

MIGRATION AND HOUSEHOLD DEMOGRAPHY IN NANG RONG, THAILAND

Martin Piotrowski

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Approved by  
Advisor: Ronald R. Rindfuss  
Reader: Barbara Entwisle  
Reader: Guang Guo  
Reader: Ted Mouw  
Reader: Lisa Pearce

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ABSTRACT  
Martin Piotrowski  
Migration and Household Demography in Nang Rong, Thailand

Under the Direction of Ronald R. Rindfuss

This work investigates various facets of migration and household demography in Thailand, a developing country that has been experiencing a shift from a rural subsistence economy to an urban industrial base. The setting is Nang Rong, a rural agrarian district located in Buriram province in the Northeast. At one time a frontier region, the district has been undergoing tremendous social, economic, and demographic transformations in the last three decades.

The first analytical portion of the work deals with care for children of absent migrant parents. I develop a model of *total* childcare, whereby someone other than a biological parent assumes total parental responsibility in the parents' absence. I describe a process whereby a mutually-beneficial intergenerational household division of labor develops in which the older generation cares for the children of absent migrant parents, who provide for economic needs of their origin households.

Next, using help with harvesting rice as an illustration of the profound changes that occur during the industrial transition, I examine intergenerational relations between young out-migrants and their parents. I find that migrants are 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 household strategy predicated on individual self-interest and bargaining.

The final analytical chapter deals with the effect of remittances on household division, a demographic process that is understudied in rural developing contexts. Results suggest that remittance money sent by other household members (especially women, who perhaps are siblings of those who eventually move) is used to finance a household split. This is potentially related to the effect that remittances have on alleviating credit constraints, which makes it possible for families and households to fund costs (such as home construction) associated with movement into an independent household. Remittance effects are particularly associated with a later stage in the Thai household life cycle whereby a young couple moves out of the household of the wife's family into an independent nuclear household.

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## CHAPTER I

### INTRODUCTION

In much of the Western world, the 19<sup>th</sup> and 20<sup>th</sup> centuries brought about massive social, demographic, and economic changes, including the shift to an industrial economy, urbanization, and relatively smaller populations in developed countries (Caldwell 2004, Coleman 1993, Thornton 2001). While these large-scale structural changes have largely become subjects of interest of today's historians, in many developing countries such transformations are now impacting people's lives.

This is certainly true in Nang Rong, Thailand, the setting for my dissertation research. Nang Rong is a small rural, agrarian district located in the Buriram province in the Northeast region. Nang Rong was an isolated frontier region until the 1970s. In recent decades development efforts such as road construction, electrification, and telecommunications improvements changed the lives of many residents. Despite the tremendous changes occurring in the last few decades, Nang Rong remains a marginal environment where villagers, whose primary economic activity is rice farming, struggle to carve out an existence amidst poor soils and unpredictable rains. In many ways, changes in Nang Rong reflect the influence of broader development efforts and macro-structural changes at the national level.

Thailand has been experiencing massive transformations in its demographic structure and economy. In the decades between 1960 and the late 1980s Thailand underwent a demographic transition whereby a decline in mortality was followed by a decline in fertility

(Hutaserani and Roumasset 1991). While the crude death rate in Thailand had been steadily declining since the 1920s, child and infant mortality, an important component of mortality decline, only began to see a significant reduction since 1960 (Knodel et al. 1987).

In 1970, a National Family Planning Program was formally established under the auspices of the Ministry of Public Health. By the end of 1971, birth control pills and condoms, a rarity at one time, became widely available throughout rural areas (Knodel et al. 1987). The eventual result of the Thai government's efforts to raise standards of living and limit family size was a decline in fertility. The fertility rate began to fall precipitously between 1960 and the late 1980s. Estimates of the total fertility rate range from 6.5 to 7.4 births per women in the early 1960s. By 1975 the TFR was just above four births per women and by the late 1980s it was below replacement levels (Hirschman et al. 1994). Because of changes in the population age structure, the population grew. Consequently Thais tend to have sizeable families, and young adult Thais have substantial numbers of siblings.

Throughout the last half-century, Thailand also began experiencing a change in its rural and urban composition. Figure 1.1, which presents data from the World Bank's World Development Indicators (WDI), shows an approximate ten percent decline in the proportional representation of the country's rural population and a corresponding increase in the proportional representation of the urban population. With almost 70 percent of its population living in the hinterland, Thailand still remains a predominantly rural country. However, the aggregate numbers hide a complexity of back-and-forth movement that characterizes the life of some rural residents who migrate periodically between rural villages and urban settings.

The timing of the rural-urban shift corresponds to a change in historical migration patterns. During the period between 1975-1980, a decline in rural-to-rural migration occurred in

tandem with an increase in rural-to-urban migration streams and counter-streams (Goldstein 1987, Pejaranonda et al. 1995). This time period also experienced a growing volume and higher rate of circular migration (Goldstein, 1987). Circular migration, as well as other types of seasonal migration, is often carried out in conjunction with variations in agricultural labor demands. During the agricultural seasons when labor demand is low, migrants often flock to Bangkok in search of work, with flows being particularly heavy during the dry season (Chamratrithirong et al. 1995, Pejaranonda et al. 1995, Richter et al. 1997).

The Northeast region, where Nang Rong is located, is the dominant supplier of migrants (Chamratrithirong et al. 1995, Goldstein 1987, Pejaranonda et al. 1995). Thai migration scholars cite a number of reasons for this prevalence, including the lack of availability of rural land for settlement, the success of family planning (Goldstein 1987), development efforts which raised aspirations for non-agricultural employment, improved transportation and information networks which increasingly link the Northeast and Bangkok, and the mechanization of agriculture (Pejaranonda et al. 1995).

While some, or perhaps all, of these factors have affected migration patterns, most Nang Rong residents I spoke to during my fieldwork in 2005 complained about the lack of local wage labor positions, the rising costs of living corresponding to a shift to a money economy. They pointed to greater opportunities for work outside of the district as the major impetus for the movement of young people. Rural-urban differentials in economic growth are associated with disparate opportunity structures, which are related to historical developments in Thailand's economy, much of which favored metropolitan Bangkok (Ayal 1992).

Thailand's economy showed considerable growth in the 1980s and 1990s. Thanks largely to a boom in manufacturing, construction, agro-industry, and tourism, Thailand's economy

greatly improved in the ten years before the Asian Financial Crisis of 1997 (MacDonald 1998). Figure 1.2 shows that Thailand's Gross Domestic Product (GDP) per capita (measured in constant 1995 international dollars<sup>1</sup>) increased from around 2,000 in 1980 to a peak of over 6,000 in the late 1990s. During this time, the percent of the population employed in agriculture declined by about 15 percent, while the percent of the population employed in the industry and service sectors increased by approximately the same percentage (see Figure 1.3).

Taking these shifts in economic development and population structure as the contextual backdrop of my research, I examine how migrants and their origin households in rural agrarian villages cope with the changes brought about by out-migration. These changes have greatly impacted the nature of family and household relationships throughout Nang Rong. Using data that span the time period between 1984 to 2000, I focus on three aspects of family life that are changing in reaction to the selective migration of household members: 1) care for children of absent migrant parents by extended household members, 2) help with agricultural labor (in the form of help with the rice harvest) provided by migrants to their origin household, and 3) the effect of migrant remittances on household splitting.

To examine care for children of absent migrant parents, I develop a model of *total* childcare, whereby someone other than the biological parents assumes total parental responsibility in the parents' absence. This pattern of childcare is different from the pattern generally found in developed countries, where children are cared for by formal daycare professionals, only when their parents are working. Due to the location of jobs as well as the availability and cost of daycare, many parents migrate to Bangkok and other cities in search

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<sup>1</sup> Gross Domestic Product (GDP) per capita is based on purchasing power parity (PPP). PPP GDP is converted to international dollars using purchasing power parity rates. An international dollar has the same purchasing power over GDP as the U.S. dollar has in the United States (World Bank 2005).

of work while leaving their children behind at origin. Non-familial child care institutions have not yet matured in Thailand and parents rely on the children's grandparents and extended kin for aid. This is a pattern found in many developing countries (Hashimoto 1991, Kinsella 2000, Knodel and Saengtienchai 2005, Oburu and Palmerus 2005).

Using a combination of qualitative primary data and quantitative secondary data I investigate the role of kin in caring for the children of migrant parents. I find that the availability of extended kin, especially maternal grandmothers, makes it possible for migrant parents to live apart from their children. The importance of maternal grandmothers is probably connected with traditional customs encouraging matrilineal postnuptial residence.

My next chapter 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. Rice is central to the economy of Nang Rong and its harvesting is labor intensive. Harvesting must occur in a short time frame, and household members sometimes need help from migrants to complete the harvest, otherwise they risk diminished yields. Nang Rong out-migrants are young adults. Their parents are approaching ages where it becomes progressively more difficult to do physically-demanding agricultural labor. Hence, rice harvest help from migrants impacts intergenerational relations between adult children and their parents.

I investigate several theories about household strategies for adult migrants and their parents. I find most support for a power and bargaining model. If the household owns securely titled land, migrants are much more likely to return and help with the rice harvest. If the migrant has more human capital, then they are less likely to return and help, suggesting they are pursuing self-interested strategies. This implies that intergenerational relations



between parents and children are becoming more instrumental, which is related to a loss of interdependency among family members. Migrants depend on non-familial institutions, such as their place of employment, which competes with the family as a source of property and security.

My next chapter deals with households splitting into two or more households. In more developed countries, an upsurge in real income, a rise in living standards, and a general process of individualization have been linked to a general decrease in the size of households. Frequently it is young people who experience residential changes. Most young people who moved into new households do so by living independently from family members.

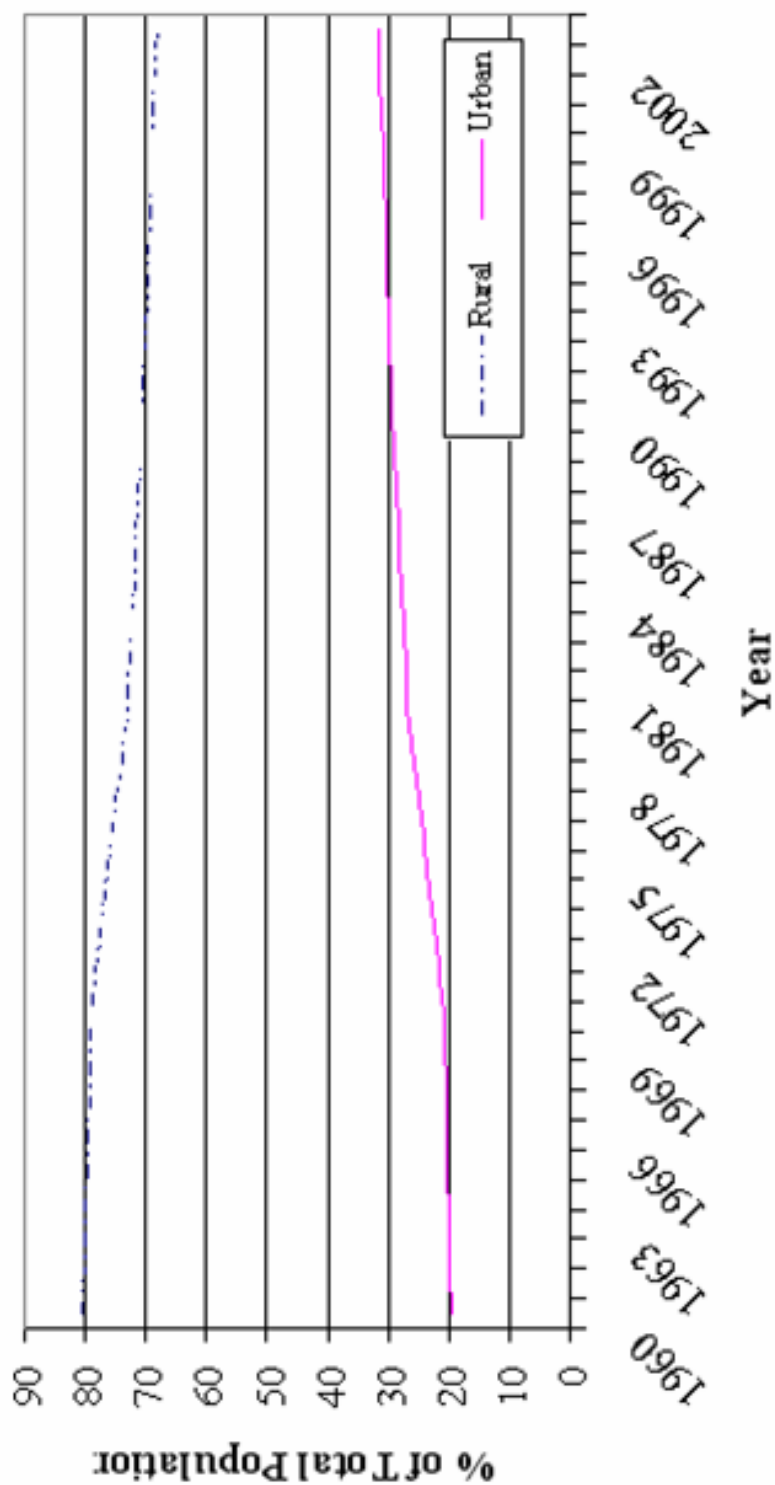
While much research exists in developed countries, this topic remains under-researched in developing countries experiencing economic transitions. I link existing literature on the process of household change to research on migrant remittances. Remittances are an invaluable source of capital which rural households use to alleviate poverty and overcome severe credit constraints in contexts where local wage employment opportunities are limited or absent. Remittances are a form of income which can raise standards of living and create aspirations for privacy and separate living.

I find that remittances sent from migrants to households are a significant determinant of household splits, particularly for couples at later stages of the household lifecycle. This is reasonable, since these couples must finance their move out of a vertically extended household into an independent nuclear household. A further finding is that household splits are sensitive to the remittances of women, not men. Because remittances from women are thought to be motivated by altruism, the gender effect is consistent with a theory of

households as corporate actors who allocate wealth across family members according to the efforts of a benevolent household head.

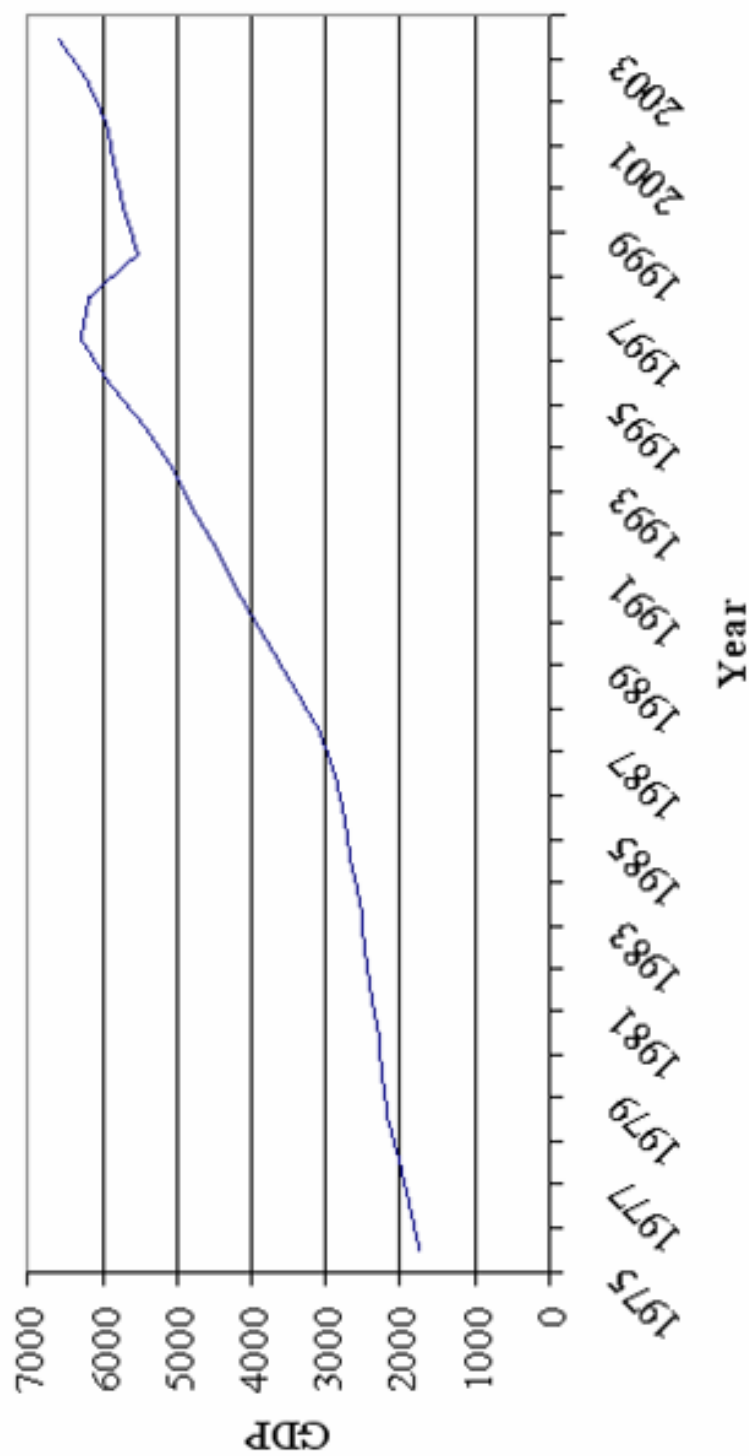
The most obvious theme uniting my analytical chapters is the influence of migration on households and on family life. Migration creates challenges for migrant parents and elderly grandparents, who frequently care for their grandchildren. It separates former and current household members. This separation makes it difficult for migrants to balance obligations to family members at origin with new family and non-family obligations at destination. It puts pressure on household members to replace household labor that could have come from migrants. Migration also brings remittances, which can lift capital constraints and raise standards of living. This enables individuals to afford new amenities like privacy and personal space.

Figure 1.1. Changes in Rural/Urban Composition of Thailand's National Population between 1960-2003



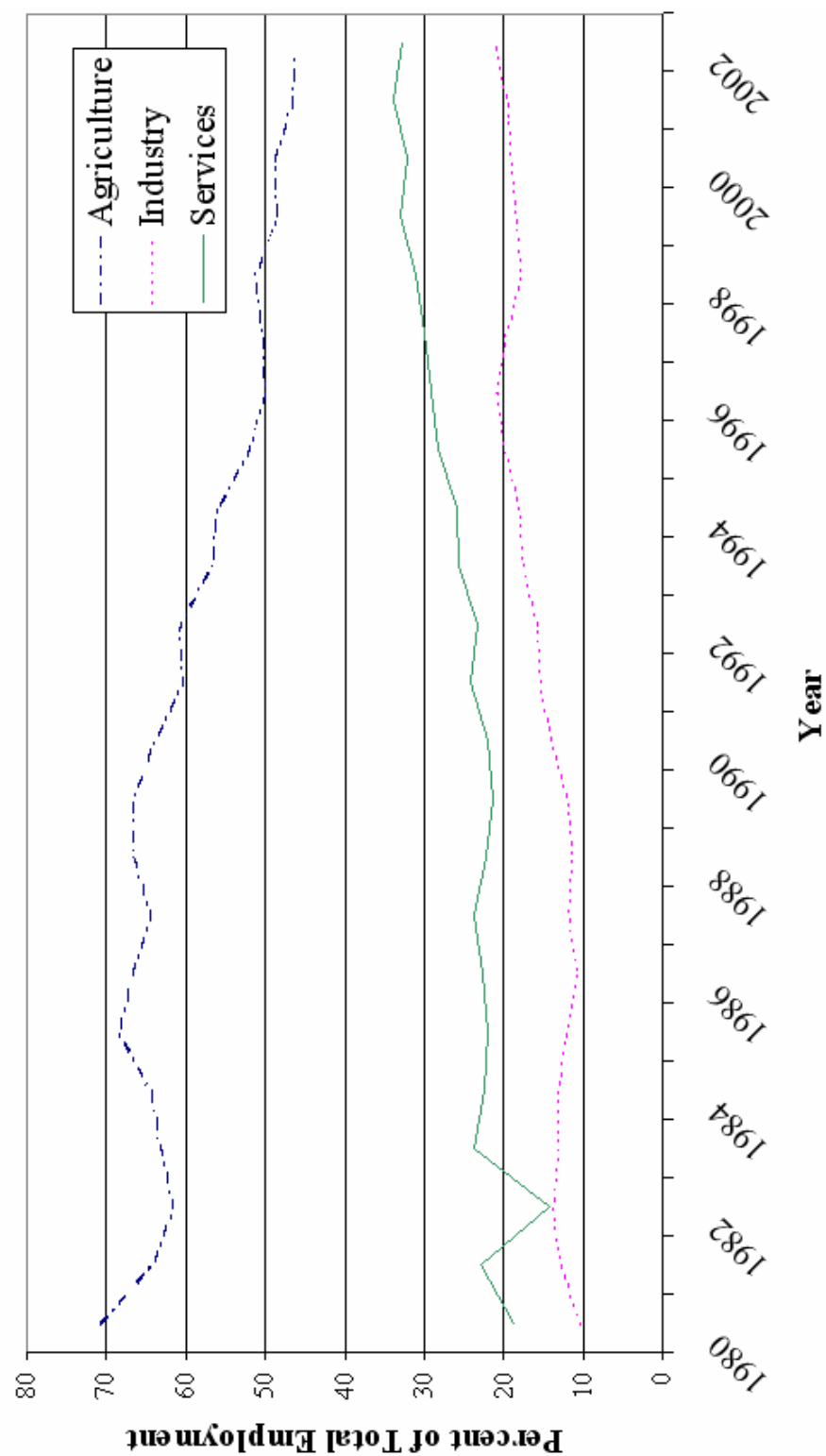
Source: World Bank, World Development Indicators

Figure 1.2. GDP per Capita (in Constant 1995 International \$) for Thailand and between 1975-2003



Source: World Bank, World Development Indicators

**Figure 1.3 Change in Percent of Population Employed in Occupational Sectors in Thailand Between 1980 - 2002**



**Source: World Bank World Development Indicators**

## CHAPTER II

### MIGRATION AND CARE FOR CHILDREN IN NANG RONG

As societies transition from a rural agrarian base to an urban industrial economy, the role of mother and the role of worker become more difficult to combine. Prior to industrialization, mothers and fathers could care for children (by watching them and being available for emergencies) while engaging in productive labor. Non-mechanized agriculture and piecework was combined with child supervision with less concern of discernible loss of productivity or danger to the child (Degler 1980, Roos 1985, Stycos and Weller 1967). As the industrialization process proceeds, societies experience a number of interrelated changes and dislocations that make the role of mother and the role of worker increasingly incompatible (Brewster and Rindfuss 2000, Presser 1986, Weller 1977).

The process of mechanization brings machines whose presence on worksites poses a danger to young children. With economic development, agricultural work is replaced by work in manufacturing and service industries, and it begins to be located at a distance from the home. Parents must commute or even migrate away in order to participate in the paid labor force. Work schedules in these new industries are set by employers, and they lack the flexibility required for raising children. The presence of children at work jeopardizes productivity, making it necessary for children to be cared for away from the work place (Brewster and Rindfuss 2000).

Usually caring for children is the responsibility of women, and women who want to participate in the workforce are forced to make provisions to have someone care for their children. The literature on childcare in settings that are transitioning from an agrarian economy to an industrial economy has identified two types of childcare arrangements. The first I refer to as daycare, whereby someone other than the biological mother (or father) takes care of the child while the mother is at work. The second, which I refer to as total care, involves the care of the child by someone other than the biological mother (and father) when the mother is at work as well as when she is not working.

Daycare is common in any industrialized society and has received a great deal of attention in the literature (see for example Gordon and Chase-Landale 2001, Hofferth and Philips 1987, Johansen et al. 1996, Zylan 2000). Literature on total care is less common. Total care is likely to be found in societies with high levels of labor migration that are in the midst of economic transition and lack formal childcare institutions. In some of these settings families adapt to changing economic circumstances by having the mother and father migrate. The parents' relatives provide care for the children who remain in the rural origin area.

In this paper I examine total care for the children of migrant parents in a developing region that has experienced a transformation in its economic base. The setting is Nang Rong, a rural, agrarian district located in Thailand's Northeast region. I use data from a rural-based sample of an ongoing longitudinal survey in Nang Rong to show interconnections among a changing economy, migration as an adjustment to economic changes, intergenerational linkages, and needs associated with care for children. Total care arrangements are an important facilitating mechanism in the transition from rural agrarian societies to those that are urban and industrialized.

## **Childcare in Developing Countries**

Most literature on childcare in settings experiencing societal changes related to industrialization (mechanization, urbanization, etc.) comes from developing countries rather than historical studies. The focus of this literature is on daycare rather than on total care. Two theoretical approaches influence most attempts to examine it in developing countries: role theory and household economic theory (Short et al. 2002). Both focus on the incompatibility that women face in dealing with their role as mothers and as workers.

Mothers' role conflict is manifest either in a diminution in working hours or a decrease in time spent rearing children. Empirical evidence that mothers reduce their number of working hours in wage labor comes from a number of urban settings, including metropolitan Brazil (Connelly et al. 1996), the Philippines (Adair et al. 2002), and China (Entwisle and Chen 2002). Research in Malaysia, India, the West Indies, Guatemala, and Nepal also suggests that non-wage agricultural work can be incompatible with childcare (DaVanzo and Lee 1983, Desai and Jain 1994, Gordon 1987, Hallman et al. 2005, Levine 1988). The finding that women reduce their hours of childcare as a result of their work schedule comes mainly from Short et al.'s (2002) research in China.

Role theory tends to focus on the strategies that women use to combine the mother and worker roles (Korinek 2004, Mason and Palan 1981, Stycos and Weller 1967). Research from the Caribbean and parts of Asia has found that the need for financial resources and the necessity for mothers to become income providers results in wage employment becoming a defining feature of motherhood (Garcia and de Oliveira 1997, Korinek 2004, Yu 2001). Instead of reducing their workload, mothers give up rest or leisure time and take on a double



or triple burden (Chant 2002, DaVanzo and Lee 1983, Desai and Jain 1994, Folbre 1984, Isvan 1991, Korinek 2004, Tiefenthaler 1997).

Household economic theory also focuses on the incompatibility between work and childrearing, but it tends to highlight the different opportunity costs of childrearing for men and women. Becker (1993) argues that physical differences between men and women, largely related to reproductive functions (breastfeeding, delivering babies), cause women to spend more of their lifetimes engaged in activities like childrearing. Men spend more time in market activities. In order to maximize utility, each sex capitalizes on its greater proclivity in the household and market sectors. Women invest mainly in developing skills and knowledge aimed at raising household efficiency while men invest in activities and skills that raise market efficiency (ibid).

The literature on total care examines role incompatibility from a different perspective than the literature on daycare. It describes circumstances under which the role of parent is assumed by someone other than the biological mother (or father). Those who have studied it in developed countries describe a residential pattern known as the “skipped generation” household in which grandparents are the primary care provider and neither parent is present (Casper and Bryson 1998, Simmons and Dye 2003).

In developing countries, the skipped generation household is associated with rural-to-urban migration. Migration in these areas is frequently an adjustment to or an attempt to participate in economic transition. According to UN estimates, in 2003, about 40 percent of the total population of less developed regions was living in urban areas, and this percentage is expected to grow to 65 percent by 2030 (United Nations 2003). As standards of living increase, and as monetized goods become increasingly available, people migrate from rural

areas to earn money in non-agricultural employment sectors concentrated primarily in cities (McDonald and Kippen 2001, Roberts 1997).

In developing countries, formal childcare options, themselves the product of economic transition, sometimes remain underdeveloped. Much of the most trusted, affordable, and adequate childcare still comes from traditional sources, notably kin living in rural areas (Richter 1997). Faced with the pressures of meeting economic necessities, parents living in these rural settings often have to make the difficult choice of migrating to urban areas while leaving their children in the care of extended kin (Richter 1996, Schoder-Butterfill 2004).

The focus of the literature on total care necessarily goes beyond the narrow focus on the role of the mother, and it pays considerable attention to the influence of a larger household context. Scholars working in developing regions of Africa and Asia view the skipped generation household as an example of a household strategy, in which household members cooperate to maximize utility (Bledsoe and Isiugo-Abanihe 1989, Lee 2000, Peterson 1993, Richter 1996).

Spatially-separated household members develop a division of labor in which the middle generation of parents migrates to raise income or living standards, while the older generation assumes responsibility for raising their grandchildren. Such an arrangement benefits all household members, as the middle generation gains a source of inexpensive and reliable childcare and the senior generation benefits from the companionship of their grandchildren and from migrant remittances (Schoder-Butterfill 2004).

Indeed, in the migration literature, rural-to-urban migration is itself seen as part of a household strategy, which is prominent in settings where capital, securities, and insurance markets are absent or underdeveloped (Stark and Bloom 1985, Lucas and Stark 1985, Stark

and Lucas 1988, Stark 1991). Stark (1991) hypothesizes that migrants play the role of financial intermediaries, enabling rural households to overcome credit and risk constraints on their ability to achieve the transition from familial to commercial production. One or more migrants are sent out to make money. Migrants remain a part of their origin household throughout the migration experience, and they send remittances back to these households.

The notion that the skipped generation residence pattern is part of a household strategy is an interesting adjunct to conventional household economic migration models. It implies that the family, and its residential unit the household, are important social institutions that cushion the effects of economic transition. Not only is the family resilient in the face of massive societal restructuring, but the family may itself contribute to structural changes. By providing childcare, extended family members free the middle generation from responsibilities that may hinder their productive capacity.

A household perspective also adds the insight that household members contribute differently to household utility depending on their life course stage. The life course perspective is useful in understanding these contributions, because it recognizes that historical social and economic changes create different opportunities and constraints for individuals at different stages in their lives (Elder and Conger 2000).

The influence of social change on migration exemplifies differential opportunities, as it is typically young adults who migrate to cities to pursue work opportunities, while it is the older generation that remains in rural origin communities. The life course perspective describes intersecting life course transitions among closely connected individuals (Elder 1994, Marshall and Mueller 2003, Moen 2003), especially friends, family members, and neighbors. As individuals' lives progress through the life course, individuals balance each

others relative abilities and constraints, a process which, in some settings, is affected by demographic changes such as migration.

I illustrate this intergenerational balance by discussing a hypothetical distribution of abilities/constraints as a function of age for three generations of family members: children (G1), parents (G2), and grandparents (G3). Each group spans both a time range, as well as a distribution of abilities and constraints. The exact age range of each generation varies across different contexts, and age limits may be related to such life course transitions as the completion of compulsory education or possibly retirement. This range of abilities and constraints can be thought of as a combination of social, economic, and physiological characteristics. By examining the nature of the abilities and constraints for each group, age-dependent complementarities begin to become apparent.

The middle generation (G2) is at a stage in their life course where it has completed compulsory education and is far from retirement. Typically members of this generation are able to take on the burden of manual labor, and they are just beginning to get established in their jobs. Parents in this generation face the so-called “mid-life squeeze” (Jiang 1995) or “life-cycle squeeze” (Hareven 2000): they must foot the costs of their children’s (G1) education, clothing, and general sustenance, while simultaneously providing for the wellbeing of their aging parents (G3). Quite frequently they do not own their own dwelling unit, they may have little land. They may not own the agricultural equipment needed to farm what land they have.

Yet these parents also have a unique ability, they are best able to migrate and earn income to meet the growing needs of family members that stem from the transition to a cash

economy<sup>2</sup>. This is important, because wage labor positions are often located at a considerable distance from rural areas in many developing countries.

The younger and older generations are also characterized by unique abilities and constraints. Children (G1) have the narrowest range of abilities and the most constraints. Children are the most limited in terms of their physical development, which makes them dependent upon parents and kin for their very survival. However, the exact degree of dependence is itself contingent on the age and physical development of the child, and decreases with age and development.

Grandparents (G3) are at the far end of their life course in terms of their chronological age, yet the distribution of their abilities and constraints is fairly wide. Often this generation is free from familial responsibilities such as having to care for their own children. This is especially true in low fertility populations. They may be asked to provide care for their grandchildren, especially if older siblings of the G2 are not available.

Members of this generation may have the advantage of owning resources such as a housing unit, land, farm machinery, and other equipment that they have accumulated throughout their lives. Because farm labor is very physically demanding, this generation's lifetime of work may have taken a heavy physical toll on its members. This physical cost may restrict their potential to continue working or to migrate away in search of new work opportunities. As such, they are dependent on the middle generation for money and care. In turn, the middle generation may be dependent on the elder generation for access to housing, land, and agricultural equipment. They may also be dependent on the senior generation for

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<sup>2</sup> It may be objected that young, single individuals, not parents, are more likely to migrate to earn money. This is no doubt correct, but, as will become apparent later in the paper, child birth may occur after migration and children can be sent back to migration-sending areas to live in skipped generation households. Parents can remain in migration destinations even after the birth of their children.

providing inexpensive and reliable childcare during the parents' absence in the course of a migration episode.

## **Setting**

Because interconnections among a changing economy, migration, intergeneration linkages, and needs associated with care for children are affected by regional context, I describe Nang Rong, the setting for this paper. Nang Rong is an agrarian district located in Buriram province, Northeast Thailand near the Cambodian border (see map in Figure 2.1). The district was a frontier region during the first six decades of the 20<sup>th</sup> century (Entwisle et al. 1998, Rindfuss et al. 2005). Following the closing of the frontier, road construction, electrification, telecommunications improvements, and migration substantially changed the way that people lived (Curran 1995). Nang Rong has been the site of on-going longitudinal research since 1984, and the district has experienced a number of changes in that time period. I use measures computed from the Nang Rong data to illustrate economic and demographic changes in the district.

Panel data were collected over the course of three waves<sup>3</sup>. Baseline data were collected in 1984 when a full household census was conducted for 51 sample villages, with information gathered for all household members. Subsequent waves of data collection occurred in 1994 and 2000, when a complete census was again conducted in each of the 51 villages. Each wave of data collection includes social and demographic information regarding household composition, migration, land use, and other subjects. In addition, a migrant follow-up was conducted in 22 sample villages in 1994 and 2000.

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<sup>3</sup> 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.

### *Economic Development and the Shift to a Money Economy*

Figure 2.2 illustrates changes in economic development. The figure includes measures of the percentage of households owning certain assets and having particular amenities across the three data waves. The data show evidence of rapid economic development and a shift to a monetized economy. There is a marked increase in the use of utilities over time. While only a fraction of households had water piped into their households in 1984, almost 40 percent of them had it by 2000. Electricity, while only available to about a third of households in 1984, was nearly universal in 2000.

The period between 1984 and 1994 shows a rise in the ownership of consumer products, particularly the television. In these ten years, television ownership increased from under eight percent to nearly 70 percent of households. This was followed by an increase of approximately 25 percent in households owning refrigerators between 1994 and 2000.

Ownership of working assets also increased. *Itans* (multi-purpose agricultural vehicles) and especially motorcycles witnessed a steady increase throughout the 16 year period. Motorcycles are a typical form of transportation in many developing countries, and can be used for any number of purposes, such as getting to and from work and bringing agricultural products to market. Automobile (cars, trucks, and pick-ups) ownership remains uncommon in the district.

### *Demographic Change in Nang Rong*

Nang Rong also experienced rapid demographic change during the period under study. The population living in study villages dropped from 32,342 to 31,128 between 1984 and 1994, and then increased to 34,298 in 2000. While some of this drop is associated with natural decrease, much of is attributable to migration. Migration has been common in the

Northeast region where migration rates are higher than other major regions (North, Central, and South) (Chamratrithirong et al. 1995, Goldstein 1987, Pejaranonda et al. 1995). My qualitative interviews with villagers suggest that poverty, job scarcity, debt, and the shift to a money economy motivate young people to leave rural villages in search of better-paying jobs on urban construction sites and in factories.

Migrants from the study area and other parts of the Northeast migrate to both rural and urban destinations (Chamratrithirong et al. 1995, VanWey 2004). Migration to rural areas is thought to be associated with marriage while urban migration is for labor. Major destinations for urban migrants include Bangkok, the Eastern Seaboard, and regional cities like Korat<sup>4</sup>. Much of migration in Nang Rong is seasonal or circular migration, and is linked to labor demand fluctuations related to the agricultural cycle (Chamratrithirong et al. 1995, Richter et al 1997).

### *Migration and Childcare*

Migration is selective of young age adults (which was roughly 16-37 in 1994)<sup>5</sup>, as shown in Figure 2.3. On a trip to Nang Rong during the dry season, an idle season from an agricultural perspective, fieldwork by Rindfuss (1991) noted that young adults were conspicuously absent. In rural villages only middle-aged and elderly adults could be seen, as well as the small children of the absent young adults. Most of the villagers that I spoke to during fieldwork in 2005 said that it was common for migrating parents to leave their children in the care of relatives, especially the maternal grandmother.

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<sup>4</sup> Korat (formally known as Nakhon Ratchasima) is a nearby provincial city, the largest city in the Northeast. The Eastern Seaboard Development Project was a major public-private joint venture carried out in three provinces in Thailand (Chonburi, Rayong, and Chacheongsao) during the late 1980s. The project sought to stimulate regional economic development, and to decentralize economic activity away from Bangkok. The plan called for investment in heavy and light industry development, tourism, and deep sea ports which were developed for the exploration of natural gas in the Gulf of Thailand (Shatkin 2004).

<sup>5</sup> The age distribution of migrants relative to the Nang Rong village population is similar in 2000.



The absence of young people has also been noted in other parts of Northeast Thailand as well (Phongphit and Hewison 2001). The 1990 Thai Census shows that compared with other migration flows throughout Thailand, a far smaller portion of rural-to-urban migrants are children (Pejaranonda et al. 1995). This may suggest that parents who migrate from rural villages to cities do so alone, while their children remain in rural villages.

To better understand Thai childcare arrangements it is important to have some background on Thai social norms about who is best suited to care for young children. Richter et al.'s (1992) in-depth interviews reveal that mothers are the first choice for care of infants, and the maternal grandmother is the clear second choice. The maternal grandmother was thought to be an even better choice for childcare than the mother if the mother could bring in a good income (ibid).

Several reasons were suggested. First, many newlyweds follow the culturally proscribed matrilocal postnuptial residence pattern (Limanonda 1995, Limanonda and Kowantanakul 2002, Knodel et al. 1995, Tan 2002). 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 next parent's daughter marries and her husband moves into the household (Limanonda 1995, Limanonda and Kowantanakul 2002, Knodel et al. 1995, Tan 2002). Traditional expectations that couples move in with the bride's family make it "normal" for children to live with maternal relatives. Second, childcare is considered the responsibility of women, not men, so grandmothers are a natural choice for childcare providers.

Nang Rong parents face a variety of childcare options if they choose to migrate. However, evidence from the survey of Childcare, Women's Status, and Fertility, conducted by the Institute of Population and Social Research (IPSR) at Mahidol University suggests that formal childcare institutions in cities and non-relative care are not popular choices (Richter et al. 1992; Richter 1997). The study collected qualitative data from a sample of Bangkok mothers. It found a high degree of conflict and distrust of non-relative childcare. Women of all socioeconomic levels expressed a similar distrust for bringing younger children into formal care in day care centers and nurseries. Perhaps because formal care was new during the study period, only a few respondents had actually used such facilities, and some described neglect and poor quality care in these settings (Richter et al. 1992; Richter 1997).

Richter (1992) found that about 16% of urban Bangkok women (including migrants and non-migrants) choose to live separately from their children, even if the child was born in Bangkok. Mothers are usually forced into such an arrangement by their economic situation, but it may also reflect the availability of relatives to provide care and a preference for care by relatives rather than non-relatives (Richter et al. 1992, Richter 1997). Richter's (1996) multivariate analysis indicates that mothers who migrate to Bangkok as young, single women, who have secondary or higher education, and who work as private employees in a formal workplace are most likely to live separately from children.

## **Data**

In this research, I use both qualitative and quantitative data. Data for the qualitative portion come from semi-structured interviews conducted in Nang Rong during February 2005. These

data were collected in seven villages throughout Nang Rong district. Villages were selected on a non-probability basis, and were intended to capture variability in village contexts<sup>6</sup>.

Qualitative Interviews targeted individuals who had experienced childcare arrangements that involved parents living away from children. Villagers who were otherwise knowledgeable about such arrangements were also interviewed. A total of 41 interviews were conducted with village headmen, public health workers, relatives caring for children of absent migrants, former migrants whose children were cared for by relatives, and parents whose spouse is a migrant. Interviews tended to last between 45 minutes to an hour. The interviews were recorded, transcribed, and translated into English.

Respondents were sampled using a combination of non-probability techniques (convenience sampling and snowball sampling). The qualitative data are not intended to be representative of the population in Nang Rong, rather they were selected to provide insights into the interpretation of the quantitative results. The quantitative data come from the 2000 wave of the Nang Rong projects social survey.

### **Basic Approach**

To grasp the interconnections among migration, intergeneration linkages, and needs associated with care for children I use insights from the semi-structured interviews and estimates from a series of statistical regression models. Of main interest is how the presence of non-parental caregivers and life course position are related to the migration status of parents relative to their children. Although the quantitative data do not measure childcare directly, my qualitative interviews were aimed in part at understanding the nature of care

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<sup>6</sup> For example, villages were chosen on the basis of distance to the district town, remoteness, age of the village, the presence of international migrants, distance to irrigation canals, the cultivation of cassava (an upland cash crop), and so on. The pattern of living separately from children seemed largely identical across villages.

provided by grandparents and other relatives. These interviews provide broad evidence that grandparents become primary care providers for children of absent parents.

The location of parents has implications for the care of the child. Married couples can adopt migration strategies that involve the migration of one or both parents. Therefore, children may live with both parents, only one parent, or neither parent. If only one parent migrates, the child could be cared for by the remaining parent. If both parents migrate and do not bring the child, someone else, most often a relative, must take over the child's supervision.

I use a cross-sectional design to look at the location of parents of Nang Rong children. To capture parental migration status, I include the migration of the child's mother and father as part of the dependent variable. I define migrants as anyone living outside of the village. In order to understand the determinants of these different parent-child arrangements, I relate them to a set of independent variables measuring household demographics, demographic characteristics of mothers and children, measures of the household economy, and village characteristics.

## **Sample**

The absence of a proper sampling frame is a reality in many migration studies because of the inherent mobility of this population. In order to capture the experiences of my population of interest, I focus on child-parent dyads for all children living in the village. I construct an analysis sample by starting with a universe of all children, age 13 or younger, living in the village in 2000. I use 13 as an age cut-off for children because compulsory education usually ends around this age and people begin to migrate on their own.

In studying the childcare arrangements for children of migrant parents, my aim is to examine both the characteristics of children and their parents. This necessitates linking data on parents and children. I link children and parents using data attributed to children regarding the location and identification number of their parents, and from information attributed to parents themselves regarding their location and identification number. However, parent and child records can only be matched if both parents and children are listed on the household roster. This is assured in the case of children, because my sample is limited to only children residing in the village, but this is only true for a subset of parents, because of the way that the data were collected. A detailed explanation of the data collection procedure will make the reasons for this clear.

Using a key informant from each household, data were collected on all household members living in the household, as well as proxy reports for anyone living outside of the household. For those living outside of the household, a proxy report is only available for anyone listed in a previous wave of data (i.e. either 1984 or 1994). Note that individuals residing outside of the household, such as migrants, would be excluded in a typical cross-sectional design. However, because they are embedded in a longitudinal study that collects info on out-migrants, I have data on these non-resident household members and I include them in my sample. Therefore my design goes beyond a conventional cross-section.

While this design has the advantage of including additional information on some absent household members, data is not available for everyone. Furthermore, coverage can be selective. For instance, in comparing a sample of 5,112 currently married Nang Rong couples, I found that 22 percent of husbands were not listed on the household roster, while

only 4 percent of women were not listed on the household roster. The majority (64 percent) of these missing men were migrants, whose wives were living with their natal family.

This pattern is not surprising given matrilineal postnuptial residence customs in Thailand. Suppose a man followed Thai tradition and moved in with his wife's family, and he subsequently migrated outside of the village. If timing of his residential changes occurred between survey waves, he would have never been included on the household roster. Hence information about him would never have been collected, although his wife's information may still be on the household roster from an earlier wave.

Because of the nearly complete coverage of women, I use the mother-child pair as the unit of analysis and I exclude the characteristics of fathers. This is reasonable, because the mother is usually the preferred caretaker of children in Thailand (Richter et al. 1992). This ensures that the characteristics of at least one of the parents can be included in analysis. Demographic characteristics of the mother are potentially important determinants of arrangements in which mothers live separately from their children. In cases in which the mother is not listed on the household roster, her characteristics cannot be used. This presents a problem: either a complete set of variables can be used for a potentially selective sub-sample of mothers and children, or a less complete set of variables can be used for a more extensive subset of mothers and children. To deal with this issue, I create several different sub-samples of children, which are shown in Table 2.1, and I conduct sensitivity analyses to determine how the inclusion of subsets of children affects results.

Table 2.1 presents the location status of parents for children residing in Nang Rong villages in 2000<sup>7</sup>. Fortunately, information on the parents' location was collected even if the parent was not listed on the roster, which allows for complete coverage of the relative location of children and both parents. The sample of most interest includes children whose mothers are listed on the household roster, because they have the most complete set of variables available.

I divide these mother-child pairs into mothers who are currently married and those who are not currently married. The latter contains single mothers, divorcees, widows, and women who are separated. I make this distinction because parental migration associated with marital instability is related to a different set of processes compared to the more common practice of migrating for labor. I focus on labor migration.

I also make separate subsets for children whose mothers were not on the household roster and for children for whom both the mother and father were not on the household roster. These sub-samples contain cases of mothers who are not currently married, but I do not attempt to distinguish them from currently married mothers because data on marital status is lacking.

Table 2.1 shows that the most common overall arrangement was for both parents to live in the same village as the child. This is the case in nearly two-thirds of the sample (67.71 percent). For currently married mothers listed on the household roster, the incidence of this arrangement was somewhat higher, accounting for almost four-fifths of the sample (79.99 percent). Not surprisingly, this arrangement was considerably less frequent for children

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<sup>7</sup> 8 cases were deleted in which the age of the mother exceeded the age of the child by 50 or more years. These are likely to be fictive mothers, whose relationship to their children is probably due to errors in the data or to calling someone other than the biological mother by the honorific term "mother."

whose mother was not on the household roster (4.27 percent) and for children whose parents are both absent from the roster (5.70 percent).

The next most common overall arrangement is for the child's father to be a migrant, while the mother remains in the village (12.61 percent). This arrangement is proportionally nearly as common for currently married mothers listed on the household roster (12.22 percent) compared to the overall sample. It is especially common for children whose mothers are not currently married (29.91 percent), which is likely related to divorce. Cases in which mothers migrate without their husbands are rare (2.01 percent), but there is variation across sub-samples. Because of its rare incidence, I do not include this category in my final regression analysis, nor do I include orphaned children and children of widows and widowers.

Overall, both parents are migrants in 11.59 percent of cases, and there are dramatic differences across the sub-samples. The lowest incidence of this arrangement is found among currently married mothers who are listed on the roster (6.84 percent), while the highest incident is an order of magnitude higher for cases in which neither parent is listed on the roster (61.84 percent).

One problem with my design is that it does not include children who are migrants. For reasons similar to those related to the selective coverage of fathers, there is selective coverage of children living outside of the household. I attempt to determine the extent to which children migrate by taking a sample of all children age 0-7 living in Nang Rong villages in 1994 (who are age 6-13 in 2000) and advancing their data to the 2000 survey, thereby determining their location in 2000. Although this approach does not account for children younger than age 6, it will determine what percentage of children age 6-13 migrated by 2000.



Table 2.2 shows that approximately 12 percent of these children were migrants by 2000: 4.98 percent were members of households in which all members moved out of the village (“moved households”) and 6.65 percent were migrants from households in which at least one member remained in the household in the village. While detailed data on the location of the parents of children from moved households is not available, this information does exist for children who are migrants from households located within the village. This data is presented in Table 2.3. Not surprisingly, the table shows that for most migrant children, both of their parents are migrants. It is likely that these children live with their parents in destination.

### **Method**

Since the dependent variable is a three-category nominal variable (both parents live in the village, father is a migrant while mother lives in the village, and both parents are migrants), I use a multinomial logit model. For a model with categories  $m = 1, \dots, M - 1$ , we have:

$$\ln \left( \frac{\text{Prob}(R_i = m)}{\text{Prob}(R_i = M)} \right) = \beta' X_i \quad (1).$$

Where  $\beta'$  is a vector of regression coefficients including the intercept, and  $X_i$  is a matrix of independent variables for each individual  $i$ . Using a logit link function to match the probability of being in each category  $m$  to the linear predictor, the dependent variable becomes the natural log-odds of a respondent being in any category of migration  $m$ . In order to get unique solutions for each set of regression coefficients, one of the response categories is set as a reference category (see Long, 1997: 152 - 153 for details). For ease of interpretation, final regression results are presented both in the untransformed logit scale and as odds ratios. I show all three contrasts for the models.

Since the unit of analysis is the mother-child dyad, and mothers can have multiple children, multiple mothers can live in each household, and multiple households can be

located in each village, the data are clustered and are not independent of each other. It is important to account for clustering, because it artificially lowers standard errors associated with coefficients, thereby overestimating  $t$ -statistics and overstating the significance of estimates. I use heteroskedastically robust standard errors (see White, 1980 for details) to correct for the clustering of child records within parents' records.

### **Operationalization of Key Independent Variables**

I now describe the operationalization of variables used to evaluate arguments put forth earlier about the determinants of parental migration. An important determinant of a migration pattern in which parents live separately from their children may be the intergenerational division of labor whereby grandparents provide childcare for the children of absent migrants, who in turn, provide financial support. It might be more difficult for a single grandparent to take care of children than it is for both grandparents to do so together. To test this possibility I include indicator variables measuring whether only the child's grandmother, only the grandfather, or both grandparents live in the household<sup>8</sup>.

Grandparents may be either maternal or paternal, and Thais clearly distinguish between the two. For instance, Thais use different words in referring to maternal and paternal grandmothers, the former as referred to as *Yai* and the latter as *Yha*. My interviews with villagers suggest that it is the duty of maternal relatives to assume childcare responsibilities. Yet, paternal relatives are sometimes used as an alternative. When asked about the children of migrant parents, an interview with a maternal grandmother illustrated this:

*Interviewer: If they have to leave their child in this village, who does the child live with?*

*Grandmother: A grandmother*

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<sup>8</sup> I use information on the relation to household head to determine this data for children whose parents are both not listed on the household roster.

*Interviewer: Can it be a paternal grandmother?*

*Grandmother: Yes, it can*

*Interviewer: Between the maternal grandmother and the paternal grandmother, who do most people use to take care of children?*

*Grandmother: Maternal grandmother*

*Interviewer: Why?*

*Grandmother: Most women will take a child to stay with her mother.*

Because a maternal and paternal grandparent may be equally capable of caring for their grandchildren, paternal relatives (in-laws of the mother) will also be counted as grandparents<sup>9</sup>.

Table 2.4 shows that approximately a fifth (18 percent) of children whose mothers were listed on the household roster and who were currently married had both grandparents living in the household. This is considerably lower compared to every other sub-sample. For children whose mothers were not currently married, over one-third (36 percent) of them had both grandparents living in the household. Approximately half of children whose mother was not on the roster (53 percent) had both parents living in the household. Nearly as many (50 percent) had such an arrangement when neither parent was listed on the roster.

Having only the grandmother living in the origin household is the next most common arrangement, and this too is the least common for children whose mothers are currently married and listed on the roster (10 percent). For the other samples the incidence of this arrangement ranges from 17 to 23 percent. Having only a grandfather in the household is rare for all sub-samples.

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<sup>9</sup> I estimated a statistical model to determine if paternal grandparents behave differently than maternal grandparents. Overall, there are few consistent differences between paternal and maternal grandparents.

It is not unexpected that sub-samples of children in which the mother or both parents are not listed on the household roster had a higher percentage of grandparents living in the household. Table 2.1 clearly showed that a much higher percentage of parents were both migrants for these cases. It is reasonable to expect that parents who both migrate are leaving their children in the care of grandparents.

Research in China has found that grandparents living outside of the natal household are a valuable source of childcare for parents (Chen et al. 2000). To determine whether grandparents living outside of the household are available to provide childcare, I include more detailed data on the location of grandparents. I show the location of the grandmother and the grandfather separately. For simplicity I restrict this data to maternal grandparents. This data is only available in the event that the mother is listed on the household roster.

Results show that the maternal grandfather lives in another household in the village in 26 percent of cases while the maternal grandmother lives in another household in the village in 34 percent of cases. It is possible that these grandparents can also be an important source of childcare for migrating parents. In the event that a grandparent lives in another village, is dead, or is living in an unknown location (perhaps indicating estrangement from the family) help with childcare is likely to be less forthcoming. I will formally test this idea in my statistical models.

Another key determinant of parents' migration status could be the life course stage of various generations of household members. I test this notion by looking at the effect of age of the various generations. Nang Rong data is quite unique in that it is possible to link the records of multiple generations of household members. In my statistical models, I include measures of the age of children (G1) and parents (G2). The age of the mother is only

available in the event that the mother was listed on the household roster. For mothers who were currently married, their average age was about 33 years. The average age of children just under seven years is each sub-sample.

I also tried to include the age of the grandparents. However, not all households had a grandparent present, so grandparent's age was not always available. Preliminary results showed that grandparent's age had few consistent statistically significant effects, thus grandparent's age is not included in the final models<sup>10</sup>.

### **Control Variables**

The rest of the covariates in the statistical models are controls, and I briefly describe key variables. I include demographic characteristics of the mother (such as education, and the number of children) characteristics of the child (such as gender) and characteristics of the origin household (the amount of land owned by the household<sup>11</sup>, whether or not the household grew rice, whether or not the household owned agricultural equipment, and household wealth). I also include demographic characteristics of the household (counts of the number of people of working age, non-working age, and number of migrants) and a single village characteristic (distance from Nang Rong town).

Controlling for the mother's number of children serves to isolate the effect of the child's age. I include a count of the total number of living children excluding the focal child. For each record, this is a count of the number of siblings of each child. I expect that parents with more children will have greater childcare needs and will find it harder to be migrants living

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<sup>10</sup> Using various age cutoffs (including 60 and over, 65 and over, and 70 and over) I included dummy variables for the age of the grandparent living in the household.

<sup>11</sup> It is possible that the effect of land is endogenous with the dependent variable. I conducted a sensitivity analysis to investigate whether excluding the land effect would substantially change results. Estimates were robust across model specifications.

apart from their children. However, they may also be under greater pressure to migrate in order to earn money to pay for their children's expenses.

Control variables at the household level serve to isolate the effects of variables of most interest, especially the age variables, which I assume are markers of generational complementarities in abilities and constraints across individual life courses. I control for indications of the household's participation in rice farming (the predominant staple crop), including whether or not the household grew rice in the growing season preceding the household survey, and whether the household owned agricultural equipment.

Table 2.4 shows most households for which the mother is currently married and listed on the household roster grew rice (81 percent), although the percentage is smaller for the other sub-samples. Ownership of agricultural equipment indicates the possession of productive assets and is measured as a dummy variable indicating whether a household owned any agricultural equipment such as tractors, rototillers, rice threshers, water pumps, and generators.

In general, most households do not own agricultural equipment although there are differences across sub-samples. Households in which the mother is currently married and is listed on the roster are the most likely to own equipment (39 percent) while those households in which neither parent is listed on the roster are the least likely to own equipment (27 percent).

To account for differences in socioeconomic status, I include dummy variables measuring relative household wealth. It is likely that respondents from both lower and upper socioeconomic groups may be more likely to migrate, given that migration is a way of loosening the household's financial constraints or a way to diversify household income.

Following work by Filmer and Pritchett (2001), I use principal components analysis to make a wealth index for each household (see Appendix 1 for details). The index uses the following household assets: 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 panes and shutters, glass panes, or bug screens. Each household is then 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 fewer households in the top of the distribution than at the bottom. Households in the lowest third will be considered to be at the “bottom,” those in the 34<sup>th</sup> to 79<sup>th</sup> percentiles will be considered “middle,” and the highest fifth will be considered to be at the “top”.

The percentage of households in each wealth category does not correspond exactly to the fixed percentile breakdown because the wealth index was created using all of the households in the sample villages, while my sampling strategy only selected certain households that were at risk of experiencing the event under investigation. Nonetheless, across most sub-samples the actual breakdown is pretty close to what is expected.

The final set of household control variables are related to the demographic composition of the household. I measure the number of working and non-working age people living in the household, as well as the number of migrants from the household. Working age people are defined as anyone age 13 to 60. In measuring these variables, I avoid double-counting individuals already accounted for in the model by excluding children, spouse, and

grandparents. This makes some of these counts look somewhat small in the descriptive statistics.

Counts appear larger for sub-samples for which the mother is not listed on the household roster compared to the sub-sample for which the mother is currently married and listed on the roster. This is most likely because children and spouses could not be identified for absent mothers, thus they were not subtracted out.

These counts include siblings and in-law siblings of the middle generation (G2), siblings' family members, and any of the parent's children who are older than 13. I expect that all else being the same, more working age people will mean a higher supply of childcare. However, more non-working age people will also mean a greater demand for both childcare and possibly elderly care. This will affect the migration of mothers.

The number of migrants is operationalized in the same manner as described previously. I count the number of migrants from a household, excluding one migrant in the event that a focal individual is a migrant. The literature on migrant networks suggests that migrants lower the risk of migration for fellow migrants, by improving each other's access to such things as employment and housing (Massey and Basem 1992, Massey et al. 1993, Roberts and Morris 2004). Maybe migration streams extend to similar migration destinations creating more contact with fellow household migrants, who in turn make it easier for their fellow migrants to move. I expect that parents will have an easier time migrating if they have migrant household members.

At the village level I also control for the distance from the village to Nang Rong town. During my fieldwork I visited a village located close to Nang Rong town. Interviews with villagers suggested that migration was less common in villages located nearest the town,



because local employment opportunities were enough to keep residents from migrating away. During data collection village coordinates were measured using a Global Positioning System (GPS) device. Using the GPS coordinates it is possible to calculate the Euclidean distance between the center of the village and the center of Nang Rong town. I expect parents to be more likely to leave children behind as the distance between their village and Nang Rong town increases.

## **Results**

I now describe the quantitative and qualitative results. I intersperse qualitative accounts with the quantitative results to aid in their interpretation. Quantitative results can be found in Tables 2.5 and 2.6, which show regression results for the sub-sample of mothers who are currently married and are listed on the household roster. Table 2.6 adds more detailed information on the location of maternal grandparents living outside of the household to determine their effect on parents' migration. Sensitivity analyses for sub-samples in which mothers or both parents are excluded are presented in Tables 2.7-2.9. Model estimates show results that are largely robust to differences across samples.

Quantitative results show that having both grandparents living in the household (compared to situations in which neither grandparent lives in the household) makes it more likely for parents to be migrants living apart from their children. Also, in choosing between strategies involving both parents migrating or having only the father migrate, married couples choose the former if both grandparents are available.

The presence of just the grandmother especially encourages the migration of both parents. This agrees with qualitative accounts which identify the grandmother as the primary childcare provider in the absence of the parents. Results show that having only the

grandfather in the household encourages both parents to be migrants. However, given how infrequently grandfathers live in a household without the grandmother, this effect should be interpreted with caution.

Qualitative interviews provide some support for the idea that a division of labor develops within households whereby parents provide money for the household and the grandparents takes over childcare responsibilities for absent migrants. Villagers report that many grandparents provide childcare in exchange for remittance money from migrant parents. An assistant headman's interview exemplifies this:

*Interviewer: From the grandparents' perspective, do you think that it is rewarding or exciting for them to have to look after their grandchildren?*

*Headman: It's to be paid for*

*Interviewer: Do you mean that parents are like an employer and grandparents are like employees?*

*Headman: Yes, they give money to the grandparent who looks after their children and someone is hired to look after their children*

I examine remittance in more detail using available data from a subset of mothers who were migrants and whose record was included on a previous data panel. Descriptive statistics in Figure 2.4 show migrant-to-household remittance (percentage by type). A majority of mothers sent some form of remittance. In general, money, food, and clothing are the most likely to be sent. Money was especially common. The percentage of mothers sending money was just over 80 percent of mothers. Mothers were less likely to send clothes and food, with over forty percent sending each kind of remittance. Qualitative interviews suggested that remittance money from parents was used to offset the costs of basic living and educational expenses.

Grandmothers take on all childcare responsibilities; they cook for grandchildren, wash their clothes, play with them, take them to school in the morning, and sometimes bathe them (depending on the age of the child). Grandfathers and aunts sometimes also help the grandmother by taking children to the public health center to get vaccinations. Children usually live with the grandparents until they themselves are old enough to migrate. They rarely see their parents. Parents only return a few times per year on long weekends or holidays like Songkran day, New Year's day (and Chinese New Year), or Election day. Children seldom visit their parents in migration destinations, and if they do, it is usually during the summer when school is not in session.

Villagers I interviewed cite a number of reasons why children cannot stay at their parents' destinations. First, parents find living apart from their children more economical. Many parents move to cities, which are expensive. Typically both parents work long hours, and even if they share a room with other people, no one has time to care for children. The cost of hiring a baby sitter is usually prohibitive. It is more affordable to leave children in rural areas, where school fees and kin-based childcare are less expensive. Villagers also expressed a distrust of non-relative daycare. Interviews also suggested that it is difficult to get grandparents to live in the city. An interview with a maternal grandmother demonstrates this:

*Interviewer: Why did her parents leave this child with you?*

*Grandma: They are too busy with their work*

*Interviewer: Do they think about taking their child to live with them?*

*Grandma: They're thinking about that.*

...

*Interviewer: Don't you like Bangkok?*

*Grandma: I hate Bangkok. It's very hot and crowded with people.*

*Interviewer: Is it a rental room [in which you stayed when you lived in Bangkok]?*

*Grandma: It was a small one.*

*Interviewer: How much is room rental per month?*

*Grandma: It's around Baht 2,000 [about \$50] per month including electricity and water charges*

*Interviewer: Were there 4 people in 1 small room?*

*Grandma: It's too small and uncomfortable. It's more space here that she can play around. And she can study here.*

In Table 2.6, I evaluate whether maternal grandparents who live in the origin household (from which the parents migrated) have a different effect on the migration of parents compared to grandparents living in other locations, particularly other households in the village. Results show that it is most likely for both parents to be migrants when the grandfather or the grandmother lives in the origin household. Having maternal grandparents live in any other location (another household in the village, somewhere outside the village, or in some unknown location) makes it less likely that the parents will both be migrants. Results are stronger for grandmothers than grandfathers, particularly grandfathers who live outside of the village for whom there is no statistically significant effect. The finding that parents' migration is more sensitive to the presence of the maternal grandmothers supports qualitative accounts that childcare is the maternal grandmother's responsibility.

Qualitative results suggest that many parents follow a familiar life course pattern and make a deliberate choice to use grandparents as childcare providers. Before they become parents, young people migrate to find work after completing primary school. While in their twenties, they often find a marriage partner at the destination, as suggested by Jampaklay's (2003)

work on marriage and migration in Nang Rong. When women become pregnant, they often return to rural origin villages to give birth, in part because it is more expensive to deliver a baby in cities like Bangkok. Mothers usually stay with their baby for three months, which is the maximum amount of time that Thai labor laws grant for maternity leave. After three months the mothers will return to work in the city, perhaps joining their husband in the process.

Quantitative results show support for the idea that intersecting life course transitions, as indicated by the effect of the age of parents and children, are related to migration and childcare. The age of the mother had a significant negative effect on the migration of her husband. As the mother's age increases the odds of a husband migrating alone decreases. This effect may be related to the age of the husband, which could not be included in the model. It may be that migration becomes more difficult at older ages, since job opportunities are more likely to be taken by younger people. It may also capture the effect of the grandparents' age, because older grandparents may have more difficulty caring for young children.

The age of the child is also important in determining the migration status of the parents. Results show that as children get older, the odds that both of parents being migrants increases. This could mean that older children are more likely to be left behind. The effect of the number of children suggests that having additional children makes it more difficult for both parents to be migrants. Unfortunately a lack of information on the exact timing of parents' migration and the children's birth makes it difficult to understand the precise connection between the child's life course characteristics and the parent's migration.

### *Control Variables*

Results of control variables point to other consistent findings. Indications of a household's involvement in farming tend to keep parents from being migrants. In general, households that grew rice were less likely to have both parents be migrants. In addition, owning agricultural equipment makes it less likely that both parents are migrants. These variables especially influence the migration of fathers, who are less likely to migrate alone. A possible explanation for the effect of farming is that families who can successfully provide for their household's livelihood through farming have less motivation to migrate. The effect of wealth is also significant. Parents from households in the highest wealth category were less likely to both be migrants relative to parents in middle wealth households. Most likely these parents can afford to stay in the village and they too probably have less motivation to migrate.

Other consistent findings are related to household demographics. For the most part, results show that having more working age people living in the household increases the likelihood that both parents will be migrants living away from their children. This suggests that other people in the household beside the grandparents may be helping parents with childcare. As the following interview with a maternal grandmother makes clear, a maternal aunt is sometimes a good substitute, and commonly aunts assist grandmothers in providing care. Another option is the paternal grandmother. Grandmothers consider it their duty to care for their grandchildren because they share blood ties.

*Interviewer: Why does the parent ask you to look after their child instead of asking anyone else?*

*Grandmother: Because I am staying alone and I don't have anything to do*

*Interviewer: How about families that have no maternal grandmother?*

*Grandmother: So it will be their aunt or someone*

*Interviewer: How do you feel about looking after your children and then you have to do the same thing again [with your grandchildren]?*

*Grandmother: Well, I have had to do it unwillingly*

*Interviewer: How?*

*Grandmother: If I looked after their children she [the mother] will give some money to me, if I do not do it, she will not give some money to me.*

*Interviewer: Is it good?*

*Grandmother: Anyway, I have to do it.*

For the most part, non-working age people have a similar effect on the migration of parents. These people are likely to be nephews and nieces of the parents (cousins of the children), and parents may take advantage of economies of scale when leaving children in the care of relatives. Such an explanation has been suggested by Holmes and Tiefenthaler's (1997) research in Cebu, Philippines.

Another finding is that the number of migrants from the household is positively related to both parents being migrants. Most likely, social network connections to these migrants lower the risk of migration by improving access to such things as employment and housing (Massey and Basem 1992, Massey et al. 1993, Roberts and Morris 2004). Also, migration streams likely extend to similar migration destinations, facilitating contacts with fellow household migrants who make it easier to migrate.

At the village level, the effect of distance from Nang Rong town had a significant positive effect on the migration of both parents. This effect is consistent with the idea that local employment provides sufficient opportunity for parents living in villages closest to Nang Rong town to prevent them from migrating. These local employment opportunities lower the parents' motivation to migrate in order to make a living.

### *Other Qualitative Findings*

Qualitative interviews yielded a few other interesting findings, which reveal some of the problems related to parents living separately from children. There were isolated cases of outright child abandonment. Some grandmothers complained that such a pattern lowered the consequences of childcare for mothers and encouraged teen pregnancy. Also, a public health worker expressed concern about the grandparent's ability to provide adequate childcare:

*Interviewer: Do older grandparents have any problem bringing up children?*

*Nurse: Yes, they will bring up children in the wrong way.*

*Interviewer: How is it the wrong way?*

*Nurse: The basic upbringing up is not good. When children have problems, grandparent will come to me. I will suggest how to do correctly. Nowadays, the elders think drugs are the best way to solve a problem.*

...

*Interviewer: Is it possible that they didn't bring up children like this in the past?*

*Nurse: Yes, it's different from before. It wasn't progressive like today. In the past, they brought up children with mother's milk and by feeding rice. Now the government informs them that children have to get mother's milk for 4 months. But children will often go hungry. So the elder will feed rice to them since children are 1 – 2 months old. The children will sleep; they will have a nutrition problem.*

### **Discussion and Conclusion**

In this paper I examine factors related to various living arrangements used to accomplish work and childcare for migrant parents. The setting is a region experiencing high migration and a shift to an industrial economy. Specifically, I investigated an intergenerational household division of labor in which the older generation cares for the children of absent migrant parents, who provide for economic needs of their origin households. The results demonstrate the flexibility with which the family institution adapts to socioeconomic change.



At a time of rapid industrialization, having a grandparent living in the origin household is an important determinant of a residential arrangement whereby parents live apart from their children.

Despite the geographic distance between the location of urban jobs and the availability of trusted and affordable childcare from extended kin, households continue to find ways to provide for the needs of their members. Parents adapt to changing economic circumstances by migrating away from rural villages in search of work. At the same time, they retain the benefits of the traditional postnuptial residence pattern, which include inexpensive and trusted childcare.

In the process the natal household gains a source of cash income, which is essential to rural villagers experiencing poverty, limited work opportunities, and a transition to a cash economy. A division of labor based on complementary abilities and constraints develops that seems to be related to earning potential or labor provided by family members at different stages of their life course.

While the family adapts to socioeconomic change, adaptations tend to reflect cultural and traditional contexts in which families are embedded. Although some aspects of the rural Thai family seem to be changing to adapt to new circumstances, other aspects of family life remain unchanged. Evidence suggests that household labor allocation can involve both an intergenerational and a gender division of labor. Currently married women with children were found to migrate without their spouse far less frequently than men. This is no doubt related to traditional Thai gender roles that encourage women to be responsible for care of dependent family members, while encouraging men to be responsible for the financial wellbeing of the household. Further evidence of gender roles is provided by the effect of

grandmothers, who, to a greater extent than grandfathers, seem to be an important correlate to the migration of both parents.

As Thailand continues its transition to an urban industrial base, future generations will probably begin to use widely available and relatively affordable childcare located closer to their place of work. At the time of the study, formal childcare institutions were not a mature industry in Thailand, but they will probably come into existence as demand increases. It is likely that the role of extended kin will take on a diminished role as new formal childcare institutions replace this more traditional form of childcare. Thus, this pattern of parents living separately from their children is most likely ephemeral, and it may exemplify a structural lag between rapid macro economic transition and sluggish adjustment in the formal childcare industry.

Table 2.1. Univariate Statistics For Location of Parents for Children Age 13 or Younger Residing in Nang Rong in 2000<sup>1</sup>

Parent's Location	Mother Currently Married, on Household Roster		Mother Not Currently Married		Mother Not on Household Roster		Parents Not on Household Roster		Total	
	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent
Both Parents in the Village	6139	79.99	17	2.46	14	4.27	26	5.70	6196	67.71
Father is a Migrant, Mother in the Village	938	12.22	207	29.91	2	0.61	7	1.54	1154	12.61
Mother is a Migrant, Father in the Village	67	0.87	32	4.62	75	22.87	10	2.19	184	2.01
Both Parents are Migrants	525	6.84	100	14.45	154	46.95	282	61.84	1061	11.59
Father is Dead, Mother is not Dead	0	0.00	263	38.01	1	0.30	26	7.89	300	3.28
Mother is Dead, Father is not Dead	0	0.00	0	0.00	64	19.51	32	7.02	96	1.05
Both Parents are Dead	0	0.00	0	0.00	3	0.91	14	3.07	17	0.19
Missing Info	6	0.08	78	10.55	15	4.57	49	10.75	143	1.56
	7675	100.00	692	100.00	328	100.00	456	100.00	9151	100.00

Notes:

<sup>1</sup> 8 Cases of Fictive Mothers (50 + years Older than Their Children) Were Deleted

Table 2.2. Location Status for Children Age 6-13 in 2000 Who Resided in Nang Rong in 1994

Location in 2000	Frequency	Percent
Living in Village	3545	87.36
Migrant	270	6.65
Moved Household	202	4.98
Dead	13	0.32
Lost To Follow-Up	21	0.52
Missing	7	0.17
Total	4058	100.00

Table 2.3. Univariate Statistics For Location of Parents in 2000 for Migrant Children Age 0-6 Residing in Nang Rong in 1994

Parent's Location	Migrant Children	
	Frequency	Percent
Both Parents in the Village	19	7.04
Father is a Migrant, Mother in the Village	12	4.44
Mother is a Migrant, Father in the Village	11	4.07
Both Parents are Migrants	195	72.22
Father is Dead, Mother is not Dead	12	4.44
Mother is Dead, Father is not Dead	4	1.48
Both Parents Are Dead	1	0.37
Missing Info	16	5.93
	270	100.00

Table 2.4. Descriptive Statistics of Independent Variables, Mother-Child Pairs

Variable	Mother Currently Married, on Household Roster <sup>1</sup>		Mother Not Currently Married <sup>2</sup>		Mother Not on Household Roster <sup>3</sup>		Parents Not on Household Roster <sup>4</sup>	
	Mean	StdDev	Mean	StdDev	Mean	StdDev	Mean	StdDev
<i>Grandparent Location / Age</i>								
Both Grandparents in the Household	0.18	0.39	0.36	0.48	0.53	0.50	0.50	0.50
Only Grandmother in the Household	0.10	0.31	0.17	0.38	0.23	0.42	0.20	0.40
Only Grandfather in the Household	0.02	0.15	0.04	0.19	0.01	0.08	0.02	0.12
(Neither Grandparent lives in Household)	0.69	0.46	0.43	0.50	0.23	0.42	0.28	0.45
Maternal Grandfather Lives in Different Household in Village	0.26	0.44	0.14	0.35	-	-	-	-
Maternal Grandfather Lives in Outside of Village	0.18	0.39	0.08	0.27	-	-	-	-
Maternal Grandfather is Dead or Location Unknown	0.35	0.48	0.38	0.49	-	-	-	-
(Maternal Grandfather Lives in Household)	0.20	0.40	0.40	0.49	-	-	-	-
Maternal Grandmother Lives in Different Household in Village	0.34	0.47	0.19	0.39	-	-	-	-
Maternal Grandmother Lives in Outside of Village	0.19	0.40	0.08	0.27	-	-	-	-
Maternal Grandmother is Dead or Location Unknown	0.18	0.40	0.20	0.40	-	-	-	-
(Maternal Grandmother Lives in Household)	0.29	0.45	0.53	0.50	-	-	-	-
<i>Mother's Demographic Characteristics</i>								
Age	33.02	7.18	32.98	7.95	-	-	-	-
Less than Primary School	0.47	0.50	0.46	0.50	-	-	-	-
Greater than Primary School	0.08	0.27	0.07	0.25	-	-	-	-
Non-Formal Education	0.03	0.16	0.04	0.19	-	-	-	-
(Primary School Only)	0.42	0.49	0.44	0.50	-	-	-	-
Number of Children	1.23	1.10	1.03	1.26	0.59	1.05	-	-

Table 2.4. (Continued)

Child's Demographic Characteristics								
Child's Age	6.44	3.99	7.03	3.68	6.04	3.94	6.77	3.73
Child is Male	0.50	0.50	0.51	0.50	0.56	0.50	0.48	0.50
(Child is Female)								
Household Characteristics								
Land Used and Owned (in Rai)	9.27	14.14	7.59	12.48	9.47	12.65	6.71	11.02
Household Grows Rice	0.81	0.39	0.65	0.48	0.70	0.46	0.63	0.48
(Household Does Not Grow Rice)								
Household Owns Agricultural Equipment	0.39	0.49	0.25	0.43	0.35	0.48	0.27	0.44
(Household Does Not Own Agricultural Equipment)								
Top Fifth of Villages Wealth Distribution	0.21	0.40	0.17	0.38	0.20	0.40	0.24	0.43
Bottom Third of Villages Wealth Distribution	0.33	0.47	0.37	0.48	0.28	0.45	0.28	0.45
(Middle 34 - 79th Percentile of Villages Wealth Distribution)	0.47	0.50	0.45	0.50	0.52	0.50	0.48	0.50
Number of Additional People of Working Age	0.34	0.78	0.75	1.15	0.92	1.17	1.51	1.38
Number of Additional People of Non-Working Age	0.25	0.60	0.47	0.85	0.55	0.86	0.94	0.99
Number of Additional Migrants	0.81	1.49	1.48	1.80	1.94	1.97	1.51	1.90
Village Characteristics								
Distance From Village to Nang Rong Town (in Km)	13.73	5.29	13.86	5.27	13.72	5.08	13.59	5.36
N	7563		675		311		455	

<sup>1</sup> 45 Cases Were Deleted Using Listwise Deletion;<sup>2</sup> Mothers Who Migrated Without Their Husbands (N = 67) Were Not Included in Final Analysis<sup>3</sup> 17 Cases Were Deleted Using Listwise Deletion<sup>4</sup> 17 Cases Were Deleted Using Listwise Deletion<sup>5</sup> 1 Cases Was Deleted Using Listwise Deletion

Table 2.5. Multinomial Logit Estimates of Parents' Location for Mother-Child Pairs in 2000, Children Living in Nang Rong Villages<sup>1</sup>

Variable	Only Father Migrated / Neither Migrated						Both Parents Migrated / Only Father Migrated					
	Coeff	Std Err	Odds Ratio	Coeff	Std Err	Odds Ratio	Coeff	Std Err	Odds Ratio	Coeff	Std Err	Odds Ratio
Intercept	-0.59	0.31	0.55	-4.17***	0.50	0.02	-3.58***	0.53	0.03			
<i>Grandparent Location</i>												
Both Grandparents in the Household	1.16***	0.13	3.18	3.91***	0.22	49.85	2.75***	0.23	15.66			
Only Grandmother in the Household	0.76***	0.15	2.14	2.85***	0.23	17.31	2.09***	0.26	8.09			
Only Grandfather in the Household	0.65*	0.29	1.91	2.05***	0.47	7.80	1.41**	0.52	4.09			
<i>(Neither Grandparent lives in Household)</i>												
<i>Mother's Demographic Characteristics</i>												
Age	-0.03***	0.01	0.97	-0.02	0.01	0.98	0.01	0.02	1.01			
Less than Primary School	0.13	0.13	1.14	-0.05	0.19	0.95	-0.18	0.20	0.84			
Greater than Primary School	-0.54**	0.19	0.58	0.25	0.22	1.29	0.8**	0.26	2.22			
Non-Formal Education	-0.21	0.26	0.81	-0.28	0.36	0.76	-0.07	0.39	0.93			
<i>(Primary School Only)</i>												
Number of Children	-0.06	0.07	0.94	-0.75***	0.12	0.47	-0.69***	0.13	0.50			

Table 2.5 (Continued)

<i>Child's Demographic Characteristics</i>									
Child's Age	0.01	0.01	1.01	0.15***	0.02	1.16	0.14***	0.02	1.15
Child is Male	0.01	0.07	1.01	0.19	0.12	1.21	0.18	0.12	1.20
(Child is Female)									
<i>Household Characteristics</i>									
L and Used and Owned (in Rai)	-0.01	0.01	0.99	-0.01*	0.01	0.99	-0.004	0.01	1.00
Household Grows Rice	-0.78***	0.13	0.46	-1.14***	0.20	0.32	-0.36	0.21	0.70
(Household Does Not Grow Rice)									
Household Owns Agricultural Equipment	-0.7***	0.13	0.50	-0.81***	0.17	0.44	-0.12	0.19	0.89
(Household Does Not Own Agricultural Equipment)									
Top Fifth of Villages Wealth Distribution	-0.03	0.14	0.97	-0.5**	0.19	0.61	-0.47*	0.21	0.63
Bottom Third of Villages Wealth Distribution	-0.19	0.12	0.83	-0.12	0.17	0.89	0.07	0.19	1.07
(Middle 34 - 79th Percentile of Villages Wealth Distribution)									
Number of Additional People of Working Age	0.32***	0.06	1.38	0.44***	0.07	1.55	0.12	0.08	1.13
Number of Additional People of Non-Working Age	-0.04	0.08	0.96	0.51***	0.10	1.67	0.55***	0.10	1.74
Number of Additional Migrants	0.11***	0.03	1.12	0.21***	0.04	1.24	0.1*	0.04	1.10
<i>Village Characteristics</i>									
Distance From Village to Nang Rong Town (in Km)	0.01	0.01	1.01	0.04**	0.01	1.04	0.02	0.02	1.02
N						7563			
LL						-3612.83			

\* p &lt; .05 \*\* p &lt; .01 \*\*\* p &lt; .001 (Two-Tailed Test)

Note: <sup>1</sup> Standard Errors Adjusted for Clustering Using Huber/White Correction



Table 2.6. Multinomial Logit Estimates of Parents Location for Mother-Child Pairs in 2000; More Detailed Information on Maternal Grandparents' Location<sup>1</sup>

Variable	Only Father Migrated / Neither Migrated						Both Parents Migrated / Neither Migrated						Both Parents Migrated / Only Father Migrated					
	Coeff	Std Err	Odds Ratio	Coeff	Std Err	Odds Ratio	Coeff	Std Err	Odds Ratio	Coeff	Std Err	Odds Ratio	Coeff	Std Err	Odds Ratio	Coeff	Std Err	Odds Ratio
Intercept	0.66*	0.32	1.94				-0.29	0.46	0.75				-0.95	0.49	0.39			
<i>Maternal Grandparent Location</i>																		
Maternal Grandfather Lives in Different Household in Village	-0.44*	0.21	0.64				-2.22**	0.77	0.11				-1.78*	0.79	0.17			
Maternal Grandfather Lives in Outside of Village	-0.52*	0.21	0.60				-0.34	0.30	0.71				0.18	0.34	1.19			
Maternal Grandfather is Dead or Location Unknown	-0.43**	0.15	0.65				-1.22***	0.18	0.30				-0.79***	0.20	0.46			
(Maternal Grandfather Lives in Household)																		
Maternal Grandmother Lives in Different Household in Village	-0.34	0.19	0.71				-3.3***	0.61	0.04				-2.96***	0.63	0.05			
Maternal Grandmother Lives in Outside of Village	-1.19***	0.22	0.30				-3.43***	0.37	0.03				-2.23***	0.40	0.11			
Maternal Grandmother is Dead or Location Unknown	-0.63***	0.17	0.53				-2.1***	0.29	0.12				-1.46***	0.31	0.23			
(Maternal Grandmother Lives in Household)																		
<i>Mother's Demographic Characteristics</i>																		
Age	-0.04***	0.01	0.96				-0.02	0.01	0.98				0.02	0.02	1.02			
Less than Primary School	0.13	0.13	1.14				-0.04	0.19	0.96				-0.17	0.20	0.84			
Greater than Primary School	-0.48*	0.19	0.62				0.24	0.22	1.27				0.72**	0.26	2.06			
Non-Formal Education	-0.16	0.26	0.86				-0.32	0.35	0.73				-0.16	0.39	0.85			
(Primary School Only)																		
Number of Children	-0.06	0.07	0.95				-0.76***	0.12	0.47				-0.71***	0.13	0.49			

Table 2.6 (Continued)

<i>Child's Demographic Characteristics</i>										
Child's Age	0.01	0.01	1.01	0.15***	0.02	1.16	0.14***	0.02	1.15	
Child is Male	0.0002	0.07	1.00	0.19	0.12	1.21	0.19	0.12	1.21	
(Child is Female)										
<i>Household Characteristics</i>										
Land Owned (in Rai)	-0.01	0.01	0.99	-0.01*	0.01	0.99	-0.01	0.01	1.00	
Household Grows Rice	-0.82***	0.13	0.44	-1.17***	0.20	0.31	-0.35	0.21	0.71	
(Household Does Not Grow Rice)										
Household Owns Agricultural Equipment	-0.69***	0.13	0.50	-0.81***	0.17	0.44	-0.12	0.19	0.89	
(Household Does Not Own Agricultural Equipment)										
Top Fifth of Villages Wealth Distribution	-0.0001	0.14	1.00	-0.49**	0.19	0.61	-0.49*	0.20	0.61	
Bottom Third of Villages Wealth Distribution	-0.19	0.12	0.83	-0.14	0.17	0.87	0.05	0.19	1.05	
(Middle 34 - 79th Percentile of Villages Wealth Distribution)										
Number of Additional People of Working Age	0.36***	0.06	1.43	0.44***	0.07	1.55	0.08	0.08	1.08	
Number of Additional People of Non-Working Age	0.01	0.08	1.01	0.51***	0.10	1.67	0.5***	0.10	1.65	
Number of Additional Migrants	0.14***	0.03	1.15	0.21***	0.04	1.24	0.07	0.04	1.08	
<i>Village Characteristics</i>										
Distance From Village to Nang Rong Town (in Km)	0.01	0.01	1.01	0.04**	0.01	1.04	0.03	0.01	1.03	
N						7563				
LL						-3568.90				

\* p &lt; .05 \*\* p &lt; .01 \*\*\* p &lt; .001 (Two-Tailed Test)

Note: <sup>1</sup> Standard Errors Adjusted for Clustering Using Huber/White Correction

Table 2.7. Multinomial Logit Estimates of Parents Location for Mother-Child Pairs in 2000, Includes Mothers Who are not on Household Roster<sup>1</sup>

Variable	Only Father Migrated / Neither Migrated			Both Parents Migrated / Neither Migrated			Both Parents Migrated / Only Father Migrated		
	Coeff	Std Err	Odds Ratio	Coeff	Std Err	Odds Ratio	Coeff	Std Err	Odds Ratio
Intercept	-1.54***	0.18	0.21	-4.5***	0.28	0.01	-2.96***	0.30	0.05
<i>Grandparent Location</i>									
Both Grandparents in the Household	1.22***	0.13	3.38	4.11***	0.21	60.66	2.89***	0.22	17.94
Only Grandmother in the Household	0.75***	0.15	2.11	3.01***	0.22	20.34	2.27***	0.24	9.63
Only Grandfather in the Household	0.68*	0.29	1.98	2.08***	0.44	8.01	1.4**	0.50	4.05
<i>(Neither Grandparent lives in Household)</i>									
<i>Mother's Demographic Characteristics</i>									
Age	-	-	-	-	-	-	-	-	-
Less than Primary School	-	-	-	-	-	-	-	-	-
Greater than Primary School	-	-	-	-	-	-	-	-	-
Non-Formal Education	-	-	-	-	-	-	-	-	-
(Primary School Only)	-	-	-	-	-	-	-	-	-
Number of Children	-0.12*	0.06	0.89	-0.86***	0.11	0.42	-0.74***	0.12	0.48

Table 2.7 (Continued)

<i>Child's Demographic Characteristics</i>									
Child's Age	-0.003	0.01	1.00	0.12***	0.02	1.13	0.13***	0.02	1.14
Child is Male	0.003	0.07	1.00	0.22*	0.11	1.25	0.22	0.11	1.24
(Child is Female)									
<i>Household Characteristics</i>									
Land Used and Owned (in Rai)	-0.01*	0.01	0.99	-0.02**	0.01	0.98	-0.01	0.01	0.99
Household Grows Rice	-0.74***	0.13	0.48	-1.11***	0.18	0.33	-0.37	0.19	0.69
(Household Does Not Grow Rice)									
Household Owns Agricultural Equipment	-0.68***	0.13	0.51	-0.81***	0.15	0.45	-0.13	0.18	0.88
(Household Does Not Own Agricultural Equipment)									
Top Fifth of Villages Wealth Distribution	-0.16	0.13	0.85	-0.38*	0.16	0.69	-0.22	0.18	0.80
Bottom Third of Villages Wealth Distribution	-0.15	0.12	0.86	-0.13	0.16	0.88	0.02	0.18	1.02
(Middle 34 - 79th Percentile of Villages Wealth Distribution)									
Number of Additional People of Working Age	0.32***	0.06	1.38	0.46***	0.07	1.59	0.15*	0.07	1.16
Number of Additional People of Non-Working Age	-0.03	0.08	0.97	0.42***	0.09	1.52	0.46***	0.10	1.58
Number of Additional Migrants	0.11***	0.03	1.12	0.22***	0.03	1.25	0.11**	0.04	1.12
<i>Village Characteristics</i>									
Distance From Village to Nang Rong Town (in Km)	0.02	0.01	1.02	0.03**	0.01	1.03	0.02	0.01	1.02
N					7733				
LL					-3824.73				
* p < .05 ** p < .01 *** p < .001 (Two-Tailed Test)									

Note: <sup>1</sup> Standard Errors Adjusted for Clustering Using Huber/White Correction

Sample includes Mothers Who are not on Household Roster, Who Either Migrated With Their Husband, Whose Husband Migrated Alone, or Who Live in the Village Along with Their Husband

Table 2.8. Multinomial Logit Estimates of Parents Location for Mother-Child Pairs in 2000; Includes Parents Who are not on Household Roster<sup>1</sup>

Variable	Only Father Migrated / Neither Migrated			Both Parents Migrated / Neither Migrated			Both Parents Migrated / Only Father Migrated		
	Coeff	Std Err	Odds Ratio	Coeff	Std Err	Odds Ratio	Coeff	Std Err	Odds Ratio
Intercept	-1.6***	0.18	0.20	-4.16***	0.24	0.02	-2.56***	0.26	0.08
<i>Grandparent Location</i>									
Both Grandparents in the Household	1.24***	0.13	3.46	3.52***	0.16	33.73	2.28***	0.17	9.74
Only Grandmother in the Household	0.78***	0.15	2.18	2.49***	0.17	12.01	1.71***	0.20	5.52
Only Grandfather in the Household	0.68*	0.29	1.98	1.46***	0.43	4.31	0.78	0.48	2.18
(Neither Grandparent lives in Household)									
<i>Mother's Demographic Characteristics</i>									
Age	-	-	-	-	-	-	-	-	-
Less than Primary School	-	-	-	-	-	-	-	-	-
Greater than Primary School	-	-	-	-	-	-	-	-	-
Non-Formal Education	-	-	-	-	-	-	-	-	-
(Primary School Only)	-	-	-	-	-	-	-	-	-
Number of Children	-	-	-	-	-	-	-	-	-

Table 2.8 (Continued)

<i>Child's Demographic Characteristics</i>									
Child's Age	-0.02	0.01	0.99	0.07***	0.01	1.07	0.09***	0.01	1.09
Child is Male	-0.01	0.07	0.99	0.05	0.10	1.05	0.06	0.11	1.07
(Child is Female)									
<i>Household Characteristics</i>									
Land Used and Owned (in Rai)	-0.01*	0.01	0.99	-0.02***	0.01	0.98	-0.01	0.01	0.99
Household Grows Rice	-0.74***	0.13	0.48	-1.1***	0.16	0.33	-0.36*	0.18	0.70
(Household Does Not Grow Rice)									
Household Owns Agricultural Equipment	-0.67***	0.13	0.51	-0.79***	0.15	0.45	-0.12	0.18	0.89
(Household Does Not Own Agricultural Equipment)									
Top Fifth of Villages Wealth Distribution	-0.14	0.13	0.87	-0.25	0.15	0.78	-0.11	0.17	0.90
Bottom Third of Villages Wealth Distribution	-0.15	0.12	0.86	-0.20	0.14	0.82	-0.05	0.16	0.95
(Middle 34 - 79th Percentile of Villages Wealth Distribution)									
Number of Additional People of Working Age	0.37***	0.06	1.45	0.69***	0.07	1.99	0.32***	0.07	1.37
Number of Additional People of Non-Working Age	-0.02	0.08	0.98	0.58***	0.08	1.79	0.6***	0.09	1.83
Number of Additional Migrants	0.11***	0.03	1.11	0.17***	0.03	1.19	0.06	0.04	1.07
<i>Village Characteristics</i>									
Distance From Village to Nang Rong Town (in Km)	0.01	0.01	1.01	0.03**	0.01	1.03	0.02	0.01	1.02
N						7878			
LL						-4147.50			
* p < .05 ** p < .01 *** p < .001 (Two-Tailed Test)									

Note: <sup>1</sup> Standard Errors Adjusted for Clustering Using Huber/White Correction

Sample includes Parents Who are not on Household Cases are Included if the Mother Either Migrated With Her Husband, The Husband Migrated Alone, or Both Parents Live in the Village

Table 2.9. Multinomial Logit Estimates of Parents Location for Mother-Child Pairs in 2000; Includes Those not on Household Roster (Both Parents and Only Mothers)<sup>1</sup>

Variable	Only Father Migrated / Neither Migrated			Both Parents Migrated / Neither Migrated			Both Parents Migrated / Only Father Migrated		
	Coeff	Std Err	Odds Ratio	Coeff	Std Err	Odds Ratio	Coeff	Std Err	Odds Ratio
Intercept	-1.59***	0.18	0.20	-4.08***	0.23	0.02	-2.49***	0.25	0.08
<i>Grandparent Location</i>									
Both Grandparents in the Household	1.24***	0.13	3.44	3.65***	0.16	38.64	2.42***	0.17	11.22
Only Grandmother in the Household	0.76***	0.15	2.13	2.58***	0.17	13.20	1.82***	0.19	6.20
Only Grandfather in the Household	0.67*	0.29	1.96	1.49***	0.41	4.43	0.81	0.46	2.26
(Neither Grandparent lives in Household)									
<i>Mother's Demographic Characteristics</i>									
Age	-	-	-	-	-	-	-	-	-
Less than Primary School	-	-	-	-	-	-	-	-	-
Greater than Primary School	-	-	-	-	-	-	-	-	-
Non-Formal Education	-	-	-	-	-	-	-	-	-
(Primary School Only)	-	-	-	-	-	-	-	-	-
Number of Children	-	-	-	-	-	-	-	-	-

Table 2.9 (Continued)

<i>Child's Demographic Characteristics</i>										
Child's Age	-0.02	0.01	0.98	0.06***	0.01	1.07	0.08***	0.01	1.08	
Child is Male	-0.01	0.07	0.99	0.12	0.09	1.12	0.13	0.10	1.14	
(Child is Female)										
<i>Household Characteristics</i>										
Land Used and Owned (in Rai)	-0.01*	0.01	0.99	-0.02***	0.01	0.98	-0.01*	0.01	0.99	
Household Grows Rice	-0.74***	0.13	0.48	-1.06***	0.16	0.35	-0.33	0.17	0.72	
(Household Does Not Grow Rice)										
Household Owns Agricultural Equipment	-0.66***	0.13	0.52	-0.77***	0.14	0.46	-0.11	0.17	0.90	
(Household Does Not Own Agricultural Equipment)										
Top Fifth of Villages Wealth Distribution	-0.14	0.13	0.87	-0.22	0.14	0.81	-0.08	0.16	0.93	
Bottom Third of Villages Wealth Distribution	-0.16	0.12	0.86	-0.20	0.13	0.82	-0.04	0.16	0.96	
(Middle 34 - 79th Percentile of Villages Wealth Distribution)										
Number of Additional People of Working Age	0.37***	0.06	1.45	0.69***	0.06	1.99	0.32***	0.07	1.37	
Number of Additional People of Non-Working Age	-0.03	0.08	0.97	0.53***	0.08	1.69	0.56***	0.09	1.74	
Number of Additional Migrants	0.11***	0.03	1.12	0.19***	0.03	1.21	0.08*	0.03	1.08	
<i>Village Characteristics</i>										
Distance From Village to Nang Rong Town (in Km)	0.01	0.01	1.01	0.03*	0.01	1.03	0.01	0.01	1.01	
N						8048				
LL						-4326.93				
* p < .05 ** p < .01 *** p < .001 (Two-Tailed Test)										

Note: <sup>1</sup> Standard Errors Adjusted for Clustering Using Huber/White Correction

Sample includes Parents Who are not on Household and Mothers Who are not On the Household Roster.

Cases are Included if the Mother Migrated With Her Husband, the Husband Migrated Alone, or Both Parents Live in the Village



Figure 2.1. Map of Nang Rong

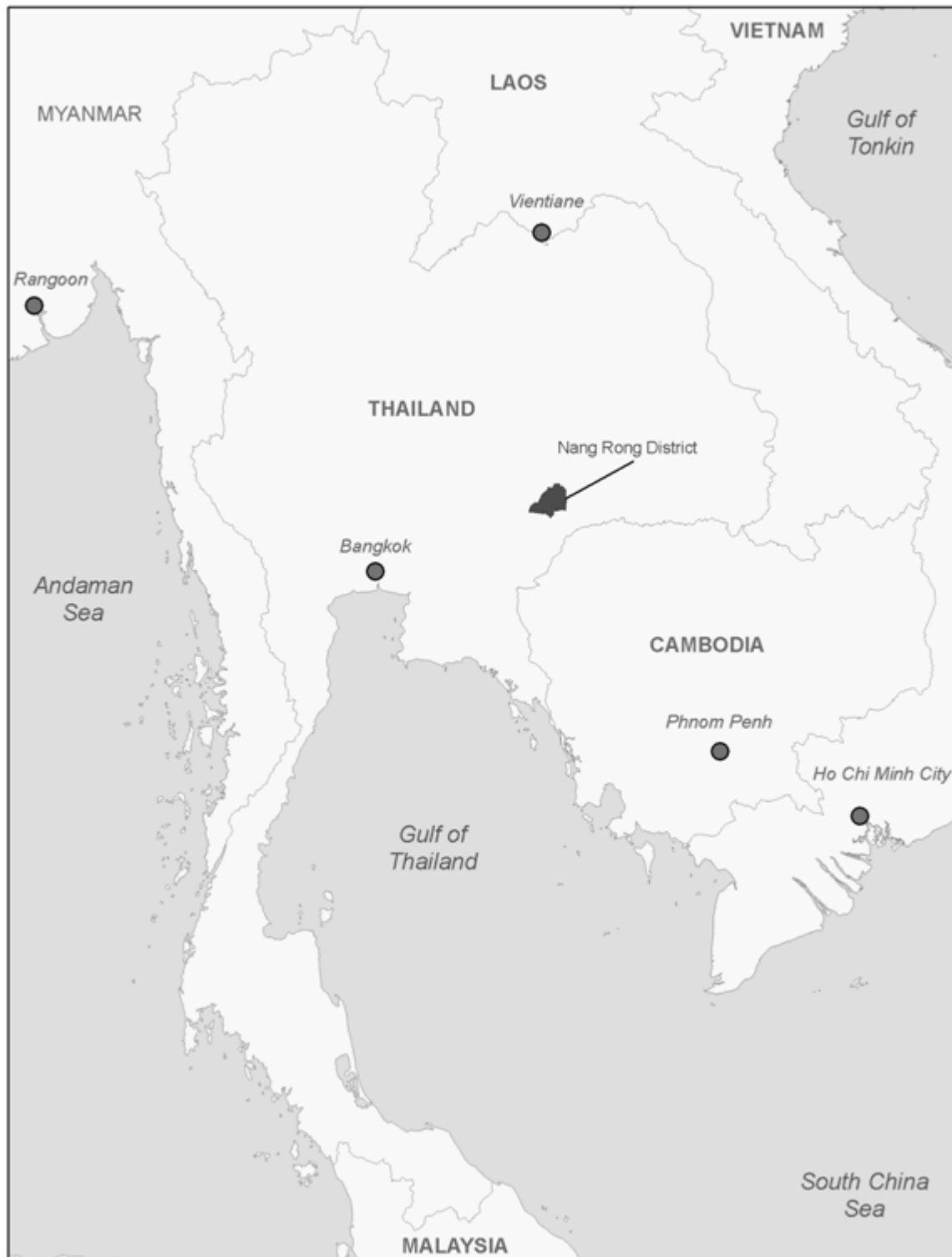


Figure 2.2. Change in Assets and Amenities in Nang Rong 1984-2000

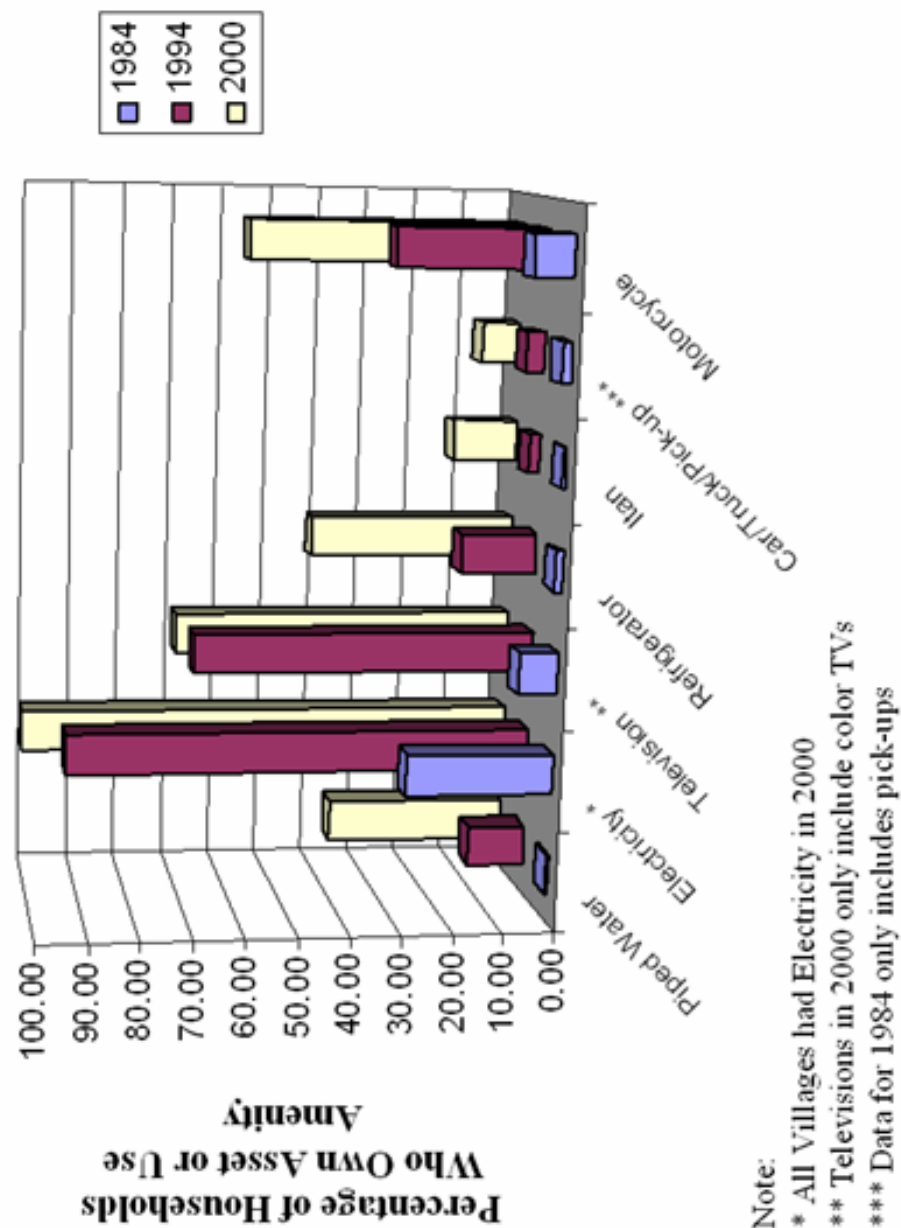
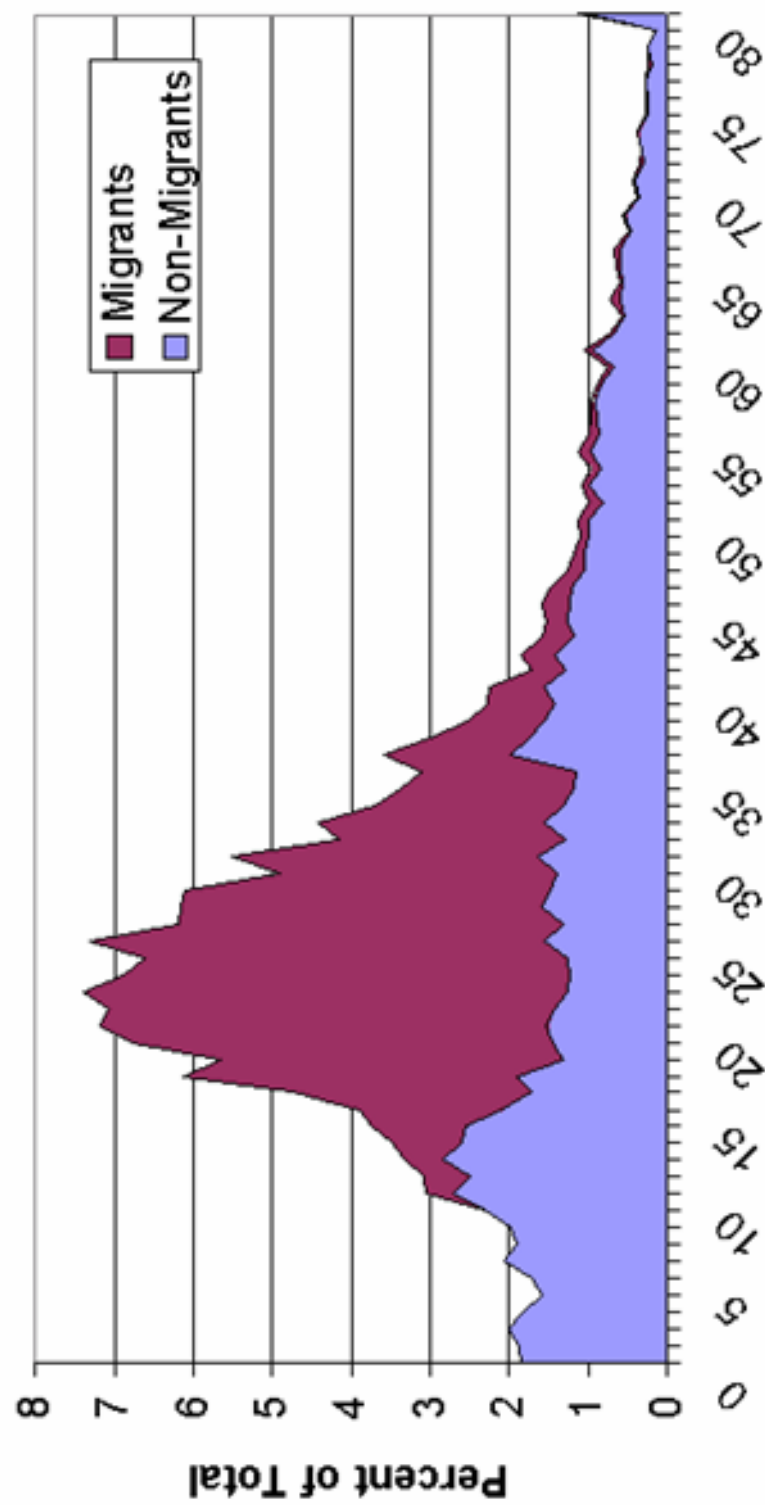
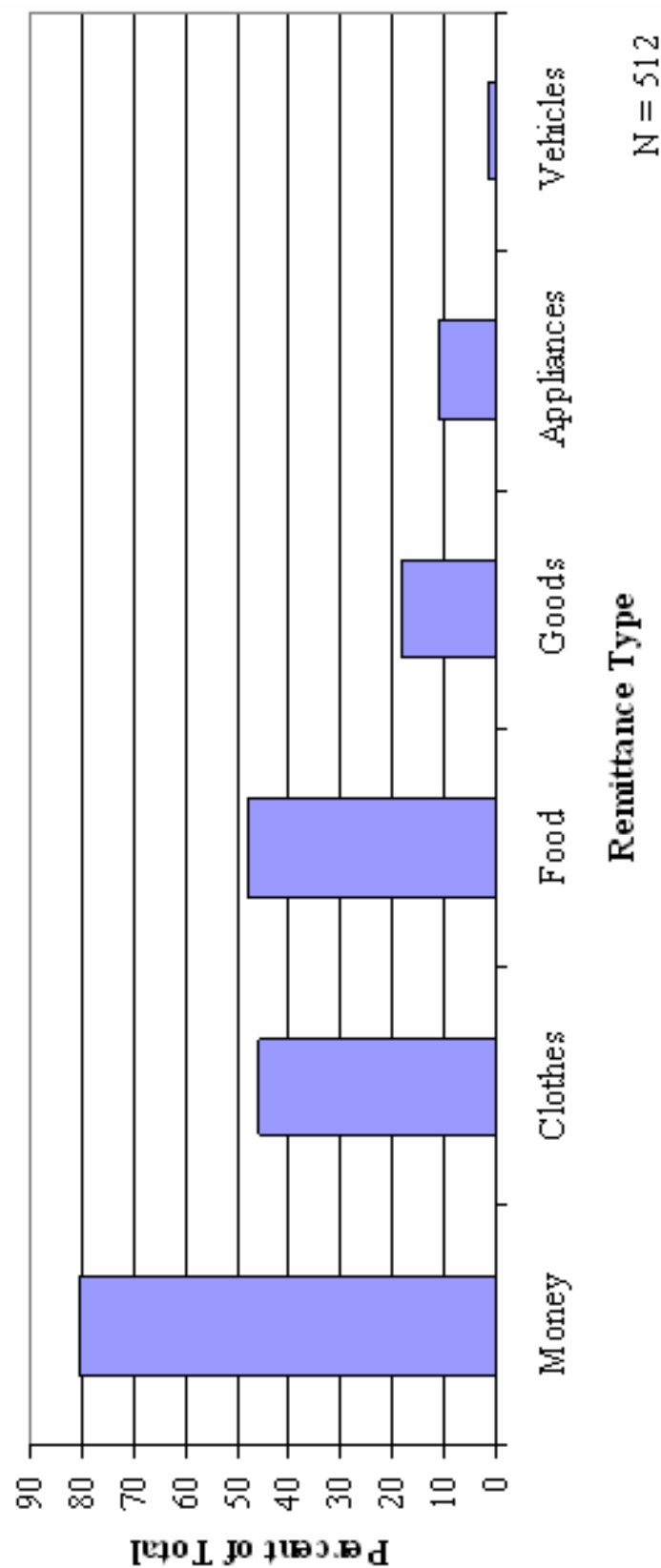


Figure 2.3. Age Distribution of Nang Rong Village and Migrant Population in 1994



Note: Age is Top Coded at 80 Years and No One Under 10 Years of Age is a Migrant as a Result of the Study Design.

**Figure 2.4. Remittance (by Category) for Migrant Mothers**



### CHAPTER III

#### AGRICULTURAL AID AND INTERGENERATIONAL RELATIONS IN A CONTEXT OF INDUSTRIAL TRANSITION

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 and non-family work, 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 1993). It is the key institution linking macro-level social change and micro-level individual behavior (Axinn and Yabiku 2001, Goldscheider 1995, 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 1993, 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 these areas. This is a pattern found historically in developed countries in the West (Elder and Conger 2000) and is presently occurring or will occur 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 or new familial ones at destination. The absence of young people is especially a concern for the older generation. This generation has the primary 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 task of replacing lost labor.

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 (Hareven 2000). Household strategies involve explicit or implicit choices families make to generate new opportunities in the face of changing opportunities and constraints (ibid).

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 as 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 that 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 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. This migration of young people is likely to reflect household strategies that show decreased dependency between the generations of family members.

Despite high migration among young people, young people's labor is valuable for rural households. Growing rice is the central subsistence activity in Nang Rong as in other parts of Thailand. Rice is the main dietary staple. 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. Although many aspects of rice farming have changed over the recent decades, rice harvesting has remained relatively unchanged, and Nang Rong villagers still rely on traditional methods.

### **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, Zimmer and Kwong 2003) 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 (Goode 1963). 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 (Becker 1974). The third model, the mutual aid model, emphasizes voluntary *quid-pro-quo* exchanges among household members (Cox 1987, Morgan and Hiroshima 1983).

In the migration literature, the work of the New Economics of Migration is most significant to understanding household migration strategies. As there are many similarities between the models developed by the intergenerational support and migration literatures, I consider the convergence of these perspectives. 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 (migrants and households or young and old generations) 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).

Migrants with higher human capital endowments (more education, more stable employment) have higher bargaining power compared to migrants with lower human capital endowments. In these cases the power and bargaining model predicts less contribution to the origin household's welfare. In contrast, when household members have more resources (such as valuable land or housing), their 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, VanWey 2004). 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.

In my analysis I consider absolute rather than relative bargaining power of migrants and households, using human capital endowments and characteristics of the household as proxy indicators. This is reasonable because migrants' and households' bargaining power is concentrated along different dimensions. On the one hand, migrants may have high human capital endowments, but their aging parents usually have low levels of education and primarily work in farming<sup>12</sup>. On the other hand, migrants are probably not land owners, which is an asset possessed by most households.

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 and less remunerative relations with non-familial institutions (such as the workplace) are the most likely to 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 households with the most desirable property can

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<sup>12</sup> This is certainly true of my analysis sample. Of the migrants who have a father living in the origin household, 95 percent of these fathers have only compulsory education or less, and 92 percent are either employed as rice farmers or are unemployed. For migrants with mothers in the home household, 98 percent of those mothers have only compulsory education or lower and about 90 percent of them are either rice farmers or are unemployed.

expect to get the most help. 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<sup>13</sup>. 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

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<sup>13</sup> However this selective investment could bring higher returns that will benefit everyone.

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.

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 (see Lillard and Willis 1997 for an empirical findings in favor of this argument). 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<sup>14</sup>. 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. This is particularly true in contexts in which migrant remittances are substitutes for instrumental old age support given by adult children co-residing with elderly parents (Rahman 1996, Zimmer and Kwong 2003). 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

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<sup>14</sup> See VanWey (2004) who treats similar issues with respect to migrant remittances.

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 giving 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.

### **Setting**

Nang Rong is a small, predominantly rural, district located in Buriram province, Northeast Thailand. It is about the size of an eastern U.S. county. The district was a frontier region during the first six decades of the 20<sup>th</sup> 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. 2005). Although some industrial development in the district has led to scattered industry, the level of non-agricultural employment provided is very low (VanWey 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. 2006).

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 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, because it is at risk of crop damage (Entwisle et. al 2005).

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.

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 2005). 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. 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 (Chamratrithirong et al. 1995, Pejaranonda et al. 1995).

Typically the majority of migrants go to urban destinations, while a sizeable minority move to rural areas. Very few go to international destinations. Major destinations for urban migrants include Metropolitan Bangkok, the Eastern Seaboard, and to regional cities like Korat.<sup>15</sup> Bangkok, the most popular urban destination, is about a four hour bus ride from Nang Rong town.

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.

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<sup>15</sup> Korat (formally known as Nakhon Ratchasima) is a nearby provincial city, the largest city in the Northeast. The Eastern Seaboard Development Project was a major public-private joint venture carried out in three provinces in Thailand (Chonburi, Rayong, and Chacheongsao) during the late 1980s. The project sought to stimulate regional economic development, and to decentralize economic activity away from Bangkok. The plan called for investment in heavy and light industry development, tourism, and deep sea ports which were developed for the exploration of natural gas in the Gulf of Thailand (Shatkin 2004).

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<sup>16</sup> 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**

To test the above hypotheses, I use data from the 1984 and 1994<sup>17</sup> waves of the longitudinal study of social change in Nang Rong, Thailand<sup>18</sup>. 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

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<sup>16</sup> 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.

<sup>17</sup> Although another wave of data was collected in 2000, it includes information on land use but not on land ownership. Land ownership is a key variable in my analysis, so I opt to use data from the 1994 wave.

<sup>18</sup> 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.

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 were 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, 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 estimated an equation that excludes households that did not grow rice. Next, using the full sample, I estimated 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 estimated 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 come back to help with the rice harvest.

Evidence that is relevant to the question of whether there is sample selection can come from two sources. First, the Heckman model can be used to calculate rho ( $\rho$ ), which is the correlation between error terms in the substantive equation and the selection equation. When  $\rho$  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,  $\rho$  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 2.

Another source of selectivity bias could be related to the exclusion of households that do not have any migrants. About 21 percent of households who have someone age 18-35 living in them have no migrants. Since I only have data for rice harvest help from migrants, I cannot simultaneously model the selection into migration and help with the rice harvest. Instead, I determine whether any observable variables used in my model may be biased by comparing these variables across households with migrants and households without migrants.

Of course, this approach does not take into account unobserved variables and the endogenous processes of self-selection into migration and return to help with the rice harvest.

I proceed as follows. First I create an indicator variable for whether a household containing anyone age 18-35 had any migrants or no migrant (the latter were not included in the original analysis). Then I estimate a logistic regression in which this variable is the dependent variable and any household or village variables used in my analysis are independent variables. Results (*not shown*) suggest that only one variable differs between migrant and non-migrant households. The effect of household wealth for the highest wealth category (relative to the middle category) is statistically significant and positively associated with households with migrants. Therefore the effect of this variable may be somewhat biased in my final models.

### **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 in the 1994 growing season. Because the outcome is dichotomous, I use a logit specification. The model can be written:

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

where  $Y_i$  is defined as help with the rice harvest provided by migrant  $i$ , and  $\beta' \mathbf{X}_i$  is matrix notation for the linear predictor, which is the linear combination of independent variables measured at the individual and household level.

Table 3.1 shows the frequency distribution of the dependent variable. About 11% of migrants helped with the rice harvest. Coming back to help reflects a number characteristics of the migrants and households. For migrants these characteristics may include occupation or



marital status. Sample migrants could have been gone for as many as ten or more years. In that time, some of them could have developed other responsibilities at destination which make it difficult for them to return. Perhaps their employment situation prohibited them from taking the time to travel back to their home villages for extended periods of time to help with their households' harvests. Maybe some of them got married and developed obligations to help with the harvest of their spouses' families.

The fact that many migrants did not help with the harvest 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. (2005) has shown that almost a quarter (27%) of households got help with the rice harvest from other people in the village, while 28% of households got help from people living outside the village. Interestingly, the percentage of households that received help (28%) is higher than the percentage of migrants that provide help (11%). This may suggest that while multiple migrants from each household could potentially help with the harvest, only a few of them actually do so. It could also suggest that households are getting help from individuals outside of the village other than migrant 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 age 18 to 35 in 1994, who are young enough to have parents who are still active in agricultural production.

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**

Descriptive statistics for all independent variables are in Table 3.2. 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 may pursue employment in the informal labor sector without a basic social security system or a pension or 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<sup>19</sup>.

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 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

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<sup>19</sup> 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).

collateral. The latter are the least secure titles, which cannot be transferred except by inheritance, and are not accepted as collateral.

From Table 3.2, 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<sup>20</sup>. On average households own almost two plots, with a total amount of land of just over six wa<sup>2</sup>. For the less secure land (NS-2/SPK/STP) households owned between zero to 88 square wa of land, with an average of just over two wa<sup>21</sup>.

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. 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.

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<sup>20</sup> Wa is a Thai unit of measurement, one Wa is equal to approximately two meters.

<sup>21</sup> Less secure land was not found to be significantly related to help with the rice harvest. I only include one measure of this type of land (the amount of land) in my final models to show that help with the rice harvest is not associated to need for help as related to the amount of land a household owns. Households who own more land can potentially grow more rice and may have more need to harvest it.

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 third will be considered to be at the “bottom,” those in the 34<sup>th</sup> to 79<sup>th</sup> percentiles will be considered “middle,” and the highest fifth will be considered to be at the “top”.

A disproportionate share of households in the various wealth categories results, due to differences in the population of households used in the construction of the index and the sample used for the present analysis. In 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. From Table 3.2, 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.

Turning to characteristics of the migrant, I argue that higher human capital variables (such as education and occupation) increase the migrants’ bargaining power. It also increases the ability to send cash. 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 more than a primary school education (17%) and just under a third (30%) of migrants have less than a primary school education.

I distinguish between the following occupations: agricultural, commerce, government, and miscellaneous other<sup>22</sup>. I expect those working in government jobs (about five percent of the

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<sup>22</sup> Government workers include mainly police officers, soldiers, teachers, security guards and janitors. Laborers are roughly equally divided among auto or furniture repair employees; factory workers; construction workers,

sample) have more stable and remunerative positions relative to all other occupations. Laborers and commerce workers, who make up about 46 and two percent of the sample respectively, are likely to have similar working conditions. Those working in agriculture (about 42 percent of the total) probably have the least stable and remunerative positions, but they may have the needed flexibility to take a leave of absence which would enable them to help with the rice harvest.

If the power and bargaining model is correct, there should be a detectable difference in help based on earning potential and job stability (i.e. the difference between government workers and all other workers). The difference in help should not be solely due to the difference in work in the informal sector (agricultural workers) versus the formal sector (other workers). Such a difference would most likely be related to the migrants' ability to leave work without the risk of losing their 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

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carpenters, masons, well drillers; and general laborers, workers in rice mills, unskilled laborers. Those in commerce work as salesperson and small shopkeepers. The majority of agricultural labors list rice farming as their primary occupation. Data on the migrant's occupation come from proxy reports from an informant in each household.

providing agricultural labor during the harvest season. They may also take the occasion to visit their children.

### **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 (Knodel et al. 1995, Limanonda 1995, Limanonda and Kowantanakul 2002, 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<sup>23</sup>, 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

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<sup>23</sup> The coefficient for the effect of this variable should not be interpreted. This variable is included merely to avoid unnecessarily deleting cases.

will be the least likely to help. The latter migrants may reside within their 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. Filial piety is the norm 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. However, 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, and I control for sex to account for gender differences in filial obligations.

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 3.2 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<sup>24</sup>.

I also control for household demographic variables. First, I count the number of siblings living in the household<sup>25</sup>. Because of changes in vital rates in Thailand (see Knodel et al. 1987), this generation of Thais tends to have many siblings. Siblings represent alternative sources of aid and they compete with migrants for resources. 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). Having many siblings may indicate high 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.

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. 2005). 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.

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<sup>24</sup> 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.

<sup>25</sup> 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.

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. 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.

## **Results**

Table 3.3 shows logistic regression results (raw coefficients, standard errors, and odds ratios). I consider first the variables that evaluate the central hypotheses<sup>26</sup>. 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 of 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 to help with the rice harvest (Model 2). The less securely titled land has no effect (see Model 3). Clearly, migrants are responding

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<sup>26</sup> 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 the availability or inheritability of securely titled or quality land<sup>27</sup>. Household wealth had no effect on migrant help, which may suggest that land is the most valuable and sought after asset.

The effects of 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 65 to 68 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 compared to laborers. In results not shown, I used agricultural occupation as the reference category. I found that migrants working in any non-agricultural occupations were less likely to help with the rice harvest relative to agricultural workers. Given that there are no differences between government workers and laborers or commerce workers (see Table 3.3), the effect of agricultural occupation is likely to be related to the flexibility of working in the non-formal sector or the seasonality of agricultural work.

It is possible that migrants with higher human capital endowments earn more, and are able to help the household in other ways, such as through remittance. Figure 3.1 shows a comparison of migrant-to-household remittance between migrants who help with the rice harvest and those who do not. Results indicate that remittance (financial support) is unlikely to be a substitute for help with agricultural labor (instrumental support). For nearly every

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<sup>27</sup> Unfortunately, other measures of land quality (e.g. soil fertility and location) are not available.

amount of remittance, migrants who help with the rice harvest are also *more likely* to send remittance. Just under half of migrants who did not help with the rice harvest sent no remittance, while nearly 35% of migrants who helped with the rice harvest sent no remittance. Furthermore, a higher percentage of migrants who helped with the rice harvest sent between 1 and 1,000 Baht in remittances and between 1,001 to 3,000 Baht in remittances. Although migrants who did not help with the rice harvest were slightly more likely to send remittances in the highest amount categories, the number of remitters in those categories is small, indicating a rare strategy.

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 percentage 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 helping with the rice harvest. 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<sup>28</sup>. These migrants may be obligated to helping their in-laws with their rice harvest or they may have their own harvest. Such an arrangement may indicate the establishment of a separate household, which competes as a source of the migrants' obligations.

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 parent lives in it. The one exception is the presence of only the mother, but this effect is not consistent across all models and should be interpreted with caution.

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 17 to 19 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.

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<sup>28</sup> 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. Also, the effect of only the mother living in the household is consistent across the other model specifications.

There are a few remaining effects that are 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 have made it more difficult to help their natal household.

The main effect of gender is not significant. Nonetheless I estimated separate models for males and females (*results not shown*). There were no gender differences for key variables (land variables and human capital variables) and results were consistent with effects presented in the final model. However, differences were detected for a few control variables. For instance, the effect of being married and having a migrant spouse (living either in the same location or a different location) was only found for males. Also, males were found to help with the rice harvest when the only parent in the household is the mother. Furthermore, the negative age effect was only found for women.

## **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 does not seem to be because they sent remittances as a substitute for agricultural help. There is a suggestion that the occupation effect may be due to the flexibility working in the non-formal sector. 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. Land may continue to be a sought after resource, even for young people who have no intention of farming it. They may rent it out to generate extra income, or perhaps they could keep the land as an eventual retirement site. They might even have sentimental attachment to the family homestead.

This may portend 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 a formal 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. They might also return for first year or two and then stop migrating. In short, they are still part of the fabric of village life and have more on-going ties and interactions with the household of origin.

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.

Table 3.1. 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 3.2. Descriptive Statistics of Independent Variables for Migrants Age 18 - 35 in 1994

Variable	Analysis Sample			
	Min	Max	Mean	StdDev
<b>Household Assets</b>				
<i>Land</i>				
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
Amount of NS-2/SPK/STP Land (in $Wa^2 / 1000$ )	0	88	2.17	6.19
<i>Household Wealth</i>				
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
<b>Migrant Human Capital Endowments</b>				
<i>Education</i>				
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
<i>Occupation</i>				
Migrant Works in an Agricultural Occupation	0	1	0.42	0.49
Migrant Works in Commerce	0	1	0.02	0.15
Migrant Works in a Government Occupation	0	1	0.05	0.22
Migrant Works in Some Other Occupation	0	1	0.05	0.23
(Migrant Works as a Laborer)	0	1	0.46	0.50

Table 3.2 (Continued)

<b>Presence of Migrant's Relatives and Spouse in Home Household</b>				
<i>Migrant's Child Location</i>				
At Least One Child Lives in the Household	0	1	0.07	0.26
(No Child Lives in the Household)				
<i>Migrant's Marital Status / Spouse Location</i>				
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
<i>Migrant's Parent (or In-Law) Location</i>				
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
<b>Household Demographics</b>				
<i>Migrant's Sibling (or In-Law Siblings) Location</i>				
Number of Siblings Living in the Household	0	7	1.40	1.18
Additional Number of Working Age People (Age 13 - 60)	0	6	0.58	0.91
Additional Number of Non-Working Age People	0	6	0.68	0.94
Additional Number of Migrants	0	7	0.17	0.60
<b>Migrant's Demographic Characteristics</b>				
Age	18	35	24.76	4.68
Migrant is Male	0	1	0.57	0.49
(Migrant is Female)				
N	2300			

Table 3.3. 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)

Variable	Model 1			Model 2			Model 3		
	Coeff	Std Err	Odds Ratio	Coeff	Std Err	Odds Ratio	Coeff	Std Err	Odds Ratio
Intercept	-1.16*	0.53	0.31	-1.02	0.52	0.36	-1.1*	0.52	0.33
<b>Household Assets</b>									
<i>Land</i>									
Number of NS-4/NS-3 Land Plots	0.19**	0.06	1.21	-	-	-	-	-	-
Amount of NS-4/NS-3 Land (in $Wa^2$ / 1000)	-	-	-	0.03***	0.01	1.03	-	-	-
Amount of NS-2/SPK/STP Land (in $Wa^2$ / 1000)	-	-	-	-	-	-	-0.03	0.02	0.97
<i>Household Wealth</i>									
Top 20th Percentile of Wealth Distribution	0.0002	0.21	1.00	-0.01	0.21	0.99	0.04	0.21	1.04
Bottom 33th Percentile of Wealth Distribution	-0.06	0.14	0.94	-0.08	0.14	0.92	-0.10	0.14	0.90
(Middle 34 - 79th Percentile of Wealth Distribution)									
<b>Migrant Human Capital Endowments</b>									
<i>Education</i>									
Less than Primary Education	-0.05	0.22	0.95	-0.09	0.23	0.91	-0.13	0.23	0.88
Greater than Primary Education	-1.12***	0.30	0.33	-1.13***	0.31	0.32	-1.04***	0.30	0.35
(Only Primary School Education)									
<i>Occupation</i>									
Migrant Works in an Agricultural Occupation	1.13***	0.22	3.10	1.12***	0.22	3.06	1.13***	0.22	3.09
Migrant Works in Commerce	-0.15	0.55	0.87	-0.14	0.55	0.87	-0.14	0.55	0.87
Migrant Works in a Government Occupation	-0.24	0.56	0.78	-0.31	0.56	0.73	-0.23	0.55	0.79
Migrant Works in Some Other Occupation	0.06	0.41	1.07	0.01	0.42	1.01	0.03	0.42	1.03
(Migrant Works as a Laborer)									

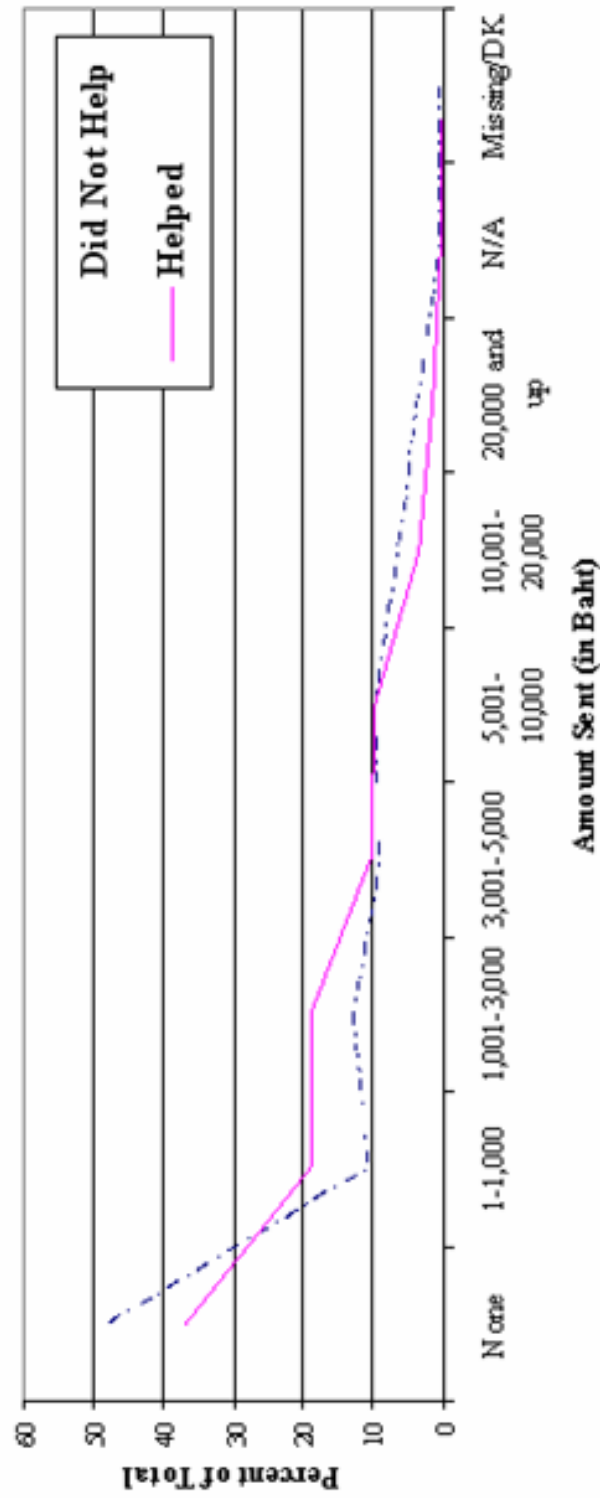
Table 3.3 (Continued)

<b>Presence of Migrant's Relatives and Spouse in Home Household</b>									
<i>Migrant's Child Location</i>									
At Least One Child Lives in the Household	0.69**	0.26	2.00	0.7**	0.27	2.01	0.68**	0.26	1.98
(No Child Lives in the Household)									
<i>Migrant's Marital Status / Spouse Location</i>									
Married, Spouse Lives in the Household or Village	0.74	0.40	2.09	0.73	0.41	2.07	0.68	0.41	1.97
Married, Spouse Lives in Same Migration Destination	-0.21	0.17	0.81	-0.19	0.17	0.83	-0.21	0.17	0.81
Married, Spouse Lives in Different Migration Destination	-0.59**	0.22	0.55	-0.56*	0.22	0.57	-0.59**	0.22	0.55
Post-Married, or Spouse Location is Unknown	-0.49	0.31	0.61	-0.51	0.32	0.60	-0.54	0.31	0.58
(Never-married)									
<i>Migrant's Parent (or In-Law) Location</i>									
Both Parents Live in Household	0.38	0.37	1.46	0.39	0.36	1.48	0.51	0.37	1.67
Only Mother Lives in Household	0.65	0.35	1.92	0.66	0.35	1.93	0.74*	0.35	2.10
Only Father Lives in Household	0.24	0.36	1.27	0.25	0.37	1.29	0.34	0.36	1.41
(Neither Parent Lives in Household)									
<b>Household Demographics</b>									
<i>Migrant's Sibling (or In-Law Siblings) Location</i>									
Number of Siblings Living in the Household	-0.2*	0.08	0.82	-0.21*	0.08	0.81	-0.18*	0.08	0.83
Additional Number of Working Age People (Age 13 - 60)	-0.36*	0.14	0.70	-0.36*	0.14	0.70	-0.32*	0.15	0.73
Additional Number of Non-Working Age People	0.04	0.12	1.04	0.04	0.11	1.04	0.04	0.12	1.04
Additional Number of Migrants	-0.03	0.14	0.98	-0.02	0.14	0.98	-0.02	0.14	0.98
<b>Migrant's Demographic Characteristics</b>									
Age	-0.06**	0.02	0.94	-0.06**	0.02	0.94	-0.05*	0.02	0.95
Migrant is Male	0.01	0.14	1.01	0.02	0.15	1.02	-0.01	0.14	0.99
(Migrant is Female)									
N	2300	2300	2300	2300	2300	2300	2300	2300	
-2LL	-717.57	-717.57	-717.57	-717.57	-717.57	-717.57	-717.57	-717.57	-722.41

\* p &lt; .05 \*\* p &lt; .01 \*\*\* p &lt; .001 (Two-Tailed Test)

Note: Standard Errors Adjusted Using Huber/White Correction

Figure 3.1. Comparison of Amount of Remittance Sent to the Origin Household for Migrants who Did and Did not Help with the Rice Harvest



## CHAPTER IV

### MIGRANT REMITTANCES AND HOUSEHOLD DIVISION

Early scholarship on the history of household systems and industrial development, which mostly focused on European civilization, was divided into two camps (Rosenfeld 2006). The first of these believed that pre-industrial societies were characterized by traditional extended family households, while the nuclear household structure became the norm following industrialization (Calhoun [1919] (1960), Le Play [1872] 1982). The opposing camp argued that the pre-modern European family had always been nuclear and its observance in modern times represents continuity over time (Hajnal 1965, Laslett 1965, 1972).

Lingering questions still persist in more recent debates about the existence of variability in household structures in the world's industrializing regions. Previously it was thought that dominant household formation systems (for example, the joint household system found in Asia) prevailed in pre-industrial regions and these gave way to simpler households following industrialization (Goody 1996, Hajnal 1982, Kertzer 1991). Some scholars have begun to question the supposed influence of the industrial revolution on the family (Furstenberg 1966, Goode 1963, Hareven 2000, Rosenfeld 2006). Recent work by Rosenfeld (2006) has shown that many characteristics of the American family remained unchanged during the years that the United States experienced the shift to an urban-industrial base. It was only after the 1950s, a time of general prosperity succeeding industrialization, that unmarried young adults starting living independently from their parents.



Despite their absence in many more developed countries, extended families are a primary structural feature still found in many developing countries today (Bongaarts 2001, Morgan and Rindfuss 1984). In these largely agrarian settings, households play a significant role as production units, since family farming is frequently organized around the household. In contemporary post-industrial settings, households play a crucial role as consumption units in the maintenance and support of their members. Households are fundamental socioeconomic institutions found in nearly all societies. They mediate between individuals and larger social structures (Boyd 1989, Goldscheider 1995) serving as a significant conduit for a variety of individual behaviors including marriage, migration, fertility, and mortality (Entwisle et al 2005).

Eventually all households go through changes in their composition by way of demographic and life course processes. For instance, households split when children depart their parental home to start new households or when parents move into a new dwelling unit, leaving their former residence in the hands of their children. New households form when young people marry and reside in their own dwelling unit. Despite their importance throughout the world, and their differences in pre- and post-industrial settings, the literature on household processes in rural developing contexts remains limited.

Perhaps due to stringent data demands, few studies have been conducted that examine the process of household splitting in developing contexts. Many existing studies are outdated and need to be reevaluated in light of more recent insights from the literature on urban migration and development. In this study I examine the relationship between migration and household splitting using social survey data from Nang Rong, Thailand, a rural agrarian district that has been undergoing rapid economic development in the last several decades.

I link existing literature on the process of household change to research on migrant remittances. Remittances are an invaluable source of capital which rural households use to alleviate poverty and overcome severe credit constraints in contexts where local wage employment opportunities are limited or absent (Durand et al. 1996, Kapur and McHale 2003, Skeldon 1997). While remittances have been the subject of much recent research, to my knowledge this is the first study that connects remittances to the process of household change in a developing country context. In subsequent sections of this paper, I review the literature on household change followed by a review of the literature on migrant remittances.

### **Theories of Household Change**

Most existing theories of household change were formulated from a developed country perspective. After reviewing some of these theories, I consider how they can be modified to fit a developing country framework. This involves specifying mechanisms linking household change to migration, non-familial employment, and remittances.

Household and family demographers pioneered early work on aspects of household structure, including household division. The distinguishing feature of this work is its focus on households, families, or groups of people living together, rather than on individuals, as units of analysis. There is an important distinction between the term *family*, which refers to a group of kin related by blood, marriage, or adoption and the term *household*, which refers to persons, who may or may not be related, living in the same dwelling unit who share resources in common (Burch 1979).

An early theme in the household demography literature was the relative invariance in the structures of households and families across a number of societies past and present, despite the popular impression of a wide variety of family forms (Burch 1979). Any attempt to

characterize whole societies in terms of their family or household structure is complicated by the substantial changes that occur during the lifetime of an individual family and household. This realization led to the adoption of the family life cycle perspective, associated with the work of Glick (1947, 1987).

Glick's family life cycle conceptualized households as having seven distinctive demographic stages: marriage, birth of the first child, birth of the last child, marriage of the first child, marriage of the last child, death of the husband (if first), and death of the wife (if last). A family typically comes into being when a couple is married. The family gains in size with the birth of successive children. Between the time that the last child is born and the first child leaves the home, family size remains relatively stable. Eventually, as all the children leave for employment or marriage, the size of the family recedes back to the original two people. Finally, as one and then the other parent dies, the life cycle comes to an end.

By the mid-1970s, the demographic literature documented an increasing complexity in family life cycle types resulting from variations away from the traditional family schedule. The trend toward delayed marriage, non-marital cohabitation, living in single households, as well as the sharp increase in divorce, and high rates of instability in non-marital unions (Burch and Matthews 1987, Bumpass 1990) made it clear that the original concept of the family life cycle was becoming inadequate (Glick 1989).

Researchers studying household formation began to favor the life course perspective, which stressed four central themes: 1) the interplay of human lives and historical time, 2) the timing of lives, 3) linked or interdependent lives, 4) and human agency in choice making. The life course perspective examines *individual* life course trajectories, including the timing and sequencing of role transitions as they are influenced by the interplay of changing

historical events, social structural organization, individuals' position in the social structure, and individual biological and psychological development (Elder 1994).

The life course perspective changed not only the way that scholars thought about household processes, but also the way that they studied them. Using the household as a unit of analysis was seen as problematic, particularly in longitudinal studies, because households are not stable units over time (Duncan and Hill 1985, Ruggles and Brower 2003). Since individual life course differences are among the most important determinants of residential behavior, it became apparent that using meso-level units of analysis (like the family or the household) made it difficult to isolate these individual-level processes (Ruggles and Brower 2003).

Following developments in theory and method, researchers began to view deviations from the traditional family life cycle as involving decisions made by individuals and couples to respond to the general question "With whom shall I live?" (Burch and Matthews 1987). Individual decisions to share a residence with children or extended family members, which resulted in separate living and smaller households, were linked to explanations describing an intertwining of economic and ideational changes in tastes and preferences (Burch 1979).

Economic explanations attribute the rise of separate living to an upsurge in real income (Burch and Matthews 1987, Kuznets 1978, Michael, Fuchs, and Scott 1980). People choose to live alone or in smaller households because they could afford to do so. Household members found it possible to forgo economies of scale represented by large households. This is especially salient given the entry of women into the paid labor force and a switch from an agricultural economy to an industrial economy. The former is associated with a reduction in

services available in households and the latter created conditions whereby production became progressively less linked to the family (Burch and Matthews 1987).

Other economic explanations highlighted the role of family income, net of personal income, in increasing family extension. Parents often use their resources to help their children leave home (Goldscheider and DaVanzo 1989, Goldscheider and Goldscheider 1993). Indeed, many parental resources, in particular parental income and wealth, are not tied to residence in the parental home (Goldscheider and DaVanzo 1989). For instance, the cost of higher education, which corresponds to the initial stage in the life course when children first move out of their parents' home, is commonly borne by parents.

Explanations that focus on ideational factors emphasize changes in tastes and preferences brought about by increased affluence, such as a preference for privacy. Following work by Lesthaeghe (1983), a general rise in the valuation of privacy could be the result of a gradual unfolding of the full implications of process of secularization and individuation.

Lesthaeghe's research integrates demographic theory with social-psychological research on human needs (Maslow 1954) and the consequences of "post-materialism" (Inglehart 1981). Ideational forces perpetuating family change initially accompanied, but become independent of, an increase in affluence and development (Lesthaeghe 1983, Lesthaeghe and Surkyn 1988). With higher real incomes and a sense of security and welfare provision, individuals turned inwards and became concerned with self-development and a sense of personal growth and experience.

Other ideational explanations link the preference for privacy and separate living to macro-level normative changes. For example, changes in attitudes brought on by the sexual revolution of the 1960s and 1970s increased tolerance for sexual activity among persons

other than young and middle-aged married couples. However, parents of single adults may have drawn the line at having such activities occur in their own homes, which could have led to a greater need for privacy and a desire to live separately (Burch and Matthews 1987). Goldscheider and Lawton (1998) argue that as living separately from extended kin became more economically feasible, adult coresidence became associated with poverty. Individuals thus choose to live separately in order to avoid the stigma of destitution.

### **Household Change in Developing Countries**

In what follows, I consider ways in which developed-country theories of household change, which stress the effects of rising real income and changes in tastes and preferences, can be adapted to developing country contexts. Household change in developing or industrializing settings was the subject of interest of early work by Goode (1963), who predicted the convergence of family systems around the world to the conjugal type. The conjugal family is characterized by a weakening of kinship ties, the dissolution of lineage patterns, and the nucleation of the family. While Goode's theory was insightful, it is considered controversial (Bongaarts 2001) and has been the subject of criticism (see McDonald 1992).

Lavelly (1990) identifies three mechanisms linking changes in household structure to industrial growth in the developing world: 1) migration, which takes individuals to urban areas, where they are isolated from their kin group 2) non-familial employment, which makes individuals independent of their family, and 3) exposure to non-traditional or "Western" ideas which are opposed to traditional ideologies needed to maintain the functioning of extended family residence<sup>29</sup>.

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<sup>29</sup> Because of data limitations and the difficulty of studying ideational effects in this paper I mainly focus my analysis on the effects of migration and non-familial employment.

These three mechanisms are interrelated. Urban migration is one channel whereby rural migrants are potentially exposed to non-traditional or “Western” cultural patterns. More importantly, migration is a common way for rural residents in industrializing countries to gain non-familial employment, especially given the lack of local wage labor positions (McDonald and Kippen 2001, Roberts 1997). By gaining access to wage labor positions, migrants have the means to send remittances. This can be beneficial to household members left behind, who sometimes face serious challenges in meeting their basic needs or the rising consumer expectations that accompany the shift from a subsistence to a monetized economy.

As the literature on microcredit makes clear, credit, insurance, and securities markets are underdeveloped or absent in many developing countries (Besley 1995). Low-income countries develop non-market institutions (credit cooperatives, informal credit and insurance arrangements, rotating credit associations, and so on) to deal with these market deficiencies (Banerjee et al 1994, Besley 1995, Rosenzweig 1988, Udry 1994). Aside from local non-market institutions, migration and migrant remittances are one of the most prominent non-market solutions to absent or underdeveloped markets (Stark 1991).

Although exact data on the amount of remittance sent by internal migrants is lacking, the amount is likely to be considerable (Entwisle and Tong 2005). The literature shows a fairly strong consensus on the use of remittances, regardless of country. Most studies find that remittances from migrants to households are spent on recurrent household expenditures, such as food, clothing, and health care (Cohen and Rodriguez 2005, Goldring 2004, Koc and Onan 2004, Taylor 1999). Many analysts agree that there is little money left over for productive

investment, although there is some debate about what should be included under the rubric “productive investment” (Taylor 1999)<sup>30</sup>.

Massey et al. (1987) argue that migrants’ savings are first channeled toward providing for the consumption needs of the home family. Once basic consumption needs are secured, migrant families allocate their savings toward investment goals, which include the purchase of land or acquisition of a home. This may explain why some studies find that a portion of remittances is used for investments such as housing (Adams 1991, Olisi 2004) or other productive assets (Durand and Massey 1992, Entwisle and Tong 2005).

Remittances alleviate household credit constraints, and being a form of income, they raise tastes and preferences. In order to understand how remittances affect household change, it is necessary to understand the motives for migration and remittances in the first place. I propose several ways in which migration motives can be used to understand household splitting. Motivations for sending remittances range from contractual to altruistic and are usually understood in the context of household or family decision-making.

Altruistic theories of remittance argue that members of households act to improve the welfare of every member of their household or family (Agarwal and Horowitz 2002). These theories do not rule out self-interested behavior; rather, behavior is seen as responding to the needs of other household members (VanWey 2004). Altruistic motives can be understood in the broader framework of models which view families and households as corporate units (Becker 1974, 1991; Lee et al. 1994). Becker’s (1974, 1993) model of household decision-making posits a family headed by an altruistic individual (perhaps a patriarch or his widow) who controls family resources and allocates them across family members. Resource

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<sup>30</sup> For instance Taylor (1999) points out that educational expenditures are often not considered productive investment, although they improve the human capital of household members and can contribute to productivity.



allocation follows a Pareto efficient pattern: no alternative allocation could improve the welfare of any given member without reducing the welfare of some other member.

It is easy to imagine how receipt of remittances could lead to household splitting under the altruism/corporate group framework. Perhaps migrants who leave their rural communities and successfully find wage labor positions remit a share of their earnings out of concern for the welfare of household members left behind. That money may be allocated across household members by a household head. A portion of that money could be used to finance the costs of home building (such as the cost of building materials or cost of labor). The building of new dwelling units allows household members to live away from their family of orientation, although they may still choose to live nearby.

Contractual motivations for remittances involve an implicit agreement between migrants and households. Contractual obligations can manifest themselves as either contemporaneous coinsurance schemes or as inter-temporal investment strategies. Unpredictable and potentially serious risks (such as droughts, floods, or famines) are a reality in some parts of developing countries. In these areas, insurance markets are often absent or undeveloped, so households send migrants to alleviate credit or risk constraints.

Coinsurance occurs when a migrant and household take turns insuring each other from market fluctuations and risky ventures. For example, the household may provide a safety net to insure the migrant against involuntary unemployment, or a migrant may send remittance to allow a household to invest in a risky new production technology, such as a high-yield crop variety (Stark and Lucas 1988). This is an effective strategy for reducing risk when the migrant moves to a location with a different risk profile than origin.

Investment can be initiated by the household. For instance, the household could bear the initial costs of the migrant's education, which allows the migrant to get a relatively stable, high-paying job. This permits the migrant to earn more money, which in turn leads to higher remittance to the household. Investment may also be initiated by the migrant, such as when the migrant sends money to invest in the education of younger siblings or when the migrant remits to the household in anticipation of future property bequests (such as land, housing, or goods) from the household (Hoddinot 1994).

If remittances come as a response to distress, they are likely to be spent on food, medical expenses, seed, and so on. Remittances that are sent with the intention of being invested may be spent on housing. Housing investments offer unique advantages in developing regions where individuals face few savings opportunities and where productive assets (such as land, farm assets) are associated with high risks or low rates of return (Besley 1995). Dwelling units or houses are durable, highly visible, and are associated with low risk and monitoring requirements (Osili 2004)<sup>31</sup>.

The investment motive for remittance is therefore either related to repayment for earlier investment or prepayment for the property that the migrant wishes to one day inherit. Perhaps in repayment for the origin household's initial investment in the migrant's education, the migrant in turn invests in a housing construction project. Maybe the migrant finances the building of a new dwelling unit for his or her parents, which allows them to live separately from other relatives. Alternatively, a migrant may simply send money for housing in the hope of one day returning to the village and taking over the property. Household members at

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<sup>31</sup> Of course there are drawbacks. Such investments may be illiquid and irreversible in areas where resale and rental markets for houses are lacking (Osili 2004).

origin may safeguard housing in the meantime, or they may contribute labor for building projects in exchange for remittance.

It is important to note that determining motivations is difficult in any setting. Usually direct data on motive are lacking, and the relative importance of different motivations is frequently inferred by the researcher (see for example: Hoddinott 1994, Lucas and Stark 1985, Stark and Lucas 1988, VanWey 2004). A potential problem with inferring motives from data on remittance is that they may not accurately reflect the migrant's intention in sending remittances.

Migrants cannot control what home households do with remittance money (Entwisle and Tong 2005). Further, remitted money is a fungible asset, and unless it is earmarked for specific uses, its use cannot be assumed to reflect the intention behind its remuneration (Taylor 1999). Irrespective of motive, theory suggests that remittances can plausibly be considered as part of a household decision-making process.

One possible way to infer motive is to use insights from research on gender and remittances. Following work by Entwisle and Tong (2005) I make inferences about motivations underlying remittances by examining whether money sent by male migrants has the same effect on splitting as money sent by female migrants. Research has shown that women remit more than men, both in Thailand (Curran 1995, Osaki 1999, VanWey 2004) and elsewhere (Chiang Huang 1984, Radcliffe 1990). Because women generally retain closer ties with kin and are more closely attuned to family obligations relative to men, women's remittance behavior is thought to be more related to altruism (Osaki 2003, VanWey 2004). I now consider how general theories linking remittance to household change are mediated by contextual factors related to the setting of this study.

## Setting

Nang Rong is a small, poor, predominantly rural, district located in Buriram province in Northeast Thailand. It is about the size of an eastern U.S. county and is located near the Cambodian border. The district was a frontier region during the first six decades of the 20<sup>th</sup> century. People in Nang Rong live in nucleated villages arranged into clusters of dwelling units that include an average of about 100 households, although the number can vary (Rindfuss et al. 2003).

Nang Rong has been the site of an on-going research project since 1984, and data on various aspects of social and demographic processes in the district were collected over three successive waves spanning 16 years. An examination of population trends over time shows that the number of people living in the district remained relatively constant between 1984 and 2000, but the number of households has increased substantially. Mean household size decreased.

A full census of all households was collected in a sample of 51 villages in 1984. Baseline data from 1984 contained 32,342 individuals living in 5,863 households. The average household size was over five people (5.52). Ten years later, the number of individuals living in the district actually *decreased* to 31,128 individuals, while the number of households increased to 7,331. The average household size decreased to 4.43. In 2000, the number of individuals increased to 34,298, while the number of households increased to 8,635. The average household size decreased to just under four (3.97).

Traditionally, growth in the number of households was related to the Thai household lifecycle. Matrilocal residence is the culturally preferred postnuptial residence pattern (Limanonda 1995, Limanonda and Kowantanakul 2002, Knodel et al. 1995, Tan 2002).

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.

The Thai household has a unique lifecycle pattern (see Limanonda 1995, Limanonda and Kowantanakul 2002, Knodel et al. 1995, Tan 2002). Traditionally women were expected to stay in their parental home until they marry and start their own household. When a daughter first marries, her husband moves in with her and her family (Tan 2002). This is a temporary arrangement that lasts until either the couple’s first child is born, or the next daughter marries and her husband moves into the household (Limanonda 1995, Limanonda and Kowantanakul 2002). This process continues until a stem family including the elderly parents, the youngest daughter, her husband, and their children are the only ones left living in the household.

Changes in the size and number of households may also be related to a general increase in standard of living in the district. The frontier closed during the 1970s and 1980s. Road construction, electrification, telecommunications, and migration substantially changed the way that people lived (Curran 1995, Rindfuss et al 2005, VanWey 2003). Figure 2.2 illustrates changes in economic development. It shows data on the percentage of households owning certain assets and having particular amenities across the three data waves<sup>32</sup>.

The data show evidence of rapid economic development and a shift to a monetized economy. There is a marked increase in the use of utilities over time. While only a fraction of households had water piped into their households in 1984, almost 40 percent of them had it by 2000. Electricity, while only available to about a third of households in 1984, was nearly universal in 2000. The period between 1984 and 1994 shows a rise in the ownership of consumer products, particularly the television. In these ten years, television ownership

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<sup>32</sup> While data on the number of dwelling units are not available, it is likely that these too have been increasing. In fieldwork during the spring of 2005, I noticed that the construction of new dwelling units was a common occurrence in many of the villages.

increased from under eight percent to nearly 70 percent of households. This was followed by an increase of approximately 25 percent in households owning refrigerators between 1994 and 2000.

Ownership of working assets also increased. *Itans* (multi-purpose agricultural vehicles) and especially motorcycles witnessed a steady increase throughout the 16 year period. Motorcycles are a typical form of transportation in many developing countries, and can be used for any number of purposes, such as getting to and from work and bringing agricultural products to market. Automobile (cars, trucks, and pick-ups) ownership remains uncommon in the district.

It is quite possible that a rise in standards of living is attributable to migration and the receipt of remittances, especially since local opportunities for employment outside of agriculture are limited. Although some industrial development in the district has led to scattered industry, the level of non-agricultural employment is very low (VanWey 2003). Some households engage in cottage industries (such as silk weaving, silk worm raising, cloth weaving, and charcoal making), but economic returns from these activities are likely to be minimal.

Paddy rice farming is the main occupation of most villagers, which tends not to be very remunerative. Rice growing is rain-fed and relies on an annual monsoon that varies greatly from year to year in its timing and amount. Risk associated with rice farming is a fact of life, as floods and droughts can have a substantial impact on crop yield (Entwisle and Tong 2005). The agricultural cycle has a pronounced seasonality, characterized by a long dry season of inactivity. The long dry season, in combination with the risks involved in agriculture, and limited opportunities for wage employment encourage villagers to migrate in search of work.

Migrants from the study area and other parts of the Northeast migrate to both rural and urban destinations (Chamratrithirong et al. 1995, VanWey 2004). Migration to rural areas is thought to be associated with marriage while urban migration is for labor. Major destinations for urban migrants include Bangkok, the Eastern Seaboard, and regional cities like Korat<sup>33</sup>. Much of migration in Nang Rong is seasonal or circular migration, and is linked to labor demand fluctuations related to the agricultural cycle (Chamratrithirong et al. 1995, Richter, et al 1997).

Entwisle and Tong (2005) find that remittances in Nang Rong are used for both consumption items and on productive assets. Research on remittance use in the Northeast mirrors findings in Nang Rong. Most of this research utilizes data from the National Migration Surveys (NMS) of 1992 and 1994. Using this data Richter et al. (1997) found that almost three-fourths of households in their sample received some form of cash remittances, which had a far more significant value than that of goods. Agricultural households in particular substantially supplement household earnings with remittances.

Remittances contributed significantly towards improving household income (Guest 1998). Remittance income tended to be used for household necessities (such as food, clothing, household goods, and medical expenses) although in some households it was used for housing projects, purchase of agricultural inputs, paying off debt, and investments in education (Richter et al. 1997, Guest 1998). Households with migrants were more likely than

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<sup>33</sup> Korat (formally known as Nakhon Ratchasima) is a nearby provincial city, the largest city in the Northeast. The Eastern Seaboard Development Project was a major public-private joint venture carried out in three provinces in Thailand (Chonburi, Rayong, and Chacheongsao) during the late 1980s. The project sought to stimulate regional economic development, and to decentralize economic activity away from Bangkok. The plan called for investment in heavy and light industry development, tourism, and deep sea ports which were developed for the exploration of natural gas in the Gulf of Thailand (Shatkin 2004).

households without migrants to state that building or improving a house was the main use of remittances (Guest 1998).

In addition to contributing to the material development of rural Thailand, ideas from returning or visiting migrants may also inspire new preferences for non-traditional or urban residence patterns. This may be especially significant for individuals living in extended family households, which are thought to be crowded, and ripe with potential conflicts between in-law relatives (Edwards et al. 1994).

## **Data**

To examine the relationship between remittances and household splitting, I use the 1994 and 2000 waves of Nang Rong data. The 1994 and 2000 waves contain a complete census of every household in all sample villages included in the original 1984 data collection.

Information was obtained on all household members, including those who were permanent residents and proxy reports for migrants. The data use two contiguous panels to identify migrants. Migrants are operationalized as anyone whose record was listed on a data panel at one point in time, who was living away from the village for two or more months in the next panel (which was collected at a subsequent point in time).

Data were collected on migration, remittances, residential moves within villages, household composition, household assets, debt, cottage industries, land ownership, and social networks. In addition, life history data were collected for anyone age 18-35 who was located in the village in 1994. Life history data include information on individual migration histories since age 13 that detail the frequency and duration of migration episodes for anyone residing in the village.



## Basic Approach

Using the Nang Rong data, I utilize a combination of descriptive analysis and regression modeling to understand the process of household splitting and to relate it to receipt of remittances. Following the recommendation of Duncan and Hill (1985) and Ruggles and Brower (2003), I use individuals as the *unit of analysis* and the household as the *unit of measurement*, that is, characteristics of the household are treated as attributes of individuals and become explanatory variables along side other characteristics of the individual, such as age, sex, or marital status. My interest is in distinguishing different pathways to household splitting and new residence formation.

Household splitting in Nang Rong can result from either migration out of the village or local moves within the village. Moves may correspond to different stages of the Thai household life cycle: a mover can either end up in an existing household or a new, previously non-existent household. Since household splits (from the perspective of an individual) are likely to occur at late adolescent or in adulthood, I limit my sample to ages 18-35 to capture the experiences of a cohort of young people who are of an age to experience their first household change. I measure household splitting from the perspective of individual members and define it as a change over time in an individual's household membership (a change from membership in one household in 1994 to membership in another household in 2000). I limit my analysis to individuals who were living in the village in 1994 in order to exclude migrants who probably have already changed their residence.

Pathways associated with household splits can involve moves into new households or existing households. A new household is one that did not exist in the 1994 wave of data, but did exist in the 2000 data. An existing household is one that was identified in both the 1994

and 2000 data. It is likely that new households are newly established independent neolocal residences, while existing households are more established households which are likely to be extended and may contain three or more generations of family members.

I operationalize household change, the dependent variable, by distinguishing the following types: 1) individual lives in same household 2) individual moves into a new household within the village 3) individual moves into an existing household within the village 4) individual moves outside of the village. I consider moves within the village to be local moves and moves outside of the village to be migrations. Table 4.1 shows that a little over half (52%) of the sample experienced no change in household, while 14 percent moved into a new household. A minority, 1.37 percent, moved into an existing household<sup>34</sup>. Despite the low incidence of these moves, I keep them separate from local moves into new households because they likely represent different stages in the Thai household lifecycle, a view that is supported by my subsequent analysis. The rest of the sample (32%) migrated outside of the village, hence experiencing a change in household.

All independent variables are measured in 1994. I use a lag between independent and dependent variables to avoid using post-movement characteristics to predict changes in residence. Indications of remittances (such as the amount of money received) are the key independent variables of interest, and remittance is measured as money sent anytime within a year prior to the implementation of the household survey. All other variables serve as controls.

Remittance data were only collected for migrants, who are defined as individuals who moved out of the village between the 1984 and 1994 data panels. Therefore, I further restrict

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<sup>34</sup> Because this category only contains 67 cases, some caution should be used in making inferences about these individuals.

my sample to only individuals from households who were eligible to receive remittances. For remittances sent in 1994, I limit my analytical sample to households found in both the 1984 and 1994 survey, because only these households had any migrants, and thus only they had the opportunity to receive remittances. Households present in 1994 that did not have a record in the preceding panel and are excluded from the analysis. I also restrict my sample to only records that have complete cases.<sup>35</sup>

There is one additional issue that needs to be discussed. Migrants are not necessarily all migrating to start a new household. Some migrations may be temporary seasonal or cyclical moves, which could end in return to the origin household. Perhaps these migrants are working as construction workers during the agricultural off-season. As comparatively less can be inferred about the household formation of migrants' households, I will focus more attention on local movers, although migrants who migrated between 1994 and 2000 will still remain in the analysis to avoid sample selection bias. However, individuals who migrated between 1984 and 1994 will be excluded from the analysis because many of them probably have already started a new household.

## Method

Since the dependent variable is a four-category nominal variable, I use a multinomial logit model. For the multinomial logit model, with categories  $m = 1, \dots, M - 1$ , we have:

$$\ln \left( \frac{\text{Prob}(R_i = m)}{\text{Prob}(R_i = M)} \right) = \beta' X_i \quad (1).$$

Where  $\beta'$  is a vector of regression coefficients including the intercept, and  $X_i$  is a matrix of independent variables for each individual  $i$ . Using a logit link function to match the probability of being in each category  $m$  to the linear predictor, the dependent variable

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<sup>35</sup> Listwise deletion eliminated 234 cases, which account for almost five percent of the original sample.

becomes the natural log-odds of a respondent being in any category of residential change  $m$ . In order to get unique solutions for each set of regression coefficients, one of the response categories is set as a reference category (see Long, 1997: 152 - 153 for details). For ease of interpretation, final regression results are presented both in the untransformed logit scale and as odds ratios.

The unit of analysis is the individual (i.e. young adults residing in Nang Rong households that had at least one migrant). Multiple individuals can live in each household and multiple households can be located in each village. Thus the data are clustered and are not independent of each other. It is important to account for clustering, because it artificially lowers standard errors associated with coefficients, thereby overestimating  $t$ -statistics and overstating the significance of estimates. I use a robust standard error correction (see White, 1980 for details) to correct for the clustering of individual records within household records.

### **Operationalization of Independent Variables**

Migrant remittances are the key independent variables of interest. Remittance data on both migrant-to-household and household-to-migrant transfers were collected in the 1994 household survey. Separate questions asked whether each migrant sent money during the previous year and whether money was sent to any migrant in this time. I am mainly interested in the amount of remittances and the number of migrants sending remittances (or the number of migrants being sent remittances). Information about the amount of remittances was collected in broad categories to reduce recall bias. The categories are: 1-1,000 baht<sup>36</sup>, 1,001-3,000 baht, 3,001-5,000 baht, 5,001-10,000 baht, 10,000-20,000 baht, and over 20,000 baht).

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<sup>36</sup> The baht is the Thai unit of currency; in 1994 one US dollar was approximately equal to 25 baht.

Following earlier work in Nang Rong (Entwisle and Tong 2005, Hull 2005) I develop an estimate of the amount of money remitted by using the midpoint of each category, except for the highest category, for which I use the lower bound. The overall estimate was obtained by weighting the number of remitters sending each amount by the midpoint of the category. Top-coding the highest category produces error because the true value of this category is underestimated. To test the robustness of this measure, I also include other measures of remittance, including the number of migrant-to-household remitters (and the number of household-to-migrant remittance occasions).

Greater amounts of migrant-to-household remittances as well as larger numbers of remitting migrants are expected to alleviate credit constraints which make it possible for families to afford housing units, permitting household splitting. Household-to-migrant remittances are included mainly as a control variable measuring the households' cash flow. Since remittance by women is thought to be related to altruistic motivations, following work by Entwisle and Tong (2005) I also include separate counts by gender of the number of migrant-to-household remitters. This should help illuminate the motivations for sending remittances.

Table 4.2 contains descriptive statistics on all independent variables. The table shows that the amount of migrant-to-household remittance ranged from zero to 100,000 baht with a mean of over 4,000 baht (\$160). The amount of household-to-migrant remittance was considerably lower, which is consistent with work by VanWey (2004) who shows that this money is mainly sent to students. It ranged from zero to approximately 67,000 baht with an average of over 600 baht. The average number of remitters to the household was also slightly higher than the average number of migrants receiving remittances from the household

(compare 0.79 to 0.19). Of the number of migrants sending remittance to the household, nearly an equivalent number of women and men sent remittances on average.

The remaining variables are control variables, including individual-level measures of demographic characteristics, marital status and spouse location, variables measuring residence in an extended household, measures of household composition, and measures of household economy. I briefly describe key control variables.

Demographic characteristics include previous migration history, age, whether the respondent was a new household member in 1994, education, and occupation. Migration history comes from the life history data. Although remittance data are not available in the life history data, this would have potentially been an important variable because it may have indicated the degree to which an individual who ever migrated earned money which could be used to finance a change in residence. Such money could have been sent to the household as a form of investment, which may be used to finance an individual's own future move into an independent residence.

I attempt to capture this effect indirectly by including variables related to an individual's migration experience. In preliminary analysis I examined the zero-order correlations between household splitting and various measures of individual migration including: the number of migration episodes, and the duration of migration episodes. None of these variables had a statistically significant effect on local moves into new households or into existing households. In my final models I only include a dummy variable indicating whether the individual was ever a circular migrant. Table 4.2 shows that less than half (41 percent) of individuals had engaged in circular migration since age 13.

Whether the respondent was a new household member in 1994 is a potentially important life course variable. This variable measures whether the individual moved into the household anytime between 1984 and 1994. If Thai couples are following the traditional Thai household postnuptial residence pattern, they first move in with the brides' family, and then they start their own neolocal residence. This variable therefore should be positively associated with local moves into a new household. Table 4.2 shows that 23 percent of individuals were new household members by 1994.

Education and occupation are measured as a series of dummy variables. For education, I distinguish between those who have greater than a primary school education, only a primary school education, and less than a primary school education. Having only a primary school education is the modal category (exactly half of the respondents have this much education) with greater than primary school being the least common category (13 percent of respondents). For occupation, I distinguish between those in agricultural occupations, those who are students or unemployed, and those who are employed in non-agriculture. The large majority (84 percent) work in agriculture, probably as paddy rice farmers.

I combine marital status and spouse location into a set of indicator variables. I distinguish between those who are married and have a spouse living in the origin household or village<sup>37</sup>, married and have a spouse who is a migrant, post-married (widowed, divorced, or separated) or spouse location is unknown, and those who are never married. Marriage marks an important life course event, and is likely to be a strong predictor of residential changes in the direction of either starting a new independent household or of moving in with the bride's family. Table 4.2 shows that about half (48 percent) of the sample are married and have a

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<sup>37</sup> Individuals who have a spouse living in another household in the same village are rare. Rather than deleting them from the sample, I combined them with individuals who have a spouse living in the origin household.

spouse living in the household or village. The next most common category is not currently married (41 percent).

Co-residence variables include measures of whether an individual lives in a vertically extended household (including three generations of family members: grandparents, parents, and children) prior to residential change. I include dummy variables for whether an individual was co-residing with both parents, just the father, or just the mother. I include parents-in-law as well as biological parents. If residential moves are occurring from vertically extended households to nuclear households, then co-residence with parents should be positively related to residential changes. From Table 4.2, it can be seen that living with both parents was the most common residential arrangement in 1994 (59 percent of the sample). Living with neither parent was just as common as living with just the mother (each account for 18 percent of the sample).

Co-residence with one's children is also related to life course events. Individuals generally live with more children after starting their own independent residence. I include a count of the number of children (of the people in my sample) living in a household. I expect that the number of children should be negatively related to residential moves, because those who have already started their own independent household are more likely to be living with larger numbers of children than those who are just beginning the family-building process. The number of children ranges from zero to six, with an average of just under one child.

Household crowding may be an important impetus for moving out of a household. Although data on the size of a dwelling unit, the number of rooms, or subjective measures of crowding or lack of privacy are not available, I try to proxy crowding indirectly by examining the effect of household composition. Household composition variables include



counts of the number of unmarried household members age 13-60 and the number of subfamilies (married couples) living in the household. It is likely that single individuals and subfamilies have different space requirements, which may contribute to crowding. Edwards et al. (1994) argue that married couples require less space than single adults, so I expect the number of subfamilies to be more related to household splits.

Since there are a number of other ways in which households can generate income in addition to remittances, I control for measures of household economy. Among these I include household debt, participation in cottage industries (cloth weaving, silk weaving and silk worm raising), charcoal production, cassava planting, an index of household wealth, and the amount of land owned.

As direct data on household wealth are not available, 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. This index uses 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 third will be considered to be at the “bottom,” those in the 34<sup>th</sup> to 79<sup>th</sup> percentiles will be considered “middle,” and the highest fifth will be considered to be at the “top.”

A disproportionate share of households in the various wealth categories results because of differences between the population of households used in the construction of the index and the sample used for the present analysis. In calculating household wealth, I used all households from all sample villages, while my analytical sample only uses households with individuals in the age range 18 – 35 who are residing in the village. Table 4.2 shows that 22 percent of the analysis sample households are in the top quintile of household wealth, while 39 percent of analysis sample households are in the bottom wealth category, and another 39 percent are in the middle category.

To account for sources of social support and aid coming from outside the household, I also control for the number of direct sibling connections between the household and other households in the village. Variables for the sibling network were constructed from survey items in which respondents age 18–35, who reside in the household, were asked to provide the names and addresses of living siblings residing in other households in the village.

## **Results**

Before describing results of the regression analysis, I present descriptive statistics on household characteristics for local movers. I compare the characteristics of the movers' household in 1994 (before the residential change) to household characteristics in 2000 (after the residential move). Results generally support the expectation that residential changes involve moves from relatively large, vertically extended households, to smaller, nuclear households.

Figure 4.1 shows the change in household size between the 1994 and 2000 household. Local movers tend to be living in smaller households after their residential change. Most of these households contain four or fewer people, which may suggest a couple is living with

their children. Before their move, most of these individuals were living in larger households of around five to seven people.

Table 4.3 shows a bivariate table of co-residence with elder parents (including in-laws) for local movers in 1994 by co-residence status in 2000. The general pattern is clear: regardless of whether an individual lived with both parents, only their father, or only their mother in 1994 (before residential change), overwhelmingly the individual does not share a residence with either parent in 2000 (after the residential change). This suggests that local movers are moving out of their natal home (or their spouse's natal home) and into an independent nuclear household.

More support for the notion that local movers are starting independent nuclear households comes from data on marriage and co-residence with spouse. In 1994 (before the residential change) over a quarter (26 percent) of local movers were not married. By 2000 (after the residential change) only a minority remained unmarried (1.72 percent). Bivariate analysis confirms that most unmarried local movers in 1994 were no longer single in 2000. Local movers were more likely to co-reside with their spouses after the residential change. In 1994, under two-thirds (60 percent) of local movers were co-residing with their spouse. After a change in residence, almost all (approximately 90 percent) were doing so.

The data also suggest that local movers are co-residing with more children after their residential change compared to before the change (see Figure 4.2). In 1994, almost half were co-residing with no children, and most of the rest only one or two children. In 2000, just under ten percent were co-residing with no children, and the majority between one and two children. It is likely that residential changes are associated with the family-building stage of

the life course. Local movers are starting new independent households around the time that they are having children.

Descriptive results support the notion that a local move ending in existing households corresponds to a different stage of the Thai household life cycle than a move into a new household. A move into an existing household may correspond with the initial co-residence between a couple and the bride's household just following marriage. A move into a new household may correspond with a couple's decision to move into a neolocal household, which is the next stage of the Thai household life cycle.

Table 4.4 shows descriptive statistics for all independent variables presented separately for local movers who moved into a new household and for those who moved into an existing household. Several differences across these two groups are worth noting. First, individuals moving into new households were far more likely to be new household members in the 1994 survey (compare 34 versus 7 percent). This suggests that before their residential change, individuals who eventually moved into a new household were more likely to have made a prior move into an existing household sometime between 1984 and 1994. This is consistent with expectations of the Thai household life cycle.

Second, the effect of marital status is worth noting. Of those who moved into an existing household, 91 percent were not married before their move, compared to only 21 percent of those who moved into a new household. This again points to different stages of the Thai household life cycle. Those who moved into an existing household were on the verge of the initial stage of the household life cycle. Most probably got married and moved in with the bride's household in the course of their residential change. Indeed, moving into the bride's family was a considerably more popular choice than moving in with the husband's family:

the former arrangement was found in about 70 percent of cases, while the latter in only 13 percent of cases. Many of those who move into a new household are already married, and probably will start a new independent household upon moving. This is consistent with a later stage of the Thai household life cycle.

Those who are moving into a new household have a higher mean number of children than those are moving into an existing household. This suggests that the latter are in a more advanced stage of family-building than the former. Those moving into existing households are more likely to be male, as the following text table illustrates:

Sex	Did not Move	Moved into New Household	Moved into Existing Household	Migrated Out of Village	Total
Female	59.13	57.16	22.39	41.38	52.59
Male	40.87	42.84	77.61	58.62	47.41
Total	100.00 N=2552	100.00 N=691	100.00 N=67	100.00 N=1591	100.00 N=4900

This is consistent with matrilocal postnuptial residence customs in Thailand. Those moving into new households are less likely to be males, because these moves probably involve men moving with their spouses.

The effect of age is also worthy of comment. Although age differences in Table 4.4 appear to be three years, a look at the age distribution of both these groups (see Figure 4.3), shows that those moving into existing households are younger. Their age distribution is skewed toward late adolescence, particularly ages 19 and 21. This is also consistent with the notion that this group is in an earlier stage in their life course.

Turning to the results of the regression analysis, there is broad support for a remittance effect as well as a household life cycle explanation. I estimate three separate models each containing different remittance variables. The first model (see Table 4.5) shows that the

amount of migrant-to-household remittance is positively and significantly associated with a move into a new household. This is consistent with the idea that remittances alleviate capital constraints which may make it easier for individuals to finance residential moves.

It is noteworthy that the remittance effect is not significant for moves into existing households. This suggests that remittance money is particularly vital for couples moving into new independent households rather than newlyweds initially moving in with the bride's family. This is reasonable, given that couples starting their own household most likely need money for housing, while those moving in with the bride's family do not.

The second model (see Table 4.6) shows that the number of remitting migrants is also positively associated with moves into new households. This suggests that these results are robust to different remittance variable specifications. The third model (see Table 4.7) adds information on gender specific migrant-to-household remittances. Results show that moves into new households are associated with remittances from females, but not from males. As the number of female remitters increases, so does the likelihood of moving into a new household. Given arguments that female remittances in Thailand are more likely to be motivated by altruistic motivations relative to male remittances (Osaki 2003, VanWey 2004), this finding lends support to an altruist model of remittance and household splitting.

Interestingly, the amount of household-to-migrant remittances is also positively related to residential moves into new households in the first model in Table 4.5. This may suggest that households with sufficient cash flow can afford to finance household splits and still send money to migrants. It is also noteworthy that the effect of ever being a circular migrant is not significant. Those who have ever migrated may have done so for a short time period to work in the paid labor force. They may have earned enough money to finance their own residential

move. Unfortunately, direct data on wages and remittance during a circular migration spell are not available.

Researchers studying the effect of remittances (Entwisle and Tong 2005, Taylor 1999) point out that the impacts of migration and remittances should be assessed relative to what origin household's circumstances would look like without migration. Individuals and households select themselves into and out of migration through an endogenous process (Taylor 1999). Selectivities in whether households send migrants, and whether migrants remit, can confound inferences, especially when analysis is based on cross-sectional data (Entwisle and Tong 2005).

Several studies in Thailand have found that migrants are more likely to come from and remit to poorer households (Guest 1998, Osaki 2003, Richter et al. 1997, VanWey 2004). If baseline differences between households who send migrants and those who do not send migrants exist, the effects of remittance will be overstated (Entwisle and Tong 2005). I attempt to evaluate the whether baseline differences in household wealth are related to receipt of remittances.

I construct another index of household wealth using principal components analysis on available data from 1984 (which is an indication of initial wealth before migration occurred). To construct the index I use the following measures: the number of consumer and productive assets owned by the household (including televisions, refrigerators, water pumps, itans, pick-ups/trucks, motorcycles), whether the household cooks with electricity or gas versus some other form of energy, the type of dwelling unit owned by the household (either a hut, a single-story dwelling, or one of the following: a wood house on stilts with concrete

foundation, a brick house, a two story house), and the amount of land owned by the household.

I use a series of simple linear regressions to relate household wealth in 1984 to 1994 migrant-to-household remittance measures (including the number of remitters and the total amount of remitters). Results (*not shown*) indicate that the 1984 wealth index is not significantly related to receipt of remittances in 1994. This suggests that the remittance effect is not overstated because of initial differences in wealth between households that existed prior to migration.

Results of the remaining variables agree with descriptive statistics and support a household life cycle or life course interpretation. Age is negatively related to a move into a new household. However, this also is not a consistent effect across models and is probably due to chance. All categories of married individuals are more likely to move into a new household compared to single individuals. This is consistent with the second stage of the Thai household life cycle, in which marriage and movement into the bride's household precede the start of an independent nuclear household. The magnitude of these effects is considerable, ranging from over five to over eight times the odds of single migrants moving into a new household.

Having both parents in the household increases the odds that an individual will move into an existing household. This is consistent with descriptive results, which reveal that local movers are leaving large extended households and are moving into smaller nuclear households. The effect is also quite strong. Compared to those who were not co-residing with either parent, the odds of moving into a new household for those co-residing with both parents are 1.27 times higher (or 2.27 times as high).



The effect of the number of children is also consistent with expectations: it is negatively related to moves into new households. Those with a larger number of children have probably already started their own independent nuclear household, while those with a few children are just on the verge of the family-building stage of the life course.

The number of unmarried household members and the number of subfamilies both have positive effects on movement into new households. These effects do little to help evaluate the effect of household crowding. However, for movement into an existing household, the number of unmarried household members is the only significant effect. As this number increases, so does the odds of moving into an existing household. This is consistent with the literature on household crowding in Thailand (Edwards et al. 1994), which argues that single individuals take up more space than married couples. The effect of the number of subfamilies on movement into new households is also consistent with the Thai household life cycle, which suggests that the movement of the next daughter and her husband perpetuates the move of any couples that are already living with the bride's household.

Other variables that predict moves into existing households include the effect of gender. Males are more likely to move into an existing household compared to females. The odds of males moving are three times higher than the odds of females moving. This effect agrees with descriptive statistics and with matrilocal postnuptial residence customs which proscribe that men should move in with the bride's household during the initial stages of the household lifecycle.

Another consistent finding is that married individuals whose spouse lives in the household or village are less likely to move into an existing household. This too is consistent with descriptive statistics and the idea that moving into an existing household corresponds with

the initial stage of the household life cycle just following marriage. Those who are already married probably have already gone through this stage and hence are less likely to do so in comparison to those who are unmarried.

## **Discussion and Conclusion**

In this paper I examine the determinants of household splitting in Thailand, a developing country experiencing the shift to an urban industrial economy. I go beyond earlier work by linking the process of residential change to a household's receipt of migrant remittances. Remittances sent from migrants to households are found to be a significant determinant of household splits, perhaps because they help alleviate credit constraints on necessary preconditions to residential change, such as house building. This may be related to the migrants sending of remittances in response to family needs, to maintaining or improving the lifestyle of those in the origin household.

Gender differences in remittance sending behavior suggest that remittances sent altruistically are perpetuating moves, particularly those associated with later stages of the Thai household life cycle. It is likely that households behave like corporate units and allocate remittances across family members. While a portion of remittance money could be spend on recurrent costs, perhaps some of the money goes to financing the movement of couples out of vertically extended households, into independent nuclear households.

The receipt of remittances may be related more generally to rising standards of living within Nang Rong. Migrants may contribute not only to changing material circumstances but also to changes in preferences for smaller families and more privacy. Migration experiences away from home increase the autonomy of youth, who, through visits or other contacts, may inspire changes in the aspirations of those left behind. Without direct data on attitudes, this is

difficult to determine. Although migration and remittances may be contributing to some changes in the district, there is little evidence that the traditional Thai household life cycle has been affected. The analysis is consistent with the Thai household life cycle, in which couples move in with the bride's household in the initial stage of the cycle. In a later stage they start their own independent household.

Further research could focus more attention on the relationship between remittances and housing improvements. Work by Rindfuss et al. (2006) has found that migrant remittances are positively associated with housing quality, which may suggest that remittances are being used to finance housing improvements and construction projects. For further analysis, more detailed data is needed to link the intervening mechanism between remittance transfers, housing projects, and household formation processes.

Table 4.1. Frequency Distributions of Change in Residence Between 1994 and 2000 for People Age 18 - 35

Variable	Category	Description	Frequency	Percent
Change in Residence between 1994 and 2000				
	0	No Change in Household	2552	52.08
	1	Moved into a New Household	691	14.10
	2	Moved into an Existing Household	67	1.37
	3	Migrated Out of the Village	1590	32.45
	Totals		4900	100.00

Table 4.2. Descriptive Statistics of Independent Variables for People Age 18 - 35 Living in Nang Rong in 1994

Variable	Min	Max	Mean	StdDev
<i>Migrant-to-Household Remittances</i>				
Total Amount of Money Remitted to Household from Migrants (in 1,000 Baht)	0	100	4.11	7.77
Total Amount of Money Remitted by Household to Migrants (in 1,000 Baht)	0	67.5	0.61	2.98
Total Number Migrants Remitting to Household	0	8	0.79	1.11
Total Number Male Migrants Remitting to Household	0	5	0.40	0.71
Total Number of Female Migrants Remitting to Household	0	6	0.39	0.73
Total Number of Migrants Receiving Remittance From Household	0	7	0.19	0.56
<i>Demographic Characteristics</i>				
Ego has Ever Been a Circular Migrant (Ego has Never Been a Circular Migrant)	0	1	0.41	0.49
Age	18	35	25.48	5.11
Ego is Male (Ego is Female)	0	1	0.47	0.50
Ego Was a New Household Member in 1994 (Ego Was Not a New Household Member in 1994)	0	1	0.23	0.42
Less than Primary Education Greater than Primary Education (Only Primary School Education)	0	1	0.37	0.48
Ego Works in Agricultural Occupation Ego is a Student or is Unemployed (Ego Works in a Non-Agricultural Occupation)	0	1	0.13	0.34
Marital Status / Spouse Location	0	1	0.50	0.50
Married, Spouse Lives in the Household or Village Married, Spouse is a Migrant Post-Married or Spouse Location is Unknown (Ego is Not Currently Married)	0	1	0.84	0.37
	0	1	0.05	0.21
	0	1	0.11	0.32
	0	1	0.48	0.50
	0	1	0.07	0.26
	0	1	0.04	0.19
	0	1	0.41	0.49

Table 4.2 (Continued)

<i>Parent (or In-Law) Location</i>					
Both Parents Live in Household	0	1	0.59	0.49	
Only Mother Lives in Household	0	1	0.18	0.38	
Only Father Lives in Household	0	1	0.05	0.22	
(Neither Parent Lives in Household)	0	1	0.18	0.39	
<i>Ego's Children</i>					
Number of Children Living in the Home Household	0	6	0.76	0.99	
<i>Household Composition</i>					
Number of Unmarried Household Members Aged 13 - 60	0	7	1.49	1.33	
Number of Sub-Families	0	3	0.27	0.49	
<i>Household Economy</i>					
Total Amount of Debt Owed by Household (in 1,000 Baht)	0	817	17.23	45.73	
Household Is Involved in Cottage Industry (Silk or Cloth Weaving or Silk Worm Raising)	0	1	0.22	0.41	
(Household is not involved in Cottage Industry)					
Household Is Involved in Charcoal Production	0	1	0.63	0.48	
(Household is not involved in Charcoal Production)					
Household Plants Cassava	0	1	0.16	0.37	
(Household Does not Plant Cassava)					
Top 20th Percentile of Wealth Distribution	0	1	0.22	0.41	
Bottom 33th Percentile of Wealth Distribution	0	1	0.39	0.49	
(Middle 34 - 79th Percentile of Wealth Distribution)	0	1	0.39	0.49	
Amount of Land Owned (in $W_a^2$ / 1,000)	0	100	10.63	10.35	
Number of Direct Household Connections in the Sibling Network	0	11	1.57	1.82	
N	4900				

Table 4.3. Cross-Tabulation of Co-residence with Parents for Adult Child Local Movers in Nang Rong 1994-2000

Co-Residence with Parents in 2000	Co-Residence with Parents in 1994				Total
	Both Parents	Only Father	Only Mother	Neither Parent	
Both Parents	0.37	2.94	0.00	4.11	0.79
Only Father	0.00	0.00	0.00	0.00	0.00
Only Mother	1.30	0.00	2.70	0.00	1.32
Neither Parent	98.33	97.06	97.30	95.89	97.89
Total	100.00	100.00	100.00	100.00	100.00
N	540	34	111	73	758

Table 4.4. Descriptive Statistics for Local Movers Age 18 - 35 Living in Nang Rong in 1994

Variable	Moved into a New Household		Moved into an Existing Household	
	Mean	StdDev	Mean	StdDev
<i>Migrant to Household Remittances</i>				
Total Amount of Money Remitted to Household from Migrants (in 1,000 Baht)	5.16	8.94	3.31	5.37
Total Amount of Money Remitted by Household to Migrants (in 1,000 Baht)	0.78	3.29	0.68	2.75
Total Number Migrants Remitting to Household	0.97	1.30	0.87	1.04
Total Number Male Migrants Remitting to Household	0.42	0.70	0.43	0.74
Total Number of Female Migrants Remitting to Household	0.55	0.85	0.43	0.68
Total Number of Migrants Receiving Remittance From Household	0.19	0.53	0.16	0.48
<i>Demographic Characteristics</i>				
Ego has Ever Been a Circular Migrant	0.39	0.49	0.36	0.48
(Ego has Never Been a Circular Migrant)				
Age	25.61	4.41	22.67	4.47
Ego is Male	0.43	0.50	0.78	0.42
(Ego is Female)				
Ego Was a New Household Member in 1994	0.34	0.47	0.07	0.26
(Ego Was Not a New Household Member in 1994)				
Less than Primary Education	0.36	0.48	0.22	0.42
Greater than Primary Education	0.09	0.29	0.09	0.29
(Only Primary School Education)	0.55	0.50	0.69	0.47
Ego Works in Agricultural Occupation	0.90	0.30	0.85	0.36
Ego is a Student or is Unemployed	0.01	0.11	0.04	0.21
(Ego Works in a Non-Agricultural Occupation)	0.09	0.28	0.10	0.31
<i>Marital Status / Spouse Location</i>				
Married, Spouse Lives in the Household or Village	0.66	0.47	0.04	0.21
Married, Spouse is a Migrant	0.09	0.28	0.03	0.17
Post-Married or Spouse Location is Unknown	0.05	0.21	0.01	0.12
(Ego is Not Currently Married)	0.21	0.40	0.91	0.29



Table 4.4 (Continued)

<i>Parent (or In-Law) Location</i>					
Both Parents Live in Household	0.72	0.45	0.67	0.47	
Only Mother Lives in Household	0.15	0.35	0.13	0.34	
Only Father Lives in Household	0.04	0.20	0.09	0.29	
Neither Parent Lives in Household	0.10	0.29	0.10	0.31	
<i>Ego's Children</i>					
Number of Children Living in the Home Household	0.75	0.77	0.12	0.48	
<i>Household Composition</i>					
Number of Unmarried Household Members Aged 13 - 60	1.52	1.32	2.45	1.37	
Number of Sub-Families	0.42	0.59	0.27	0.51	
<i>Household Economy</i>					
Total Amount of Debt Owed by Household (in 1,000 Baht)	15.59	39.91	13.32	33.41	
Household Is Involved in Cottage Industry (Silk or Cloth Weaving or Silk Worm Raising)	0.24	0.43	0.21	0.41	
(Household is not involved in Cottage Industry)					
Household Is Involved in Charcoal Production	0.69	0.46	0.63	0.49	
(Household is not involved in Charcoal Production)					
Household Plants Cassava	0.20	0.40	0.16	0.37	
(Household Does not Plant Cassava)					
Top 20th Percentile of Wealth Distribution	0.27	0.44	0.21	0.41	
Bottom 35th Percentile of Wealth Distribution	0.34	0.48	0.45	0.50	
(Middle 34 - 79th Percentile of Wealth Distribution)	0.39	0.49	0.34	0.48	
Amount of Land Owned (in $W_{A^2}$ / 1,000)	12.35	11.32	11.48	9.88	
Number of Direct Household Connections in the Sibling Network	1.60	1.63	1.13	1.51	
N	691			67	

Table 4.5. Multinomial Logit Estimates For Change in Residence Between 1994-2000 for People Age 18-35 living in Nang Rong in 1994; Effect of Total Amount of Remittance

V variable	Moved into a New Household / Did Not Move			Moved into an Existing Household / Did Not Move			Migrated Out of the Village / Did Not Move		
	Coeff	StdErr	Odds Ratio	Coeff	StdErr	Odds Ratio	Coeff	StdErr	Odds Ratio
Intercept	-3.48***	0.50	0.03	-2.23	1.16	0.11	1.55***	0.32	4.70
<i>Migrant-to-Household Remittances</i>									
Total Amount of Money Remitted to Household from Migrants (in 1,000 Baht)	0.03***	0.01	1.03	-0.01	0.02	0.99	0.03***	0.01	1.03
Total Amount of Money Remitted by Household to Migrants (in 1,000 Baht)	0.03*	0.02	1.03	0.02	0.04	1.02	0.01	0.01	1.01
<i>Demographic Characteristics</i>									
Ego has Ever Been a Circular Migrant	0.19	0.10	1.21	-0.20	0.27	0.82	0.55***	0.07	1.74
(Ego has Never Been a Circular Migrant)									
Age	-0.03*	0.02	0.97	-0.07	0.04	0.93	-0.11***	0.01	0.90
Ego is Male	-0.04	0.09	0.96	1.39***	0.32	4.02	0.61***	0.07	1.84
(Ego is Female)									
Ego Was a New Household Member in 1994	-0.07	0.13	0.93	0.26	0.52	1.30	0.09	0.10	1.10
(Ego Was Not a New Household Member in 1994)									
Less than Primary Education	0.09	0.14	1.10	0.15	0.38	1.16	0.08	0.10	1.09
Greater than Primary Education	-0.15	0.18	0.86	-0.48	0.51	0.62	0.31*	0.13	1.36
(Only Primary School Education)									
Ego Works in Agricultural Occupation	0.02	0.19	1.02	-0.15	0.43	0.86	-0.38**	0.12	0.69
Ego is a Student or is Unemployed	-0.62	0.42	0.54	-0.45	0.80	0.64	-0.16	0.19	0.85
(Ego Works in a Non-Agricultural Occupation)									
<i>Marital Status / Spouse Location</i>									
Married, Spouse Lives in the Household or Village	2.21***	0.19	9.12	-3.2*	1.32	0.04	0.09	0.14	1.10
Married, Spouse is a Migrant	2.16***	0.22	8.68	-0.78	0.58	0.46	0.81***	0.17	2.24
Post-Married or Spouse Location is Unknown	1.87***	0.29	6.48	-1.15	1.14	0.32	0.75***	0.22	2.11
(Ego is Not Currently Married)									

Table 4.5 (Continued)

<i>Parent (or In-Law) Location</i>										
Both Parents Live in Household	0.82***	0.20	2.27	-0.31	0.46	0.73	-0.09	0.13	0.91	
Only Mother Lives in Household	0.21	0.23	1.23	-0.50	0.57	0.60	-0.17	0.14	0.84	
Only Father Lives in Household	0.23	0.31	1.26	0.23	0.59	1.26	-0.48*	0.21	0.62	
(Neither Parent Lives in Household)										
<i>Ego's Children</i>										
Number of Children Living in the Home Household	-0.34***	0.08	0.71	0.24	0.44	1.27	-0.10	0.07	0.91	
<i>Household Composition</i>										
Number of Unmarried Household Members Aged 13 - 60	0.47***	0.05	1.60	0.24*	0.11	1.27	0.22***	0.04	1.24	
Number of Sub-Families	0.68***	0.12	1.97	0.43	0.28	1.53	0.56***	0.08	1.75	
<i>Household Economy</i>										
Total Amount of Debt Owed by Household (in 1,000 Baht)	-0.001	0.002	1.00	-0.003	0.004	1.00	-0.0002	0.001	1.00	
Households Involved in Cottage Industry (Silk or Cloth Weaving or Silk Worm Raising)	-0.12	0.14	0.89	-0.02	0.32	0.98	-0.11	0.10	0.89	
(Household is not involved in Cottage Industry)										
Households Involved in Charcoal Production	0.12	0.12	1.13	-0.07	0.26	0.93	-0.19*	0.08	0.83	
(Household is not involved in Charcoal Production)										
Household Plants Cassava	0.02	0.15	1.02	-0.20	0.38	0.82	-0.10	0.11	0.91	
(Household Does not Plant Cassava)										
Top 20th Percentile of Wealth Distribution	-0.07	0.13	0.93	0.29	0.29	1.34	0.12	0.09	1.13	
Bottom 33th Percentile of Wealth Distribution	0.08	0.15	1.09	-0.003	0.36	1.00	-0.10	0.10	0.91	
(Middle 34 - 79th Percentile of Wealth Distribution)										
Amount of Land Owned (in Wa <sup>2</sup> / 1,000)	0.01	0.01	1.01	0.01	0.01	1.01	0.003	0.004	1.00	
Number of Direct Household Connections in the Sibling Network	-0.002	0.03	1.00	-0.03	0.09	0.97	-0.09***	0.03	0.91	
N					4900					
LL					-4391.05					

\* p &lt; .05 \*\* p &lt; .01 \*\*\* p &lt; .001 (Two-Tailed Test)

1 Standard Errors Have Been Corrected For Clustering Using Huber/White Correction

Table 4.6. Multinomial Logit Estimates For Change in Residence Between 1994-2000 for People Age 18-35 living in Nang Rong in 1994; Effect of Total Number of Remitters<sup>1</sup>

Variable	Moved into a New Household / Did Not Move			Moved into an Existing Household / Did Not Move			Migrated Out of the Village / Did Not Move		
	Coeff	StdErr	Odds Ratio	Coeff	StdErr	Odds Ratio	Coeff	StdErr	Odds Ratio
Intercept	-3.64***	0.51	0.03	-2.21	1.17	0.11	1.44***	0.32	4.22
<i>Migrant-to-Household Remittances</i>									
Total Number Migrants Remitting to Household	0.26***	0.05	1.30	0.15	0.11	1.16	0.17***	0.04	1.19
Total Number of Migrants Receiving Remittance From Household	-0.01	0.11	0.99	-0.21	0.25	0.81	0.07	0.07	1.07
<i>Demographic Characteristics</i>									
Ego has Ever Been a Circular Migrant	0.18	0.10	1.20	-0.20	0.27	0.82	0.55***	0.07	1.74
(Ego has Never Been a Circular Migrant)									
Age	-0.03	0.02	0.97	-0.08	0.04	0.93	-0.1***	0.01	0.90
Ego is Male	-0.03	0.09	0.97	1.4***	0.32	4.04	0.61***	0.07	1.84
(Ego is Female)									
Ego Was a New Household Member in 1994	-0.09	0.126	0.912	0.22	0.522	1.247	0.08	0.101	1.081
(Ego Was Not a New Household Member in 1994)									
Less than Primary Education	0.06	0.14	1.07	0.16	0.38	1.17	0.06	0.10	1.07
Greater than Primary Education	-0.10	0.18	0.90	-0.47	0.51	0.63	0.34**	0.13	1.41
(Only Primary School Education)									
Ego Works in Agricultural Occupation	0.02	0.19	1.02	-0.16	0.43	0.85	-0.37**	0.12	0.69
Ego is a Student or is Unemployed	-0.60	0.42	0.55	-0.43	0.80	0.65	-0.14	0.19	0.87
(Ego Works in a Non-Agricultural Occupation)									
<i>Marital Status / Spouse Location</i>									
Married, Spouse Lives in the Household or Village	2.24***	0.19	9.35	-3.1*	1.29	0.04	0.11	0.15	1.12
Married, Spouse is a Migrant	2.18***	0.22	8.81	-0.77	0.58	0.46	0.82***	0.17	2.26
Post-Married or Spouse Location is Unknown	1.85***	0.29	6.37	-1.15	1.14	0.32	0.74***	0.22	2.09
(Ego is Not Currently Married)									



Table 4.7. Multinomial Logit Estimates For Change in Residence Between 1994-2000 for People Age 18-35 living in Nang Rong in 1994: Effect of Gender-Specific Number of Remitters<sup>1</sup>

Variable	Moved into a New Household / Did Not Move				Moved into an Existing Household / Did Not Move				Migrated Out of the Village / Did Not Move			
	Coeff	StdErr	Odds Ratio		Coeff	StdErr	Odds Ratio		Coeff	StdErr	Odds Ratio	
Intercept	-3.61***	0.51	0.03		-2.21	1.17	0.11		1.45***	0.32	4.27	
<i>Migrant-to-Household Remittances</i>												
Total Number Male Migrants Remitting to Household	0.10	0.08	1.10		0.10	0.18	1.10		0.10	0.06	1.11	
Total Number of Female Migrants Remitting to Household	0.4***	0.08	1.49		0.20	0.17	1.22		0.24***	0.06	1.28	
Total Number of Migrants Receiving Remittance From Household	0.01	0.11	1.01		-0.20	0.25	0.82		0.08	0.07	1.08	
<i>Demographic Characteristics</i>												
Ego has Ever Been a Circular Migrant	0.18	0.10	1.19		-0.20	0.27	0.82		0.55***	0.07	1.74	
(Ego has Never Been a Circular Migrant)												
Age	-0.03	0.02	0.97		-0.08	0.04	0.93		-0.11***	0.01	0.90	
Ego is Male	-0.04	0.09	0.96		1.4***	0.32	4.04		0.61***	0.07	1.84	
(Ego is Female)												
Ego Was a New Household Member in 1994	-0.08	0.13	0.92		0.22	0.52	1.25		0.08	0.10	1.09	
(Ego Was Not a New Household Member in 1994)												
Less than Primary Education	0.07	0.14	1.08		0.16	0.38	1.17		0.07	0.10	1.07	
Greater than Primary Education	-0.12	0.18	0.89		-0.47	0.51	0.62		0.34***	0.13	1.40	
(Only Primary School Education)												
Ego Works in Agricultural Occupation	0.03	0.19	1.03		-0.16	0.43	0.85		-0.37**	0.12	0.69	
Ego is a Student or is Unemployed	-0.59	0.42	0.56		-0.43	0.80	0.65		-0.13	0.19	0.88	
(Ego Works in a Non-Agricultural Occupation)												
<i>Marital Status / Spouse Location</i>												
Married, Spouse Lives in the Household or Village	2.22***	0.19	9.23		-3.1*	1.29	0.05		0.11	0.15	1.11	
Married, Spouse is a Migrant	2.18***	0.22	8.87		-0.76	0.58	0.47		0.82***	0.17	2.28	
Post-Married or Spouse Location is Unknown	1.86***	0.29	6.42		-1.15	1.14	0.32		0.74***	0.22	2.09	
(Ego is Not Currently Married)												



Figure 4.1. Change in Household Size for Local Movers in Nang Rong 1994-2000

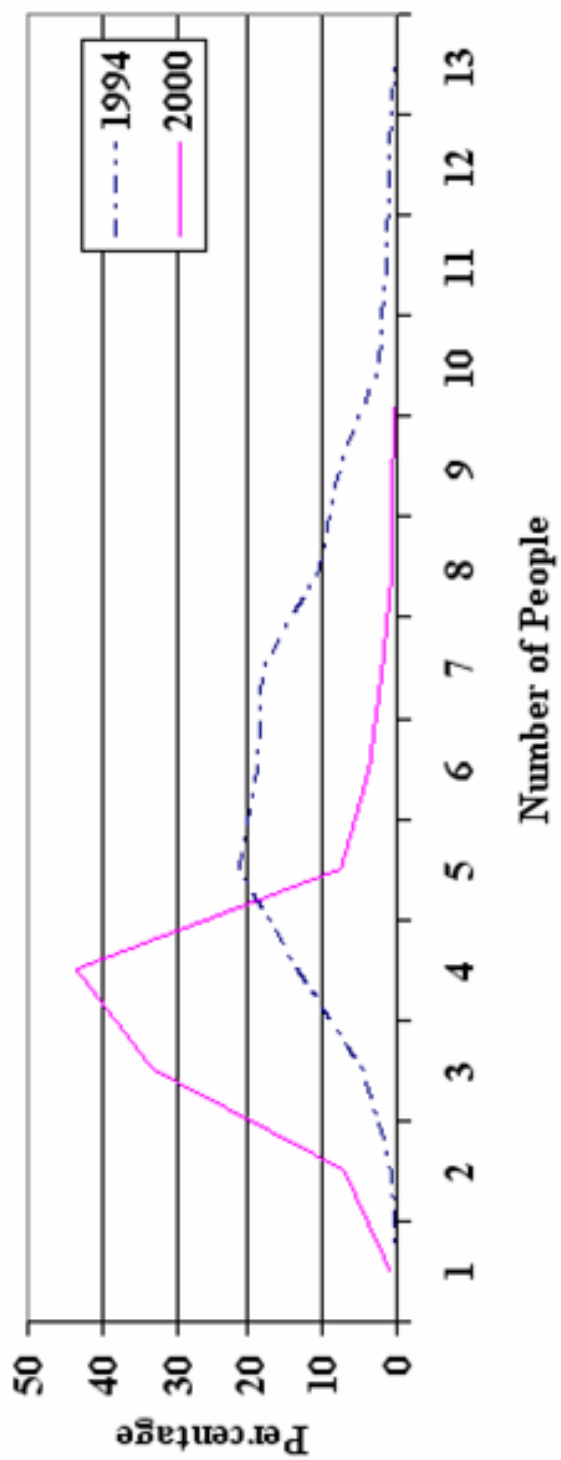




Figure 4.2. Change with Co-Residence with Number of Children for Local Movers in Nang Rong 1994-2000

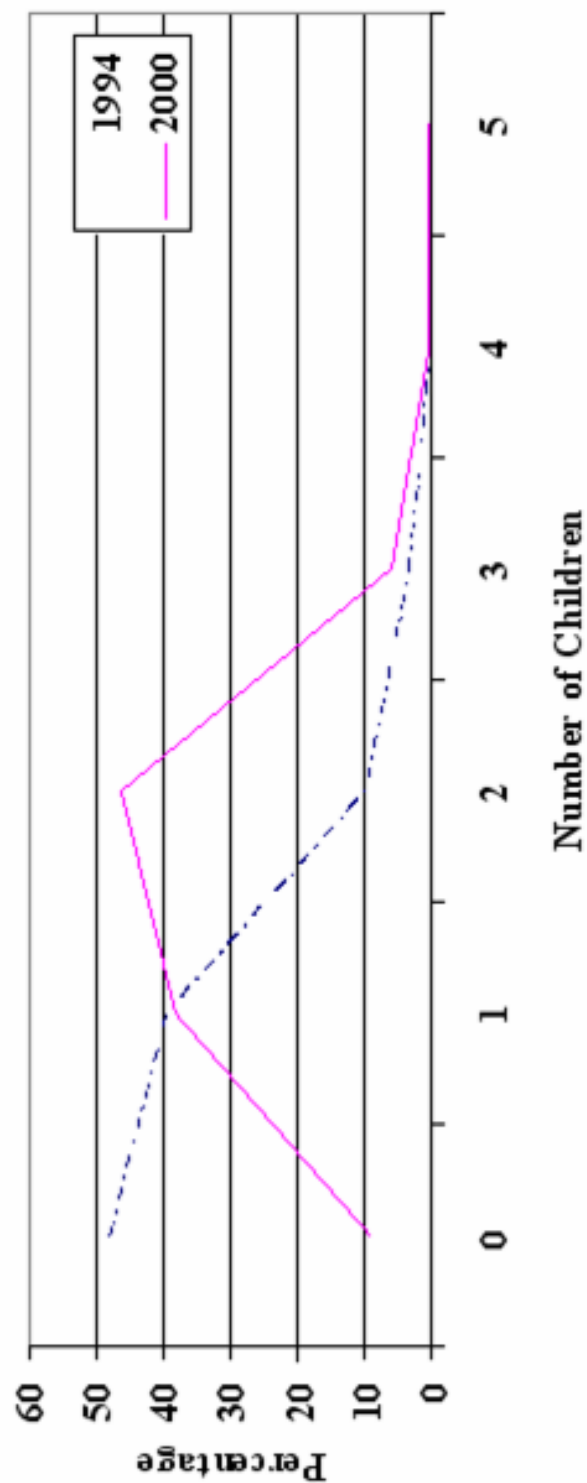
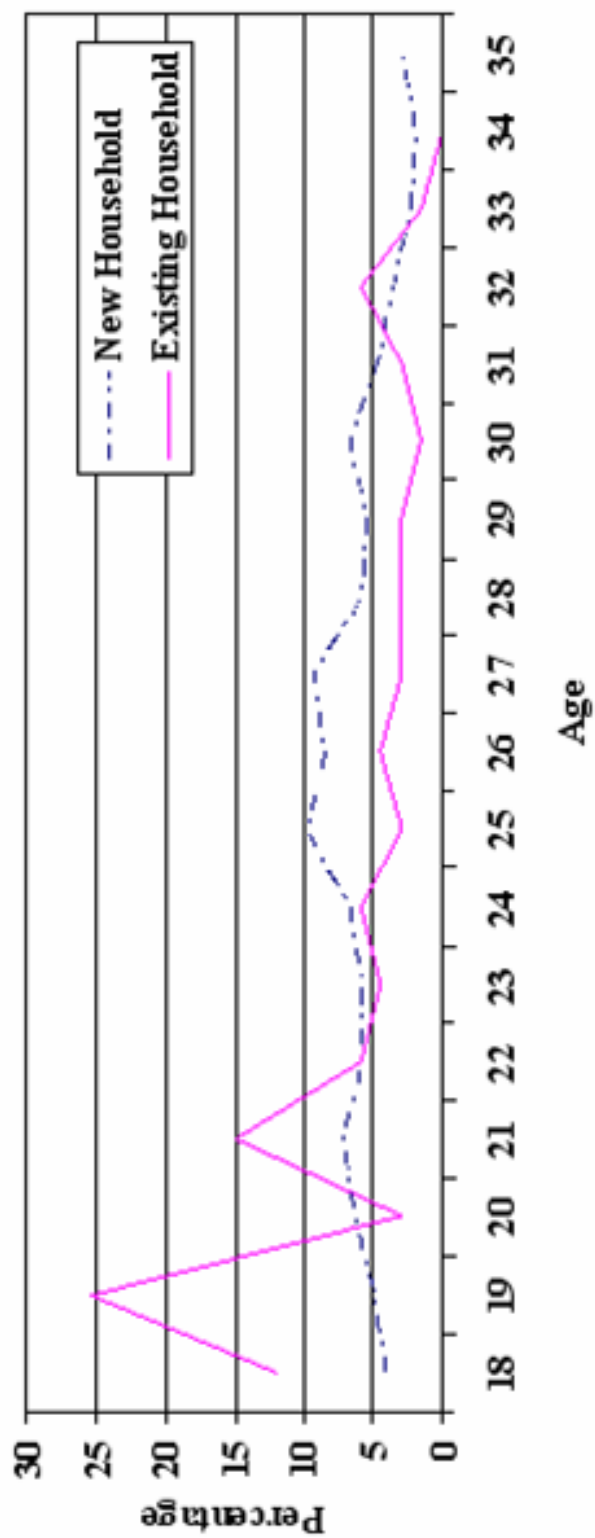


Figure 4.3. Age Differences between Local Movers Moving into New and Existing Households



# APPENDIX 1

## 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  $\mathbf{x}$  ( $x_1, x_2, \dots x_p$ ) into a one-dimensional wealth index  $z$ , using the following equation:

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

The weights ( $u_1, u_2, \dots u_p$ ) 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:

$$\begin{aligned}
 Z_1 &= u_{11}x_1 + u_{12}x_2 + \dots + u_{1p}x_p \\
 Z_2 &= u_{21}x_1 + u_{22}x_2 + \dots + u_{2p}x_p \\
 &\dots \\
 Z_p &= u_{p1}x_1 + u_{p2}x_2 + \dots + u_{pp}x_p
 \end{aligned} \tag{2}$$

or in matrix form:

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

where  $\mathbf{u}_i$  is a weight vector ( $u_{i1}, u_{i2}, \dots, u_{ip}$ ) associated with the  $i$ th principal component, which can be calculated separately for every household  $j$ . Also,  $\mathbf{x}$  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,  $\lambda_i$  (Duntelman 1989).

PCA finds a weight matrix  $\mathbf{U}$  that maximizes  $\mathbf{U}'\mathbf{R}\mathbf{U}$ , given the constraint that  $\mathbf{U}'\mathbf{U} = \mathbf{I}$ , the identity function. This method is based on a result from matrix algebra involving a  $p \times p$  symmetric, nonsingular matrix  $\mathbf{R}$ , 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 (Duntelman 1989).

As detailed in Jackson (1991), the matrix  $\lambda$  can be calculated by premultiplying and postmultiplying  $\mathbf{R}$  by a weight vector  $\mathbf{U}$  such that:

$$\mathbf{U}'\mathbf{R}\mathbf{U} = \lambda \tag{3}$$

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

$$|\mathbf{R} - \lambda \mathbf{I}| = 0 \quad (4)$$

where  $\mathbf{I}$  is the identity matrix. After solving for  $\lambda$ , one can obtain eigenvectors by finding the solution of the equations:

$$[\mathbf{R} - \lambda \mathbf{I}]\mathbf{t}_i = 0 \quad (5)$$

and

$$\mathbf{u}_i = \frac{\mathbf{t}_i}{\sqrt{\mathbf{t}_i' \mathbf{t}_i}} \quad (6)$$

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

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

$$\mathbf{U} = [\mathbf{u}_1 | \mathbf{u}_2 | \dots | \mathbf{u}_p]. \quad (7)$$

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

$$\mathbf{z} = \mathbf{U}'\mathbf{x} \quad (8)$$

where  $\mathbf{z}$  is a  $p \times p$  matrix of principal components,  $\mathbf{U}'$  is a  $p \times p$  matrix of eigenvectors and  $\mathbf{x}$  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:

$$\begin{aligned} Z_{11} &= u_{11}x_{1j} + u_{12}x_{2j} + \dots + u_{1p}x_{pj} \\ \dots & \\ Z_{1j} &= u_{11}x_{1j} + u_{12}x_{2j} + \dots + u_{1p}x_{pj} \end{aligned} \quad j = 1, \dots, J$$

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

## APPENDIX 2

### EXAMINING SAMPLE 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:

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

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

Where  $X_{ji}$  is a vector of exogenous variables,  $\beta_j$  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  $\sigma$ . 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  $\rho$ , which is the correlation between  $U_{1i}$  and  $U_{2i}$ .

When  $\rho$  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  $\rho$  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 those 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 A2.1. 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 A2.2 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 A2.2 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  $\rho$  coefficient, estimated by the Heckman model, is statistically significant. Recall that when  $\rho$  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 A2.3 show that  $\rho$  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)<sup>38</sup>. Therefore I also estimate a model that uses the full sample in order to test the robustness of my findings.

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<sup>38</sup> 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 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.

From Table A2.4, 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.

Table A2.1. Frequency Distributions of Return to Help With the Rice Harvest and Rice Growing in 1994 for

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

Table A2.2. Descriptive Statistics of Independent Variables for Migrants Age 18 - 35 in 1994

Variable	Analysis Sample			Full Sample		
	Min	Max	Mean	StdDev	Min	Max
<b>Household Assets</b>						
<i>Land</i>						
Number of NS-4/NS-3 Land Plots	0	10	1.90	1.40	0	10
Amount of NS-4/NS-3 Land (in $W\bar{A}^2 / 1000$ )	0	101	6.46	7.71	0	101
Amount of NS-2/SPEKSTP Land (in $W\bar{A}^2 / 1000$ )	0	88	2.17	6.19	0	88
<i>Household Wealth</i>						
Top 20th Percentile of Wealth Distribution	0	1	0.20	0.40	0	1
Bottom 33th Percentile of Wealth Distribution	0	1	0.41	0.49	0	1
(Middle 34 - 79th Percentile of Wealth Distribution)	0	1	0.39	0.49	0	1
<b>Migrant Human Capital Endowments</b>						
<i>Education</i>						
Less than Primary Education	0	1	0.30	0.46	0	1
Greater than Primary Education	0	1	0.17	0.38	0	1
(Only Primary School Education)	0	1	0.53	0.50	0	1
<i>Occupation</i>						
Migrant Works in an Agricultural Occupation	0	1	0.42	0.49	0	1
Migrant Works in Commerce	0	1	0.02	0.15	0	1
Migrant Works in a Government Occupation	0	1	0.05	0.22	0	1
Migrant Works in Some Other Occupation	0	1	0.05	0.23	0	1
(Migrant Works as a Laborer)	0	1	0.46	0.50	0	1
<b>Presence of Migrant's Relatives and Spouse in Home Household</b>						
<i>Migrant's Child Location</i>						
At Least One Child Lives in the Household	0	1	0.07	0.26	0	1
(No Child Lives in the Household)						
<i>Migrant's Marital Status / Spouse Location</i>						
Married, Spouse Lives in the Household or Village	0	1	0.03	0.16	0	1
Married, Spouse Lives in Same Migration Destination	0	1	0.33	0.47	0	1
Married, Spouse Lives in Different Migration Destination	0	1	0.23	0.42	0	1
Post-Married, or Spouse Location is Unknown	0	1	0.05	0.21	0	1
(Never-married)	0	1	0.48	0.50	0	1
<i>Migrant's Parent (or In-Law) Location</i>						
Both Parents Live in Household	0	1	0.67	0.47	0	1
Only Mother Lives in Household	0	1	0.16	0.36	0	1
Only Father Lives in Household	0	1	0.06	0.24	0	1
(Neither Parent Lives in Household)	0	1	0.11	0.32	0	1

Table A2.2 (Continued)

<b>Household Demographics</b>									
<i>Migrant's Sibling for In-Law Sibling's Location</i>									
Number of Siblings Living in the Household	0	7	1.40	1.18	0	7	1.28	1.16	
Additional Number of Working Age People (Age 13 - 60)	0	6	0.38	0.91	0	6	0.55	0.90	
Additional Number of Non-Working Age People	0	6	0.68	0.94	0	6	0.68	0.95	
Additional Number of Migrants	0	7	0.17	0.60	0	7	0.19	0.64	
<b>Migrant's Demographic Characteristics</b>									
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)									
<b>Selection Model Variables - Household Level</b>									
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 Paddy 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 Rice	0	46	9.98	13.65	0	46	9.93	13.55	
N			2300			2792			

Table A2.3. Bivariate Probit with Heckman Sample Selection Estimates for Migrants Age 18 - 35 in 1994

Dependent Variable: Help with the Rice Harvest Variable	Model 1		Model 2		Model 3	
	Coeff	Std. Err	Coeff	Std. Err	Coeff	Std. Err
Intercept	-0.91**	0.29	-0.8**	0.28	-0.81**	0.30
<b>Household Assets</b>						
<i>Land</i>						
Number of NS-4/NS-3 Land Plots	0.1**	0.03	-	-	-	-
Amount of NS-4/NS-3 Land (in Wa <sup>2</sup> / 1000)	-	-	0.02***	0.01	-	-
Amount of NS-2/SPK/STP Land (in Wa <sup>2</sup> / 1000)	-	-	-	-	-0.02	0.01
<i>Household Wealth</i>						
Top 20th Percentile of Wealth Distribution	0.02	0.11	0.01	0.11	0.03	0.11
Bottom 33th Percentile of Wealth Distribution (Middle 34 - 79th Percentile of Wealth Distribution)	-0.04	0.08	-0.05	0.07	-0.06	0.07
<b>Migrant Human Capital Endowments</b>						
<i>Education</i>						
Less than Primary Education	-0.04	0.12	-0.07	0.12	-0.08	0.12
Greater than Primary Education (Only Primary School Education)	-0.57***	0.13	-0.58***	0.14	-0.53***	0.13
<i>Occupation</i>						
Migrant Works in an Agricultural Occupation	0.59***	0.11	0.59***	0.11	0.59***	0.11
Migrant Works in Commerce	-0.08	0.26	-0.08	0.26	-0.08	0.26
Migrant Works in a Government Occupation	-0.07	0.24	-0.12	0.24	-0.06	0.23
Migrant Works in Some Other Occupation (Migrant Works as a Laborer)	0.01	0.20	-0.02	0.20	-0.01	0.20
<b>Presence of Migrant's Relatives and Spouse in Home Household</b>						
<i>Migrant's Child Location</i>						
At Least One Child Lives in the Household (No Child Lives in the Household)	0.39**	0.14	0.39**	0.14	0.38**	0.14
<i>Migrant's Marital Status / Spouse Location</i>						
Married, Spouse Lives in the Household or Village	0.44*	0.22	0.44	0.23	0.41	0.23
Married, Spouse Lives in Same Migration Destination	-0.10	0.09	-0.10	0.09	-0.10	0.09
Married, Spouse Lives in Different Migration Destination	-0.29**	0.11	-0.27*	0.11	-0.3**	0.11
Post-Married, or Spouse Location is Unknown (Never-married)	-0.24	0.16	-0.24	0.17	-0.27	0.16
<i>Migrant's Parent (or In-Law) Location</i>						
Both Parents Live in Household	0.28	0.18	0.27	0.18	0.33	0.18
Only Mother Lives in Household	0.38*	0.17	0.38*	0.17	0.43*	0.17
Only Father Lives in Household (Neither Parent Lives in Household)	0.17	0.18	0.17	0.18	0.23	0.17

Table A2.3 (Continued)

<b>Household Demographics</b>						
<i>Migrant's Sibling (or In-Law Sibling's) Location</i>						
Number of Siblings Living in the Household	-0.08	0.04	-0.09*	0.04	-0.09*	0.04
Additional Number of Working Age People (Age 13 - 60)	-0.13*	0.06	-0.13*	0.06	-0.13	0.07
Additional Number of Non-Working Age People	0.02	0.06	0.01	0.06	0.02	0.06
Additional Number of Migrants	-0.04	0.07	-0.03	0.07	-0.03	0.07
<b>Migrant's Demographic Characteristics</b>						
Age	-0.03**	0.01	-0.03**	0.01	-0.03*	0.01
Migrant is Male	0.002	0.07	0.01	0.08	-0.01	0.07
(Migrant is Female)						
<b>Dependent Variable: Household Grows Rice</b>						
Variable	Model 1		Model 2		Model 3	
	Coeff	Std Err	Coeff	Std Err	Coeff	Std Err
Intercept	-0.04	0.20	-0.04	0.20	-0.03	0.19
Household is Landless	-0.24	0.16	-0.24	0.15	-0.24	0.15
(Household Owns Land)						
Household Owns Agricultural Equipment	1.32***	0.20	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	0.16***	0.04
Age of Household Head	-0.004	0.003	-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	0.26***	0.03
Total Number of Non-Working Age People	0.01	0.03	0.01	0.03	0.01	0.03
Total Number of Migrants	-0.01	0.02	-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	-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	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	-0.27	0.31
(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	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	0.45***	0.08
(No one in the Household Engages in Charcoal Making)						
The Household Grows Cassava	0.42**	0.15	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	0.01*	0.003
Inverse Hyperbolic Tangent of $\rho$	0.36	0.45	0.33	0.43	0.16	0.35
Total N	2792		2792		2792	
-2LL	-1673.29		-1673.71		-1678.01	

\* p &lt; .05 \*\* p &lt; .01 \*\*\* p &lt; .001 (Two-Tailed Test)

Note: Standard Errors Adjusted Using Huber/White Correction

Table A2.4. Binary Logit Estimates of Return to Help with the Rice Harvest for Migrants Age 18 - 35 in 1994 (Full Sample)

Variable	Model 1			Model 2			Model 3		
	Coeff	Std Err	Odds Ratio	Coeff	Std Err	Odds Ratio	Coeff	Std Err	Odds Ratio
Intercept	-1.63**	0.50	0.20	-1.5**	0.49	0.22	-1.6**	0.49	0.20
<b>Household Assets</b>									
<i>Land</i>									
Number of NS-4/NS-3 Land Plots	0.22***	0.06	1.25	-	-	-	-0.03	0.02	0.97
Amount of NS-4/NS-3 Land (in $Wa^2$ / 1000)	-	-	-	0.03***	0.01	1.03	-	-	-
Amount of NS-2/SPK/STP Land (in $Wa^2$ / 1000)	-	-	-	-	-	-	-	-	-
<i>Household Wealth</i>									
Top 20th Percentile of Wealth Distribution	0.01	0.21	1.01	0.0002	0.21	1.00	0.06	0.21	1.07
Bottom 33th Percentile of Wealth Distribution	-0.09	0.14	0.91	-0.12	0.14	0.89	-0.13	0.14	0.87
(Middle 34 - 79th Percentile of Wealth Distribution)									
<b>Migrant Human Capital Endowments</b>									
<i>Education</i>									
Less than Primary Education	-0.09	0.22	0.92	-0.14	0.23	0.87	-0.18	0.23	0.84
Greater than Primary Education	-1.24***	0.30	0.29	-1.27***	0.31	0.28	-1.15***	0.30	0.32
(Only Primary School Education)									
<i>Occupation</i>									
Migrant Works in an Agricultural Occupation	1.27***	0.21	3.56	1.26***	0.22	3.52	1.28***	0.22	3.59
Migrant Works in Commerce	-0.10	0.54	0.91	-0.08	0.54	0.92	-0.10	0.54	0.91
Migrant Works in a Government Occupation	-0.28	0.56	0.75	-0.36	0.56	0.70	-0.30	0.55	0.74
Migrant Works in Some Other Occupation	0.10	0.40	1.11	0.003	0.41	1.00	0.07	0.40	1.08
(Migrant Works as a Laborer)									



Table A2.4 (Continued)

<b>Presence of Migrant's Relatives and Spouse in Home Household</b>									
<i>Migrant's Child Location</i>									
At Least One Child Lives in the Household	0.78**	0.24	2.18	0.79**	0.25	2.21	0.78**	0.25	2.19
(No Child Lives in the Household)									
<i>Migrant's Marital Status / Spouse Location</i>									
Married, Spouse Lives in the Household or Village	0.74*	0.35	2.09	0.7*	0.36	2.02	0.67	0.36	1.96
Married, Spouse Lives in Same Migration Destination	-0.30	0.17	0.74	-0.30	0.17	0.74	-0.33	0.17	0.72
Married, Spouse Lives in Different Migration Destination	-0.67**	0.22	0.51	-0.64**	0.22	0.53	-0.68**	0.22	0.51
Post-Married, or Spouse Location is Unknown	-0.64*	0.30	0.53	-0.68*	0.31	0.51	-0.72*	0.30	0.49
(Never-married)									
<i>Migrant's Parent (or In-Law) Location</i>									
Both Parents Live in Household	0.63	0.37	1.88	0.66	0.36	1.94	0.78*	0.36	2.19
Only Mother Lives in Household	0.68*	0.33	1.97	0.69*	0.34	1.99	0.77*	0.34	2.16
Only Father Lives in Household	0.49	0.36	1.64	0.52	0.37	1.69	0.61	0.35	1.83
(Neither Parent Lives in Household)									
<b>Household Demographics</b>									
<i>Migrant's Sibling (or In-Law Sibling's) Location</i>									
Number of Siblings Living in the Household	-0.14	0.08	0.87	-0.15	0.08	0.86	-0.13	0.08	0.88
Additional Number of Working Age People (Age 13 - 60)	-0.26*	0.13	0.77	-0.27*	0.14	0.77	-0.22	0.14	0.80
Additional Number of Non-Working Age People	0.04	0.11	1.04	0.05	0.11	1.05	0.05	0.11	1.06
Additional Number of Migrants	-0.06	0.14	0.95	-0.05	0.14	0.95	-0.06	0.14	0.94
<b>Migrant's Demographic Characteristics</b>									
Age	-0.07**	0.02	0.94	-0.06**	0.02	0.94	-0.05*	0.02	0.95
Migrant is Male	-0.02	0.15	0.98	-0.004	0.15	1.00	-0.04	0.14	0.96
(Migrant is Female)									
N		2792			2792			2792	
-2LL		-7551.5			-757.55			-763.32	

\* p &lt; .05 \*\* p &lt; .01 \*\*\* p &lt; .001 (Two-Tailed Test)

Note: Standard Errors Adjusted Using Huber/White Correction

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