Agricultural Aid and Intergenerational Relations in a Context of Industrial Transition: the Case of Nang Rong, Thailand

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Abstract

This work investigates impacts on rural areas during a country's transition from rural subsistence to urban industrial, using help with harvesting rice as an illustration of the profound changes that occur. The setting is Nang Rong, Thailand, a region that has been experiencing social, economic, and demographic transforms in the last three decades. Nang Rong out-migrants are young adults. Their parents are approaching ages where it becomes progressively more difficult to do agricultural labor. Hence, rice harvest help from migrants impacts intergenerational relations between adult children and their parents. I find that migrants are much more likely to help with the rice harvest if their origin household owns securely titled land, and if the migrant has lower human capital endowments. Results suggest that intergenerational relations between parents and children are becoming more instrumental, which is related to a loss of interdependency among family members.

Introduction

Changes in social relationships associated with the transformation from a rural, subsistence-based economy to an urban, industrial economy have preoccupied sociologists from the very inception of the discipline (see for example Durkheim [1893] 1984, Marx [1847] 1978, and Weber, [1904] 1998). This transformation, typified by a decline in family farming and an increase in urban migration, creates massive dislocations that affect the nature of social relationships. In recent discussions on this issue, a predominant theme is change within the family, and its residential unit, the household. The family is the primary social unit within pre-industrial or agricultural communities (Caldwell 2004, Coleman 1990). It is the key institution linking macro-level social change and micro-level individual behavior (Axinn and Yabiku 2001, Hareven 2000), and it acts as an agent of change as well as being subject to the effects of changes (Hareven 2000, Thornton 2001).

Researchers studying family change resulting from the transition to an industrial base have focused on the gradual loss of family functions to non-familial entities (Axinn and Yabiku 2001, Caldwell 2004, Coleman 1990, Hareven 2000, Morgan 2003). Underlying these losses in family function are dramatic changes in the way that family members orient themselves to one another. Examples of this abound in the literature. For instance, changes in transportation, communication, and monetization reorganize production outside of the household, altering the significance of individual labor for the household as a collective entity as well as for individual household members (Axinn and Yabiku 2001).

Loss of function is not limited to production, but can include consumption, socialization, and social control. Changes in formal education, for example, reverse the flow of wealth previously running from the younger generation to older generation, to one flowing from the older generation to the younger generation. This alters the costs and benefits of child bearing (Caldwell 1976).

The effects of transformations stemming from urban migration and industrialization are especially salient for families living in rural developing regions in which economic activities centered on household subsistence are under transition. Employment prospects in cities and seemingly shrinking opportunities in rural areas have created a diaspora of young people out of rural areas. This is a pattern found historically in developed countries in the West (Elder and Conger 2000) and is presently occurring or will in much of the developing world (Caldwell 2004).

The movement of young people out of agrarian communities has important implications for the way in which a generation of adult children relate to their parents. In such areas, contributing to household production (in the form of agricultural labor) is perhaps one of the most important obligations to the family economy because such labor enables the household to continue its fundamental productive activity. Yet, rapid economic change and migration make fulfilling this obligation considerably difficult for migrating young people.

While the younger generation migrates, the older generation remains behind in rural areas. This creates pressure on the younger generation to fulfill its duties to kin at origin, because they must balance these responsibilities with obligations to non-familial institutions at destination. The absence of young people is especially a concern for the

older generation. This generation has the primarily responsibility for the family farm. Members of this generation are usually the heads of rural households, and they own the land and equipment needed to farm the land. Yet, as this generation ages it becomes increasingly difficult for it to keep up with the burden of physically demanding agricultural work. Thus, as the young generation leaves, the older generation is faced with the choice of either requesting help from migrants or performing physically demanding agricultural labor without the help of an able-bodied younger generation.

To better understand generational relations in the context of industrialization and mass migration, I draw on insights from the life course perspective and from the literature on migration and intergenerational support. The life course perspective views families as being made up of a matrix of interlinked lives (Elder and Conger 2000). Individual lives are connected and integrated within family goals or larger household strategies. Household strategies involve explicit or implicit choices families make to generate new opportunities in the face of changing opportunities and constraints (Hareven 2000).

Household strategies result from both external social and cultural changes as well as the internal composition and life course stages of household members. In the absence of non-familial institutions (such welfare agencies, social security, pensions, childcare centers, and nursing homes) the family is the primary source of security, and the interdependency of household members is high. Household strategies reflect this interdependency.

The life course perspective recognizes that individual agency is constantly adapting and reshaping life plans to meet new circumstances and the changing social reality (Hareven 2000). It also recognizes that historical social and economic changes

create different opportunities and constraints for individuals at different points in their life course (Elder and Conger 2000). The migration experience exemplifies this, as it is typically young adults who migrate to cities to pursue work opportunities, while it is the older generation who remains in rural origin communities.

With the onset of social changes associated with a loss of family function and the rise of institutions that compete with family obligations, family members begin to reorient their behavior in ways that reflect less dependence on family and more dependence on non-familial institutions. Such changes are perceptible in the strategies that household members begin to follow. Prior to the economic transition, household strategies aim to distribute human labor in ways that maximize agricultural output (i.e. older women are primarily responsible for the care of children, younger men are primarily responsible for physically demanding work, and so forth).

During the transition young people begin to work as wage laborers in factories or on construction sites. Such labor can be related to household strategies aimed at diversifying risk or creating investment, but this also exposes young people to sources of labor that compete with the rural household as the sole source of labor. This can lead to less dependence on family members, as migrants begin to depend more on their employers. In this paper I compare models of household strategies to understand which strategies typify relations among family members in times of transition to an industrial economy. These models are the altruism/corporate group model, the power and bargaining model, and the mutual aid model. I discuss each in turn below.

I focus on one aspect of this broad process of changing family relations, using a case study of agricultural help provided by adult children to their parents. Specifically, I

examine household strategies associated with help with the rice harvest provided by a cohort of working-age migrants to their origin households in Nang Rong, Thailand. Thailand is a developing country which has been experiencing a shift to an urban industrial economy since the 1980s. In recent decades Nang Rong has experienced rapid development accompanied by high rates of out-migration, especially among young people.

Growing rice is the central subsistence activity in Nang Rong as in other parts of Thailand. Rice is the main dietary stable. Rice production has a pronounced seasonality, which follows the timing of the monsoon and rice harvesting needs to be completed within a short time frame. This involves significant labor inputs, and failure to harvest quickly can result in a lower yield. Help from migrants is therefore valuable.

Migration and Models of Household Strategies

Two bodies of literature address intergenerational relations during the industrial urban transition: the migration literature and the literature on intergenerational support. Both have developed models of household strategies that arise between the younger generation of migrants and the older generation of parents residing in origin households.

In the intergenerational support literature, various researchers (e.g. Frankenberg, et al. 2002, Lillard and Willis 1997, Lee et al. 1994) have broadly defined three models for understanding familial support within households. The first model is the power and bargaining model, which emphasizes power relationships that decide different levels of losses and gains in the struggle for family resources. The second is the altruism/corporate group model, which emphasizes the allocation of wealth among household members that initially maximizes wealth, and subsequently distributes that

wealth in an efficient manner. The third model, the mutual aid model, emphasizes voluntary *quid-pro-quo* exchanges among household members.

In the migration literature, the work of the New Economics of Migration is most significant to understanding household migration strategies. New Economics of Migration researchers view migration decisions as choices made by households to diversify their income while minimizing risks in settings where capital, insurance, and futures markets are absent (Lucas and Stark 1985, Stark and Taylor 1989, Stark and Taylor 1991, Stark 1991). The New Economics of Migration argues that as part of these decisions, a tacit contract is developed that is designed to improve the welfare of both households and migrants.

With regard to interdependency among family members, the power and bargaining model is the only model which suggests low levels of interdependency. Although the altruism/corporate group model and the mutual aid model both predict relatively high interdependency among family members, these models are slightly different from one another. The altruism/corporate group model is associated with inter-temporal exchanges which yield efficiency in the distribution of household resources. The mutual aid model describes contemporaneous exchanges of services, which do not necessarily distribute household resources in an efficient manner. What follows is a more detailed explanation of each model, and corresponding hypotheses.

Power and Bargaining Model

The power and bargaining model is analogous to a bargaining model developed by the New Economics of Migration. It suggests that migrants and households (or younger and older generations in the intergeneration support model) agree on the

particulars of their obligations by means of bargaining. Through bargaining, both parties pursue an arrangement that best suits their individual interests, be it motivated by altruistic or instrumental ends. Bargaining power is determined by relative attributes of the origin household and the migrant (Lucas and Stark 1988).

In cases in which migrants have greater resources (such as higher human capital endowments: more education, more stable employment), their bargaining power is enhanced. In these cases the power and bargaining model predicts less contribution to the origin household's welfare. In contrast, when households have more resources (such as valuable land, or housing), the household's bargaining power is increased, and the model predicts that migrants will contribute *more* to the household welfare.

The household's bargaining power is frequently linked to strategic property bequests that the household uses to entice the migrant into giving assistance. For instance, households may reward migrants' cooperation by the promise of inheritance of land, household assets, or other forms of property (Hoddinot, 1994). Furthermore, migrants who fail to follow the expressed wishes of household heads could jeopardize their claim to inheritance rights.

Two hypotheses can be deduced from the power and bargaining model. First, households with more resources (such as land or consumer durables) should be able to elicit more help from migrants by using these resources as a promise of strategic bequest. Second, migrants with more resources (such as higher education and more stable wage paying jobs) should contribute less labor to households because their bargaining power is higher and they are less susceptible to the influence of the promise of strategic bequests.

Finding evidence for the power and bargaining model would suggest that familial intergenerational relations exhibit low dependency. Both households and migrants are simply instrumentally pursuing personal goals, rather than being dependent on family members. From the point of view of migrants, it indicates migrants with less stable relations with non-familial institutions (such as the workplace) are the only ones who participate in exchanges with households. The remaining migrants stop participating in household strategies once they secure stable or relatively high-wage positions. From the household's perspective it proposes that only those households with the most desirable property can expect to get any help whatsoever. Thus poorer households with no strategic property to use as a bequest are left to their own devices. In contrast to this model, the altruism/corporate group model and the mutual aid model predict greater household interdependence.

Altruism/Corporate Group Model

The altruism/corporate group model describes a process in which household members strive to allocate wealth in a Pareto efficient manner, that is, resources are allocated across household members such that no alternative allocation could improve the welfare of any given household member without reducing the welfare of some other household member. This usually follows two stages. First, households try to maximize wealth attainment, and second, they try to optimally distribute the ensuing wealth.

The counterpart to this model in the migration literature is related to the New Economics of Migration's theoretical arguments about investment and risk, the two underling components of the migrant-household arrangement. According to the investment argument, initial funds aimed at improving migrants' human capital

endowments (i.e. education) are borne by the household. Often this investment is selective and is aimed at maximizing wealth among household members. For instance, perhaps investment is made only on behalf of males, if these males can bring in higher wages[1]. In turn, the yields from this investment will be redistributed among other household members. For example, migrants with higher human capital endowments frequently earn more money, which they are expected to remit to the origin household to increase its welfare (Lucas and Stark 1985).

New Economics of Migration theorists have argued that households and migrants develop a coinsurance scheme to reduce risk (Lucas and Stark 1985, Stark and Lucas 1988). Such an arrangement can work in the following manner. Rural households send migrants to seek urban employment as a way of diversifying the household's income flow in the face of risks from such things as crop failures, price fluctuations, insecurity of land tenancy, or livestock diseases. Meanwhile, the agrarian household facilitates the migrant's initial efforts at finding employment by acting as an insurer against the risks of entry into employment sectors (i.e. the risk of unemployment). This is done either through household-to-migrant remittance or by giving the migrant a place to return if the need arises. This way the migrant gains from the initial investment.

Upon gaining sufficient place-specific capital, the migrant in turn acts as an insurer, by providing monetary support through remittance, allowing the household to engage in risk-increasing ventures, such as technological change on the family farm. In this way, the household is able to generate wealth, which can be redistributed to other household members.

[1] Presumably, however, this selective investment will bring higher returns that will benefit everyone.

Hypotheses stemming from the altruism/corporate group model predict effects that run counter to effects predicted by the power and bargaining model. First, migrants with more resources (such as higher education) will likely contribute more labor, as a repayment for the household's initial investment in the migrant. Second, households with fewer resources will be more likely to receive help from the migrant, because they are at higher exposure to various risks. Clearly, this household strategy involves relatively high dependency among family members. Inter-temporal repayment of investment and insurance schemes need to be carefully orchestrated and coordinated between family members in order to be effective.

It is important to note that these hypotheses assume that agricultural help from migrants and migrant remittance are not substitutes for each other; although they very well could be. Perhaps migrants substitute money for time by sending remittance in lieu of providing agricultural labor. Past research has suggested that adult children repay their parents for past care by substituting money for time (Cox 1987). Perhaps household members optimize the use of labor and financial capital of various household members by requesting remittance from some while requesting rice harvest help from others. To evaluate the assumption that remittance and agricultural help are not substitutes for one another, I will examine the remittance patterns of both migrants who provide agricultural help and those who do not to see if they differ.

Mutual Aid Model

The New Economics of Migration acknowledges the substantial temptation for both the household and the migrant to renege on their obligations. However, the nature of their relationship makes it unlikely that either side will do so, because these are family

members, who are endowed with mutual altruism, which is akin to trust or loyalty. This assists both parties in solving problems that emerge when legally enforceable contracts are absent (Lucas and Stark 1985).

The mutual aid model is built upon this principle. It stresses that residential sharing and assistance among household members is driven by voluntary mutual assistance in the form of reciprocal exchanges, and it generally describes the kind of everyday transactions among household members that make households valuable and productive forms of social organization. For instance, perhaps in exchange for providing help with agricultural labor, household members can help migrants during their absence, such as by taking care of the migrant's children while the migrant has a factory job in a regional city.

The mutual aid model suggests that migrant help with agricultural labor is given in exchange for help provided by the household. Thus, a logical hypothesis stemming from this model is that migrants who receive household assistance (for example care for children during the migrant's absence), will be more likely to contribute to household agricultural labor.

Unlike the power and bargaining model, both the altruism/corporate group model and the mutual aid model suggest a household strategy involving relatively high dependency among family members. The difference between the latter two models is that the former predicts distribution of family resources in an efficient manner, while the latter predicts exchanges of favors among family members, which do not necessarily strive to achieve the most efficient arrangement.

The effects of key variables are needed to differentiate among the three models. Variables related to everyday exchanges, such as the presence of migrants' children in the household, can be used to evaluate the mutual aid model. Variables related to inter-temporal investment (such as education) or related to coinsurance (such as occupation), can be used to provide evidence for the altruism/corporate group model. Under the altruism/corporate group model higher human capital attributes (higher education, more stable higher-paying wage jobs) predict a higher likelihood of help.

The power and bargaining model predicts the opposite effects for human capital variables, because these increase the bargaining power of young migrants. Characteristics of the household (ownership of valuable land or working assets) can also be used to distinguish between the altruism/corporate group model and the power and bargaining model. The former model predicts that households with fewer resources should expect to get more help, while the latter model predicts the opposite, which is consistent with a strategic property bequest motive.

[Figure 1 about here]

Setting

I now describe the setting. Nang Rong is a small, predominantly rural, district located in Buriram province, Northeast Thailand (see map in Figure 1). It is about the size of an eastern U.S. county. The district was a frontier region during the first six decades of the 20th century. The frontier closed during the 1970s and 1980s, when road construction, electrification, telecommunications, and migration substantially changed the way that people lived (Curran, 1995, Rindfuss et al 2005, Vanwey 2003). In 1984 only one-third of villages had electricity, while in 2000 nearly every household in the sample villages

had electricity (Rindfuss et al. 2003). Although some industrial development in the district has led to scattered industry, the level of non-agricultural employment provided is very low (Wanwey 2003).

Like the rest of Northeast Thailand, rain-fed paddy rice cultivation is central to the economy. Most Nang Rong residents are poor subsistence farmers who sell only their excess yields. Some grow upland cash crops like cassava for export to foreign markets (Curran 2005). Households usually farm small plots that are located in agricultural fields surrounding nucleated villages.

Land is a crucial source of employment and income in Nang Rong (VanWey 2003). Inheritance is the dominant mechanism whereby land is transferred among villagers. Nang Rong does not have an active land sales market, and no real estate specialists serve the villages. Although land is rarely sold, there is an active rental market, and households that own more rice land than they can farm usually rent out excess land. Renters typically pay with a share of the yield rather than cash (Rindfuss et al. 2005).

Deeds and titles for the plots exhibit considerable variation because of the nature of the expansion of cultivatable land and the government's initiatives to institute a formal titling system. It is important to understand the nature of this variability because land is among the most valuable inheritable property sought by young people. Land that is securely titled may represent a significant strategic property bequest that households can use to persuade migrants to help with the rice harvest.

The history of land titling is described in detail by Feder et al. (1988). During a time when all land belonged to the Thai king, Thai citizens could claim land in order to

provide for their families. Widespread clearing of forests, settlement, and cultivation were permitted with few restrictions and little government control. Rights to land were customary rather than formally recorded. Although earlier attempts were made to institute a land title system, it was the Land Code of 1954 which is the basis for the legal system of land rights used in Thailand today.

Under the Land Code, farmers were able to acquire secure titles which established full ownership rights enabling the farmer to legally sell, mortgage, or bequeath the land. The Land Code defined the power and duties for the allocation and acquisition of state land to reside with the Department of Lands (DOL). In addition to secure titles, the Department of Land also issued Preemptive Certificates for temporary use of land and Claim Certificates for land possessed and used of prior to the passage of the Land Code. Other land titles include usufruct certificates issued by the Royal Forestry Department in 1981, which grant temporary cultivation rights to squatters in forest reserves. In addition, there are a number of other documents issued by various government agencies that confer some rights to land within the purview of specific settlement and welfare programs.

Most Nang Rong households grow rice, and so, face the issue of harvesting it. The rice harvest is particularly sensitive to features of the agricultural cycle and can require a great deal of labor in a short time period. Toward the end of the wet season, once the rains have ceased and the fields are drained, rice harvesting must be finished quickly, before it is at risk of crop damage (Entwisle et. al 2003).

Crop damage can come from a number of sources, all of which become more problematic the longer the rice is left in the fields (Hull 2005, Rajadhon 1955). One source is the ever-present risk of insects and pests, which can damage the rice stalks.

Another problem is that rice stalks tend to fall over from the weight of mature heads, which is known as lodging. Lodging causes rice stalks to fall in random directions, which results in a tangle of rice stalks that are difficult to harvest. Another problem is that rice becomes drier and more brittle the longer it stays in the field. This significantly reduces the yield of rice.

It is important to understand that rice harvesting coincides with the beginning of the dry season in Thailand's monsoon climate. During midday when the sun is directly overhead, it is extremely hot. This limits the amount of time that can be spent harvesting rice (Hull 2005, Rajadhon 1955). Harvesting is still done in the traditional manner: rice stalks are cut by hand, using a small sickle or knife. Because of the size of the fields, using large tractors would ruin the elevated bunds that hold water in the paddy fields (Entwisle et. al 2003). Reaping and gathering rice stalks can be extremely labor-intensive, and even households with small land holdings may have difficulty harvesting their crop quickly without help (Hull 2005).

Migration in Patterns Thailand

Throughout Thailand between 1965 and 1990, rural-to-rural migration was the dominant form (Pejaranonda et al. 1995), which is probably related to marriage patterns. However, a decline in rural-to-rural migration occurred in tandem with an increase of rural-to-urban. Thailand's Northeast region, in which Nang Rong is located, became the major sending region, with much of the migration going to metropolitan Bangkok (Chamratrithirong et al. 1995, Pejaranonda et al. 1995).

To explain the increase in rural-to-urban migration from the Northeast, researchers (e.g. Chamratrithirong et al. 1995, Goldstein 1987, Pejaranonda et al. 1995)

cite historical development efforts directed at the region, which was the poorest in Thailand. These development efforts raised aspirations while doing little to create local employment opportunities. Among the development efforts were new employment opportunities concentrated in urban-based service and manufacturing industries; rising levels of education, which have increased aspirations for employment in non-agricultural employment; and social, transportation, and information networks which link the Northeast and Bangkok.

Much of migration in Nang Rong is temporary or circular migration, and is linked to labor demand fluctuations related to the agricultural cycle (Chamratrithirong et al. 1995). Richter, et al (1997), using a sample of Northeast households from a follow-up to the National Migration Survey, confirm earlier findings about the prevalence of temporary migration.

Richter et al (1997) report that just under half of the migrants[2] in their sample (40%) reported that seasonal factors in their home areas were involved in their decision to migrate. Furthermore, seasonal cycles involved in rice farming were a major determinant of migration for many rural residents. These authors' findings suggest that the peak for seasonal migrants occurred around the months of December or January, during the dry season, an idle season from an agricultural perspective. They also note that a higher than average amount of seasonal and repeat migration occurred in September, just before the harvest season in November and December.

Data

[2] Migrants were defined as anyone who was living outside of their home district for at least one month prior to the implementation of the survey.

To test the above hypotheses, I use data from the 1984 and 1994 waves of the CEP-CPC longitudinal study of social change in Nang Rong, Thailand[3]. In 1984, the first wave of the study, data was collected on all households living in a sample of 51 Nang Rong villages. Information was obtained on all household members, including those who were permanent residents and proxy reports for migrants. A subsequent wave of data collection occurred in 1994, at which time a complete census was again conducted of each of the 51 villages. The 1994 wave includes a household survey with data on social and demographic information regarding household composition, migration, land use, and complete household network data on sibling ties and rice harvest help ties.

The Nang Rong data are excellent for examining the hypotheses described above. The data contains a full household census, which includes all permanent residents, new residents between survey waves, as well as those who were gone for more than two months prior to the new survey wave. Data was collected on household assets, agricultural equipment, land use status, characteristics of land plots, and details of the household's harvesting of rice.

Basic Approach

Using the Nang Rong data, I estimate a series of regressions to examine the three models of household strategies described above. One complication is whether the migrant's household actually grows rice, and about 18 percent of households do not grow rice. Clearly, migrants cannot return to the home household to help with the harvest if that household does not grow rice. Further, a household's decision to stop growing rice may itself be the result of individuals migrating, and thus not having enough help to plow,

[3] For more details on the Nang Rong data see http://www.cpc.unc.edu/projects/nangrong/data; also see Entwisle et al. 1996, Godley 2001, Vanwey 2003.

plant, transplant, and harvest rice. Excluding households that did not grow rice from the analysis of migrant labor may lead to selectivity bias.

I checked for possible selectivity bias by estimating of a series of regression equations, which make different assumptions about selectivity bias. First, I estimate an equation that excludes households that did not grow rice. Next, using the full sample, I estimate a Heckman sample selection model (Heckman 1979) that simultaneously estimates a selection equation (predicting whether the household grew rice) and a substantive equation (predicting whether the migrant came to help with the rice harvest). Third, I estimate an equation that uses the full sample, including households that did not grow rice, in which I constrain migrants from non-rice-growing households to not coming back to help with the rice harvest.

Evidence for sample selection can come from two sources. First, the Heckman model can be used to calculate rho (ρ), which is the correlation between error terms in the substantive equation and the selection equation. When ρ is equal to zero, unmeasured variables in the selection equation are unrelated to unmeasured variables in the substantive equation, and regression coefficients are unbiased or unaffected by selection. Second, one can simply compare coefficient estimates between the results of models which include the entire sample to the sample which excludes non-rice-growing household, to see if the estimates are consistent throughout.

Results from the Heckman model provide no evidence that a household's decision to grow rice is related to the migrant's decision to help with the rice harvest; that is, ρ is not statistically different from zero. Also, coefficient estimates across the three models are fairly robust, suggesting that sample selectivity is not influencing results. I present

results for only the first equation (which excludes households not growing rice). Results for the Heckman model and for the full sample (which includes households that do not grow rice) are shown in Appendix 1.

Operationalization of Key Measures and Method

Help with the rice harvest, the dependent variable of substantive interest, is operationalized as a two-category variable indicating whether a migrant returned to help with the rice harvest. Because the outcome is dichotomous, I use a logit specification. The model can be written:

$$\ln\left(\frac{\Pr(Y_i = 1)}{\Pr(Y_i = 0)}\right) = \boldsymbol{\beta}'\mathbf{X} \qquad (1).$$

where Y_i is defined as help with the rice harvest provided by migrant *i,* and $\boldsymbol{\beta}'\mathbf{X}$ is matrix notation for the linear predictor, which is the linear combination of independent variables measured at the individual and household level. I make the standard assumption that the errors follow a binomial distribution.

[Table 1 about here]

Table 1 shows the frequency distribution of the dependent variable. Only a small percentage (about 11%) of migrants actually helped with the rice harvest. Such a small percentage of migrants coming back to help may reflect their employment situations, which may prohibit them from taking the time to travel back to their home villages for extended periods of time to help with their households' harvests. It could also suggest that households may not need migrant labor to help them with the rice harvest. Perhaps local sources are sufficiently available or inexpensive to meet the demand for harvest labor. Prior work on rice harvest help by Entwisle et al. (2003) has shown that almost a

quarter (22%) of households got help with the rice harvest from other people in the village, while 23% of households got help from people living outside the village. Also, almost two-thirds (64%) of households receiving help with the rice harvest paid at least one worker, although cash remuneration was almost exclusively reserved for helpers who were not former household members.

Migrants are the units of analysis. They are individuals who lived in the household in 1984, or were temporarily absent in 1984, and who were not in the village in 1994 (having been gone for at least two months). The analysis sample is limited to a cohort of adult migrants of working age, who are young enough to have parents who are still active in agricultural production, specifically 18 to 35.

Since multiple migrants can come from a household, and multiple households live in a village, the data are clustered, and thus not independent of each other. The model must account for the nested structure, or levels, of the data. This is important because each observation contributes less information than it is assumed to, which artificially lowers standard errors associated with coefficients, thereby overestimating *t*-statistics and overstating the significance of estimates. To account for this, I randomly select one migrant from each household, eliminating the clustering of migrants within households. To account for clustering of households in villagers, I use a robust standard error correction (White, 1980) at the village level.

Operationalization of Independent Variables

[Table 2 about here]

Descriptive statistics for all independent variables are in Table 2. Land is the first indicator of the household's relative bargaining power. Inheritance of land is a basic

social security strategy in rural areas of developing countries, especially for rural-to-urban migrants who pursue employment in the informal labor sector without a basic social security system or a pension / retirement plan. Land provides an investment opportunity, in addition to providing employment and a livelihood for rural residents. Also, land is often the primary source of collateral used to obtain bank loans in parts of rural Thailand (Feder et al. 1988; Routray and Sahoo 1995). Migrants who help with agricultural labor may be doing so in anticipation of someday inheriting land.

Land inheritance in Thailand is described in detail by Feder et al. (1988). As noted above, land titling in Thailand can range from securely titled land to land that is certified for use by squatters. The most securely titled land in Thailand is that which has a titled deed (*Chanod*), or what is commonly referred to by the Thai acronym NS-4. Such a title gives the owner full unrestricted ownership of the land, which can be sold, rented, subdivided, or mortgaged. The next most secure title is a certificate of use or NS-3 (*Nor Sor Sarm*). The possessor of such a deed can sell, transfer, or mortgage land, and can opt to convert the certificate into a titled deed (NS-4). In addition to being the most secure titles, these are the only documents that can be used as collateral to obtain bank loans[4].

Other land titles are less secure, have much more restrictive transfer provisions, and cannot be used as collateral. For instance, the Department of Lands also issued preemptive certificates, or NS-2 (*Bai-Chong*). NS-2 authorizes the temporary occupation of land, but restricts transfer of land to inheritance only. Also, it confers validity of rights

[4] Specialized institutions, such as the Bank of Agriculture and Agricultural Cooperatives (BAAC) were established to alleviate credit restraints in parts of rural Thailand. The BAAC offers short-term and medium-term loans with collateral security. Immovable property (mainly land) is the prime collateral offered by borrowers. Titled land which is transferable is the only acceptable form of collateral, thus only farmers with the most secure titles can use land as collateral (Routray and Sahoo 1995).

on the condition that the land is used within six months of issuance. In 1981, the Royal Forestry Department issued usufruct certificates to large numbers of squatters in forest reserves. These usufruct certificates, known by their Thai acronym STK (*Sor Tor Kor*) provide temporary cultivation rights, but prohibit the transfer of land by any means other than inheritance. Another example is SPK (*Sor Por Kor*) documents, which the Land Reform Office issued as an analogous document to the STK certificates issued by the Forestry Department. SPK were also relatively less secure, only transferable via inheritance, and cannot be used as collateral.

I operationalize household land as a series of variables that count the number of plots and the amount of land designated under various land titles. Preliminary analysis showed that migrants were reacting similarly to the two securely titled types of deeds. Therefore I grouped together NS-4 and NS-3 titled land, and I also grouped SPK, STK, and NS-2 land together. The former are the most securely titled land, and the only land that be used as collateral. The latter are the least secure titles, which cannot be transferred except by inheritance, and are not accepted as collateral.

From Table 2, it can be seen that households can own anywhere from zero to ten NS-4 / NS-3 land plots, while the amount of this land ranges from zero to 101,000 square wa[5]. On average households own almost two plots, with a total amount of land of just over six wa[2]. For the less secure land, results (not shown) suggest that migrants are not coming back to help with the rice harvest as a result of this type of land, therefore I do not consider this type of land any further. These less secure types of land are not clustered in a few villages, but are found in relatively constant proportions throughout sample villages.

[5] Wa is a Thai unit of measurement, one Wa is equal to approximately two meters.

If the power and bargaining hypothesis is correct, households with the most securely titled land (NS-4, NS-3) should be the most likely to use this land as a strategic bequest. Therefore they should receive more agricultural help from migrants. The altruism/corporate group model predicts the opposite.

In addition to land, I also look at the independent effect of consumer assets on migrants' helping with the harvest. Since monetary values for assets are unavailable, I follow work by Filmer and Pritchett (2001) and create a household wealth index, based on the presence of various consumer durables. The procedure uses principal components analysis (see appendix 2). This index includes data on the number of black and white televisions, color televisions, VCRs, refrigerators, Itans (agricultural trucks), cars/trucks/pickups, motorcycles, and sewing machines. In addition, I include dummy variables for whether a household cooks with electricity or gas, and has windows with wood shutters, glass panes, or bug screens.

Each household is grouped into one of three categories, based on its overall household wealth index score. Since wealth often tends to be clustered at the top of a wealth distribution, I include relatively fewer households in the top of the distribution than at the bottom. Specifically, households in the lowest 33rd percentile will be considered to be at the "bottom," those in the 34^{th} to 79^{th} percentiles will be considered "middle," and the highest fifth will be considered to be at the "top". From Table 2, one can observe that about 20 percent of the analysis sample households are in the top quintile of household wealth. Also, just about 41 percent of analysis sample households are in the poorest wealth category and 39 percent are in the middle category[6].

[6] The disproportionate share of households in the various wealth categories is related to the population of households used in the construction of the index and the sample used for the present analysis. In

Turning to characteristics of the migrant, I argue that higher human capital variables (such as education and occupation) increase the migrants' bargaining power. I operationalize education as a series of dummy variables indicating whether the migrant completed less than primary school, primary school only, or greater than primary school. Only a minority of migrants have greater than a primary school education (17%) and just under a third (30%) of migrants have less than a primary school education. I distinguish between agricultural occupations and non-agricultural occupations[7]. I expect those working in non-agricultural occupations, almost half of whom are employed as craftsmen, worker, or labors[8], have more stable and higher paying jobs.

In Thailand, parents who migrate from rural areas to cities frequently leave children behind in the care of relatives, especially the children's grandparents (Richter et al. 1992, Richter et al. 1994, Richter 1997). The mutual aid model predicts that voluntary *quid-pro-quo* exchanges among household members constitute the basis of resource sharing within the household. To test the predictions of the mutual aid model, I include a measure of the location of the migrant's children, which measures whether any of the migrants' children live in the home household. The mutual aid model would predict that migrants who receive child rearing assistance from their household should be more likely to reciprocate help, perhaps by providing agricultural labor during the harvest season.

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calculating household wealth, I used all households from all sample villages, while my sampling strategy only selected households with a migrant in the age range 18 – 35.

[7] Data on the migrant's occupation come from proxy reports from an informant in each household. There are instances in which the household's report of a migrant's occupation does not match the migrant's self report of occupation on addition data from a migrant follow-up survey. This discrepancy may be due to such things as job changes occurring in the time between the household interview and the migrant follow-up interview, or a lack of awareness of the migrant's occupation on the part of the interviewed household members.

[8] These wage labor occupations are roughly equally divided among auto or furniture repair employees; factory workers; construction workers, carpenters, masons, well drillers; and general laborers, workers in rice mills, unskilled laborers. The majority of agricultural labors list rice farming as their primary occupation.

Control Variables

The rest of the covariates serve primarily as control variables. There are three types: the location of key family members of the migrant, household demographics, and characteristics of the migrant.

The migrant's decision to help the household may be directed at particular individuals living within the household, and not at the household as a whole. Therefore I considered the location of the migrant's spouse and parents. In Thailand, postnuptial residence often follows the culturally preferred matrilocal pattern, with young couples temporarily residing with the wife's parents. Given the "loosely structured" nature of Thai society, newly married couples may live anywhere, but they are expected to, and commonly do, live with the bride's parents. This is a temporary arrangement that lasts until either the couple's first child is born, or the parent's next daughter marries (Limanonda 1995, Limanonda and Kowantanakul 2002, Knodel et al. 1995, Tan 2002). Married couples may also choose a living arrangement in which one of the marriage partners migrates alone for some period of time. I distinguish among migrants who are married and have a spouse living in the home household or village, married and have a spouse living in the same destination outside the village, married and living in a different location outside the village, post-married or whose spouse's location is unknown[9], and never-married.

Migrants whose spouse lives in the home household or village should be the most likely to help the household with the rice harvest, while those whose spouse lives outside the village will be the least likely to help. The latter migrants may reside within their

[9] The coefficient for the effect of this variable should not be interpreted. This variable is included merely to avoid unnecessarily deleting cases.

spouse's family. They are most likely obligated to provide help to their spouse's household. Migrants who live with their spouse in the same migration destination should be less likely to help their home household because they probably already started their own new household, for which they have responsibilities.

Thai customs are not only important to understanding the influence of spouses on the behavior of their marital partners, but also in understanding the influence of parents on the behavior of their children. A mild form of filial piety exists in Thailand, which is related to Buddhist practices (Knodel et al. 1995). Children pay off parental debt in gratitude for the efforts their parents made in giving them birth and in raising them.

To consider the influence of parents, I include variables measuring whether both parents live in the home household, only the mother lives in the household, only the father lives in the household, or neither parent lives in the household. I expect migrants to be more likely to help households where parents are residing, and there may be differences regarding help to widowed or divorced parents. Table 2 shows that having both parents living in the household is the most common living arrangement (67 percent of the sample). Having only the father in the household is rare. Only 11 percent of households have neither parent living in them[10].

I also control for household demographic variables. First, I count the number of siblings living in the household[11]. Because of changes in vital rates in Thailand (see Knodel et al. 1987), this generation of Thais tends to have many siblings. Siblings

[10] Indeed among both migrants who help with the rice harvest, and those who do not, a majority (over 80% of both) are children of the household head. I also include in-law parents in my counts because sons and daughters-in-law may feel similar pressure to help their spouse's parents. I also include in-law in my count of siblings.

[11] As the youngest daughter is expected to care for parents, it is common for her to receive a larger share relative to the other siblings (Fukui 1993). To examine this, I tried disaggregating the count of siblings by gender, although doing so did not yield substantively different results. Therefore, such a distinction was ultimately not made in the final models.

compete with their migrants for resources and they represent alternative sources of aid. The presence of siblings may be particularly relevant to inheritance of land or assets.

The customary inheritance practice is for all siblings to receive equal shares, although children who remain to care for elderly parents often inherit more land (Knodel et al. 1995). Relatively few siblings may indicate low fertility or a late stage in the household life cycle where parents are on the verge of transferring family property or have already done so. Many siblings may indicate high fertility, an early stage in the household life cycle, or both.

Second, I also count the number of household members of working and non-working age, with ages 13 to 60 considered working age. In Nang Rong, young adults begin to migrate to find jobs around age 13, when compulsory education ends (Rindfuss et al. 2003). Furthermore, by age 60, many are beginning to be unable to participate in strenuous agricultural work. I expect that the number of working age household members is related to a household's relative supply and demand of labor. On the one hand, working age people, who are able to provide agricultural labor, should discourage the migrant from coming back. On the other hand, non-working age dependents will encourage the migrant to come and help.

I also consider the influence of other household migrants. Migrants, who are selectively drawn from among the younger and most able portion of the population could also represent alternative sources of labor and competition for resources. Therefore, I expect that households with more migrants will be less likely to have the focal migrant help them with the rice harvest.

I also control for the migrant's age and gender. Aging and human development are lifelong processes, in which individual life courses are embedded in and shaped by historical events and interlocking, interdependent, and reciprocal exchanges among networks of relations (Elder 1994). Because the analysis sample is relatively young (18 – 35), they vary in their dependence on their natal households. Their obligation and to dependence on their home household will wane as they age. As such, it is likely that increasing age will be associated with less agricultural help.

There are gender differences in the ways that men and women repay parental debt associated with filial piety. Males pay off their debt by becoming monks, while females pay off their debt by helping parents with household labor and caring for them in their old age (Chamratrithirong et al. 1988, Limanonda 1995). Therefore I expect that females should provide more help than males.

Regression Results

Table 3 shows logistic regression results (raw coefficients, standard errors, and odds ratios). I consider first the variables that evaluate the central hypotheses[12].

[Table 3 about here]

The effects of the land variables lend firm support to the bequest argument. Starting with the most securely titled land, the results show that as the number plots of NS-4/NS-3 land increases, migrants are more likely to help with the rice harvest, with the odds of helping increasing by about 21 percent for an increase in one securely titled plot. Also, as the amount of securely titled land increases, so does the propensity for a migrant

[12] In results not shown I also included controls for the number of people, other than the focal migrant, who helped with the rice harvest (both inside and outside the village) as well as a control for migration destination. As these variables are endogenous with the dependent variable I exclude them from the final models. Results are not sensitive to changes in this model specification.

to help with the rice harvest (Model 2). Clearly, migrants are responding to the availability or inheritability of securely titled or quality land[13]. Household wealth had no effect on migrant help, which may suggest that land is most valuable and sought after asset.

Migrant human capital variables support the power and bargaining model. Migrants who have completed more than a primary school education are less likely to help with the rice harvest. The odds of them doing so are 68 to 69 percent lower than those with only a primary school education. The effect of education is consistent with the power and bargaining model. Migrants who are better educated are not providing more help as repayment for the household's initial investment in their education as the altruism/corporate group model would suggest. Instead they provide less help, as suggested by the power and bargaining model, they are less reliant on the household for support.

Also, migrants working in agriculture are more likely to help with the rice harvest. Assuming that those working in non-agricultural jobs have more stable and higher paying wage jobs, this is exactly what the power and bargaining model predicts.

One possibility is that migrants with higher human capital endowments earn more, and are able to help the household in other ways, such as through remittance. In results not shown, I examined migrant-to-household and household-to-migrant monetary remittance of those who help with the rice harvest and those who do not. Migrants who help with the rice harvest are also *more likely* to send remittance, and are slightly more likely to receive it. Of the migrants in the sample, just over half (53%) of migrants who did not help with the rice harvest sent remittance, while nearly two-thirds (65%) of

[13] Unfortunately, other measures of land quality (e.g. soil fertility and location) are not available.

migrants who did help with the rice harvest sent remittance. Thus remittance seems not to be a substitute for help with the rice harvest.

There is also anecdotal evidence that migrants who help with the rice harvest are seasonal migrants, and their migration is attuned to the seasonal demand of agricultural work cycles. In results not shown, I find that the duration of migration among the majority (over 60%) of migrants who help with the rice harvest is less than one year. The corresponding duration for those who do not help is 20%.

The effect of having a child living in the household is in line with the predictions of the mutual aid model. Migrants who have at least one child living in the household are more likely to return to help with the rice harvest. The odds of them doing so are two times as high as the odds of migrants whose children do not live in the household. It is likely the case that migrant parents who leave their children behind in the care of relatives are reciprocating such voluntary assistance by themselves providing assistance. They also use the occasion to visit their children.

The control variables suggest that migrants may be responding to the presence of certain individuals, rather than the household as a whole. As expected, migrants whose spouse lives in a different location outside of the village are less likely to help with the rice harvest. In fact, the odds of a migrant whose spouse lives in a different location than the migrant (somewhere outside of the village) helping with the rice harvest are about 45 percent lower relative to the odds of an unmarried migrant helping with the rice harvest[14].

Overall there is little evidence that agricultural help is related to parental support. Migrants are no more likely to help a household if both parents live in it than if neither

[14] In the Heckman model, the effect of being married and having a spouse live in the household is also significant, and the effect is in the expected direction. The effect is not robust across types of model specification, although it is nearly significant in the remaining models.

parent lives in it. The one exception is the presence of only the mother. If the migrant's mother is living in the household and the father is not, migrants are more likely to help with the rice harvest. This is unlikely to be related to obligations to parents, but rather to the mother's need for help. These women are probably widows who cannot farm rice without labor from migrant household members. This effect is in line with an altruistic/corporate group perspective, especially the altruist argument.

Siblings and working-age people also influence a migrant's decision to provide agricultural labor. The odds of a migrant helping with the rice harvest decrease by about 20 percent with an increase in one sibling in the household. With more siblings, focal migrants tend not to help with the rice harvest. Perhaps siblings provide a sufficient supply of labor to keep the migrant from returning.

A similar effect can be observed for the number of working-age people living in the household. As the number of working-age people increases, migrants are less likely to help with the rice harvest. Other working-age people either may provide the necessary agricultural labor or they compete with the migrant for inheritable assets. Either way, migrants are less likely to provide help.

There is one remaining effect that is worth mentioning. The age of the migrant is a significant determinant of rice harvest help. Age is negatively related to help with the rice harvest. Recalling that this is a young adult sample, it seems reasonable to expect that older migrants have probably experienced a number of life course transitions (perhaps marriage and childbearing) that has made it more difficult to help their natal household.

Discussion and Conclusion

In this paper I examined agricultural labor, in the form of help with the rice harvest, provided by migrants to their home households. The main aim was to examine the household strategies that migrants engage in with their origin households in order to make inferences about the interdependency of family members, which may be related to loss of family function.

Although there is evidence for all three household strategies, suggesting a variety of motivations, the power and bargaining model received more support than the altruism corporate group model. The power and bargaining model emphasizes power relationships that decide differential levels of losses and gains in the struggle for household resources. The strongest evidence for this model is the effect of securely titled land, which is most likely being used by households as a strategic property bequest. Further evidence is given by the effect of human capital characteristics of the migrant (education and occupation). The most educated migrants and migrants who work in relatively stable and higher-paying jobs were less likely to help with the rice harvest, relative to migrants with lower levels of human capital. This seems not to be because they sent remittances as a substitute for agricultural help. Results suggest that the bargaining power of both the migrant and of the household significantly determine the level of mutual assistance within households.

The power and bargaining model has implications for intergenerational relations and interdependency among family members. Social and economic changes that accompany the transition from a subsistence economy into an industrial economy have led to a loss of family function and a reduction of interdependency within families. This may suggest that individual people are adapting and reshaping life plans and household

strategies to meet new circumstances and the changing social reality. These findings are in accordance with the life course perspective (Elder 1994; Elder and Konger 2000; Hareven 2000).

The loss of production and education functions to non-familial institutions seems to undermine traditional roles within families and households. Once young people turn their human capital into wage positions, they are no longer dependent on the household as the sole source of property and security, and they are less likely to return to rural areas to help their parents' generation. For the older generation, their children's obligations to contribute to household production remain unfulfilled, unless secure land holdings can be used to entice children into coming back to help.

This may portent problems for those in the senior generation who own smaller, relatively less secure landholdings, for whom less help may be forthcoming. It was secure land that motivated them. Long term, such differential help could lead to inequality between Nang Rong residents, as those with fewer resources (i.e. less secure land) may have to rely increasingly on non-family labor, perhaps in the form of paid labor. It could also presage rifts in social support among household members as more people in Nang Rong achieve higher levels of educational attainment and more stable jobs.

Support for the loss of family function is not unequivocal. There is also support for the mutual aid model, which suggests the family members exchange services among themselves. There is evidence that migrants are helping with the rice harvest in exchange for childrearing aid from the household. Such exchange of aid is likely to be especially related to family functions that have not experienced a transition to more formal

institutions. Childcare as an institution is still developing in Thailand (Richter et al. 1992, Richter et al. 1994, Richter 1997). If Thai society follows the historic pattern found in developed countries (Presser 1989), someday more formal childcare institutions may replace existing care provided by kin. This may also explain why migrants are more likely to help their widowed mothers. Formal institutions like social security and retirement are not available in rural Thailand, but this too may change as they begin to develop to meet the needs of dependant elderly.

A few other results are worth mentioning. Descriptive results show that migrants who help with the harvest are much more likely to have been gone for less than one year, which may indicate that migrants who provide help with the rice harvest are seasonal migrants. Perhaps these migrants move for a short period of time during the agricultural off-season and time their return to coincide with a peak in labor associated with the harvest. In short, they are still part of the fabric of village life.

Results may also indicate that households value equity among siblings when making bequests. Perhaps there is a trade-off between land inheritance and investment in schooling, whereby those who get more land receive less education. Such a pattern has been suggested in parts of Thailand (De Jong, et al. 1996) as well as in the rural Philippines (Estudillo et al. 2001) and Sumatra (Quisumbing and Otsuka 2001). Maybe educated migrants do not engage in agricultural labor because they have no claim to agricultural land, having relinquished their entitlement to it by receiving an education.

It is also possible that securely titled land is the very land that is most suitable for agriculture, which would be attractive to young less-educated migrants whose occupation aspirations involve continuing to manage the family farm. It could be that these migrants

differ fundamentally from more educated migrants in that they only move for relatively short periods in order to earn additional income that they use as a supplement to farm income.

Appendix 1. Examining Sampling Selection Bias Due to the Exclusion of Households Not Growing Rice.

To test the possibility that excluding households that do not growing rice leads to selectivity bias, I estimate both a Heckman sample selection model and a model that includes the entire sample where migrants from non-rice-growing households are constrained to have not helped with the rice harvest.

The Heckman model is two-step sample selection model (see Heckman, 1979 for details). It simultaneously estimates two equations. The first is a selection equation, in which the outcome of interest (in this case) is whether or not the household grew rice. The second equation is the one of substantive interest, in which the outcome variable measures whether or not a migrant came back to help with the rice harvest. The standard Heckman model can be written:

$$Y_{1i} = \beta_1 X_{1i} + U_{1i} \quad (1)$$

$$Y_{2i} = \beta_2 X_{2i} + U_{2i} \quad (i = 1,\ldots, I). \quad (2)$$

Where X_{ji} is a vector of exogenous variables, β_j is a vector of parameters. The standard assumption is that both U_{1i} and U_{2i} are distributed normally with a mean of zero and a standard deviation of σ. In addition, it is argued that sample selection causes the set of unmeasured variables that are related to the selection criteria to be correlated with the set of unmeasured variables related to the substantive outcome. The degree to which this is true can be determined by looking at ρ, which is the correlation between U_{1i} and U_{2i}.

When ρ is equal to zero, unmeasured variables in the selection equation are unrelated to unmeasured variable in the substantive equation, and regression coefficients are unbiased. However, in cases in which ρ is not equal to zero, the Heckman selection

model allows us to use information from migrants of non-rice growing households to estimate consistent, asymptotically efficient estimates for all parameters in the model.

In addition to the Heckman model, I estimate a model that uses the entire sample of migrants (including does from households that do not grow rice). This uses a logit specification, and is identical to the model featured in the paper, except for the differences in sample. Frequency distributions for these models can be found in Table 1 of Appendix 1. From the table, it can be seen that nine percent of migrants in the full sample help with the rice harvest compared to eleven percent of the analysis sample. Also, a large minority, around one-fifth (18%) of households, do not grow rice.

Table 2 of Appendix 1 shows descriptive statistics for all independent variables. Descriptive statistics are presented for the full sample (including households that did not grow rice) and the analysis sample (which excludes households that did not grow rice). It also includes variables used in the selection equation of the Heckman model.

For the selection equation, which determines whether or not a household grew rice, I include the following covariates, all of which are measured in 1994: a dummy variable indicating whether the household was landless; a dummy variable indicating whether the household owned agricultural equipment; a count of the number of alter households who grow rice having a sibling network tie to the ego household; the age of the household head; a dummy variable for whether someone in the household has a relatively high paying wage job; the number of people of working (13 – 60) and non-working age living in the household; the number of individuals who migrated from the household between 1984 and 1994; dummy variables indicating whether the household participated in any of several cottage industries (silk weaving, silk worm raising, cloth

weaving, charcoal making); a dummy variable indicating whether the household grew cassava; and the percent of land that is well suitable for growing rice in a five kilometer radial buffer around the village center.

Table 2 of Appendix 1 shows that differences between the full sample and the analysis sample with respect to values of independent variables are minor, which does not suggest selection bias. Selection bias can be formally determined by observing whether the ρ coefficient, estimated by the Heckman model, is statistically significant. Recall that when ρ is equal to zero, the set of unmeasured variables that are related to selection are not related to the outcome of substantive interest. Results from Table 3 of Appendix 1 show that ρ is not statistically different from zero. Therefore, assuming the Heckman model is correctly specified, regression coefficients in the substantive equation should be unbiased.

It should be noted, however, that the Heckman model has been criticized for several reasons. A common complaint against the model is that variables in the selection equation could also affect the dependent variable in the substantive equation. However, specifying these paths eventually leads to identification problems with the model. Another complaint comes from research findings that the Heckman model performs no better than uncorrected ordinary least squares in simulation studies (Stolzenberg and Relles 1990)[15]. Therefore I also estimate a model that uses the full sample in order to test the robustness of my findings.

[15] Stolzenberg and Relles (1990) empirically evaluated the performance of the Heckman estimator under conditions in which the normality assumption held, censoring was "severe" (set at ten percent), and samples were relatively small (n = 500). Having established the values of their regression parameters *a priori*, the authors generated data using a Monte Carlo simulation. The authors generated 100 random data sets, with an average selection probability of 10 percent for each data set. They then modeled the data, while varying the values of design parameters such as the regression R^2, selection R^2, squared correlation

From Table 4 of Appendix 1, it can be seen that results for the full sample are similar to that of the results for the featured model, which uses an analysis sample excluding households that do not grow rice. Results are largely similar, with a few exceptions, especially with regard to the presence of spouses and parents.

One finding that contrasts the analytical sample findings is the effect of both parents. Among the full sample, migrants are more likely to help with the rice harvest if both parents live in the household, relative to cases in which neither parent lives in the household. This effect is questionable however. The difference between the full sample, in which the effect was found, and the analytical sample (a sub-sample of only rice-growing households), in which the effect was not found, is due to the exclusion of households that do not grow rice in the latter sample. Thus the difference in results has to be due to households that do not grow rice being included in the full sample, whose migrants are all constrained to have not helped with the harvest. If none of these migrants helped with the rice harvest, how can it be that the presence of both parents in these households made it more likely that they would return? This finding is likely to be due to chance, and it is not robust across different models.

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between regression and selection independent variables, and squared correlation between regression and selection error terms. The authors found that, on average, Heckman's method performs no better than uncorrected ordinary least squares, sometimes exacerbating bias, and worsening the accuracy of estimates almost as often as it improves them.

Appendix 2. Creating a Wealth Index from Household Assets Using Principal Components Analysis

While the Nang Rong data do not contain information on individual income or household consumption expenditures, data were collected about household ownership of various consumer durables or assets. These variables can be used to create an index of assets that is a proxy for household wealth. In creating such an index, choosing an appropriate weight to attribute to each asset maybe difficult. To calculate these weights, I use principal components analysis (PCA), a well-known technique for reducing the dimensionality of a data set.

PCA is a technique that extracts a few uncorrelated linear combinations of an original set of variables that captures most of the information in the original variables (Dunteman 1989). Suppose we had a set of *p* variables, representing the ownership of assets by each household. PCA transforms these *p* wealth indicator variables, which can be characterized as a *p* dimensional random vector **x** (x_1, x_2, … x_p) into a one-dimensional wealth index *z*, using the following equation:

$$z = u_1x_1 + u_2x_2 + \ldots + u_px_p \quad (1)$$

The weights (u_1, u_2, … u_p) are determined mathematically by maximizing the variation of the linear composite. Furthermore, the principal components are ordered with respect to their variation so that the first principal component accounts for the most variation in the original variables, and each subsequent principal component accounts for less and less of the remaining variation.

The first principal component is the line of closest fit to the *j* observations in the *p* dimensional variable space defined by the asset variables. It minimizes the squared distance (defined in a direction perpendicular to the line) of the *j* observations from the

line in the variable space representing the first principal component. The *p* principal components can be expressed in equation form:

$$z_1 = u_{11}x_1 + u_{12}x_2 + \ldots + u_{1p}x_p$$

$$z_2 = u_{21}x_1 + u_{22}x_2 + \ldots + u_{2p}x_p$$

...

$$z_p = u_{p1}x_1 + u_{p2}x_2 + \ldots + u_{pp}x_p \quad (2)$$

or in matrix form:

$$\mathbf{z}_i = \mathbf{u}_i'\mathbf{x}$$

where $\mathbf{u}_i$ is a weight vector ($u_{i1}, u_{i2}, \ldots, u_{ip}$) associated with the *i*th principal component, which can be calculated separately for every household *j*. Also, **x** is a $p \times 1$ vector of original variables. The main statistics resulting from PCA are the variable weight vector $\mathbf{u}_i$ associated with each principal component and its corresponding variance, λ_i (Dunteman 1989).

PCA finds a weight matrix **U** that maximizes **U′RU**, given the constraint that **U′U** = **I**, the identity function**.** This method is based on a result from matrix algebra involving a $p \times p$ symmetric, nonsingular matrix **R**, a correlation matrix of asset variables. Because the units in which the original variables are measured are often arbitrary, and variables with large variances automatically get large weights in the principal component, a correlation matrix is often preferred to a covariance matrix (Dunteman 1989).

As detailed in Jackson (1991), the matrix λ can be calculated by premultiplying and postmultiplying **R** by a weight vector **U** such that:

$$\mathbf{U}'\mathbf{R}\mathbf{U} = \lambda \quad (3)$$

The diagonal elements of $\boldsymbol{\lambda}$ ($\lambda_1, \lambda_2, \ldots \lambda_p$) are called *characteristic roots* or *eigenvalues*, and they are equal to the variance of each respective principal component. The off-diagonals of $\boldsymbol{\lambda}$ are all equal to zero. The columns of **U**, $\mathbf{u}_1, \mathbf{u}_2, \ldots \mathbf{u}_p$ are called *characteristic vectors* or *eigenvectors* of **R**. Eigenvalues can be obtained by solving for λ in the *characteristic equation*:

$$| \mathbf{R} - \lambda \mathbf{I} | = 0 \tag{4}$$

where **I** is the identity matrix. After solving for λ, one can obtain eigenvectors by finding the solution of the equations:

$$[\mathbf{R} - \lambda \mathbf{I}]\mathbf{t_i} = 0 \tag{5}$$

and

$$\mathbf{u_i} = \frac{t_i}{\sqrt{t_i' t_i}} \tag{6}$$

for $i = 1,2, \ldots, p$.

Upon solving for these eigenvectors, one can make up the matrix **U**, with the *i*th row corresponding to the elements of the eigenvector associated with the *i*th eigenvalue:

$$\mathbf{U} = [\mathbf{u}_1 \,|\, \mathbf{u}_2 \,|\, \ldots \,|\, \mathbf{u}_p]. \tag{7}$$

This can be used to express the functional relationship between principal components, the weight vector, and the original variables more succinctly as:

$$\mathbf{z} = \mathbf{U}'\mathbf{x} \tag{8}$$

where **z** is a $p \times p$ matrix of principal components, $\mathbf{U}'$ is a $p \times p$ matrix of eigenvectors and **x** is a p column vector of original variables (Jackson 1991). While there are p principal components of the original p variables, it is the first principal component that captures the most variation. Thus, following work by Filmer and

Pritchett (2001), I use only the eigenvectors from the first principal component as weights in creating a wealth index for each household *j*, which can be expressed as:

$$z_{11} = u_{11}x_{1j} + u_{12}x_{2j} + \ldots + u_{1p}x_{pj}$$

$$\ldots \qquad\qquad j = 1,\ldots,J$$

$$z_{1j} = u_{11}x_{1j} + u_{12}x_{2j} + \ldots + u_{1p}x_{pj}$$

The critical assumption is that household wealth is what causes the most common variation in asset variables (Filmer and Pritchett 2001).

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Figure 1. Map of Thailand and the Nang Rong District

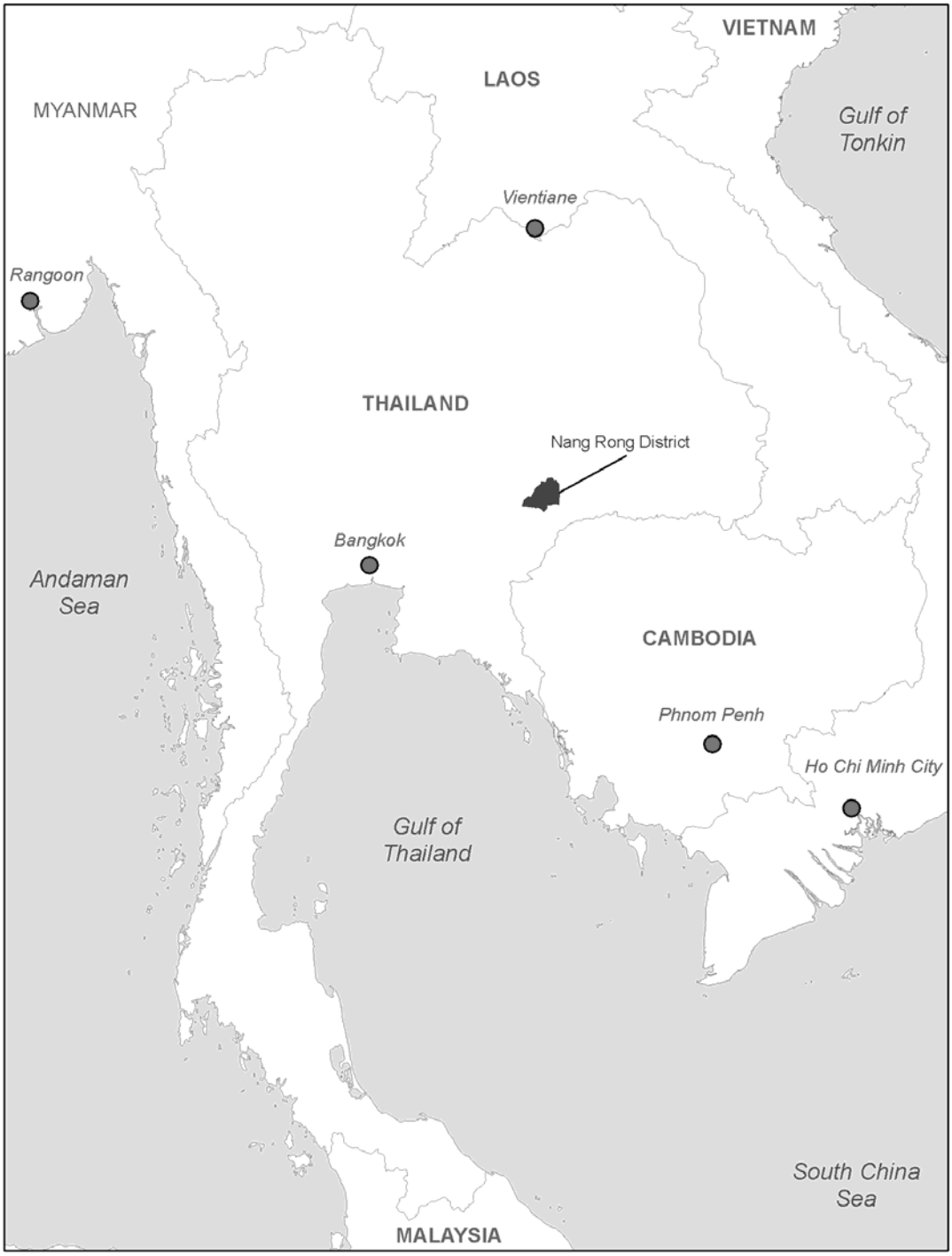

Table 1. Frequency Distributions of Return to Help With the Rice Harvest in 1994 for Migrants Age 18 - 35

Variable	Category	Description	Frequency	Percent
Migrant Returned to Help with the Rice Harvest	0	Migrant Did Not Return to Help	2046	89
	1	Migrant Returned to Help	254	11
	Total		2300	100

Table 2. Descriptive Statistics of Independent Variables for Migrants Age 18 - 35 in 1994

Variable	Analysis Sample Min	Max	Mean	StdDev
Household Assets				
Land				
Number of NS-4/NS-3 Land Plots	0	10	1.90	1.40
Amount of NS-4/NS-3 Land (in Wa^2 / 1000)	0	101	6.46	7.71
Household Wealth				
Top 20th Percentile of Wealth Distribution	0	1	0.20	0.40
Bottom 33th Percentile of Wealth Distribution	0	1	0.41	0.49
(Middle 34 - 79th Percentile of Wealth Distribution)	0	1	0.39	0.49
Migrant Human Capital Endowments				
Education				
Less than Primary Education	0	1	0.30	0.46
Greater than Primary Education	0	1	0.17	0.38
(Only Primary School Education)	0	1	0.53	0.50
Occupation				
Migrant Works in an Agricultural Occupation	0	1	0.42	0.49
(Migrant does not Work in an Agricultural Occupation)				
Presence of Migrant's Relatives and Spouse in Home Household				
Migrant's Child Location				
At Least One Child Lives in the Household	0	1	0.07	0.26
(No Child Lives in the Household)				
Migrant's Marital Status / Spouse Location				
Married, Spouse Lives in the Household or Village	0	1	0.03	0.16
Married, Spouse Lives in Same Migration Destination	0	1	0.33	0.47
Married, Spouse Lives in Different Migration Destination	0	1	0.23	0.42
Post-Married, or Spouse Location is Unknown	0	1	0.05	0.21
(Never-married)	0	1	0.48	0.50
Migrant's Parent (or In-Law) Location				
Both Parents Live in Household	0	1	0.67	0.47
Only Mother Lives in Household	0	1	0.16	0.36
Only Father Lives in Household	0	1	0.06	0.24
(Neither Parent Lives in Household)	0	1	0.11	0.32
Household Demographics				
Migrant's Sibling (or In-Law Sibling's) Location	0	7	1.40	1.18
Number of Siblings Living in the Household	0	6	0.58	0.91
Number of Working Age People (Age 13 - 60)	0	6	0.68	0.94
Number of Non-Working Age People	0	7	0.17	0.60
Number of Migrants				
Migrant's Demographic Characteristics				
Age	18	35	24.76	4.68
Migrant is Male	0	1	0.57	0.49
(Migrant is Female)				
N			2300	

Table 3. Binary Logit Estimates of Return to Help with the Rice Harvest for Migrants Age 18 - 35 in 1994 (Analysis Sample: Only Households That Grow Rice)

	Model 1			Model 2		
Variable	Coeff	Std Err	Odds Ratio	Coeff	Std Err	Odds Ratio
Intercept	-1.15*	0.58	0.32	-1.01	0.59	0.36
Household Assets						
Land						
Number of NS-4/NS-3 Land Plots	0.19***	0.05	1.21	-	-	-
Amount of NS-4/NS-3 Land (in Wa^2 / 1000)	-	-	-	0.03***	0.01	1.03
Household Wealth						
Top 20th Percentile of Wealth Distribution	0.0003	0.20	1.00	-0.01	0.20	0.99
Bottom 33th Percentile of Wealth Distribution	-0.06	0.16	0.94	-0.08	0.16	0.92
(Middle 34 - 79th Percentile of Wealth Distribution)						
Migrant Human Capital Endowments						
Education						
Less than Primary Education	-0.04	0.21	0.96	-0.09	0.21	0.92
Greater than Primary Education	-1.13***	0.29	0.32	-1.16***	0.29	0.31
(Only Primary School Education)						
Occupation						
Migrant Works in an Agricultural Occupation	1.14***	0.16	3.13	1.14***	0.16	3.12
(Migrant does not Work in an Agricultural Occupation)						
Presence of Migrant's Relatives and Spouse in Home Household						
Migrant's Child Location						
At Least One Child Lives in the Household	0.69*	0.28	2.00	0.7*	0.28	2.01
(No Child Lives in the Household)						
Migrant's Marital Status / Spouse Location						
Married, Spouse Lives in the Household or Village	0.73	0.40	2.08	0.72	0.40	2.06
Married, Spouse Lives in Same Migration Destination	-0.21	0.18	0.81	-0.19	0.18	0.83
Married, Spouse Lives in Different Migration Destination	-0.6**	0.19	0.55	-0.56**	0.19	0.57
Post-Married, or Spouse Location is Unknown	-0.49	0.39	0.61	-0.51	0.39	0.60
(Never-married)						
Migrant's Parent (or In-Law) Location						
Both Parents Live in Household	0.38	0.32	1.47	0.40	0.32	1.49
Only Mother Lives in Household	0.66*	0.33	1.93	0.66*	0.33	1.94
Only Father Lives in Household	0.23	0.43	1.26	0.24	0.43	1.28
(Neither Parent Lives in Household)						
Household Demographics						
Migrant's Sibling (or In-Law Sibling's) Location						
Number of Siblings Living in the Household	-0.2**	0.07	0.82	-0.21**	0.07	0.81
Number of Working Age People (Age 13 - 60)	-0.36**	0.12	0.70	-0.36**	0.12	0.70
Number of Non-Working Age People	0.04	0.09	1.04	0.04	0.09	1.04
Number of Migrants	-0.02	0.14	0.98	-0.02	0.14	0.98
Migrant's Demographic Characteristics						
Age	-0.06**	0.02	0.94	-0.06**	0.02	0.94
Migrant is Male	0.004	0.15	1.00	0.02	0.15	1.02
(Migrant is Female)						
N	2300			2300		
- 2LL	1435.45			1437.16		

* p < .05 ** p < .01 *** p < .001 (Two-Tailed Test)

Appendix Table 1. Frequency Distributions of Return to Help With the Rice Harvest and Rice Growing in 1994

Variable	Category	Description	Analysis Sample Frequency	Analysis Sample Percent	Full Sample Frequency	Full Sample Percent
Migrant Returned to Help with the Rice Harvest	0	Migrant Did Not Return to Help	2046	89	2538	91
	1	Migrant Returned to Help	254	11	254	9
	Totals		2300	100	2792	100
Household Grew Rice	0	Household Did Not Grow Rice	-	-	492	18
	1	Household Did Grow Rice	-	-	2300	82
	Totals		-	-	2792	100

Appendix Table 2. Descriptive Statistics of Independent Variables for Migrants Age 18 - 35 in 1994

	Analysis Sample				Full Sample			
Variable	Min	Max	Mean	StdDev	Min	Max	Mean	StdDev
Household Assets								
Land								
Number of NS-4/NS-3 Land Plots	0	10	1.90	1.40	0	10	1.82	1.37
Amount of NS-4/NS-3 Land (in W$\hat{a}^2$ / 1000)	0	101	6.46	7.71	0	101	6.18	7.85
Household Wealth								
Top 20th Percentile of Wealth Distribution	0	1	0.20	0.40	0	1	0.19	0.39
Bottom 33th Percentile of Wealth Distribution	0	1	0.41	0.49	0	1	0.43	0.49
(Middle 34 - 79th Percentile of Wealth Distribution)	0	1	0.39	0.49	0	1	0.38	0.49
Migrant Human Capital Endowments								
Education								
Less than Primary Education	0	1	0.30	0.46	0	1	0.31	0.46
Greater than Primary Education	0	1	0.17	0.38	0	1	0.19	0.39
(Only Primary School Education)	0	1	0.53	0.50	0	1	0.50	0.50
Occupation								
Migrant Works in an Agricultural Occupation	0	1	0.42	0.49	0	1	0.39	0.49
(Migrant does not Work in an Agricultural Occupation)								
Presence of Migrant's Relatives and Spouse in Home Household								
Migrant's Child Location								
At Least One Child Lives in the Household	0	1	0.07	0.26	0	1	0.08	0.27
(No Child Lives in the Household)								
Migrant's Marital Status / Spouse Location								
Married, Spouse Lives in the Household or Village	0	1	0.03	0.16	0	1	0.03	0.16
Married, Spouse Lives in Same Migration Destination	0	1	0.33	0.47	0	1	0.34	0.47
Married, Spouse Lives in Different Migration Destination	0	1	0.23	0.42	0	1	0.23	0.42
Post-Married, or Spouse Location is Unknown	0	1	0.05	0.21	0	1	0.05	0.22
(Never-married)	0	1	0.48	0.50	0	1	0.46	0.50
Migrant's Parent (or In-Law) Location								
Both Parents Live in Household	0	1	0.67	0.47	0	1	0.64	0.48
Only Mother Lives in Household	0	1	0.16	0.36	0	1	0.18	0.39
Only Father Lives in Household	0	1	0.06	0.24	0	1	0.06	0.23
(Neither Parent Lives in Household)	0	1	0.11	0.32	0	1	0.12	0.33
Household Demographics								
Migrant's Sibling (or In-Law Sibling's) Location	0	7	1.40	1.18	0	7	1.28	1.16
Number of Siblings Living in the Household	0	6	0.58	0.91	0	6	0.55	0.90
Number of Working Age People (Age 13 - 60)	0	6	0.68	0.94	0	6	0.68	0.95
Number of Non-Working Age People	0	7	0.17	0.60	0	7	0.19	0.64
Number of Migrants								
Migrant's Demographic Characteristics								
Age	18	35	24.76	4.68	18	35	24.93	4.73
Migrant is Male	0	1	0.57	0.49	0	1	0.58	0.49
(Migrant is Female)								
Selection Model Variables - Household Level								
Household is Landless	0	1	0.03	0.18	0	1	0.04	0.19
(Household Owns Land)								
Household Owns Agricultural Equipment	0	1	0.26	0.44	0	1	0.22	0.41
(Household Does Not Own Agricultural Equipment)								
Number of Path-Length One Sibling Households that Grow Rice	0	10	0.95	1.33	0	10	0.87	1.28
Age of Household Head	20	80	55.24	10.24	20	80	55.60	10.42
Total Number of Working Age People (Age 13 - 60)	0	10	3.06	1.49	0	10	2.87	1.53
Total Number of Non-Working Age People	0	9	1.42	1.24	0	9	1.42	1.24
Total Number of Migrants	1	10	2.53	1.51	1	10	2.58	1.53
At Least One Person in the Household Has a Relatively Wage Job	0	1	0.02	0.13	0	1	0.05	0.21
(No One in the Household Has a Relatively Wage Job)								
Someone in the Household Engages in Silk Weaving	0	1	0.12	0.32	0	1	0.10	0.31
(No one in the Household Engages in Silk Weaving)								
Someone in the Household Engages in Silk Worm Raising	0	1	0.08	0.27	0	1	0.07	0.26
(No one in the Household Engages in Silk Worm Raising)								
Someone in the Household Engages in Cloth Weaving	0	1	0.21	0.41	0	1	0.19	0.39
(No one in the Household Engages in Cloth Weaving)								
Someone in the Household Engages in Charcoal Making	0	1	0.64	0.48	0	1	0.59	0.49
(No one in the Household Engages in Charcoal Making)								
The Household Grows Cassava	0	1	0.14	0.35	0	1	0.12	0.33
(Household Does Not Grow Cassava)								
Percent of Village Land in 5 Km Buffer That is Well Suitable for Wet R	0	46	9.98	13.65	0	46	9.93	13.55
N			2300				2792	

Appendix Table 3. Bivariate Probit with Heckman Sample Selection Estimates for Migrants Age 18 - 35 in 1994

Dependent Variable: Help with the Rice Harvest	Model 1		Model 2	
Variable	Coeff	Std Err	Coeff	Std Err
Intercept	-0.9**	0.29	-0.8**	0.28
Household Assets				
Land				
Number of NS-4/NS-3 Land Plots	0.1**	0.03	-	-
Amount of NS-4/NS-3 Land (in Wa^2 / 1000)	-	-	0.02***	0.01
Household Wealth				
Top 20th Percentile of Wealth Distribution	0.02	0.11	0.01	0.11
Bottom 33th Percentile of Wealth Distribution	-0.04	0.08	-0.05	0.07
(Middle 34 - 79th Percentile of Wealth Distribution)				
Migrant Human Capital Endowments				
Education				
Less than Primary Education	-0.04	0.12	-0.06	0.12
Greater than Primary Education	-0.58***	0.14	-0.59***	0.14
(Only Primary School Education)				
Occupation				
Migrant Works in an Agricultural Occupation	0.59***	0.11	0.6***	0.11
(Migrant does not Work in an Agricultural Occupation)				
Presence of Migrant's Relatives and Spouse in Home Household				
Migrant's Child Location				
At Least One Child Lives in the Household	0.39**	0.14	0.39**	0.14
(No Child Lives in the Household)				
Migrant's Marital Status / Spouse Location				
Married, Spouse Lives in the Household or Village	0.44*	0.23	0.43	0.23
Married, Spouse Lives in Same Migration Destination	-0.10	0.09	-0.10	0.09
Married, Spouse Lives in Different Migration Destination	-0.29**	0.11	-0.27*	0.11
Post-Married, or Spouse Location is Unknown	-0.24	0.16	-0.25	0.17
(Never-married)				
Migrant's Parent (or In-Law) Location				
Both Parents Live in Household	0.28	0.18	0.27	0.18
Only Mother Lives in Household	0.38*	0.17	0.38*	0.17
Only Father Lives in Household	0.17	0.17	0.17	0.18
(Neither Parent Lives in Household)				
Household Demographics				
Migrant's Sibling (or In-Law Sibling's) Location				
Number of Siblings Living in the Household	-0.08	0.05	-0.09*	0.05
Number of Working Age People (Age 13 - 60)	-0.13*	0.06	-0.13*	0.06
Number of Non-Working Age People	0.02	0.06	0.02	0.05
Number of Migrants	-0.04	0.07	-0.03	0.07
Migrant's Demographic Characteristics				
Age	-0.03**	0.01	-0.03**	0.01
Migrant is Male	0.003	0.07	0.01	0.08
(Migrant is Female)				
Dependent Variable: Household Grows Rice	Model 1		Model 2	
Variable	Coeff	Std Err	Coeff	Std Err
Intercept	-0.04	0.20	-0.04	0.20
Household is Landless	-0.24	0.16	-0.24	0.15
(Household Owns Land)				
Household Owns Agricultural Equipment	1.32***	0.20	1.33***	0.20
(Household Does Not Own Agricultural Equipment)				
Number of Path-Length One Sibling Households that Grow Rice	0.16***	0.04	0.16***	0.04
Age of Household Head	-0.004	0.003	-0.004	0.003
Total Number of Working Age People (Age 13 - 60)	0.26***	0.03	0.26***	0.03
Total Number of Non-Working Age People	0.01	0.03	0.01	0.03
Total Number of Migrants	-0.01	0.02	-0.01	0.02
At Least One Person in the Household Has a Relatively Wage Job	-1.43***	0.16	-1.43***	0.16
(No One in the Household Has a Relatively Wage Job)				
Someone in the Household Engages in Silk Weaving	0.56**	0.18	0.56**	0.18
(No one in the Household Engages in Silk Weaving)				
Someone in the Household Engages in Silk Worm Raising	-0.25	0.32	-0.25	0.32
(No one in the Household Engages in Silk Worm Raising)				
Someone in the Household Engages in Cloth Weaving	0.25*	0.11	0.25*	0.11
(No one in the Household Engages in Cloth Weaving)				
Someone in the Household Engages in Charcoal Making	0.45***	0.08	0.46***	0.08
(No one in the Household Engages in Charcoal Making)				
The Household Grows Cassava	0.42**	0.15	0.42**	0.15
(Household Does Not Grow Rice)				
Percent of Village Land in 5 Km Buffer That is Well Suitable for Wet Rice	0.01*	0.003	0.01*	0.003
Inverse Hyperbolic Tangent of ρ	0.35	0.45	0.32	0.43
Total N	2792		2792	
- 2LL	3346.74		3347.72	

* p < .05 ** p < .01 *** p < .001 (Two-Tailed Test)
Note: Standard Errors Adjusted Using Huber/White Correction

Appendix Table 4. Binary Logit Estimates of Return to Help with the Rice Harvest for Migrants Age 18 - 35 in 1994 (Full Sample)

	Model 1			Model 2		
Variable	Coeff	Std Err	Odds Ratio	Coeff	Std Err	Odds Ratio
Intercept	-1.61**	0.57	0.20	-1.49**	0.57	0.23
Household Assets						
Land						
Number of NS-4/NS-3 Land Plots	0.22***	0.05	1.25	-	-	-
Amount of NS-4/NS-3 Land (in $W\mathring{a}^2$ / 1000)	-	-	-	0.03***	0.01	1.03
Household Wealth						
Top 20th Percentile of Wealth Distribution	0.01	0.19	1.01	0.00	0.19	1.00
Bottom 33th Percentile of Wealth Distribution	-0.09	0.15	0.91	-0.12	0.15	0.89
(Middle 34 - 79th Percentile of Wealth Distribution)						
Migrant Human Capital Endowments						
Education						
Less than Primary Education	-0.08	0.20	0.92	-0.13	0.20	0.88
Greater than Primary Education	-1.25***	0.29	0.29	-1.31***	0.29	0.27
(Only Primary School Education)						
Occupation						
Migrant Works in an Agricultural Occupation	1.28***	0.16	3.60	1.28***	0.16	3.59
(Migrant does not Work in an Agricultural Occupation)						
Presence of Migrant's Relatives and Spouse in Home Household						
Migrant's Child Location						
At Least One Child Lives in the Household	0.78**	0.27	2.18	0.8**	0.27	2.22
(No Child Lives in the Household)						
Migrant's Marital Status / Spouse Location						
Married, Spouse Lives in the Household or Village	0.74	0.38	2.09	0.71	0.38	2.03
Married, Spouse Lives in Same Migration Destination	-0.30	0.18	0.74	-0.29	0.18	0.75
Married, Spouse Lives in Different Migration Destination	-0.67***	0.19	0.51	-0.64***	0.19	0.53
Post-Married, or Spouse Location is Unknown	-0.64	0.38	0.53	-0.68	0.38	0.51
(Never-married)						
Migrant's Parent (or In-Law) Location						
Both Parents Live in Household	0.64*	0.32	1.89	0.67*	0.32	1.95
Only Mother Lives in Household	0.68*	0.32	1.98	0.69*	0.32	2.00
Only Father Lives in Household	0.49	0.42	1.62	0.51	0.42	1.67
(Neither Parent Lives in Household)						
Household Demographics						
Migrant's Sibling (or In-Law Sibling's) Location						
Number of Siblings Living in the Household	-0.14*	0.06	0.87	-0.15*	0.06	0.86
Number of Working Age People (Age 13 - 60)	-0.26*	0.12	0.77	-0.27*	0.12	0.77
Number of Non-Working Age People	0.04	0.09	1.04	0.05	0.09	1.05
Number of Migrants	-0.06	0.14	0.95	-0.05	0.14	0.95
Migrant's Demographic Characteristics						
Age	-0.07**	0.02	0.94	-0.06**	0.02	0.94
Migrant is Male	-0.03	0.15	0.98	-0.01	0.15	0.99
(Migrant is Female)						
N		2792			2792	
- 2LL		1510.72			1515.61	

* p < .05 ** p < .01 *** p < .001 (Two-Tailed Test)