Job Choice of Three Generations in Rural Laos

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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.*

I.   Introduction

In 2005, about 1.4 billion people subsist on less than $1.25 per day; approximately 1 billion of them—around 70 per cent—live and work in the rural areas (UN, 2010a). The rural poor live in remote areas, cultivate dry and marginal land, have few earning opportunities off the farm, and cannot read or write (IFAD, 2000). There are fears that rural poverty may increase further because of the high growth rates of the labor force, thereby putting pressure on fixed land resources. The resultant decrease in the size of farmland could increase poverty further inasmuch as farmland is a major source of income of rural households in the early stage of development (Hayami and Kikuchi, 2000). Indeed, landless households and smallholder farmers are documented to be the poorest in rural Asian communities (Otsuka, Estudillo, and Sawada, 2009). 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 skill requirements and wages varying differently across them. In some parts of Asia, farming has become a side enterprise and a group of landless workers, who eke out their living from casual daily wage work on-farm, has evolved in village communities where farmland has become scarce (Hayami and Kikuchi, 2000). Agricultural labor markets alone will not reduce poverty to a significant extent because agricultural wage income is low and declining in importance as a source of household income (Otsuka, Estudillo, and Yamano, 2010).

Long-term panel data sets in Asia and Africa have shown that the development of the nonfarm sector has become the decisive factor in reducing rural poverty inasmuch as nonfarm income has emerged as a major source of household income (Otsuka, Estudillo, and Sawada, 2009). The expansion of employment opportunities in the nonfarm sector induces labor to move

out of agriculture to the nonfarm sector, leading to the tightening of the agricultural labor market and subsequently increasing wages (David and Otsuka, 1994; Lanjouw, 2007). Yet, the poor remain largely on the farm and are not the main beneficiaries of the more lucrative sources of nonfarm income because of differential access to high-skill and low-skill jobs (World Bank, 2008).

Migration has been playing an important role in poverty reduction (World Bank, 2008). In the Philippines, the green revolution allowed children (especially daughters) of land reform beneficiaries and large farmers to attain high levels of schooling, migrate overseas, and send large remittances back home in the rural villages (Estudillo, Sawada, and Otsuka, 2008). Females are equally likely to migrate: the current share of females in the world's international migrant population is close to one-half (UN, 2010b). If male outmigration leaves females on the farm and if females have less access to inputs, extension services, and credit (World Bank, 2012), farm productivity may fall.

Using a rare individual-level data set, this research explores dynamic changes in the structure of rural labor market through the lens of sector of employment of members belonging to three generations of households. We choose the Lao People's Democratic Republic (Laos), a country that underwent a transition from a command- to a market-based economy. One important finding is the structural shift of the rural labor market away from the farm to the nonfarm sector and overseas. The underlying forces appear to be the decrease in size of farmland in a largely traditional agriculture and the rising demand for overseas workers in neighboring Thailand. The structural shift appears to be pro-poor as it opens up job opportunities to the lowly educated and to females who have limited options in agriculture.

Reducing poverty in Laos means investing in people—portable investments (primary education and basic health)—that stimulate mobility (World Bank, 2009, Ch.8).

This paper has four remaining sections. Section II presents the available land resources and population growth in the Greater Mekong Subregion (GMS). Section III describes the structure of and changes in the Lao economy. Section IV describes the study villages and sample individuals. Section V identifies the determinants of inherited farmland, schooling, and job choice in three generations. Finally, Section VI presents the summary and conclusions of the study.

II.   Land resources, population growth, and poverty in the GMS

The GMS countries, which include Laos, Thailand, Cambodia, Vietnam, and Myanmar, have been characterized by high rates of population growth for four decades from 1960 to 2000 (Appendix Table 1 available online).[1] All five countries in the GMS had experienced population growth rate averaging more than 2 per cent per annum in 1960-69, 1970-79, and 1980-89. An exception is Cambodia with a negative population growth rate in 1970-79 because of the war. Average population growth rate in the five GMS countries declined to slightly less than 2 per cent in 1990-2000 (inclusive of Laos and Cambodia, which has 2.5 and 2.8 per cent growth rates, respectively) and to slightly above 1 per cent in 2000-11.

The GMS countries seem to be nearing closure of their land frontier. From 1980 to 2005, Laos increased its arable land by only about 0.2 million ha; Vietnam, by about 0.4 million ha; and Myanmar, by about 0.5 million ha, whereas the size of Cambodia's arable land remained fairly the same between 1990 and 2005 (World Bank, 2011). Population growth rates in the GMS far exceeded the increases in arable land, leading to a decline in size of arable land per person (Appendix Table 1 available online). Given the limits to arable land, this rapid growth in

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labor force will not be productively absorbed in the agricultural sector. Expansion of rural nonfarm employment and migration to urban areas or overseas must take up the slack. Indeed, the GMS countries have seen a rapid increase in urbanization: the proportion of urban population in the GMS (except in Cambodia) rose to about one-third of the entire population in 2011. Thailand, which is an economic engine of growth in the GMS, is estimated to have 1.5 to 2 million of regular and irregular migrants from this region (World Bank, 2009; Box 5.2, p.153).

Amidst increasing scarcity of farmland, there was remarkable movement out of poverty. The proportion of population living on less than US$1.25 per day declined from 56 to 34 per cent in Laos, from 9 to 0 per cent in Thailand, from 45 to 23 per cent in Cambodia, and from 64 to 17 per cent in Vietnam from the early 1990s to the late 2000s. In Myanmar, poverty headcount ratio declined from 32 to 26 per cent between 2005 and 2010 (UNDP, 2011). The rise in nonfarm income has been documented to be the major driver behind poverty reduction amidst the unfavorable scenario of increasing scarcity of farmland and declining labor employment opportunities in agriculture (Otsuka, Estudillo, and Sawada, 2009).

III. Changing economic structure in Laos

Laos in brief

Laos is a small country in Southeast Asia with a population of about 6 million people in 2009 (ADB, 2010). It is classified by the United Nations (UN) as one of the least developed countries in the world (UN, 2011). The country has a transition economy, transforming gradually from a command- to a market-based economy since the implementation of the New Economic Mechanism (NEM) in 1986. Its gross domestic product (GDP) has grown at a reasonably high rate of 6-7 per cent annually during 1990-2008 (WB, 2011), with industry (particularly garments,

mining, and hydroelectricity) leading the way. The share of agriculture in the GDP declined from 61 per cent in 1992 to 31 per cent in 2010 (WB, 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, 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).

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 that of industry and services in 2010 (Appendix Table 2 available online). 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 more compared with agriculture and 3.8 times more compared with the service sector in 1992.

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

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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 high GDP growth rate was accompanied by a reduction in poverty headcount ratio by 22 percentage points from 1992 to 2008 (Appendix Table 3 available online). Growth and poverty reduction appear to move in tandem. GDP grew at an annual rate of 6.84 per cent during 1992-97, along with a reduction in headcount ratio by 6.4 percentage points. When GDP 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. 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. It thus appears that growth is accompanied by a rise in inequality, which may mean that, in the case of Laos, the benefits of economic growth do not trickle down to the ultra poor.

International migration

International Lao migrants commonly go to neighboring Thailand with which Laos shares a similar culture and language and a long island border. 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 (UNDP, 2009). A large majority of out-bound migrants to Thailand are undocumented as

it is easy to cross the border illegally. Lao migrants continue to flock to Thailand, motivated primarily by higher wages, prospects of having a better job, and access to modern urban amenities.

IV.   Study villages and sample individuals

Location

Our study villages are located in three provinces: Xayaboury, Champasak, and Savanakhet (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). Since the purpose of the benchmark survey was to explore migration to Thailand, 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, one farther away) were thus selected for each province. About one-half of the 610 households have members working in Thailand. These households were selected purposely based on information on migrant workers provided by the village leaders.

The two study villages in Champasak have a higher population density (96 and 56 people per square km compared with 25 for Laos as a whole in 2007), as they are near the city of Pakse with a distance of 19 km and 20 km, respectively. In Savanakhet, one study village has 60 and the other village has 10 people per square km; their distance from the city of Kaysonephomvihane are 71 km and 52 km, respectively,. In Xayaboury, the two study villages are thinly populated□with only 16 and 19 people per square km□as these villages are far off the

city of Xayaboury (250 km and 214 km, respectively). In brief, our study villages give a good spectrum of typical Lao villages with respect to distance and population density.

The survey

In collaboration with NERI, the National Graduate Institute for Policy Studies (GRIPS) in Tokyo (with generous funding from the Japan Society for the Promotion of Science) conducted in 2010 a retrospective schooling and inheritance survey of three generations of household members. Our respondents 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. We ran a probit function on the probability of being present in the 2010 survey using the baseline information in 2007 such as age, education, and inherited farmland of household head. The coefficients of these variables were all not statistically significant, indicating that attrition is largely random.

Characteristics of households

All households in our study villages belonged to the majority Lao-Thai ethnic group, which comprises about 60 per cent of the entire population in 2005.[2] 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. Seventy-six 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 (Table 2). 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).

Sources of household income

The households in our study villages derived their income from agricultural and nonfarm activities (Table 2). 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. Nonfarm income contributed 45 per cent to total income: 8 per cent from mainly rural self-employment activities (e.g., retail and trade, transport, restaurants, renting of equipment, rural manufacturing, services, etc.);[3] 26 per cent from nonfarm wage income earned mainly in urban Laos and Thailand (e.g., construction, domestic, factory, government, military, teaching, etc.); and 11 per cent from remittances and other sources.[4] Nonfarm wage income could be earned within Laos (comprising 11 per cent of total income) and through seasonal migration in Thailand (comprising 15 per cent). Close to 30 per cent of our sample households

reported that at least one of their members goes to nearby Thailand for seasonal jobs. The major activities of seasonal migrants in Thailand were domestic, factory, and construction work.

Average per capita income was US$734 at the current exchange rate, which is comparable with the US$800 national average in 2007 and much higher than the US$299 average from the results of a nationally representative household survey conducted by UNDP in 2007-08. Interestingly, the structure of household income in our study villages was fairly similar to that found by the UNDP survey (UNDP, 2009, p.124). In the UNDP 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 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.

Jobs

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 and restaurants and domestic work. Overseas jobs are largely concentrated in urban Thailand. 'Others' largely refers to retired workers and housekeepers.

Of the 528 households, 458 were headed by males born in 1958, on average (Table 3). Male heads completed 4.6 years of schooling, whereas female heads completed only half of that; the difference of 2.3 years was statistically significant. Farming was the predominant occupation among household heads, while a small number were engaged in nonfarm wage employment (more than 80 per cent were government employees), indicating that the private formal wage sector remains thin. Nonfarm self-employment (or home-based enterprise) was also not common. Surprisingly, the proportion of female heads in other job categories (consisting of housekeepers, retired, unemployed, those with disability, and unreported) was considerably higher (20 per cent) than that of male heads (6 per cent) because there are more retired female heads: retirement age is 55 years old for females and 60 for males, a practice mandated by the civil service law.

The first generation (G1), consisting of the father (male G1) and the mother (female G1) of the respondents, was born around 1930 (Table 4). The male G1 inherited significantly more farmland than did the female G1 (4 ha compared with 2.3 ha) and obtained significantly more education (1.1 years compared with 0.4 year). This means that parents disfavored females in both schooling investments and farmland bequests. A large majority of G1 were engaged in farming, indicating that the nonfarm labor market is largely undeveloped.[5]

The second generation (G2) consists of the male respondents and brothers of respondents (male G2) and the female respondents and sisters of respondents (female G2). We have a total of 1,052 male G2 and 830 female G2, who were born in 1965, on average (Table 4).[6] G2 received significantly more education than their parents G1—a difference of about 3-4 years. Similar to

their mothers, female G2 remained at a significant disadvantage with respect to schooling, but they received significantly more farmland. 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.

Like their parents, a large number of G2 continued to engage 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) (Table 4). 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.

The third generation (G3) consists of sons of respondents (male G3) and daughters (female G3) who were born in 1981, on average. We have 732 male G3 and 772 female G3.[7] G3 received significantly more schooling than G2, higher by about 1-2 years. Yet, female G3 continued to be at a significant disadvantage in schooling, although the schooling gap between male and female has declined, from 1.5 years in G2 to only 1 year in G3. This implies that rural Laotian parents have become egalitarian 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 G3 was almost the same as that to female G3 (1.28 ha for the male G3 compared with

1.21 ha for the female G3), a discontinuation of the traditional practice in the previous generation of giving more farmland to females.

In contrast to the older generations—G1 and G2 who were primarily engaged in farming—the job choice of G3 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 of preference tends to be more pronounced among female G3, 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 G3 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 G3 as well, although there was a much smaller proportion of female G3 in nonfarm wage work and a larger proportion working in Thailand.[8] Females made up 61 per cent of overseas workers in G3. 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. The nonfarm wage sector and self-employment sector in retailing and rural transport remained thin: nonfarm wage income earned within Laos comprised a mere 11 per cent of total household income, nonfarm self-employment a mere 8 per cent (Table 2).

For female G3, 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 G3, the most common jobs were construction, transport, factory, and farm wage. While the

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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 G3 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 or a negative self-selection seems evident. Overseas workers were disproportionately young (28 years old, on average) and got lowly paid jobs offering wages that could be even lower than those prevailing in Laos.[9] Yet, urban Thailand is attractive because it has a huge job market and offers modern amenities.

In brief, our evidences show that, while the rural labor market in Laos consists largely of farming in G1 and G2, it has subsequently evolved in G3 to 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; it induced G2 to invest relatively equally in the schooling of both female G3 and male G3. It also reduced poverty as wages in nonfarm and overseas work were higher. Otsuka, Estudillo, and Yamano (2010) stated that, in Asian countries, the daily wage earnings of a casual nonfarm worker are comparable with or slightly higher than the daily agricultural wage earnings, whereas wage rates in regular rural nonfarm and urban labor markets are significantly higher, thereby reflecting differences in skill requirements. In the Philippines, for example, on average, the annual income of a permanent migrant urban

worker is higher than that of a full-time rural nonfarm worker (US$10,752 in PPP for permanent

migrants and US$5,091 in PPP for rural nonfarm workers).

V. Farmland, schooling, and job choice

Econometric model

Farmland bequests and schooling

Farmland and schooling are the most important forms of wealth transfer in rural communities in developing countries. Here, we explore the factors affecting farmland bequests and schooling investments from the older to the younger generations—i.e., (1) from G1 to G2 and (2) from G2 to G3. We specify the linear latent functions of inherited farmland L^* and completed years in school E^* of individual i of household h as follows:

$$L^*_{ih} = \sum_j a_j \left(own\ characteristics\right)_{jih} + \sum_k b_k \left(parent\ characteristics\right)_{kh}$$

$$+ \sum_k c_k \left(female\ dummy\right) \times \left(parent\ characteristics\right)_{kh} + intercept + e_{1h} + e_{2ih},$$

$$\text{(1)}$$

where we observe $L=L^*$ if $L^*>0$ and $L=0$ if otherwise; a, b, and c are regression parameters; e_1 denotes the household-specific effect, and the error term e_2 is i.i.d. across individuals according to $N\left(0, \sigma_2^2\right)$.

$$E^*_{ih} = \sum_j \alpha_j \left(own\ characteristics\right)_{jih} + \sum_k \beta_k \left(parent\ characteristics\right)_{kh}$$

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$$+\sum_{k}\gamma_{k}(female\,dummy)\times(parent\,characteristics)_{kh}+intercept+e_{3h}+e_{4ih},$$

$$(2)$$

where we observe $E=E^{*}$ if $E^{*}>0$ and $E=0$ if otherwise, α, β, and γ are regression parameters, e_3 denotes the household-specific effect, and the error term e_4 is i.i.d. across individuals according to $N(0,\sigma_{4}^{2})$. Household-specific effects e_1 and e_3 are included in Eq. (1) and (2) to account for the unobserved heterogeneity at the household level. Specifically, the presence of children belonging to the same household enables us to address potential bias emanating from unobservable household-specific factors that may be correlated with the explanatory variables.

We use the following as explanatory variables: (1) characteristics of the child, (2) parents' characteristics, and (3) interaction term between parental characteristics and female child dummy. Characteristics of the child include year of birth, birth order (shown as a dummy for the youngest child and eldest child), female child dummy, and number of siblings. From the estimated coefficients of these three dummies, we can test whether there is autonomous discrimination against daughters and younger children within a household□that is, if a_i and α_i have opposite signs, we can infer that schooling and farmland are alternative forms of transferring wealth.

Parental characteristics include father's and mother's completed years in school and father's and mother's inherited farmland in hectares: b_k and β_j are expected to measure the effects of parental characteristics on son's farmland inheritance and schooling, while c_k and γ_k capture the gender bias associated with parental characteristics. Thus, for example, if an educated mother particularly favors a daughter in schooling investments, then the coefficient of the term *mother's education × female child dummy* is positive in schooling regression.

Eq. (1) and (2) are estimated separately for the wealth transfers from G1 to G2 and only Eq. (2) for transfers from G2 to G3. This is because, at the time of the 2010 survey, G2 was largely undecided on farmland bequests to G3; we thus skipped the analysis of farmland bequests from G2 to G3. Since not all children received transfers from the older generation, either schooling or farmland or both, we estimated Eq. (1) and (2) as a Tobit using household-fixed effect (FE) (Honore, 1992) and random effect (RE) models.

Job choice functions

Here we explored the role of education and inherited farmland as these are the major forms of parental bequests that profoundly affect the job choices of children. Since education and farmland inheritance could be correlated with unobserved determinants of job choice (e.g., ability), we considered the two as endogenous variables. In the analysis of job choice of G2, we used both education and farmland inheritance. In G3, however, we used parent's inherited farmland in place of children's inherited farmland because a large number of G3 have not yet received farmland bequests.

In G2, we were able to identify two alternative job choices: (1) farm job and (2) nonfarm job; in G3, there were three alternatives: (1) farm job, (2) nonfarm job, and (3) overseas job.

Let us define Y_i^* as a latent variable corresponding to alternative k, which follows

$$Y_{kih}^* = \sum_j \phi_{kj} \left(own\ characteristics \right)_{jih} + \theta_k L_{ih} + \psi_k E_{ih} + e_{5kh} + e_{6kih},$$

(3)

where we observe $Y_{kih} = 1$ if and only if $Y_{kih}^* > Y_{mih}^*$ for $m \neq k$; i.e., alternative k is chosen over

other types of job, and $Y_k = 0$ if otherwise. L denotes inherited farmland in G2 and it denotes

parental farmland in G3; E denotes the completed years of schooling; ϕ, θ, and ψ are regression

parameters; e_{5k} is the household-level random effect; and error term e_{6k} is i.i.d. In the analysis of

the job choice of G2, we used Rivers and Vuong's (1988) method in estimating the Probit model

with endogenous regressors and household random effects (hereafter, we call this model the IV

RE Probit model) of Eq. (3) with endogenous regressors L and E by additionally incorporating

into the regression function the residuals obtained from the first-stage education and farmland

bequest functions Eq. (1) and Eq. (2) to control for the endogeneity of schooling and inherited

farmland. We applied the same methodology to the analysis of job choice of G3 but

incorporated only the residuals of education obtained in the first-stage regression since we

treated inherited farmland of parents as exogenous.

Determinants of farmland bequest and schooling

<u>Respondents' generation</u>

Table 5 shows the household FE and RE tobit regressions with respect to parental bequest

decisions on schooling and farmland: columns A and B for schooling and columns C and D for

farmland inheritance of G2 and columns F and G for schooling of G3. We show results from the

FE tobit (Honore, 1992) and RE tobit models. Nonetheless, we have also estimated the linear FE

and RE models and calculated the Hausman statistics accordingly. The estimation results, by

using the four methods (i.e., the FE and RE Tobit models and the linear FE and RE models),

were remarkably similar to each other, and the Hausman tests did not reject the consistency of

the linear RE. We decided to report the estimation results of the FE and RE Tobit models below as these results were, by far, the best.

Year of birth had a positive and significant coefficient in the schooling function of G2, suggesting that later-born children have received more schooling. The youngest children were significantly favored, whereas the eldest children were significantly disfavored compared with the middle children (control group). 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). There seemed to be no significant sibling rivalry in terms of schooling and farmland inheritance. Schooling and farmland are substitute forms of wealth transfers to children in G2 (Table 5, columns A to D).

Fathers' education assumed a positive and significant coefficient in schooling and farmland inheritance. Mother's education did not matter much primarily because female G1 had very low schooling: 87 per cent of them finished only 1 year of schooling, the rest never went to formal school. Parental gender preferences with respect to resources under their control were largely absent, indicating the egalitarian characteristics of G1.

Children's generation

Later-born children in G3 continued to receive significantly higher levels of schooling (Table 5, columns F and G). The eldest child received the highest schooling in G3 while she/he received the lowest schooling in G2. Female G3 was no longer at a significant disadvantage with respect to schooling investments. Sibling rivalry was also absent in G3. Education of the father has continued to exert a positive and significant impact on schooling of G3. Size of parental

farmland has a positive effect on child schooling (after controlling for parental education). The same gender principle applies in G3: the more educated mothers preferred daughters in schooling investments, the more educated fathers preferred sons. Village dummies were all significant, reflecting differences in the supply of education and complementary infrastructure.

To summarize, our results show that parental wealth transfer decisions on farmland and schooling have changed dynamically over time. G1 invested significantly much less on schooling of female G2 but nonetheless compensated for it with farmland inheritance. G2 invested relatively equally on schooling of G3, when farmland has become scarce and the labor market has evolved to give relatively equal job opportunities to both female and male workers alike.

Determinants of job choice

Table 6 identifies the determinants of job choice of G2 and G3 with a focus on the role of education and inherited farmland.

To address the endogeneity of education and inherited farmland in estimating the Probit model of job choice for G2, we extended Rivers and Vuong's (1988) method and estimated the Instrumental Variable Random Effect (IV RE) Probit model, using the residuals obtained from the FE Tobit model and RE Tobit model of schooling and inherited farmland. For G3, we used the multinomial Probit model because the coefficients of the residual terms are not statistically significant which indicates the absence of the endogeneity problem.

In G2, the choice was between farming and nonfarm job (Table 6, columns A and B). The impact of education on the choice of nonfarm job was not statistically clear: the coefficient of education was positive and significant only in the IV RE Probit Model II (column B). The

impact of inherited farmland on the choice of nonfarm job of G2 was consistently positive and significant (columns A and B). Females and males are equally likely to get a nonfarm job after controlling for both education and inherited farmland and village dummies are largely insignificant. In short, inherited farmland in G2 is an important linkage between parental decisions and children's job choice.

In G3, there were three choices: (1) farming (control), (2) nonfarm, and (3) overseas jobs. Turning to nonfarm job in G3 (Table 6, column C), both education and farmland had exerted significant impacts on the choice of nonfarm job. Female G3 had a higher probability of getting a nonfarm job, in contrast to G2, when both female and male have equal probability. Turning to overseas job in G3 (Table 6, column D), education did not have a significant coefficient in the probability of having an overseas job, which means that both highly and lowly educated have an equal probability of moving overseas. Female G3 are more likely to cross the border (after controlling for education and parental farmland). G3 whose parents have larger inherited farmlands are more likely to migrate to Thailand. The wealth effect conferred by farmland on job choice has declined from G2 to G3, as shown by the decline in the magnitude of the coefficient of farmland. These evidences show 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. Lao migrants to Thailand consist largely of unskilled wage workers that

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are employed in informal jobs that a wealthy Thai would rather opt to decline—jobs that the lowly educated and the women would accept.

VI. Summary and conclusions

The key to enabling the poor to move out of poverty is to give them the opportunity to put their abundant asset—unskilled labor—into profitable use. Labor markets could serve as the key transmission mechanism through which the poor could escape poverty. Using a rare individual-level data set, this research explores how the rural labor market has changed in structure over time through the lens of job choice of three generations of household members. We choose Laos because its labor markets are gradually evolving, accompanying its transition towards a market-based economy that began in 1986. We found evolutionary changes in its rural labor market that may serve as an important catalyst for income growth and poverty reduction.

Three major conclusions have emerged from this study. First, there is gradual transformation of the rural labor market away from farming to nonfarm wage work and overseas work, indicating the evolution of a labor market that offers a broader set of jobs with vastly different skill requirements. This development appears to have been induced by the decline in farmland size in largely traditional agriculture and the rise in Thailand's demand for overseas workers, particularly in the informal sector. Second, while there has been a decline in the size of inherited farmland, there has been an improvement in schooling attainment of three generations of household members. Parental preferences with respect to bequest decisions on schooling and farmland have moved away from pro-male bias to gender equality: female G1 was not favored; female G2 was disfavored in schooling but nevertheless was compensated with more farmland; female G3 and male G3 received relatively equal schooling. This has enabled the younger

females to have far greater access to economic resources than ever before. Third, and finally, education significantly matters in the choice of nonfarm jobs in G3 but does not significantly matter in overseas jobs, indicating that the poorly educated have an equal opportunity to work in Thailand; female G3 are more likely to cross the border. This last finding indicates that the poorly educated and the females appear to have been "pushed out" of the domestic labor market because of the increasing scarcity of jobs in the local labor market.

This study is able to identify two strategic policies to enhance the workings of the labor market to effectively address poverty problems in Laos. First, investments in human capital, in primary education and basic health, are fundamental as these two are clearly linked to employment by bringing jobs to people and encouraging migration. This strategy strongly corroborates with the policy priorities set forth by the Sixth National Socio-Economic Development Plan of promoting development in human capital by putting top priority in education and health. To date, the Lao government spends less than 3 per cent of its GDP in education and less than 1 per cent in health, which falls far short (6 per cent in education and 2.5 in health) of the spending of countries that achieve rapid progress in this front (UNDP, 2009).

Second, public investments in electricity and roads as well as expansion of credit facilities cannot be ignored. In the Philippines, electricity and road quality have exerted positive impacts on income from the trade, transport, and communications sector, which employs a large number of the rural poor (Ramos et al, 2012). In Bangladesh, the development of rural roads has boosted the rural transport sector while micro-credit has created a large number of small businesses opening up jobs for the poor (Hossain and Bayes, 2009). While returns to investments in infrastructure are expected to be higher in areas closer to ports, natural resources, or large cities, the World Bank (WB, 2009, Map 8.5, p.243), on the other hand, 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. To sum up, with the strong commitment of the government to remove the country from the UN roster of least developed countries, it seems that stimulating the growth of the rural labor market is a step in the right direction, as it is through the labor market that the poor could participate in and benefit from economic growth.

Notes

1. The GMS countries also include People's Republic of China (PRC) Yunnan Province and Guangxi Zhuang Autonomous Region. We exclude PRC in Appendix Table 1 available online because of unavailability of data.
2. There are 50 ethnic groups in Laos (Steering Committee for Census of Population and Housing, 2006, Table 1.6, p.15).
3. Retail and trade comprise small village stores, buying and selling of fruits, vegetables, livestock, and meat. Transport means operation of public and cargo transport, vehicle repair, car rental and services. Renting of equipment is confined to tractors and threshers only. Rural manufacturing refers to furniture shop while services refer largely to beauty parlors and barber shops.
4. In Laos, urbanization is the main motor of rural nonfarm growth (Haggblade, Hazell, and Dorosh, 2007) driven by growing urban markets, high urban wages, commuting, and migration. Much of it emanates from nearby Thailand, as only 27 per cent of the Lao population lives in urban areas, about one-third of them lives in the main city of Vientiane.
5. The Lao war from the mid-1950s to the mid-1970s appears to have had an impact on occupational structure: 18 male G1, consisting of about 4 per cent of our sample, were identified as soldiers.
6. We have a total of 2,044 male G2 and female G2. A total of 162 individuals were dropped because they were dead, have disability, are retired, or have missing or unreported occupation data.
7. We have a total of 1,597 male G3 and female G3. A total of 93 individuals were dropped because they were dead, have disability or are currently in school.

8. While Thailand is documented to accommodate Lao "sex workers," we found that only 10 out of 772 female G3 are working in hotels, restaurants, and salons (supposedly where female sex workers are concentrated), indicating that much of the demand for overseas female G3 falls on domestic and factory work.
9. Molland (2010, p.841) reported that the payment per unit of service of female Lao sex workers in Bangkok is unexpectedly far lower compared with that in Vientiane.

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

Province	Number	Percentage
Xayaboury	166	31
Savanakhet	194	37
Champasak	168	32
Total	528	100

Table 2. Farm description and sources of household income of sample households in Laos, 2010

Description	Average	Standard deviation
Farm size (ha)	2.92	0.108
Rice yield (ton per ha)	1.84	0.256
	Proportion of farmers	
Farmers using modern rice variety (%)	66	
Farmers with access to irrigation (%)	17	
	Average	
Total household income (current '000 Kip)[1] [A]	36,772	3,006
Total household income (current US$)[2] [B]	4,381	
Total household income (US$ PPP in 2005) [C]	8,795	
Household size [D]	5.97	0.096
Household per capita income (current '000 Kip) [E=A÷D]	6,159	
Household per capita income (current US$) [F=B÷D]	734	
Household per capita income (US$ PPP in 2005) [G=C÷D]	1,473	
	Share of total income	
Agricultural income (%)	55	
Rice production (%)	37	
Nonrice production (%)	8	
Livestock production (%)	10	
Agricultural wage work (%)	0[3]	
Nonfarm income (%)	45	
Nonfarm self-employment income (%)	8	
Nonfarm wage income (%)	26	
Earned in Laos	11	
Earned in Thailand	15	
Remittances and others (%)	11	
Total (%)	100	

Notes:
[1]Refers to September 2009 to August 2010.
[2]Exchange rate is the average of 2009 and 2010.
[3]Less than 1 per cent.

Table 3. Characteristics of household heads in sample villages in Laos, 2010

Characteristic	Male head	Female head	Both
Number of observations	458	70	528
Year of birth	1958	1954	1958
Completed years in school	4.6	2.3	4.3
Primary occupation			
Farming (%)	84	74	83
Nonfarm self-employed (%)	3	3	3
Nonfarm wage (%)	7	3	7
Others (%)[1]	6	20	7
Total (%)	100	100	100

Note: [1]Includes housekeepers, retired, unemployed, those with disability, and unreported.

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

Characteristic	First generation (G1)	
	Fathers of respondents	Mothers of respondents
Number of observations	528	528
Year of birth	1928	1934
Completed years in school	1.1	0.4
Inherited landholdings (ha)	4.0	2.3
Primary occupation		
Farming (%)	93	99
Nonfarm (%)	7	1
Total (%)	100	100
	Second generation (G2)	
	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	Third generation (G3)	
	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.

Table 5. Determinants of schooling and farmland inheritance in sample villages in Laos
(Tobit with household fixed and random effects)

Variable	Respondents and siblings (G2)					Respondents' children (G3)	
	A	B	C	D		F	G
	Education		Inherited farmland			Education	
	FE Tobit[1]	RE Tobit[1]	FE Tobit	RE Tobit		FE Tobit	RE Tobit
Year of birth	0.0356*	0.0446***	0.0034	-0.0032		0.0777***	0.0560***
	(1.610)[2]	(3.295)	(0.219)	(-0.301)		(3.021)	(2.790)
Youngest dummy	0.4580*	0.3565*	0.4639	0.4808***		0.2635	0.3866
	(1.952)	(1.651)	(1.454)	(2.977)		(0.897)	(1.442)
Eldest dummy	-0.5474**	-0.6293***	0.6187***	0.6418***		0.8312***	0.7155***
	(-2.020)	(-2.853)	(2.726)	(4.107)		(2.698)	(2.806)
Female child dummy	-2.6128***	-2.9688***	1.2142	0.8511***		-0.4406	-0.1842
	(-5.852)	(-7.447)	(1.429)	(3.066)		(-0.536)	(-0.353)
Number of siblings		0.0265		-0.0610			0.1587
		(0.348)		(-1.096)			(1.552)
Education of father		0.1866**		0.1010*			0.3147***
		(2.385)		(1.899)			(3.517)
Education of mother		0.0296		-0.1171			-0.0885
		(0.198)		(-0.960)			(-0.808)
Size of farmland inherited by parents							0.3269***
							(2.633)
Number of siblings x female child dummy	0.1781**	0.1981***	-0.0948	-0.0203		-0.1027	-0.1447**
	(2.312)	(2.817)	(-0.782)	(-0.375)		(-1.142)	(-2.281)
Education of father x female child dummy	0.0549	0.1137	0.0278	-0.0162		-0.1974	-0.1615**
	(0.638)	(1.356)	(0.304)	(-0.269)		(-1.378)	(-2.007)
Education of mother x female child dummy	0.1021	0.1707	-0.0990	-0.0408		0.2765*	0.2469**
	(0.952)	(1.153)	(-0.926)	(-0.290)		(1.799)	(2.515)
Size of farmland inherited by parents x female child dummy						-0.2763	-0.2451**
						(-1.375)	(-2.498)

Table 5. (*Continued*)

Variables	Respondents and siblings (G2)					Respondents' children (G3)	
	A	B	C	D		F	G
	Education		Inherited farmland			Education	
	FE Tobit	RE Tobit	FE Tobit	RE Tobit		FE Tobit	RE Tobit
Champasak I dummy							-3.3216***
							(-4.269)
Champasak II dummy							-4.7700***
							(-5.781)
Savanakhet I dummy							-5.3627***
							(-7.582)
Savanakhet II dummy							-3.8860***
							(-5.111)
Xayaboury I dummy							-6.0834***
							(-6.966)
Constant		-82.81***		5.792			-103.4851***
		(-3.210)		(0.280)			(-2.602)
Observations	1,795	1,795	1,243	1,243		1,009	1009
Number of groups		423		328		288	288

Notes:
[1]FE means fixed effects, RE means random effects
[2]Numbers in parentheses are z statistics.
[3]*** means significant at 1% level; ** at 5% level; * at 1% level.

Table 6. Determinants of job choice in sample villages in Laos

Variable	Respondents and siblings (G2)		Children of respondents (G3)	
	A	B	C	D
	Nonfarm	Nonfarm	Nonfarm	Overseas
	IV RE Probit I[1]	IV RE Probit II[1]	Multinomial Probit	
Year of birth	-0.0107	-0.0102	0.0036	0.0219**
	(-0.756)[2]	(-0.830)	(0.281)	(2.495)
Female child dummy	-0.5139	-0.3994	0.6867***	0.4001***
	(-1.431)	(-1.437)	(3.134)	(3.095)
Education of the child	0.1959	0.2387**	0.0980***	0.0025
	(0.984)	(2.088)	(2.976)	(0.125)
Size of farmland inherited from parents	0.3838*	0.3771**	0.1287*	0.0663*
	(1.771)	(2.251)	(1.930)	(1.912)
Residual of education function from FE tobit[1]	0.0501			
	(0.250)			
Residual of farmland inheritance function from FE tobit[1]	-0.3674*			
	(-1.688)			
Residual of education function from RE tobit[1]		0.0042		
		(0.036)		
Residual of farmland function from RE tobit[1]		-0.3613**		
		(-2.166)		
Champasak I dummy			0.3006	0.2191
			(0.759)	(0.783)
Champasak II dummy			-0.3886	-0.8400**
			(-0.906)	(-2.272)
Savanakhet II			-1.4605**	0.0662
			(-2.488)	(0.236)
Savanakhet I			-0.5954	0.4362
			(-1.152)	(1.634)
Xayaboury I			-1.2803**	-1.4560***
			(-2.074)	(-4.074)
Constant	19.0138	17.2003	-10.2966	-44.9819***
	(1.020)	(0.726)	(-0.409)	(-2.582)
Number of observations	1,183	1,183	1,127	1,127

Notes:
[1]IV RE means instrumental variable random effects, FE means fixed effects, RE means random effects. Education and farmland are corrected for endogeneity using the residuals of farmland and education function from the first-stage FE tobit model.
[2]Numbers in parentheses are z statistics.
*** means significant at 1% level; ** at 5% level; * at 1% level.

Figure 1. Location of study sites in Laos