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Abstract

Using a rare individual-level data set, this paper explores the role of education and farmland on the choice of job of three generations of household members in rural Laos. While the first (G1) and the second (G2) generations are mainly engaged in farming, the youngest generation (G3) is engaged in nonfarm wage and overseas work. Education matters in nonfarm wage work, but not necessarily in overseas work. The female members of G3 are more likely to migrate. Our findings imply a shortage of jobs in rural Laos, pushing the less educated and the females to cross the border to Thailand.

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Pathways out of poverty in rural Laos

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ABSTRACT: *This research aims to identify pathways out of poverty in rural Laos. The authors found that participation in nonfarm labor market and cross-border migration to Thailand were the most important pathways. Migration is particularly beneficial to women and the less educated who are more likely susceptible to spells of unemployment and poverty.*

Category of paper: Labor and demographic economics

JEL Classification Codes: J1, J6

Keywords: Education, Land inheritance, Job choice, Farming, Nonfarm jobs, Poverty

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I. Introduction

The United Nations has announced that the Millennium Development Goal 1 (MDG1) on poverty reduction has been achieved 5 years before the deadline of 2015. To date, about 1 billion people subsist on less than \$1.25 per day (World Bank 2014) and around 70 per cent of them live and work in rural areas (United Nations, 2010). To reduce poverty, it is crucial to put into productive use the main asset of the rural poor—unskilled labor. The labor market could serve as a key transmission mechanism to enable the rural poor to overcome poverty. Labor markets consist of (1) farm, (2) nonfarm, and (3) overseas markets with varying skill requirements and different wages across them.

Farm labor market is thin, partly because of the difficulty in monitoring hired farm laborers in spatially wide and diverse agricultural environment (Hayami and Otsuka 1993) and partly because of the synchronization of busy season among rural households, particularly under rainfed condition where everybody begins planting at the onset of rainy season (Estudillo, Otsuka, and Yamano, 2010). Furthermore, agricultural mechanization tends to reduce labor demand. Thus, in order to earn subsistent income from farming activities, ownership of some land, or at least access to land through tenancy contract, is needed. In other words, we can hardly expect that the development of farm labor market contributes to poverty reduction.

Increasing nonfarm income is undoubtedly a major driver of growth in income even among farmer and landless worker household in Asia (Otsuka, Estudillo, and Sawada, 2009). It is common that husbands and sometimes wives of rural households work in nonfarm sector during off-season of agriculture, e.g., construction. More often than not, their children find jobs outside the farms because of the limited cultivation area. Furthermore, nonfarm sector grows

faster than farm sector, so that employment opportunities in the former also grow faster than in the latter. Children who are engaged in nonfarm jobs often remit a part of their income to their parents, which can significantly contribute to the reduction in rural poverty. In order to facilitate such job transformation, labor markets must connect both rural and urban jobs with workers in rural villages.

While education represented by schooling year is not critical factor affecting the efficiency of farm management, it is education that largely determines the choice of nonfarm jobs and the amount of nonfarm income. For example, the educated workers can find lucrative jobs in formal sector, whereas the uneducated workers obtain low-paying jobs in informal sector in local towns (Otsuka, Estudillo, and Sawada, 2009). Thus, investment in schooling of children and the development of nonfarm labor market are crucial for poverty reduction and improvement of wellbeing of rural population. Another important role of nonfarm jobs is to reduce gender inequality, as there is no handicap for female workers vis-à-vis male workers in nonfarm jobs, unlike farming which requires manual work (Quisumbing, Estudillo, and Otsuka 2004). It must be also noticed that domestic labor market is often integrated with foreign labor markets through overseas migration. A critically important empirical question is whether overseas migration confers benefits primarily to the wealthy and educated male family members or to the poor and uneducated female family members. Considering that the importance of overseas migration has been increasing, this question can be of utmost importance in reducing rural poverty and increasing women's economic and social status.

This research explores pathways out of poverty by exploring dynamic changes in the structure of rural and overseas labor markets. Since the main asset of the poor is their labor, we look through sectors of employment of members belonging to two generations of households in

rural Laos. One important finding is the structural shift of the rural labor market away from the farm to the nonfarm sector and overseas. Another important finding is that transmission of poverty from parents to their children seems to be halted with the shift of job choice of the younger generation away from farm work to nonfarm work. The underlying forces behind the choice of overseas work among the younger generation, the women, and the less educated are the decrease in size of farmland in a largely traditional agriculture and the rising demand for overseas workers in neighboring Thailand. This study attempts to explore the extent to which structural shift is pro-poor as it opens up job opportunities to the lowly educated and to females who have limited options in agriculture.

This paper has three remaining sections. Section II describes the structure of and changes in the Lao economy. Section III describes the study villages and sample individuals. Section IV identifies the determinants of inherited farmland, schooling, and job choice in two generations. Finally, Section V presents the summary and conclusions of the study.

II. Changing economic structure in Laos

Laos in brief

Laos is a small country in Southeast Asia with a population of about 6.8 million people in 2013 (World Bank, 2013). It is classified by the United Nations (UN) as one of the least developed countries in the world (UN, 2011). The country implemented a liberalization policy “New Economic Mechanism” (MEC) in 1986 that transformed its economy away from a command- to a market-based economy. Arable land per capita remained fairly similar at 0.40 from 1990 to 2012 indicating that population pressure on closed land frontier has not increased. Its gross domestic product (GDP) per capita rose from PPP US\$1,622 in 1990 to PPP US\$4,388 in 2011

for an annual growth rate of 4.6 per cent (World Bank, 2013). The development of industry (particularly garments, mining, and hydroelectricity) is the major source of GDP growth.

In contrast, the share of agriculture in the GDP declined from 61 per cent in 1992 to 31 per cent in 2010 (World Bank, 2011). Ironically, 78 per cent of the workforce continued to be engaged in agriculture even as late as 2005 (UNDP, 2009). Meanwhile, the incidence of poverty declined from 55 per cent in 1992 to 34 per cent in 2008 (i.e., 1 out of 3 Lao people are poor in 2008), accompanied by a rise in inequality—the Gini coefficient of income inequality rose from 0.304 in 1992 to 0.367 in 2008 (World Bank, 2011). The development of Lao economy is inclusive of the poor but largely “exclusive” of income classes other than the most wealthy.

Composition of GDP and labor force

Laos experiences a shift of its aggregate output away from agriculture to other sectors. In 1992, agriculture is the dominant sector, but its share of GDP declined by about 30 percentage points from 1992 to 2010; its GDP share became almost equal to that of industry and services in 2010. The industry sector employs less than 5 per cent of the labor force while its share in total GDP is about one-third. Mining and quarrying and hydroelectricity are the major ones, which, combined, contributed about 10 per cent to total GDP in 2008 (MPI, 2009a), while employing 14,500 workers only (UNDP, 2009, p.82-83). Labor productivity in industry was about 10 times higher compared with agriculture and 3.8 times compared with the service sector in 1992, even though labor productivity in agriculture is under-estimated because many most farmers are part-time.

Agriculture remains unproductive as only 16 per cent of the cropland is irrigated. Nonetheless, the yield of rice, which is the major crop, rose from 2.6 per ha in 1992 to 3.6 tons per ha in 2009, presumably because of the increasing adoption of modern high-yielding rice varieties (MVs) from 30 per cent in the 1990s to 50 per cent in the 2000s (Asian Development

Bank, 2006). Farm size is declining and landlessness is increasing because of the high population growth rate—exceeding 2 per cent annually in the 1980s and 1990s—on a land frontier that is beginning to close. In the service sector, the major employers are government, education, and wholesale and retail trade. While the more educated tend to enter the government and education sectors, the service sector, as a whole, has low productivity inasmuch as an adult Lao person has an average schooling of only about 4 years.

Income growth and poverty reduction

The major question is the extent to which the high growth rate of GDP per capita at 4.6 per cent annually is translated into poverty reduction. The high and sustained GDP growth was accompanied by a reduction in poverty headcount ratio by 22 percentage points from 1992 to 2008. Thus, growth and poverty reduction appear to move in tandem. When GDP growth slumped to a lower rate of 5.71 per cent during 1997-2002, reduction in headcount ratio was 5.4 percentage points only. And when GDP grew rapidly at 7.01 per cent from 2002 to 2008, reduction in poverty was more pronounced at 10 percentage points during the period. This means that the aggregate economic growth in Laos is inclusive; the poor is able to participate in and benefit from economic growth. Yet, the Gini coefficient (based on consumption) continued to rise over time, attaining the highest level in 2008, when income share of the richest decile reached more than 30 per cent. This means that while “the rising tide lifts all boats,” there a few high-speed boats that go uphill faster and further up.

Cross-border migration to Thailand

Cross-border migration to Thailand is increasing because Laos shares a similar culture and language and a long island border with Thailand. Those migrants comprise about 8 per cent of

the total labor force and their savings and remittances constitute about 7 per cent of the Lao GDP (United Nations Development Programme, 2009). A large majority of out-bound migrants to Thailand are undocumented as it is easy to cross the border illegally. According to World Bank (2009, Box 5.2, p.153), most migrants to Thailand are from Laos, Myanmar, and Cambodia and they are predominantly young male. Lao migrants continue to flock to Thailand, motivated primarily by higher wages, prospects of having a better job, and access to modern urban amenities. Unique to the Lao migrants is the large share of female workers.

III. Study villages and sample individuals

Our surveys

Our study villages are located in three provinces: Xayaboury, Champasak, and Savanakheth (Figure 1). A benchmark survey was conducted among 610 households in six villages (two villages for each province) in 2007 by the National Economic Research Institute (NERI) of the Lao government's Ministry of Planning and Investments (MPI). These three provinces were selected purposely because they have the highest rate of circulatory and permanent out-migration. Two villages (one near the Thai border and another one farther away) were selected for each province. About one-half of the 610 households have members working in Thailand.

In collaboration with NERI, the National Graduate Institute for Policy Studies (GRIPS) in Tokyo conducted two adjacent surveys in 2010-11. The first survey is the household survey, which consists of two parts: (a) retrospective schooling and inheritance survey of three generations of household members and (b) household income sources. The second survey is the children's survey, which is intended to collect data on the sources of income of respondents' children. The respondents' children consist of those who are currently residing in the study

villages and those who migrated out to local towns, Vientiane, and Thailand. We interviewed about 60 per cent of children who are living in the study villages. For children in local towns and Vientiane, we were able to interview 50 children because of difficulty of tracing their whereabouts during our surveys. We could not conduct the survey of migrant children to Thailand, who have been outside the village. Therefore, it must be pointed out at this stage, the sampling of children's generation is non-random and incomplete, so that the data and analytical results must be interpreted with caution.

Our respondents in the household survey were the heads of households. We were able to catch 528 out of the original 610 households (i.e., attrition was as small as 13 per cent); these 528 households were almost equally distributed across the three provinces (Table 1). The major reasons for attrition were out-migration, refusal of interview, and absence during the survey visit. Interestingly, a larger proportion of the respondents' children (151 out of 628 or 24 per cent) in Savanakhethave migrated out to Thailand possibly because our study villages in Savanakheth are far from the main town and have bad rough roads, but it is easy to cross the border to Thailand by boat. About 13 per cent of children in Xayabury (56 out of 407 children) and Champasak (75 out of 592 children) have migrated out of the villages to reside in local towns, indicating that local towns in these provinces could give job opportunities to younger people.

Characteristics of respondents' households

All people in our study villages belonged to the majority Lao-Thai ethnic group, which comprises about 60 per cent of the entire population in 2005. Ninety-eight per cent of the 528 households have electricity and 80 per cent have access to tubewell water. About 50 per cent have houses built with concrete and semi-concrete materials, yet only 1 per cent have water-flush

latrine, indicating that housing standards in rural Laos are far from modern. However, 76 per cent of households have at least one mobile phone. Average household size in our study villages was 5.9, comparable with rural Laos' 5.8 in 2007/08 (MPI, 2009b).

Average size of farm was 2.92 ha, which is bigger than the 2 ha average for the whole of Laos. Ninety-two per cent of the households reported income earnings from rice production. The average yield of rice in the wet-season crop was only 1.84 tons per ha, which is lower than the Lao average of 3.8 tons per ha. The reasons are low adoption of MVs (only 66 per cent of farmers in the study villages have adopted MVs), inadequate irrigation (only 17 per cent have access to irrigation water), and low fertilizer use (only 40 per cent of farmers apply inorganic fertilizer). In general, agriculture is underdeveloped, so that this sector can hardly provide decent income earning opportunities.

Characteristics of respondents' children

It is found that respondents' children were born around 1980 on average and have completed more than 6 years of schooling of (Table 2). Interestingly, those children living in Vientiane have the highest schooling attainment (10 years) followed by those in local towns (8.4 years). Interestingly, those in Thailand have lower years of schooling (5.9 years) compared to those living in the villages (6.1 years) indicating a push to cross the border for the less educated. Presumably this is because of the scarcity of job opportunities for the less educated in the local labor market within Laos.

Inherited farmland is highest for children who are currently living in the study villages (1.32 ha) followed by those who are in Thailand (1.01 ha), as shown in Table 3. It appears that those who migrated to Thailand continue to keep their farmland in the villages while seasonally

migrating to Thailand during off season period in rice farming. In fact, a large majority of respondents' children living in Thailand are engaged in informal wage work (141 out of 257 children), which is likely to be seasonal or temporary, reflecting that the current demand for foreign workers in Thailand lies in the informal sector. Those children living in the villages continue to be engaged in farming (959 out of 1,151 children), while about one-fourth of those children living in local towns (39 out of 162 children) are engaged in formal work largely in the government sector. Children in Vientiane are engaged in varied occupations from farming to formal wage and informal wage work, indicating that the labor market in Vientiane could accommodate both the highly educated and less educated workers.

Retrospective overview of two generations

Here we compare educational, occupational, and other basic characteristics of females and males in two generations: (1) the first generation consisting of the respondents and their sisters and brothers (G1), and (2) the second generation consisting of the respondents' daughters and sons (G2). We have a total of 1,052 male G1 and 830 female G1, who were born in 1965, on average (Table 4). The number of male respondents is larger because respondents are household heads who are mostly males. Female G2 was at a significant disadvantage with respect to schooling (5.4 years for male G1 vs. 3.9 years for female G1), but they received significantly more farmland (0.63 ha for male G1 vs. 0.86 ha for female G2). This pattern shows the emergence of gender specificity in parental bequest decisions: sons received more education while daughters received more farmland, which largely characterizes the matrilineal system of farmland inheritance in Southeast Asia (Quisumbing, Estudillo, and Otsuka, 2004). Having received a

piece of farmland, female G2 chose to become farmers (not housewives)—91 per cent classified themselves as farmers.

Children of respondents (G2) were born in 1981 and received about two more years of schooling attainment than their parents (G1). Female G2 remained significantly disadvantaged in schooling attainment although the gap between the schooling years of female G2 and male G2 have gone down from 1.5 years in G1 to only 1.0 years in G2. This implies that rural Laotian parents have become more egalitarian over time with respect to schooling investments. At the time of our survey in 2010, 79 per cent of the children mentioned that their parents were still undecided on farmland bequests. For the remaining 21 per cent, we found that bequest to male G2 was almost the same as that to female G2 (1.28 ha for the male G2 compared with 1.21 ha for the female G2), a discontinuation of the traditional practice in the previous generation of giving more farmland to females.

We classified jobs into five distinct categories: (1) farming, (2) nonfarm self-employed, (3) nonfarm wage work, (4) overseas work, and (5) others. Farming includes self-cultivation of crops and livestock, fishing, forestry, and a negligible number of casual agricultural wage workers. Nonfarm self-employment includes retail trade and commerce, operation of rural transport, and traditional manufacturing industry. Nonfarm wage work includes jobs in the government (e.g., teachers, military, office workers, and rural health workers), in manufacturing, mining and construction, and in services such as hotels, restaurants, and domestic work. Overseas jobs are largely concentrated in urban Thailand. ‘Others’ largely refer to retired workers and housekeepers.

According to Table 4, a large number of G1 engaged in farming (90 per cent). Nonfarm self-employment was rather limited (2 per cent) and nonfarm wage employment was confined

mainly to government service (8 per cent). It appears that the rural labor market in rural Laos in the 1970s and 1980s consisted of two large groups—farming and formal employment in the government sector. Rather unique in Laos is the small size of the nonfarm self-employment sector, which, in many developing countries, is largely dominated by retail trade and operation of rural transport (e.g., Ramos et al., 2012). The job choice of G2 shifted away from farming in rural villages to nonfarm jobs in local towns and cities within Laos (including the main city Vientiane) and to overseas jobs in Thailand. This change in preference among respondents' children tends to be more pronounced among the female, who are traditionally the caretakers of farmland.

Around the mid-1990s (10 years after the liberalization), a larger nonfarm sector has emerged along with a higher incidence of overseas work. While 65 per cent of male G2 were farmers, about one-third of them have diversified into nonfarm wage work and overseas work, and a tiny little minority remained in rural villages engaged in nonfarm self-employment (Table 4). This pattern holds true for female G2 as well, although there was a much smaller proportion of female G2 in nonfarm wage work and a larger proportion working in Thailand. Females made up 61 per cent of overseas workers in G2. While the domestic labor market has bifurcated, overseas work was mainly confined to low-productivity “last-resort” jobs undertaken by the unskilled and less educated workers who were “pushed out” of the domestic labor market because of the lack of alternative options domestically.

For female G2, the most common jobs in Thailand were domestic, factory, farm wage, informal trade and commerce, and casual work in hotels, restaurants, and beauty shops. For male G2, the most common jobs were construction, transport, factory, and farm wage. While the 2010 data do not give the exact place of workers' destination in Thailand, the 2007 benchmark

survey shows that a large majority of out-bound Lao overseas workers went to Bangkok (62 per cent) and other cities (21 per cent) while the rest went to bordering provinces (10 per cent) and other rural areas (7 per cent).

Statistical tests revealed significant differences in education levels across types of workers: farmers in G2 have an average schooling of 5.0 years; nonfarm workers, including self-employed and wage workers, 9.0 years; and overseas workers, 5.5 years. Inasmuch as overseas workers have comparable levels of education with farmers and much lower education than those in the nonfarm sector, there appears to be a push to migrate for the less educated rather than to continue farming. Overseas workers were disproportionately young (28 years old, on average) and got jobs offering wages that could be even lower than those prevailing in Laos. Yet, urban Thailand is attractive because it has a huge job market and offers modern amenities.

In brief, the labor market in Laos appears to have become highly diversified, including jobs in nonfarm and overseas sectors, and highly segmented in terms of schooling and gender. This development tends to reduce gender inequality, evidenced by the facts that parents invest relatively equally in the schooling of both female and male children and that female children more actively seek employment in Thailand. It also reduced poverty as wage income in nonfarm and overseas work were higher than income from farming, as will be discussed shortly.

Sources of household income

Table 5 shows sources of household income of respondents and their children. In the respondents' households, agricultural income comprised 55 per cent of the total household income: 37 per cent from rice, 8 per cent from nonrice crops, and 10 per cent from livestock. Agricultural wage work in planting, weeding, and harvesting of rice consisted of less than 1 per cent of total income. Therefore, it is clear that agricultural labor market is truly thin. Nonfarm income contributed 45

per cent to total income: 19 per cent from mainly rural self-employment activities (e.g., retail and trade, transport, restaurants, renting of equipment, rural manufacturing, services, etc.) and nonfarm wage income earned within Laos; 15 per cent from nonfarm wage income earned in Thailand, and 11 per cent from remittances and other sources. Note that remittances come from other areas in Laos and Thailand. Close to 30 per cent of our sample households reported that at least one of their members goes to nearby Thailand for seasonal jobs.

For children living in the villages, 67 per cent of household income came from agricultural sources, 27 per cent from nonfarm self-employment and nonfarm wage work within Laos, 1 per cent from nonfarm wage work in Thailand, and 5 per cent from remittances (Table 5). For children living in local towns and Vientiane, agricultural income and nonfarm income are equally important. It seems that some of them are engaged in farming on part-time basis.

Average household income of the respondents is US\$8,807 PPP in 2005 (Table 5). Household income of children living in the villages is much lower compared to their parents (US\$6,088 versus US\$8,807), indicating that children in the villages are poorer than their parents. This is consistent with the observation that the poverty headcount ratio of respondents (36 per cent) is much lower compared to their children who are living in the villages (61 per cent). For children who migrated to local towns and Vientiane, household income is US\$14,187 PPP in 2005 and is much higher than that of their parents and that poverty incidence of migrant children stands at only 26 per cent. These observations indicate that participation in nonfarm labor market and migration are important pathways out of poverty for rural Lao people.

Interestingly, the structure of household income of the respondents in our study villages was fairly similar to that found by the survey of the United Nations Development Programme, or UNDP (2009, p.124). In this survey, agricultural sources contributed 60 per cent to total

household income (in our study villages, 55 per cent) and nonfarm sources contributed 40 per cent (in our study villages, 45 per cent). The 60 per cent of income from agricultural sources in the UNDP survey was further divided into 44 per cent from crop production, 9 per cent from livestock, and 7 per cent from common property resource, whereas the 40 per cent from nonfarm sources consisted of 30 per cent from wage work and self-employment activities combined, 8 per cent from remittances, and 2 per cent from other sources. Overall, in terms of household and farm characteristics as well as sources of household income, our sample households could be considered representative of a typical rural Lao household.

IV. Determinants of farmland bequest and schooling and job choice

By using the same data set, Estudillo, Mano and Seng-Arloun (2013) analyzed the factors affecting parental decisions on inheritance of farmland and schooling and how these two bequests have affected children's decision on the choice of jobs. Here we review their findings before undertaking our own analysis of the determinants of household income.

Their findings on schooling and farmland inheritance for the respondents generation can be summarized as follows: (I) Later-born children have received significantly more schooling than earlier born children, suggesting the increased importance of schooling over time; (II) the youngest children were significantly favored and the eldest children were significantly disfavored in schooling investment, which may be taken to imply that younger children receive more schooling to engage in lucrative nonfarm jobs; (III) the female G2 were significantly disfavored in schooling (receiving about 3 years less than male G2), while they were favored in terms of farmland inheritance (receiving about 1 ha more than male G2) (after controlling for other child characteristics and parental wealth), reflecting the tradition of matrilineal land

inheritance; (IV) there is significant sibling rivalry amongst male G1 and female G1, as is often observed; and (V) father's education significantly increases schooling investments on children regardless of gender whereas mother's education has no significant effect. The third finding indicates that farmland and schooling are substitute forms of wealth,

The following are the findings on children's generation: (I) later-born continued to receive more schooling; (II) the eldest child received the highest schooling in G2 while she/he received the lowest schooling in G1; (III) female G2 was no longer at a significant disadvantage with respect to schooling investments; (IV) sibling rivalry was also absent in G2, (V) education of father continues to exert positive impact on children's schooling; (VI) size of parental farmland has a positive effect on child schooling (after controlling for parental education); and (VII) the more educated mothers preferred daughters in schooling investments, whereas the more educated fathers preferred sons.

To summarize, the results of Estudillo, Mano and Seng-Arloun (2013) show that parental wealth transfer decisions on farmland and schooling have changed dynamically over time. Investments in schooling between girls and boys have been largely equalized in the children's generation, when farmland has become scarcer and the labor market has evolved to give plentiful and relatively equal job opportunities to both female and male workers.

How do schooling investment and farmland inheritance affect job choice of children? In the respondents' generation, the impact of education on the choice of nonfarm job was not clear, whereas the impact of inherited farmland on their choice of farm job was consistently positive and significant, indicating that inherited farmland in G1 represents an important linkage between parental decisions and children's job choice. Females and males are equally likely to get a nonfarm job after controlling for both education and inherited farmland.

In the children's generation, both education and farmland had exerted significant impacts on the choice of nonfarm job. Female G2 had a higher probability of getting a nonfarm job, in contrast to G1, when both female and male have equal probability. Turning to overseas job in G2, education did not have a significant coefficient in the probability of having an overseas job, which means that both highly and lowly educated workers have an equal probability of moving overseas. Female G2 are more likely to cross the border (after controlling for education and parental farmland). G2 whose parents have larger inherited farmlands are more likely to migrate to Thailand, which suggests that ownership of land is used to finance migration cost to Thailand. These findings demonstrate that the labor market in Laos has evolved dynamically to become pro-poor, offering a new and broader set of job choices to the more marginalized segment of the community—the lowly educated and the females—who are more susceptible to poverty.

It is reasonable to speculate that the dynamic changes in the rural labor market in Laos has been brought about by the declining supply of farmland under a scenario of stagnant agriculture (low irrigation, MV ratio, and fertilizer use) as well as the rising demand for overseas workers in Thailand. It may well be that migrants to Thailand from the surrounding poor countries, including Laos, Cambodia, and Myanmar, consist largely of unskilled wage workers that are employed in informal jobs that a wealthy Thai would rather opt to decline—jobs that the lowly educated and the women would accept. This is likely to be positive spillover benefits of Thailand's spectacular economic development accrued to the poor people in the neighboring countries.

Determinants of household income

Having reviewed the determinants of land inheritance and schooling, let us now examine the impacts of access to land and schooling on agricultural income, nonfarm income in Laos, nonfarm income in Thailand, and remittances, as well as total income. For the ease of interpretation of coefficients, we took logarithm for continuous variables. Because of this procedure, we had to drop observations which are zero, e.g., no nonfarm income in Thailand. Even if linear specification is applied and all the observations are used, the qualitative results remain largely unchanged.

Table 6 shows the determinants of respondents' household income. Several important findings can be highlighted. First, farm size had significantly positive effects on agricultural income and remittances as well total income. As was pointed in the previous section, access to land has significant impact on migration to Thailand, which leads to larger amount of remittances. Second, schooling was the most important factor affecting nonfarm income in Laos as well as total income as shown by the positive coefficients of secondary and tertiary schooling in the nonfarm income and total income functions. It is clear that returns to schooling have been increasing in nonfarm jobs in Laos. Thus, schooling is likely to be the major determinant of income, poverty, and income distribution in this country. Indeed, the declining poverty and increasing income inequality observed in Laos can be explained by increasing schooling level and increasing schooling gap between the rich and poor income classes. Third, schooling was unimportant in informal wage jobs in Thailand, indicating that both educated and non-educated can find jobs in Thailand. Finally, the proportion of female working members had a significant effect on remittances which indicates that the availability of nonfarm domestic and overseas jobs contributes to the increased income of women. An important conclusion is that there is no gender bias against female workers in nonfarm labor market.

Table 7 shows the determinants of income of respondents' children divided into two groups: those living in the villages and those who migrated out to other areas in Laos. Since sample size is small and sampling is biased for migrant children, we can hardly expect to obtain unbiased and consistent estimates. Yet, it is remarkable to find that years of schooling is decisive factor determining the income of migrant children. This is consistent with the finding from Table 6 that schooling is the critical factor affecting nonfarm income and remittances for respondents' generation. It is also worth pointing out that female dummy is insignificant, which confirms the absence of gender discrimination or female-specific disadvantage in nonfarm sector.

It is disappointing to find that none of the explanatory variables are significant in the income regressions for children who reside in the village. Although further inquiries are called for, it appears that schooling is not important factor in farm management and nonfarm jobs in rural areas.

V. Summary and conclusions

The main objective of this study is to identify pathways out of poverty in rural Laos. We explored this issue using individual-level data on job choice and sources of household income. We choose Laos because we found evolutionary changes in its rural labor market since its economic liberalization in 1986 that may serve as an important catalyst for income growth and poverty reduction. The most important finding is that participation in nonfarm labor market and cross-border to migration are two of the most critical pathways that effectively lifted poor rural Lao households out of poverty. In other words, it is the development of the nonfarm sector and increased opportunities of migration that the poor, uneducated, and female workers are able to put into productive use their most important asset, which is unskilled labor.

What does this mean for policy? First, it must be clearly recognized that investments in human capital, particularly in primary and secondary education and basic health, are fundamental as these two are clearly linked to employment by bringing jobs to people and encouraging migration. Secondly, the government must contemplate the strategy to development nonfarm sectors, particularly labor-intensive manufacturing sector, which offers ample employment opportunities for unskilled workers. Although our knowledge on appropriate “industrial policy” is far from adequate, there are renewed interests in this issue and new arguments on the appropriate development strategies of manufacturing sectors (Sonobe and Otsuka, 2006, 2011, 2014). Finally, we would like to point out that public investment in roads and communication systems should not be ignored. Laos has one of the poorest supplies of physical infrastructure in the ASEAN region. World Bank (WB, 2009, Map 8.5, p.243) argues that for poverty reduction, public investments in infrastructure should be spatially neutral since the poor in Laos are spread out quite uniformly across the country. So far as transportation and communication infrastructures connect jobs with people by supporting functioning and integration of labor markets, the government should recognized their roles.

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Table 1. Number of respondents and respondents children in sample provinces in Laos, 2010

Residence	Province			Total
	Xayabury	Savanakhet	Champasak	
Number of respondents	166	194	168	528
Number of respondents' children by place of residence ¹				
Villages	308	425	418	1,151
Local towns	56	31	75	162
Vientiane	17	21	19	57
Thailand	26	151	80	257
Total	407	628	592	1,627

¹Between 15 and 60 years old

Table 2. Characteristics of respondents' children by place of residence, Laos, 2011

Characteristics	Place of residence			
	Villages	Local towns	Vientiane	Thailand
Number of respondents' children	1,151	162	57	257
Male	569	101	29	100
Female	582	61	28	157
Average year of birth	1981	1978	1982	1982
Average years in school	6.1	8.4	10.0	5.9
Inherited farmland (ha)	1.32	0.87	0.63	1.01

1 Between 15 and 60 years old

Table 3. Sector of employment of respondents' children by place of residence, Laos, 2010¹

Sector	Villages	Local towns	Vientiane	Thailand
Agriculture:	964	77	19	76
Farming	959	73	19	0
Agricultural worker	5	4	0	76
Non-farm:	152	80	35	170
Trade and business	44	25	5	11
Formal wage	44	39	12	18
Informal wage	64	16	18	141
Others	35	5	3	11
Total	1,151	162	57	257

¹Children between 15 and 60 years old

Table 4. Characteristics of two generations of household members in sample villages in Laos, 2010

Characteristic	Respondents' generation (G1)	
	Male respondents and brothers	Female respondents and sisters
Number of observations ¹	1,052	830
Year of birth	1965	1965
Completed years in school	5.4	3.9
Inherited landholdings (ha) ²	0.63	0.86
Primary occupation		
Farming (%) ³	88	91
Nonfarm self-employed (%)	2	3
Nonfarm wage (%)	10	5
Others (%) ⁴	0	1
Total (%)	100	100

Table 4. (Continued)

Characteristic	Generation of Respondents' Children (G2)	
	Sons of respondents	Daughters of respondents
Number of observations ¹	732	772
Year of birth	1981	1981
Completed years in school	6.5	5.5
Primary occupation		
Farming (%) ³	63	65
Nonfarm self-employed (%)	2	4
Nonfarm wage work in rural villages (%)	10	6
Nonfarm wage work in local towns and cities (%)	10	3
Overseas (%)	14	20
Others (%) ⁴	1	2
Total	100	100

Notes:

1 Consists of those who are 17 to 60 years old at the time of the survey.

2 Refers to those whose bequests have been completed.

3 Includes a negligible number of casual agricultural workers.

4 Includes housekeepers, retired, unemployed, those with disability, and unreported.

Source: Estudillo, Mano and Seng-Arloun (2013, Table 4, p.998)

Table 5. Sources of household income of respondents and their children, Laos, 2009-2011

Income source	Respondents ² (G1)	Respondents' children (G2) by place of residence ³	
		Villages	Local towns and Vientiane
Agricultural income (%) ¹	55	67	51
Nonfarm entrepreneurial income earned within Laos (%)	19	27	42
Nonfarm wage income earned within Laos (%)			
Nonfarm wage income earned in Thailand (%)	15	1	0
Remittances and others (%)	11	5	7
Total (%)	100	100	100
Total income (\$ PPP in 2005)	8,807	6,088	14,187
Average household size	5.97	5.12	3.9
Total per capita income (\$ PPP in 2005)	1,474	1,189	3,637
Incidence of poverty (%)	36	61	26
Poverty gap (%)	16	34	12
Severity of poverty (%)	10	23	8
Number of Observations	490	164	50

¹Includes rice, nonrice crop, livestock, and agricultural wage

²Parents' income refers to September 2009 to August 2010.

³Children's income refers to September 2010 to August 2011.

Table 6. Determinants of respondent' household income, Laos, 2010¹

VARIABLES	(1) Log agricultural income	(2) Log nonfarm income in Laos	(3) Log nonfarm income inThailand	(4) Log remittance income	(5) Log total income
Log farm size	0.2988*** (5.508)	-0.0822 (-0.625)	0.0970 (0.719)	0.4121*** (3.370)	0.2263*** (3.908)
Log number of working age members	0.1965* (1.758)	0.8145*** (3.018)	0.7603** (2.582)	-0.0040 (-0.017)	0.4951*** (4.296)
Proportion of working age members					
Female	-0.3867 (-1.460)	-0.5151 (-0.798)		1.0318* (1.920)	
Between 25 and 34 years old	0.0181 (0.081)	1.0565** (2.016)	-0.0305 (-0.058)	-0.2796 (-0.573)	-0.0193 (-0.083)
Between 35 and 44 years old	0.1482 (0.528)	1.0017 (1.588)	0.6810 (0.857)	-0.7382 (-1.237)	0.0551 (0.191)
Between 45 and 60 years old	0.3304 (1.082)	1.9603*** (2.705)	0.6782 (0.871)	-0.3987 (-0.610)	0.5622* (1.784)
With primary schooling	0.2005 (0.903)	1.6542*** (3.148)	0.1378 (0.242)	0.5005 (1.030)	0.4674** (1.981)
With secondary schooling	0.4312* (1.861)	3.0247*** (5.519)	0.7656 (1.266)	0.9093* (1.835)	0.7839*** (3.202)
With tertiary schooling	-0.0959 (-0.242)	3.3739*** (4.546)	1.5153 (1.553)	1.8474** (2.380)	1.8587*** (4.439)
Savannakhet	-0.7139*** (-5.655)	-0.7227** (-2.303)	0.5656** (2.119)	-0.6688** (-2.384)	-0.7029*** (-5.216)
Champasak	-0.6164*** (-4.852)	-0.1637 (-0.599)	0.0407 (0.133)	-0.6189** (-2.130)	-0.5944*** (-4.422)
Constant	7.2619*** (19.644)	3.9499*** (4.689)	6.1526*** (7.045)	5.9550*** (7.906)	7.2977*** (20.317)
Observations	415	181	118	194	426
R-squared	0.174	0.321	0.203	0.149	0.234
t-statistics in parentheses					
*** p<0.01, ** p<0.05, * p<0.1					

¹Refers to September 2009 to August 2010.

Table 7. Determinants of respondent' children's income, Laos, 2011¹

	(1)	(2)	(3)	(4)
VARIABLES	Children in the village (Linear)	Migrant children (Linear)	Children in the village (Log)	Migrant children (Log)
Child years of school	-485.9628 (-0.440)	6,960.2570** (2.458)	0.0488 (1.412)	0.2906*** (3.595)
Child year of birth	-96.4700 (-0.115)	2,674.8116 (1.465)	0.0088 (0.337)	0.0441 (0.846)
Female child (1=yes)	4,045.4522 (0.502)	2,268.7479 (0.093)	-0.1284 (-0.509)	-0.0555 (-0.079)
Inherited farmland of child and spouse	-5,282.1142 (-1.046)	-13,576.7104 (-1.042)	0.1734 (1.097)	-0.4961 (-1.333)
Spouse schooling	447.4065 (0.462)	-2,018.9458 (-0.605)	0.0649** (2.142)	-0.0601 (-0.631)
Spouse year of birth	-36.1709 (-0.045)	-2,893.1360 (-1.668)	-0.0070 (-0.274)	-0.0437 (-0.883)
Constant	269,976.4182 (0.378)	418,079.2655 (0.278)	3.1652 (0.142)	6.1576 (0.144)
Observations	156	41	156	41
R-squared	0.014	0.345	0.077	0.470

t-statistics in parentheses

*** p<0.01, ** p<0.05, * p<0.1

¹Refers to September 2010 to August 2011.

Figure 1. Location of study sites in Laos

