Teacher Ratio	0.001 (0.002)	0.005 (0.005)	0.008 (0.006)	0.018 (0.012)
- Distance to PS	-0.050*** (0.015)	-0.054 (0.066)	0.137* (0.078)	-0.125 (0.112)
- Distance to LSS	-0.041*** (0.003)	-0.047*** (0.008)	-0.048*** (0.011)	-0.053* (0.030)
Constant	-4.171*** (0.227)	-6.148*** (0.877)	-4.371*** (0.912)	-4.592*** (1.362)
AIC	47,773	5,964	4,514	1,482
BIC	47,973	6,106	4,650	1,588
Observations	12,361	1,446	1,134	365
R-squared	0.674	0.564	0.629	0.646

Source: Created by the author using CSES (2009).

Robust standard errors in parentheses.

*** p<0.01 indicates significance at the 1% level. ** p<0.05 indicates significance at the 5% level. * p<0.10 indicates significance at the 10% level.

Table A.7. 2SLS Results of Remittances on the Completed Grade of Education by Migration Types (Without Supply-side)

VARIABLES	(1) Non-Migrant	(2) Within-Province	(3) Across-Province	(4) International
Ln Remittances	0.065*** (0.008)	0.028 (0.021)	0.063*** (0.019)	0.006 (0.062)
Male	-0.158*** (0.031)	-0.274*** (0.101)	-0.238** (0.106)	-0.319 (0.195)
Age	0.760*** (0.034)	0.802*** (0.111)	0.900*** (0.115)	0.596*** (0.206)
Age Square	-0.006*** (0.002)	-0.010** (0.005)	-0.013** (0.005)	0.001 (0.009)
Urban	0.384*** (0.045)	0.513*** (0.161)	0.535*** (0.183)	0.308 (0.303)
HH Head Age	-0.003 (0.002)	0.020*** (0.006)	-0.002 (0.006)	0.005 (0.011)
HH Male	-0.010 (0.050)	-0.017 (0.147)	0.025 (0.149)	-0.543** (0.275)
Adult Member	0.036** (0.015)	0.121*** (0.040)	0.141*** (0.044)	0.107 (0.082)
Child Member	-0.097*** (0.013)	-0.114*** (0.040)	-0.072 (0.046)	-0.088 (0.083)
Loans	-0.010*** (0.002)	0.002 (0.007)	-0.020** (0.008)	-0.013 (0.016)
After July	0.403*** (0.031)	0.325*** (0.105)	0.388*** (0.113)	0.046 (0.223)
Father Education				
- Primary	0.335*** (0.043)	0.569*** (0.135)	0.187 (0.141)	0.356 (0.300)
- Lower Secondary	0.681*** (0.049)	0.501*** (0.176)	0.681*** (0.178)	0.731* (0.393)
- Upper Secondary or Higher	0.728*** (0.064)	0.716** (0.288)	0.487* (0.255)	0.028 (0.531)
Mother Education				
- Primary	0.563*** (0.038)	0.366*** (0.116)	0.264** (0.121)	0.425* (0.228)
- Lower Secondary	0.912*** (0.051)	1.131*** (0.238)	0.593*** (0.212)	0.374 (0.514)
- Upper Secondary or Higher	0.931*** (0.082)	0.525 (0.362)	0.441 (0.324)	0.874 (0.542)

VARIABLES	(1) Non-Migrant	(2) Within-Province	(3) Across-Province	(4) International
Consumption Quintile				
- Quintile 2	0.287*** (0.045)	0.077 (0.136)	0.233 (0.153)	0.487 (0.308)
- Quintile 3	0.533*** (0.047)	0.376** (0.153)	0.566*** (0.152)	0.508* (0.282)
- Quintile 4	0.733*** (0.052)	0.871*** (0.169)	0.757*** (0.181)	1.122*** (0.421)
- Quintile 5	1.052*** (0.061)	1.289*** (0.213)	1.263*** (0.241)	0.974** (0.390)
Constant	-5.381*** (0.192)	-6.732*** (0.728)	-6.821*** (0.736)	-4.300*** (1.122)
Weak Instruments				
F statistics	814.16***	152.66***	97.70***	12.72***
(p-value)	(0.000)	(0.000)	(0.000)	(0.000)
Endogeneity				
Robust score chi2	63.32***	2.598	6.61***	0.050
(p-value)	(0.000)	(0.107)	(0.010)	(0.823)
Robust regression F	63.32***	2.560	6.47***	0.046
(p-value)	(0.000)	(0.109)	(0.011)	(0.828)
Observations	12,361	1,446	1,134	365
R-squared	0.657	0.549	0.606	0.630

Source: Created by the author using CSES (2009).

Robust standard errors in parentheses.

*** p<0.01 indicates significance at the 1% level. ** p<0.05 indicates significance at the 5% level. * p<0.10 indicates significance at the 10% level.

Table A.8. 2SLS Results of Remittances on the Completed Grade of Education by Migration Types (With Supply-side)

VARIABLES	(1) Non-Migrant	(2) Within- Province	(3) Across- Province	(4) International
Ln Remittances	0.043*** (0.008)	0.016 (0.022)	-0.002 (0.023)	-0.096 (0.074)
Male	-0.150*** (0.030)	-0.294*** (0.099)	-0.256** (0.103)	-0.209 (0.199)
Age	0.752*** (0.033)	0.792*** (0.110)	0.881*** (0.112)	0.736*** (0.216)
Age Square	-0.006*** (0.002)	-0.010** (0.005)	-0.012** (0.005)	-0.005 (0.010)
Urban	0.193*** (0.054)	0.113 (0.195)	0.203 (0.228)	-0.236 (0.347)
HH Head Age	-0.003 (0.002)	0.019*** (0.006)	-0.001 (0.006)	0.018 (0.013)
HH Male	0.033 (0.049)	0.022 (0.146)	0.003 (0.148)	-0.619** (0.278)
Adult Member	0.030** (0.015)	0.121*** (0.040)	0.137*** (0.044)	0.055 (0.086)
Child Member	-0.090*** (0.013)	-0.119*** (0.039)	-0.089** (0.045)	-0.030 (0.094)
Loans	-0.012*** (0.002)	-0.002 (0.007)	-0.020** (0.008)	-0.005 (0.016)
After July	0.326*** (0.031)	0.229** (0.104)	0.360*** (0.111)	-0.005 (0.231)
Father Education				
- Primary	0.287*** (0.043)	0.600*** (0.134)	0.215 (0.139)	0.199 (0.304)
- Lower Secondary	0.612*** (0.049)	0.468*** (0.175)	0.633*** (0.178)	0.775** (0.377)
- Upper Secondary or Higher	0.641*** (0.063)	0.679** (0.285)	0.474* (0.246)	-0.539 (0.578)
Mother Education				
- Primary	0.496*** (0.037)	0.303*** (0.116)	0.223* (0.118)	0.468** (0.230)
- Lower Secondary	0.815*** (0.050)	1.062*** (0.239)	0.462** (0.206)	0.658 (0.544)
- Upper Secondary or Higher	0.838*** (0.081)	0.457 (0.356)	0.225 (0.313)	0.928 (0.595)

VARIABLES	(1) Non-Migrant	(2) Within- Province	(3) Across- Province	(4) International
Consumption Quintile				
- Quintile 2	0.235*** (0.044)	0.090 (0.135)	0.262* (0.150)	0.678* (0.347)
- Quintile 3	0.487*** (0.046)	0.319** (0.151)	0.594*** (0.149)	0.499 (0.310)
- Quintile 4	0.675*** (0.051)	0.839*** (0.164)	0.778*** (0.177)	1.091** (0.439)
- Quintile 5	0.992*** (0.060)	1.211*** (0.213)	1.306*** (0.237)	0.849** (0.419)
Supply Side Factor				
- STR	-0.012*** (0.001)	-0.013*** (0.005)	-0.014** (0.006)	-0.015* (0.008)
- School Shift	-0.196* (0.100)	0.349 (0.380)	-0.708* (0.415)	0.119 (0.754)
- Female Teacher Ratio	-0.001 (0.002)	0.004 (0.005)	0.008 (0.006)	0.026* (0.013)
- Distance to PS	-0.043*** (0.015)	-0.061 (0.066)	0.136* (0.077)	-0.102 (0.109)
- Distance to LSS	-0.040*** (0.003)	-0.045*** (0.008)	-0.048*** (0.012)	-0.055* (0.030)
Constant	-0.012*** (0.001)	-0.013*** (0.005)	-0.014** (0.006)	-0.015* (0.008)
Weak Instruments				
F statistics (p-value)	753.97*** (0.000)	127.88*** (0.000)	68.25*** (0.000)	10.17*** (0.000)
Endogeneity				
Robust score chi2 (p-value)	26.748*** (0.000)	1.363 (0.242)	0.011 (0.915)	2.452 (0.117)
Robust regression F (p-value)	26.715*** (0.000)	1.341 (0.246)	0.010 (0.917)	2.269 (0.132)
Observations	12,361	1,446	1,134	365
R-squared	0.671	0.562	0.629	0.619

Source: Created by the author using CSES (2009).

Robust standard errors in parentheses.

*** p<0.01 indicates significance at the 1% level. ** p<0.05 indicates significance at the 5% level. * p<0.10 indicates significance at the 10% level.

Table A.9. Two-Step Heckman Results of Effects of Migration and Remittances on Children's Working Hours

VARIABLES	(1)	(2)	(3)	(4)
	Rural		Urban	
	Step 1	Step 2	Step 1	Step 2
Ln Remittances	-0.082 (0.059)	-0.004 (0.003)	-0.482** (0.225)	-0.008 (0.007)
Within-province	2.801*** (1.039)	0.187*** (0.044)	-5.934 (4.864)	-0.158 (0.154)
Across-province	-0.735 (1.153)	0.169*** (0.049)	13.386*** (5.128)	0.328** (0.146)
International	-6.574*** (1.987)	-0.183** (0.085)	11.844* (6.416)	0.083 (0.227)
Male	0.898 (0.571)	0.070*** (0.024)	-4.883* (2.671)	-0.183*** (0.067)
Age	4.790*** (0.619)	0.201*** (0.004)	6.411*** (2.415)	0.225*** (0.012)
HH Head Age	0.040 (0.032)	-0.003* (0.001)	0.127 (0.112)	0.002 (0.004)
HH Head (Male)	-1.081 (0.803)	-0.027 (0.037)	4.846 (3.175)	0.097 (0.104)
Adult Member	-0.860*** (0.287)	-0.056*** (0.011)	-3.023* (1.765)	-0.153*** (0.027)
Child Member	0.530** (0.212)	0.012 (0.010)	0.315 (0.790)	-0.005 (0.028)
Father Education				
- Primary	-0.766 (0.696)	-0.027 (0.032)	-5.798 (4.084)	-0.267** (0.109)
- Lower Secondary	-3.673*** (0.916)	-0.079* (0.040)	-10.910** (4.572)	-0.331*** (0.110)
- Upper Secondary or Higher	-4.653*** (1.404)	-0.063 (0.062)	-9.273 (6.056)	-0.451*** (0.130)
Mother Education				
- Primary	-1.029* (0.624)	-0.035 (0.028)	-1.181 (2.705)	0.128 (0.086)
- Lower Secondary	-1.329 (1.047)	-0.051 (0.046)	-13.426*** (3.352)	-0.034 (0.109)
- Upper Secondary or Higher	-4.338** (2.143)	-0.048 (0.093)	-24.508*** (8.142)	-0.559*** (0.161)
Consumption Quintile				
- Quintile 2	0.908 (0.724)	-0.020 (0.033)	-6.222 (5.774)	-0.511*** (0.134)

- Quintile 3	0.605 (0.783)	-0.039 (0.036)	-3.521 (6.234)	-0.552*** (0.135)
- Quintile 4	-1.600 (1.009)	-0.156*** (0.041)	-10.414 (7.752)	-0.732*** (0.130)
- Quintile 5	-5.159*** (1.433)	-0.264*** (0.053)	-13.440 (9.361)	-0.895*** (0.133)
Electricity	-0.011 (0.019)	-0.004*** (0.001)	0.047 (0.050)	-0.001 (0.002)
Piped Water	-0.098*** (0.027)	-0.006*** (0.001)	-0.039 (0.048)	-0.003*** (0.001)
Industrial Area	-1.948*** (0.589)	0.006 (0.027)	6.142 (5.036)	0.383*** (0.116)
Distance Restaurant	-0.113*** (0.043)	-0.009*** (0.001)	1.620 (1.026)	0.065** (0.028)
Distance to Credit	0.119*** (0.039)	0.007*** (0.002)	0.671* (0.381)	0.018 (0.011)
Distance to Agro Farm	-0.041*** (0.013)	-0.000 (0.001)	-0.128 (0.081)	-0.002 (0.003)
Distance to Market	0.082** (0.035)	0.004** (0.002)	0.253 (0.734)	-0.002 (0.024)
Ln Local Wage	-0.362 (1.221)	-0.018 (0.055)	-2.677 (3.513)	-0.169* (0.090)
Inverse Mills Ratio (Lambda)		20.370*** (4.936)		25.632* (14.906)
Constant	-42.515*** (15.241)	-1.965*** (0.514)	-54.577 (36.919)	-0.932 (0.876)
Observations	12,700	12,700	2,606	2,606

Source: Created by the author using CSES (2009).

Robust standard errors in parentheses.

*** p<0.01 indicates significance at the 1% level. ** p<0.05 indicates significance at the 5% level. * p<0.10 indicates significance at the 10% level.

Table A.10. Two-Step Heckman Results of Effects of Remittances by Migration Types on Children's Working Hours (Non-Migrants and Within-Province Migrants)

VARIABLES	(1)	(2)	(3)	(4)
	Non-Migrant		Within-Province	
	1st Step	2nd Step	1st Step	2nd Step
Ln Remittance	-0.001 (0.003)	-0.130** (0.065)	-0.012 (0.007)	0.139 (0.134)
Male	0.013 (0.026)	-0.361 (0.579)	0.144* (0.075)	2.197 (1.443)
Age	0.202*** (0.004)	4.616*** (0.649)	0.228*** (0.013)	2.439* (1.267)
Urban	-0.217*** (0.053)	-4.290*** (1.450)	-0.597*** (0.194)	-1.895 (5.334)
HH Head Age	-0.003* (0.001)	0.078** (0.034)	-0.003 (0.005)	-0.071 (0.084)
HH Head (Male)	-0.027 (0.039)	-1.367 (0.876)	-0.153 (0.112)	3.746* (2.054)
Adult Member	-0.070*** (0.012)	-0.982*** (0.340)	-0.052* (0.029)	-0.939* (0.559)
Child Member	0.025** (0.010)	0.732*** (0.237)	-0.012 (0.030)	0.311 (0.521)
Father Education				
- Primary	-0.095*** (0.034)	-1.366* (0.810)	0.247** (0.101)	-2.723 (2.080)
- Lower Secondary	-0.132*** (0.041)	-4.371*** (1.023)	0.137 (0.133)	-1.550 (2.379)
- Upper Secondary or Higher	-0.178*** (0.059)	-5.824*** (1.517)	0.590*** (0.202)	-5.855 (4.336)
Mother Education				
- Primary	-0.007 (0.030)	-1.015 (0.681)	-0.094 (0.085)	-1.648 (1.477)
- Lower Secondary	-0.074 (0.045)	-3.756*** (1.078)	-0.076 (0.201)	-0.405 (3.430)
- Upper Secondary or Higher	-0.153* (0.082)	-7.745*** (2.085)	-1.017** (0.436)	-12.771 (11.464)
Consumption Quintile				
- Quintile 2	-0.064* (0.036)	1.068 (0.821)	0.281*** (0.104)	-2.622 (2.121)
- Quintile 3	-0.053 (0.039)	0.927 (0.872)	-0.002 (0.112)	-0.532 (1.878)
- Quintile 4	-0.157*** (0.043)	-1.531 (1.070)	-0.281** (0.125)	-0.587 (2.680)
- Quintile 5	-0.310*** (0.051)	-4.658*** (1.542)	-0.369** (0.169)	-2.747 (3.631)
Electricity	-0.004***	-0.014	-0.006***	0.079

	(0.001)	(0.019)	(0.002)	(0.050)
Piped Water	-0.006***	-0.071***	0.002	-0.045
	(0.001)	(0.026)	(0.002)	(0.048)
Industrial Area	0.057*	-1.392**	-0.080	-2.370
	(0.029)	(0.678)	(0.084)	(1.464)
Distance Restaurant	-0.010***	-0.101**	-0.002	-0.051
	(0.002)	(0.048)	(0.005)	(0.089)
Distance to Credit	0.007***	0.101**	0.004	0.089
	(0.002)	(0.043)	(0.005)	(0.081)
Distance to Agro Farm	-0.000	-0.041***	-0.001	-0.048
	(0.001)	(0.014)	(0.002)	(0.033)
Distance to Market	0.003**	0.090**	0.010*	0.013
	(0.002)	(0.038)	(0.005)	(0.092)
Ln Local Wage	-0.067	0.099	-0.068	-3.864
	(0.051)	(1.244)	(0.173)	(3.195)
mills		19.195***		-1.896
lambda		(5.031)	-	(9.981)
Constant	-1.456***	-44.219***	-1.720	40.466
	(0.476)	(14.591)	(1.635)	(33.833)
Observations	12,361	12,361	1,446	1,446

Source: Created by the author using CSES (2009).

Robust standard errors in parentheses.

*** p<0.01 indicates significance at the 1% level. ** p<0.05 indicates significance at the 5% level. * p<0.10 indicates significance at the 10% level.

Table A.11. Two-Step Heckman Results of Effect of Remittances by Migration Types on Children's Working Hours (Across-Province and International Migrants)

VARIABLES	(1)	(2)	(3)	(4)
	Across-Province		International	
	1st Step	2nd Step	1st Step	2nd Step
Ln Remittances	-0.014* (0.008)	-0.180 (0.211)	-0.034* (0.018)	-0.777 (0.534)
Male	0.077 (0.082)	1.067 (1.853)	0.197 (0.165)	-1.131 (4.249)
Age	0.179*** (0.014)	4.814*** (1.629)	0.244*** (0.029)	5.616** (2.812)
Urban	0.011 (0.194)	7.072 (4.390)	-0.483 (0.394)	-4.021 (10.569)
HH Head Age	-0.003 (0.005)	-0.073 (0.101)	-0.002 (0.009)	0.001 (0.177)
HH Head (Male)	-0.031 (0.118)	-2.011 (2.571)	0.262 (0.241)	5.390 (5.856)
Adult Member	-0.086** (0.034)	-0.300 (1.039)	-0.098 (0.073)	-1.998 (2.081)
Child Member	-0.113*** (0.038)	-1.836 (1.277)	-0.020 (0.065)	1.581 (1.394)
Father Education				
- Primary	0.119 (0.109)	1.358 (2.531)	-0.135 (0.244)	-2.173 (5.677)
- Lower Secondary	0.024 (0.140)	-1.982 (2.996)	-0.478 (0.377)	-10.849 (10.343)
- Upper Secondary or Higher	-0.505** (0.217)	-7.736 (6.805)	1.129** (0.538)	21.160 (17.409)
Mother Education				
- Primary	0.059 (0.092)	1.453 (2.001)	-0.448** (0.207)	-6.233 (7.116)
- Lower Secondary	0.168 (0.171)	6.227 (3.812)	0.278 (0.438)	15.261 (9.633)
- Upper Secondary or Higher	-0.853** (0.366)	-17.817 (14.132)	-0.755 (0.612)	4.087 (16.112)
Consumption Quintile				
- Quintile 2	-0.096 (0.123)	0.867 (2.712)	-0.817*** (0.262)	-8.652 (10.611)
- Quintile 3	-0.051 (0.123)	1.834 (2.620)	-0.626*** (0.236)	-1.730 (8.213)
- Quintile 4	-0.380*** (0.143)	-1.526 (4.527)	-0.976*** (0.322)	-15.718 (12.424)
- Quintile 5	-0.320* (0.186)	-5.170 (4.823)	-0.290 (0.326)	0.322 (7.696)
Electricity	-0.005**	-0.037	0.004	0.216*

	(0.002)	(0.068)	(0.005)	(0.116)
Piped Water	-0.001	-0.050	-0.018***	-0.284
	(0.002)	(0.056)	(0.004)	(0.231)
Industrial Area	-0.101	-0.877	0.079	0.857
	(0.095)	(2.197)	(0.189)	(4.208)
Distance Restaurant	-0.007	-0.170	-0.019	0.251
	(0.006)	(0.142)	(0.018)	(0.506)
Distance to Credit	0.015**	0.320*	-0.002	0.767
	(0.006)	(0.172)	(0.020)	(0.671)
Distance to Agro Farm	-0.000	-0.010	0.005	-0.015
	(0.002)	(0.042)	(0.005)	(0.136)
Distance to Market	-0.008	-0.128	0.025	-0.209
	(0.006)	(0.136)	(0.023)	(0.725)
Ln Local Wage	-0.062	-4.260	0.684	12.132
	(0.183)	(3.969)	(0.429)	(12.381)
mills		23.648		20.279
lambda		(15.063)		(19.104)
Constant	-0.583	-1.395	-8.397**	-171.292
	(1.725)	(42.151)	(3.995)	(145.031)
Observations	1,134	1,134	365	365

Source: Created by the author using CSES (2009).

Robust standard errors in parentheses.

*** p<0.01 indicates significance at the 1% level. ** p<0.05 indicates significance at the 5% level. * p<0.10 indicates significance at the 10% level.