Increasing Migration, Diverging Communities: Changing Character of Migrant Streams in Rural Thailand*

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Abstract

This paper studies how increasing migration changes the character of migrant streams in sending communities. Cumulative causation theory posits that past migration patterns determine future flows, as prior migrants provide resources, influence, or normative pressures that make individuals more likely to migrate. The theory implies uniform patterns of exponentially increasing migration flows that are decreasingly selective. Recent research identifies heterogeneity in the cumulative patterns and selectivity of migration in communities. We propose that this heterogeneity may be explained by the differential accessibility of previously accumulated migration experience. Multi-level, longitudinal migration data from 22 rural Thai communities allow us to measure the distribution of past experience as a proxy for its accessibility to community members. We find that migration becomes a less-selective process as migration experience accumulates, and migrants become increasingly diverse in socio-demographic characteristics. Yet, selectivity within migrant streams persists if migration experience is not uniformly distributed among, and hence not equally accessible to, all community members. The results confirm that the accumulation and distribution of prior migrants' experiences distinctly shape future migration flows, and may lead to diverging cumulative patterns in communities over time.

Keywords: Internal Migration, Cumulative Causation, Selectivity, Thailand.

1 Introduction

This paper studies how social, economic, and demographic characteristics of migrant streams change as migration gains prevalence in sending communities. Prior research suggests that the accumulation of past migration experience initiates a process of 'cumulative causation' through which migration flows become self-sustaining (Massey, 1990). With each migrant from a community, social networks that connect migrants to other community members expand. These networks alter the context of future migration by providing access to resources, influence, or normative pressures from prior migrants. The theory posits that access to migrant networks makes future migration more likely, eventually dampening the effect of other social, economic, or demographic factors on migration, and lowering the selectivity within migrant streams, predictions that are confirmed by empirical evidence (Dunlevy, 1991; Massey and Espinosa, 1997; Massey, Goldring, and Durand, 1994).

Recent research also points to heterogeneities in migration outcomes that cannot be completely explained through the current cumulative causation framework. Studies find that the effect of social networks on migration is not necessarily uniform across settings, and may be shaped by the structure of community networks (Garip, 2008), gender relations (Curran et al., 2005; Kanaiaupuni, 2000), and sending or receiving community contexts (Curran and Rivero-Fuentes, 2003; Fussell and Massey, 2004). These findings imply that social networks can create differential migration outcomes for different groups of individuals or in different settings. Because social networks feed a cumulative migration mechanism, these differences in their effects are likely to grow and create divergent migration patterns across communities over time. Despite their critical theoretical and practical implications, these ideas have not been incorporated

into mainstream cumulative causation theory.

In this paper, we seek to fill this gap in the literature and offer an extension to prior work. We consider the accessibility of past migration experience, as well as its accumulated level, in assessing its effect on future migration flows. We argue that the mechanisms of cumulative causation that link past and future migration flows work only if individuals in a community can easily access prior migrants through their social networks. In the absence of complete social network data, the distribution of past migration experience in a community provides a proxy measure for observing the accessibility of prior migrants. Then, depending on the level and distribution of past migration experiences, we suggest that cumulative causation can work differently in communities and lead to divergent patterns of migration and migrant selectivity.

2 Cumulative Migration Patterns in Thailand

We study 22 villages in Northeastern Thailand to understand the relationship between cumulative migration patterns and the changes in the character of migrant streams. These villages are located in the historically poor, rural region of Nang Rong, and due poverty, past high fertility and limited arable land for future development, provide an important source of migrants to urban centers, primarily Bangkok. We observe the period from 1984 to 2000, when Thailand's shift from an agriculture-based export economy to a manufacture-based export economy occurred and migration took added significance in Thai livelihoods (Bello, Cunningham, and Poh, 1998; Phongpaichit, 1980; Phongpaichit and Baker, 1998; Warr, 1993; Warr and Nidhiprabha, 1996).

During the period from the mid-1980s to mid-1990s, Thailand's economy grew on average 10 percent per year (Bello et al., 1998; Warr and Nidhiprabha, 1996). This

growth was fueled by production in export manufacturing, which was a result of the rising value of the Yen, rising wages in nearby newly industrialized countries (NICs), changes in textile import quotas to the United States, and dramatic increases in foreign direct investment, primarily from Japan (Nidhiprabha, 1994; Phongpaichit and Baker, 1998). By 1985, Thai manufacturing exports had outpaced rice and other agricultural exports in value (Nidhiprabha, 1994; Warr and Nidhiprabha, 1996). With the growth in manufacturing export came an increased demand for labor. Rural migrants provided much of this labor, coming mostly from the Northeastern part of the country, the region of this study (Chamratrithirong et al., 1995; Mills, 1997; Phongpaichit and Baker, 1998). This period of expansive growth began to slow down in the mid-1990s. In 1996, the export growth slumped from over 20 percent to zero, partly due to increasing competition from China and India. In 1997, Asian financial crisis hit Thailand leading to a devaluation of the Thai currency, baht, and precipitating recession. Unemployment rates increased as a consequence, and migration flows from rural to urban regions slowed down.

Employing the social survey data from the Nang Rong Project, we study this period of economic growth and its downturn in Thai history from 1984 to 2000. Different than most migration data available to researchers, these data contain information on all individuals (between the ages 13 to 41) in the study villages, not just a random sample, and allow for longitudinal analysis of the accumulation and distribution of migration experiences over a 16-year period.

– Figure 1 about here –

Figure 1 displays the migration prevalence of villages and shows a pattern of dramatic growth over 16 years. (Migration prevalence is defined as the proportion of

people that have ever migrated in a village up to a point in time). There is also considerable variation across villages, which is maintained over time. In 1984, at the low end, in one village only 7% had ever migrated and at the higher end 31% had ever migrated. By 2000 all villages had increased their prevalence rates, albeit at different rates, but the wide range between the high and low prevalence villages is still apparent.

These descriptive data demonstrate how the cumulative dynamic builds in the Thai internal migration case as it does in international flows between Mexico and the United States studied in prior work (Massey et al., 1994; Massey and Zenteno, 1999). While Mexico-U.S. flows have begun almost a century ago in many Mexican communities, the internal migration in Thailand is a rather recent phenomenon, which has gained prevalence from the mid-1980s onward. Our data allow us to observe the initiation and perpetuation of cumulative migration flows, which are unlikely to have reached saturation by 2000, the end of the study period. Despite the short tenure of migration, the migration prevalence rates we observe are much higher compared to the U.S.-migration prevalence rates observed in Mexican communities (Massey et al., 1994). This difference may be explained by the type of migration (internal versus international) or types of communities studied (small villages in our case versus large localities in the Mexican case).[1]

Rural to urban moves within Thailand may not be seen as dramatic as migrating from Mexico to the United States, however they do carry significant costs and risks, which make information or assistance provided by prior migrants an invaluable resource. During our fieldwork in Nang Rong, villagers told stories of migrants being mistreated, not being paid in full, or losing all their belongings to drinking and

[1] We are grateful to an anonymous reviewer for drawing these comparisons between the Thai and Mexican-U.S. cases.

gambling.[2] Social ties to other migrants, according our informants, helped alleviate concerns of exploitation in destination, and mitigated the risks of migrating for potential migrants.

Despite the increasing patterns of migration in all villages over a 16-year time period, the data in Figure 1 also show significant variability in migration prevalence across villages, which provides an opportunity to evaluate how cumulative migration might yield divergent patterns of selectivity within migrant streams.

We draw on a method used by Massey et al. (1994) in the context of Mexico-U.S. migration to elaborate the relationship between the migration experience of communities and the characteristics of their migrants. This method involves categorizing sending communities by their count of migrants, or what the authors call 'migration prevalence ratios,' and analyzing the socio-demographic changes in migrant characteristics. We extend this approach by proposing a 'migration history index,' a measure that combines the extent of migration experience and its distribution in the community, as an alternative to counts of migrants. We claim and show that the level and distribution of past migration experience differentially affect future patterns and selectivity of migration in the Thai villages.

The remainder of this article is organized as follows: We first provide background information on cumulative causation theory and its predictions regarding the selectivity of migration. We then review empirical studies that suggest heterogeneity in cumulative migration patterns and provide an extension to cumulative causation theory that leads to novel predictions. In the subsequent part of the paper we describe data, operational

[2]We have spent three weeks in Nang Rong in November 2005. We conducted in-depth and focus group interviews with current and return migrants in 8 of the 22 villages, with the participation of 158 individuals. Although these qualitative data are not used directly in this study, they inform our theoretical insights and empirical analysis.

measures of concepts and devise a novel method to capture the cumulative migration patterns and changing character of migrant streams. We then present our results from the empirical analysis and conclude with remarks on the implications of our ideas and methods.

3 Theoretical Background

Prior research identifies migration as a dynamic and cumulative process by demonstrating the importance of past migration patterns in influencing present and future levels and directions of movement. We can distinguish two components of this pattern conceptually. First, the objective conditions creating a migration stream in the first place are likely to continue and cause further migration (Fuller et al., 1985). Second, social networks to prior migrants are likely to expand and facilitate the attraction of new migrants over time, propelling more migration. Focusing on this second aspect, in his seminal article, Massey (1990) coins this dynamic and self-feeding mechanism of migration as 'cumulative causation.'

The idea underlying cumulative causation is that, by connecting prior migrants to community members, social networks alter the context within which future migration decisions are made. First, networks act as hubs of information or assistance resources from prior migrants, which reduce the costs and risks of migrating for individuals (Massey and Garcia-Espana, 1987). The visible signs of increased earnings of prior migrants, in some cases, cause other community members to migrate as well (Stark and Taylor, 1991). The ties to prior migrants also foster the establishment and diffusion of migration norms, and in some communities migrating becomes a 'rite of passage' for young adults (Kandel and Massey, 2002; Piore, 1979).

The theory predicts that, through resource exchange, influence, or normative pressures, social networks to prior migrants increase future migration flows, eventually dampen the effect of other social, economic, or demographic factors on migration and lower the selectivity within migrant streams.[3] Evidence provided by prior work confirms these empirical predictions. For example, Dunlevy (1991) and Massey and Espinosa (1997) demonstrate exponentially increasing migration patterns between Mexico and the United States, while Massey et al. (1994) note declining selectivity and increasing diversity of migrant streams over time in the same study setting. Similar to these studies, *we expect to observe a declining migrant selectivity in terms of socio-demographic characteristics due to the accumulation of past experience in the Thai villages.*

Recent work, however, shows that this process of growth and sustained migration momentum is not uniform, but exhibits significant heterogeneity across origin communities, destinations, and among migrants. For example, Fussell and Massey (2004) demonstrate that cumulative causation varies in its influence across rural and urban origin communities. Similarly, Taylor (1986) and Curran and Rivero-Fuentes (2003) find that the influence of social networks varies across destinations. Others show how the gendered nature of migrant networks in both origin and destination yield varied impacts on migrant outcomes (Curran et al., 2005; Curran and Rivero-Fuentes, 2003; Hagan, 1998). Research also suggests that social categories of kinship, ethnicity, or community differentially structure social networks and impact migration outcomes (Bauer and

[3]To clarify with an example, as Massey et al. (1994) demonstrate, because migration is a costly and risky undertaking, at initial stages of migration from a community, migrants are typically positively selected on socio-demographic and economic attributes. However, social ties to past migrants plays an important role in mitigating these costs and risks and reducing the selectivity of migration. Therefore, individual attributes of migrants may vary across communities and over time depending on the migration experience of the community.

Zimmerman, 1997; Curran et al., 2005; Winters et al., 2001). Taken together, these findings continue to provide evidence that supports the theory of cumulative causation, but they are also provocative and suggest that there are critical mechanisms fueling migration momentum and creating divergent outcomes that have yet to be systematically explored.

Inspired by these findings, this study seeks to identify a network-based mechanism that may similarly lead to divergent patterns and selectivity of migration among communities. Rather than observing specific destination conditions, or character of gender relations, as in prior work, we focus on a general characteristic of social networks that may moderate the cumulative migration momentum: their differential accessibility to individuals in a community. Namely, the theory of cumulative causation assumes that all individuals in a community are equally likely to have access to and be influenced by migrant networks. However, based on gender differences, ethnic cleavages, kinship structures, or a number of other factors, access to migrant networks may be constrained for certain groups of individuals in communities. These differences in network access may differentiate migration outcomes for individuals and eventually disrupt the cumulative momentum of migration in communities (Garip, 2008).

We propose that differential accessibility of social networks in communities is a critical mechanism moderating the cumulative causation of migration. The ideal way of measuring accessibility is to collect complete social network data in villages, and construct a measure of ties to prior migrants for each individual. In the absence of complete information on social networks, as is the case for all migration data including ours, we suggest that the distribution of past experience among individuals in a community provides an alternative measure for the accessibility of networks.

To clarify with an example, consider two villages of equal size with equal amount of past migration experience, say, accumulated trips. In village A, there are only 5 migrants making those trips, while in village B there are 20 migrants. Although the total amount of resources available to potential migrants is the same in both villages, the resources are clearly more widespread and accessible in village B since more people contribute to their accumulation. Hence, we assume that the distribution of migration experience among community members serves as a reasonable proxy for the accessibility of migratory resources.

We argue that in communities where the distribution of past experience is not uniform, individuals will be less likely to access resources (or be exposed to influence) from prior migrants, in which case their own social, economic, or demographic characteristics will be important in determining their migration outcomes. Then, in the Thai villages, *we expect to observe a persistent migrant selectivity if the accumulated migration experience is not uniformly distributed, and hence not equally accessible to, community members.*

In sum, this article argues that the maturity and distribution of past migration flows in a community determines the selectivity within migrant streams on social, economic, or demographic characteristics. We suggest that selectivity declines with increasing past migration experiences, yet persists when these experiences are not uniformly distributed among community members.

A competing explanation for declining selectivity of migration proposes exogenous factors that are independent of the past migration paths in a community. For instance, in *Men in a Developing Society*, Balan, Browning, and Jelin (1973) attribute the declining selectivity of migration to static and diminishing reservoir of potential migrants.

The authors argue, "a combination of increasing demands put upon the rural reservoir by the continuous high rate of urbanization, and in particular by the rapid growth of [destination], with either an absolute decline in the size of the reservoir or at least a decline in its relative rate of growth produces a situation whereby the migratory flow must be supplied from an increasingly representative sample of the origin population." (p.168) Then, as an alternative to cumulative explanations of migration, *we can expect to observe decreasing migrant selectivity due to an increasing demand for migrants in the destination communities.* Given the rapid economic growth from mid-1980s to mid-1990s in Thailand, and the resulting increase in the labor demand in urban centers, this alternative hypothesis may be especially relevant in our case.

4 Methods

4.1 Data

The data for this study come from the Nang Rong survey, a longitudinal data collection effort conducted by the Carolina Population Center at the University of North Carolina and the Institute for Population and Social Research at Mahidol University in Thailand.[4] Nang Rong is a relatively poor, rural district in Northeastern Thailand, and a major provider of migrants to urban centers, primarily Bangkok. The survey captures the period from 1984 to 2000, when Thailand's economy shifted from agriculture to manufacturing, propelling the migration from rural areas to urban destinations.

We employ the first three waves of data for our analysis (the 1984, 1994 and 2000 surveys). The 1984 data collection was a census of 51 villages and included information

[4]More information can be found at http://www.cpc.unc.edu/projects/nangrong.

on individual demographic data, household assets and village characteristics. The 1994 data collection not only replicated the 1984 survey, including a census of all households and information about former 1984 village members, but also included a 10-year retrospective life history about education, work, and migration, as well as key social and demographic events. The 2000 round of surveys built on the previous data collection efforts by following all of the 1994 respondents and adding to the database any new residents and households in the original villages.

The 1994 and 2000 surveys included a migrant follow-up component, which identified the migrants who were absent during the time of the survey and found them in their new destinations. The migrant follow-up was conducted among persons who had resided in 22 of the original 1984 villages, and defined a migrant as someone who was a member of a 1984 household and had since left a village for more than two months to one of four destinations: the provincial capital, Buriram; the regional capital, Korat or Nakhon Ratchasima; Bangkok and the Bangkok Metropolitan Area; or Eastern Seaboard provinces. In related project manuscripts it has been documented how successful the surveys were at following households and individuals.[5] For this kind of migrant follow-up, the success at finding migrants is considered remarkably high (Rindfuss et al., 2007). On average, for the twenty-two villages, about 44% of the migrants were successfully interviewed at some point in the six months following the village surveys. (We address the potential bias in our results due to missing migrants in an additional analysis presented in the Appendix.)

The Nang Rong survey data provide unique advantages for testing cumulative causation of migration. Most surveys collect data from randomized samples of individuals

[5]We restrict our analysis to 22 villages (out of the 51 original villages) where migrant were followed-up in destination.

or households. The Nang Rong survey contains information from *all individuals* between the ages of 13-41 in the study villages. Hence, we are able to measure the distribution of migration experiences in villages, which are central to our account of cumulative causation and migrant selectivity. The data used in this analysis are based on the life history survey, which begins with 13-35 year olds in 1994 (i.e., the age group at risk of migrating) and follows them retrospectively in the 10-year period from 1984 to 1994. Adding the 6-year retrospective life history collected from 18-41 year olds in 2000, the resulting data set covers a 16-year period. To obtain household and village level indicators, life history data are merged with four cross-sections of household censuses (1984, 1988, 1994, 2000) and three cross-sections of village-level surveys (1984, 1994, 2000).

An important shortcoming of these data is the restricted age distribution. Due to the retrospective data collection, we observe 13-25 year old individuals in 1984, 13-35 year olds in 1994 and 18-41 year olds in 2000. The non-uniform age composition over time could bias our results on migrant selectivity. We address this issue by conducting additional analysis on a restricted sample of 18-25 year old individuals (the age group present in each year), which is presented in the Appendix.

Despite this shortcoming, using the Thai data set provides two additional advantages: First, the hypotheses implied by the theory of cumulative causation have typically been tested only on the Mexican-U.S. migration data. (Curran et al. (2005); Curran and Rivero-Fuentes (2003) are exceptions.) Second, researchers have predominantly studied international migration flows to uncover the interdependence between individual characteristics and the community context. The Thai data allow us to evaluate the relevance of these dynamics outside the Mexican-U.S. case and for internal

migration flows.

4.2 Operational Measures

This article studies the interaction between the maturity and distribution of past migration experiences and the selectivity within migrant streams of communities. Using the definition in the survey, we define a migrant as a person who has been out of Nang Rong for more than two months in a year.[6] We identify age, educational attainment, sex, marital status, and wealth as the important social, economic, and demographic characteristics that migrants are likely to be selected on. We measure educational attainment using years of education completed. At the household level, we measure total land owned (in rai=0.46 acres) by household members as a proxy for household's wealth and hence to represent a condition that influences the migration propensity of each member. Similarly at the village level, we include an indicator of remoteness to urban centers[7] to represent levels of development that can cause migration propensities of village members to be correlated. We also include an indicator of migrant follow-up rate in the village to account for any potential differences between villages in survey success.

To measure the past migration experience in a community, we take as a starting point an indicator proposed by Massey et al. (1994) called the 'migration prevalence ratio.' For any community in any year, migration prevalence ratio is defined as the

[6]This definition is reasonable in the Thai setting, since the majority of migrants make one trip of long duration to their destinations.

[7]A village is considered remotely located if there are three or more obstacles to traveling to the district town. The obstacles are the presence of a portion of the route to the district town that is a cart path (unpaved, rutted, and narrow), the lack of public transportation to the district town, travel to the district town takes an hour or more, that during the year there are four or months of difficult travel to leave the village, and it is 20 or more kilometers to the district town.

percentage of people who have ever been a migrant. We argue that this measure can be improved on at least two accounts.

First, prevalence ratio treats migration as a binary outcome, and simplistically equates the migration history of a community with a count of its migrants. Implicit in this is the assumption that the experience of each migrant, and hence his or her contribution to the stock of migration information in the community, is identical. Questioning this assumption, studies have shown that the resources available through prior migrants' experiences can be better captured by their frequency of trips to destination (Curran et al., 2005; Curran and Rivero-Fuentes, 2003; Massey and Zenteno, 1999).

Second, prevalence ratio treats community as a homogeneous entity and implicitly suggests that past migration experiences in a community are uniformly distributed among all individuals. However, past migration experiences can be concentrated in few individuals in a community, limiting their accessibility (Garip, 2008). Then, the ideal measure of a community's migration history should incorporate the distribution of past experiences as well as their extent.

We measure the extent of past experiences in a community using the accumulated number of prior migrant trips by community members up through the previous year. These trips capture prior migrants' experience in destination as well as their frequency of contact with the origin villages. To combine the level and distribution of past experiences within a common indicator, we define the following measure:

$$\text{MigrationHistoryIndex}_{vt} = \mu_{vt}(1 - I_{vt}) \tag{1}$$

where μ_{vt} is the mean number of trips to destination by members of village v up to time $t-1$ and I_{vt} is the inequality in the distribution of trips among village members

in time $t-1$. In this measure, the overall migration history depends on μ_{vt}, the mean experience, however since an inequality, I_{vt}, in the distribution of migration experience implies reduced access to social networks for some individuals, this mean has a lower contribution to the migration history the higher the inequality in its distribution within the community. This measure is decomposable into mean experience and inequality components, which allows us to observe how each component differentially alters migrant selectivity in the Thai villages.

To measure inequality, we use a commonly used inequality measure, coefficient of variation, which is simply defined as the standard deviation divided by the mean. More formally,

$$CV_{v,t-1} = \frac{\sigma_{v,t-1}}{\mu_{v,t-1}} \tag{2}$$

where $CV_{v,t-1}$ is the coefficient of variation of accumulated individual trips in village v up through time $t-1$. $CV_{v,t-1}$ is computed by dividing the standard deviation of accumulated individual trips in village v up through $t-1$, $(\sigma_{v,t-1})$, by its mean $(\mu_{v,t-1})$. The coefficient of variation is rescaled to vary between 0-10. In a village where all the individuals have the same number of prior trips, the standard deviation of trips equals zero and the inequality index reaches its minimum value of 0.

Finally, to capture the macro-economic climate of Thailand, we use a number of annual statistics that proxy the changing labor market conditions from 1984 to 2000. These statistics are collected from various resources, such as International Labor Organization Database, Thai National Statistics Office, and reports prepared by the World Bank and Thailand Development Research Institute. *Unemployment rate* and *annual growth in Gross Domestic Product* are included to measure the changes in labor supply

and demand, respectively. *Productivity-wage gap in agriculture* measures the trend in wages for farm jobs relative to average productivity in those jobs. A negative value would indicate wages lagging behind productivity and suggest a potential 'push' factor to migrate to urban areas to seek jobs in manufacturing or service sectors. *Relative average wage in Bangkok versus Northeast* provides a proxy for destination-origin wage differentials. Finally, *percent employed in manufacturing* captures the trend in labor demand in manufacturing. A number of other statistics, such as percent employed in agriculture or service sectors, or relative wages in regions other than Bangkok, are not included due to their collinearity with the measures above. After experimenting with various combinations, we concluded that the above-listed variables capture the relevant dimensions of labor market change without introducing redundancy. (Descriptive statistics for all variables are provided in the Appendix, Table A1.)

4.3 Analytic Strategy

Before testing the relationship between the maturity and distribution of past migration experiences, and the selectivity within migrant streams of communities, we employ a descriptive analysis, similar to Massey et al. (1994). We use the migration history index (as opposed to their migration prevalence ratio) to categorize communities and observe the changes in patterns of migration and migrant selectivity across categories. We expect to demonstrate that migration patterns, as well as characteristics of individuals within migrant streams exhibit a temporal order that is reflective of different migration histories of communities.

We also employ statistical models to jointly test our hypotheses of *decreasing* migrant selectivity with (i) increasing migration experience in the community, and (ii)

increasing demand for migrants in destination, and *increasing* migrant selectivity with (iii) increasing inequality in the distribution of migration experience in the community. Within a regression framework, the first hypothesis implies that the effect of socio-demographic characteristics (age, sex, marital status, education and wealth) on individuals' migration should decrease with increasing migration experience in the community (represented by μ_{vt} and measured by the mean number of accumulated trips). For example, assuming education has a positive effect on migration, then an interaction term between years of education and the mean number of trips should obtain a negative coefficient. Similarly, the second hypothesis suggests a declining effect of socio-demographic characteristics on migration with increasing demand for migrants in destination. Then, an interaction term between these two sets of variables should diminish the effect of socio-demographic characteristics on migration. Finally, our third hypothesis suggests that the effect of socio-demographic characteristics should increase with increasing migration experience inequality in the community (represented by I_{vt} and measured by the coefficient of variation of migrant trips). Again, in regression terminology, an interaction term between these two sets of variables should amplify the effect of socio-demographic characteristics on the probability of migration.

Also implicit in these hypotheses are the direct effects of migration experience and the inequality of its distribution. We expect the regression estimates to show that migration experience in the community increases the probability of migration, and the inequality in the distribution of that experience decreases it. Similarly, we expect the labor market demand indicators to affect individuals' migration propensities. Increasing unemployment rate and productivity-wage gap should decrease migration, while increasing annual GDP growth, relative average wage in Bangkok vs. Northeast,

and percent employed in manufacturing should increase it.

Because our data set contains multiple observations for the same individual over time, it is necessary to take into account the potential correlation between these observations due to unobserved individual characteristics. This can be shown formally. Let y_{it} represent our dependent variable, such that $y_{it} = 1$ if person i ($i = 1, \ldots, n$) is a migrant at time t ($t = 1984, \ldots, 2000$) and $y_{it} = 0$ otherwise. Let x_{it} contain a set of time-invariant (e.g. sex) and time-varying (e.g. age, education, marital status) explanatory variables. To allow for a correlation between the observations of an individual across time, we introduce an individual-level effect, u_i, in the model. The probability of being a migrant, that is $p_{it} = Pr(y_{it} = 1)$, is modeled as a function of x_{it} and u_i, using the following *logit* regression model:

$$\log\left(\frac{p_{it}}{1 - p_{it}}\right) = \alpha + \beta' x_{it} + u_i \tag{3}$$

In this specification, the individual effects, u_i, can be treated as either fixed or random; in either case they represent unobserved time-invariant individual-level variables, but a random-effects specification is more appropriate in our case because it allows us to estimate the effects of time-invariant variables (e.g., sex) that cannot be estimated by a fixed-effects model. We estimate the random-effects using the *xtlogit* routine in Stata.

5 Results

5.1 Descriptive Analysis of Patterns of Change in the Migrant Stream

We start with a descriptive analysis of the twenty-two villages in Nang Rong to grasp their variability in migration patterns. The first two columns in Table 1 display the village size and mean number of village migration trips in 2000. The fourth and fifth columns document the migration history index for all villages in 1994 and 2000, the mid- and end-period of data collection respectively. Migration history index is the average number of accumulated migrant trips in the community weighted negatively by its variation. Villages are ranked by their migration history levels in 2000 and listed in ascending order with respect to their rank (column 3). Given that these villages are neighbors and subject to similar economic conditions, there is striking variation in their migration experiences. Mean number of cumulative trips per person in 2000 reaches very high levels for some villages (1.02 in the highest-ranked village), while it lingers at moderate levels for others (0.44 in the lowest-ranked village). Villages also differ in their growth of migration history from 1994 to 2000 (column 6). Some villages more than double their migration experience in a period of six years, while others show modest growth. Migration prevalence ratio, defined as the percentage of individuals who have ever migrated and displayed in column 7, provides a ranking consistent with the migration history index for only five out of the twenty-two villages. This discrepancy suggests that migration history index indeed captures a different aspect of the migration process than the prevalence ratio by taking into account both the level and distribution of accumulated experience.

– Table 1 about here –

In order to describe the changes that occur in migrant characteristics as migration history moves from low to high, we employ a strategy used by Massey et al. (1994) and classify villages according to their levels of the migration history index. The goal is to standardize communities with respect to their migration histories and then observe the patterns of change in migration flows and migrant characteristics. Accordingly, we create five progressive categories of migration history level and determine the break-points by observing the quintiles of the migration history index.[8] Then, we assign each community-year from 1984 to 2000 to one of the categories according to its migration history level. The implicit assumption is that each community-year is 'similar' in terms of migration context to others in its category. Then, we average the characteristics of individuals and their migration moves in each category, and analyze how these averages vary across categories of migration history [9].

The first panel in Table 2 traces shifts in the prevalence of migration as communities pass through the various phases of the migration process. We compute the prevalence ratios separately for males and females to capture sex-specific differences in migration. At the first stage of migration history, few people, male or female, have any migration

[8]Migration history categories are denoted as follows: Community-year has I - smaller than 20th percentile; II - between 20th and 40th percentiles; III - between 40th and 60th percentiles; IV - between 60th and 80th percentiles; V - larger than 80th percentile of the migration history index.

[9]Massey et al. (1994) use migration prevalence ratio to categorize villages. We performed the descriptive analysis in Tables 2 and 3 using this ratio as well and the results were similar. This is expected as both indices provide roughly similar, albeit not identical, classifications of villages into quintiles. (Although the individual rankings of villages may differ significantly across the two indices, as shown in Table 1, the categorical assignments to quintiles are roughly consistent across the prevalence ratio and the migration history index.) However, the similarity of the two indices end there. Prevalence ratio is a simple count of migrants, and cannot be decomposed into mean experience and inequality components as the migration history index. This decomposition is crucial to test our first and second hypotheses in the analysis presented in Tables 4 and 5.

experience: only 17% of men and 12% of women. In later stages, migration spreads increasingly throughout the population. By the final stage of the observed migration history, about six out of ten men have migrated at least once, while the same ratio for women is 5 out of 10. The prevalence of migration among women slightly lags behind that of men at all stages of the migration process, but the differential grows increasingly smaller as migration history accumulates in the community.

– Table 2 about here –

The second panel shows how migration trips accumulate as migratory behavior becomes more diffused in communities. At the first stage of migration history, the mean number of trips in the community is 32, a figure that considerably increases in each of the four subsequent categories. At the highest level of migration history, mean experience accumulated in a typical community is 120 trips. Inequality in the distribution of trips follows a reverse trend: as migration history moves from the first to the last stage, inequality (measured by the coefficient of variation scaled to 0-10) declines from 5.7 to 0.9.

Hence, as migration history evolves, the accumulated experience in a community, which proxies the stock of migratory information available, increases. By contrast, the inequality in migration experience declines, corresponding to an increasing accessibility of migratory information. In light of the cumulative causation theory, we expect both trends to reduce the risks of migrating for new migrants, and decrease the selectivity of migration.

In the last two panels of Table 2, we observe the dispersion of migrant trips across different destinations as migration history evolves. Using Shannon's entropy index, we

measure destination diversity of trips as follows:

$$Diversity = \frac{-\sum_{i=1}^{n} p_i \times \log(p_i)}{\log(n)} \times 100 \tag{4}$$

where n is the number of possible destinations and p is the proportion of trips to destination i. The index varies between 0 and 100. Minimum diversity occurs when all trips are concentrated in one destination and the index equals zero. Maximum diversity occurs when each destination category contains the same proportion of trips, yielding an index of 100.

In the Thai context, we identify five major categories that exhaust all possible destinations for Nang Rong residents: Bangkok, Bangkok Metropolitan Area, Eastern Seaboard, North Eastern Region and Other (including international destinations). In Table 2, for both men and women, we see an increasing diversity of destinations as communities reach high levels of previously accumulated experience. While majority of migrants in early stages of migration history move to the North East, the closest destination to Nang Rong, migrants in later stages spread out to other, farther and riskier destinations, such as Bangkok or Eastern Seaboard. This finding is consistent with cumulative causation theory, which suggests declining risks of migration and destination choices for potential migrants with increasing accumulated migratory experience in a community.

– Table 3 about here –

Cumulative causation theory also implies that, as migration history accumulates in a community, its socio-demographic base should increasingly broaden due to declining risks of migration for new migrants. This hypothesis receives preliminary support

from the data presented in Table 3, which compares the demographic background of migrants to the overall population at different stages in the migration process.

Before interpreting the findings, a word of precaution is in order. Our data was collected retrospectively in 1994 and 2000, and the age distribution of the sample is not uniform across years. The 1994 data set begins with 13-35 year old individuals in 1994, and contains retrospective information on their migration patterns from 1984 to 1994. Similarly, the 2000 wave begins with those aged 18-41 in 2000 and gathers retrospective information from the period 1994-2000. Then, the sample includes 13-25 year olds in 1984, 13-35 year olds in 1994 and 18-41 year olds in 2000. The changing age distribution over time makes it difficult to evaluate the trends in migrant selectivity. We circumvent this problem by comparing migrants to the overall sample when assessing the changes in selectivity across phases of community migration history.

Table 3 compares migrants and the overall sample in terms of sex composition, marital status, years of education, and land owned across quintiles of the migration history index. Individuals are classified by the migration history level of the village they reside in. Each characteristic is summarized in a panel, where its average value for migrants and the overall sample is reported, along with their ratio. If migrants are a random draw from the overall sample (that is, if there is no selectivity), then the migrants-to-overall ratio of means for each characteristic should be approximately 1. We expect migrant selectivity to decline as migration history grows in a community. Then, the migrant-to-overall ratio in each characteristic should converge to 1 as communities reach higher stages of migration history.

The first panel shows the sex composition. As migration history accumulates in a community, the migrant stream becomes increasingly female, rising from 37% at the

lowest level to 49% at the highest level. As expected, the overall sample displays an even sex distribution across the stages of migration history. The migrants-to-overall means ratio increases from 0.81 in the earliest stage to 0.98 in the latest stage of migration, suggesting that migrants become increasingly representative of the overall population.

Second panel shows that, due to our data structure, we observe an older group of individuals in later stages of migration history, which correspond to later years for most villages (e.g., the fifth quintile covers the years from 1993-2000). Average age increases from 20.3 to 26.3 for male migrants, and from 19.6 to 25.6 for female migrants. Compared to migrants, the overall sample is slightly older, yielding a ratio of means that is smaller than 1. This ratio declines from 0.98 to 0.94 for males, and from 0.98 to 0.94 for females, suggesting that migrants become increasingly younger compared to the overall population as a community's migration history grows.

The marital status of migrants also changes considerably, partly due to our data structure, and migrants become more likely to be married at higher levels of migration history. The ratio of the married migrants to the married in the overall sample is always less than 1, meaning migrants are less likely to be married than the rest of the population. Yet, the ratio becomes larger at higher levels of migration history, suggesting a declining selectivity of migrants on marital status.

The subsequent two panels in Table 3 examine the migrant selectivity on education. Educational levels increase among migrants and the overall sample as migration becomes more prevalent. As the community moves from the lowest level of migration history to the highest, the mean years of education for male migrants increases from 6.3 to 7.5, the same trend for female migrants is from 5.9 to 7.2 years. Migrants are

more educated than the overall population at each stage of the migration history. The selectivity of migrants on education first declines, only to rise again to reach or surpass its former level, as suggested by the trend in the migrants-to-overall ratio of mean education.

Migrants' status in terms of wealth also changes throughout different phases of migration history. In the Thai case, both male and female migrants become less likely to come from poor families as migration history evolves. The ratio of average land of a migrant to that of a village resident increases from 0.90 to 1.03 for men and from 0.78 to 1.02 for women. Migrants become less likely to be selected on wealth as migration history evolves.

Overall, these results suggest that, as a community moves from low to high levels of migration history, migrants become more likely to be selected on age and education, but less likely to be selected on sex, marital status, and land. These patterns may be partly reflect time trends, as stages of migration history tend to occur at different historical periods. While the earliest stage of migration history includes communities observed from 1984 to 1993, the final stage covers communities from 1993 to 2000. Another concern is our strategy to group villages by their migration history, which disregards potential heterogeneity across villages. To address both issues, we include a village-specific analysis of selectivity, which compares the trends in migrant selectivity over time.

– Figure 2 about here –

Box plots in Figure 2 show the distribution of migrants' average characteristics *relative* to the overall population across villages from 1984 to 2000. Some common trends in all villages are: (i) declining age of migrants relative to the population (i.e.,

migrants-to-overall mean ratio drops below 1 around 1990), (ii) migrants' increasing level of education in comparison to the population, and (iii) their first increasing, and then decreasing, relative wealth. These trends over time are similar to those observed across migration history quintiles in Table 3. To parse out migration-stage effects from year effects, we include the trend lines for the two villages with the highest and lowest migration history in 2000 in the figure. If migration history affects selectivity independently from time, then we should observe differences in selectivity between the two villages.

The figure shows that migrants tend to be relatively older and less educated in the village with the highest migration history compared to the village with the lowest one. Imagine a horizontal line crossing the y-axis at 1, which would represent the case where the migrants are identical to the overall population in terms of key characteristics. The trend line for age and education in the highest migration history village is closer to this imaginary 'no selection' line compared to the line for the lowest migration history village. The patterns for land are more complicated: compared to the overall sample, migrants in the high migration village are poorer in the early years, and then richer after 1993. Migrants in the low migration village by contrast are similar to the overall population in wealth over time, and hence less likely to be selected. This simple exercise suggests that accumulation of migration experience exerts an effect on migrant selectivity that is independent from time, albeit providing mixed evidence on the direction of this effect. We now turn to more rigorous regression analysis to adjudicate how community migration history and time-specific economic conditions differentially affect the selectivity of migrants.

5.2 Statistical Analysis of Patterns of Change in the Migrant Stream

After descriptively analyzing how migrant characteristics change as migration history accumulates in a community, now we turn to statistical analysis. Table 4 includes separate models for each of the five migration history categories to observe whether the importance of key characteristics changes by migration history. Included in all models are indicators of age, sex, years of education, marital status, household land owned (in rai), the level and inequality of migrant trips in village. Controls for remoteness to urban centers and migrant follow-up rate in surveys capture village-specific conditions. Macro-economic indicators of unemployment rate, productivity-wage gap in agriculture, destination-to-origin wage ratio (Bangkok/Northeast) and percent employed in manufacturing capture year-specific changes in the internal migration context of Thailand.

– Table 4 about here –

The findings mirror our conclusions from the prior descriptive analysis. We observed in Table 3 that migrants tend to be similar in age to the overall population in early stages of migration, but become increasingly younger as migration history grows. Accordingly, in Table 4, the odds ratio of age drops from 1.15 in the first stage of migration history to 0.9 in the fifth stage. While a unit increase in age increases the odds of migration in the first three stages of migration history, it decreases the likelihood of migrating in the last two stages. Similarly, the higher propensity of migration for males compared to females declines from 174% to 23% (not significant) as migration history of the community moves from the lowest to highest category. The detrimental effect of

marriage on migration also wanes as migration history grows. The odds of migrating is 90% lower for individuals in the first stage of migration, compared to 54% in the final stage. The effect of educational attainment on migration changes in a nonlinear fashion, first increasing then decreasing only to increase again through higher levels of migration history. In each stage of migration, education positively affects migration likelihood, with each additional year increasing the odds by about 45%. By contrast, the selectivity of migrants on land declines as migration history grows. In the first stage of migration, each rai of land reduces the odds of migrating by 2%, which in later phases drops to 1% and eventually to nil.

The results show how the level and distribution of migrant trips (standardized to mean 0 and standard deviation 1 for comparability) differentially influence migration propensities. In the first stage of migration history, neither variable has a significant effect. In the second stage, a standard deviation increase above average community trips more than doubles individuals' likelihood of migrating, while a similar change in the inequality of trips reduces the odds by more than half. The positive effect of migration trips drops only slightly at later stages. By contrast, the negative effect of the inequality of migrant trips increases as migration history grows. This result suggests that the relative importance of the distribution of migration experience, compared to its extent, increases at later phases of a community's migration history.

Village-specific follow-up rate has a positive and consistent effect on migration across the phases of migration history. Obviously, migration seems more likely in villages where surveyors were more successful in identifying migrants in destination. Remote villages, which are initially less likely to send migrants, become more likely to do so as migration history accumulates. Indicators of the economic context, unem-

ployment rate, productivity-wage gap in agriculture, Bangkok-to-Northeast wage ratio and percent employed in manufacturing, significantly affect migration patterns in later stages of migration history, possibly capturing the shifting historical periods across migration history phases.

Overall, the results in Table 4 show that the determinants of migration and their effects vary considerably as a community passes through different stages of migration. As villages move from low to high levels of migration, migrants become more likely to be selected on age and education, and they tend to be younger and more educated compared to the overall population. By contrast, in later stages of migration history, migrants become less likely to be selected on sex, marital status and land. Migrant streams tend to include increasingly women and the married, and become representative of the overall population in terms of wealth.

5.3 Statistical Analysis of the Sources of Change in the Migrant Stream

The analysis so far demonstrated how migrant selectivity changes as a community moves from low to high levels of migration. We have also shown that the level and inequality of migration experience, as well as changing economic conditions, affect migration patterns in communities. We now bring these together and ask: How does migrant selectivity change as a result of changes in (i) the level of migration experience, (ii) the inequality of migration experience, and (iii) the economic context? Based on our hypotheses, we expect migrant selectivity to decrease with increasing migration experience in origin and increasing demand for labor in destination. We expect selectivity to increase with increasing inequality in the distribution of migration experience.

These hypotheses are tested in models displayed in Table 5.

– Table 5 about here –

The first column shows the baseline model for migration, which includes the full set of indicators included in Table 4, but is estimated on the whole sample here. The propensity to migrate increases with age (by 3%), decreases with marriage (by 67%), is higher for men than women (by 32%). Each additional year of education increases the likelihood of migrating by 35%, while each rai of land owned decreases it by 0.1%. Living in remote village increases migration odds by 6%.

Our key variables have the expected effects on migration. Increasing community migration trips by one standard deviation above its mean more than doubles the odds of migrating, while a commensurate increase in inequality decreases the likelihood of migration by 17%. The economic indicators significantly shape migration flows. Migration rates decrease with increasing unemployment rate, and increase with the growth in the GDP. The growing gap between productivity and wages in agriculture, which provides a 'push' factor to migrate for rural farmers in Nang Rong, also increases the odds of migrating. Individuals become more likely to migrate as the ratio of average wages in destination (Bangkok) and origin (Northeast) increases. The availability of manufacturing jobs, captured with an indicator for percent employed in manufacturing in the country, also increases the odds of migrating.

The second model introduces interactions between community migration trips and socio-demographic characteristics (age, sex, education, marital status and land owned) to test the hypothesis of declining influence of these characteristics with increasing migration experience in the community. This hypothesis is supported for age and sex, but not for marital status, education or land owned. The estimates suggest that the

effect of age on migration decreases by 8% for a standard deviation increase above average community trips while the effect of sex decreases by a remarkable 20%. By contrast, the negative effect of being married on migration becomes more pronounced as community migrant trips increase. An increase of a standard deviation in community trips decreases the odds of migrating for married individuals by 9%. The positive effects of years of education and land owned on individuals' migration propensity do not change with community migration experience, as the interaction term coefficients for both education (not significant) and land are close to unity.

Interactions between the inequality of community trips and socio-demographic characteristics are introduced in the third model. Given the hypothesis of increasing migrant selectivity with increasing inequality of trips in community, we expect the interaction term coefficients to be positive for age, sex, education and land, and negative for marital status. The estimates confirm our expectations for all variables but age. The higher likelihood of men's migration compared to women becomes more pronounced in communities with an unequal distribution of migration experience. Namely, a standard deviation increase in inequality in village trips increases the effect of sex on migration by 14%. Similarly, the effect of each year of education on migration increases by 3%, while the effect of each rai of land owned increases by 1%. The negative effect of being married becomes larger as inequality increases, and married individuals become 15% less likely to migrate with a standard deviation increase above the mean inequality of village trips. In line with our expectations, these findings suggest that, in villages with higher inequality of migration experience, migrants become more likely to be selected on sex, marital status, education and wealth.

In sum, the hypothesis regarding the declining selectivity with increasing community migration experience holds for age and sex, but not for marital status, education or land. The opposing hypothesis of increasing selectivity with increasing inequality of migration experience holds for sex, marital status, education and land, but not for age. Our fourth model tests whether these findings remain robust when we consider Balan et al.'s (1973) alternative hypothesis that decreasing migrant selectivity results from an increasing demand in receiving community. This hypothesis is especially viable in the rapidly-changing economic context of Thailand in the study period. We test this idea by introducing interaction terms between socio-demographic characteristics and an indicator of labor demand (percent employed in manufacturing). The estimates show that as demand for manufacturing workers increases, migrants become less likely to be selected on age, sex (not significant), education and wealth, but more likely to be selected on marital status. Reassuringly, the inclusion of these interactions does not alter the results related to the first two hypotheses, which are the main focus of our analysis. Even controlling for the changing economic context of the country, the level and inequality of migration experience in communities uniquely alter migrant selectivity, as the theory of cumulative causation suggests. (We provide a number of robustness checks in the Appendix utilizing alternative samples.)

6 Conclusion

In an age of increasing migration, anticipating and directing migration flows is a major concern for policy makers around the world. A critical research finding in the migration literature shows that migration flows can develop a self-sustaining momentum that is difficult to control or redirect. This phenomenon, called the cumulative causation

of migration, occurs because prior migrants provide resources of information or assistance, influence or normative pressures that make individuals in origin communities more likely to migrate. Cumulative causation explains how past migration patterns determine future magnitudes and directions of movement and diminish the importance of other social, economic, or demographic factors that influence migration.

Empirical studies evaluating the cumulative causation theory are substantial, especially for the Mexican-U.S. migration flows, demonstrating exponentially increasing patterns of migration that are decreasingly selective on individual characteristics, as the theory predicts. However, recent research also shows there is significant heterogeneity in patterns and selectivity of migration across communities. In this article, we proposed that this heterogeneity in migration outcomes can be explained by further theorizing the mechanisms underlying cumulative causation. We argued that the differential accessibility of previously accumulated migration experience to individuals is one such mechanism that may disrupt the cumulative migration dynamic and trends in selectivity, and lead to divergent migration patterns in communities.

We built on the analytical approach of Massey et al. (1994) to study the patterns of migration and migrant selectivity out of 22 rural communities in Northeastern Thailand. This approach categorizes communities by their count of migrants or 'migration prevalence ratios' and observes patterns of change in migrant characteristics. Differently, we proposed a 'migration history index,' which combines the extent of past migration experience and its distribution among individuals, which signifies its accessibility to community members.

We used this index to categorize the 22 villages over a 16-year time period (1984-2000) into 5 progressive stages of migration history. We found that, as a community

moves from initial to later stages of migration history, migrants become less likely to be selected on sex, marital status and land. Hence, migrant streams tend to include increasingly women and the married, and become representative of the overall population in terms of wealth.

To better evaluate the sources of the declining migrant selectivity, we decomposed the migration history index into its constitutive components, that is, level and distribution of migration experience, in a statistical analysis. Focusing on the level of migration experience, similar to prior studies and in line with the expectations of the cumulative causation theory, we found that migration becomes a less-selective process as migration experience accumulates, and migrants become increasingly diverse in terms of age and sex in the context of Thai internal migration. Contrarily, we also found that the selectivity within migrants by education and wealth remains constant, while selectivity by marital status increases as migration gains prevalence. Different than any prior study, we also considered how the distribution of migration experience in a community, signifying its accessibility to individuals, shapes the selectivity of migration. We found that migrants' likelihood of being selected on age, sex, marital status, education and wealth persists or increases with increasing inequality in the distribution of migration experience in a community. These findings remained robust when we controlled for the potential time trends in migrant selectivity due to the rapidly-changing economic context of Thailand in the study period.

Hence, we provided additional evidence from Thailand to a dynamic relationship between community migration experience and migrant selectivity first identified by Massey et al. (1994) in the Mexico-U.S. context; we showed that similar mechanisms govern internal migration as international migration; and demonstrated the usefulness

of a new methodological tool to disentangle these dynamics. Theoretically, our findings helped qualify the predictions of cumulative causation theory regarding migrant selectivity, and pointed to the importance of considering the distribution, as well as the level, of community migration experience. We thus extended the reach of cumulative causation theory to explain the heterogeneity in patterns and selectivity of migration observed in reality. Future research should systematically analyze how the distribution of migration experience shapes migration flows or selectivity in other settings to generalize our findings.

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Appendix

A Robustness Checks with Alternative Samples

We perform robustness checks to address two data-related issues that might bias our results. First issue is the migrant follow-up rate in our data. The Nang Rong surveys were conducted in 22 migrant sending communities. Migrants who were absent at the time of the survey were followed up in four major migrant destinations. On average, 44% of migrants were successfully located. To see how the exclusion of the remainder of migrants biases our results, we use the variability among villages in migrant follow-up rates, which range from 40% to 70%. Namely, we repeat our most comprehensive analysis (Model 4 of Table 5) on a restricted sample of four villages with the highest follow-up rates (all above 65%). Comparing the coefficient estimates for the whole and restricted samples in Table A2, we find that, despite the drastic change in sample size, the estimates are mostly similar. The only major change is in the coefficient of sex, which is much higher in the restricted sample. Accordingly, the coefficients for the interaction terms including sex differ remarkably in the two samples. Other coefficients remain consistent in direction, and differ negligibly in magnitude, across samples. This evidence increases our confidence that low follow-up rates in some villages do not bias our results.

The second issue is related to the age structure in our data. The retrospective life history survey was administered to 13-35 year olds in 1994, and 18-41 year olds in 2000. Thus, we observe 13-25 year olds in 1984, 13-35 year olds in 1994 and 18-41 year olds in 2000. The changing age distribution over time may bias the results. To

address this issue, we restrict our sample to 18-25 year olds (the age group present in each year), and estimate model 4. The results presented in Table A2 show a number of differences from those for the overall sample. First, the coefficient of sex is higher in the age-restricted sample, and the coefficient for age is insignificant. The latter is expected due to the narrow age range of the restricted sample. Different than the overall sample, the selectivity in marital status in the age-restricted sample declines with increasing migration experience. Other coefficients remain similar in direction, but slightly different in magnitude or significance, across the samples. Despite these minor differences, our main conclusions (regarding the differential effect of the level and inequality of migration experience on selectivity) remain unaltered.

Tables and Figures

Table 1. HISTORY OF INTERNAL MIGRATION* (Data collected from 13-41 year olds in 22 villages in Nang Rong, Thailand in 1984-2000)

(1) Village Size 2000	(2) Mean Trips per Person 2000	(3) Migration History Rank 2000	(4) Migration History 2000	(5) Migration History 1994	(6) Growth in History 1994-2000 (%)	(7) Migration Prevalence Rank 2000	(8) Migration Prevalence 2000
315	0.44	1	34	20	76%	1	38
259	0.57	2	47	20	136%	2	42
293	0.60	3	49	29	72%	4	49
191	0.65	4	56	26	115%	5	49
349	0.66	5	56	35	59%	3	49
293	0.68	6	59	37	59%	7	52
328	0.68	7	61	39	55%	13	54
323	0.71	8	61	41	47%	6	50
441	0.68	9	61	37	63%	11	53
362	0.72	10	63	33	92%	10	53
409	0.72	11	63	40	58%	9	53
468	0.71	12	63	36	75%	12	54
312	0.70	13	64	42	54%	17	56
254	0.75	14	64	44	46%	8	53
302	0.73	15	64	39	65%	14	54
233	0.74	16	67	47	43%	15	55
254	0.76	17	68	39	75%	16	56
322	0.78	18	70	46	52%	18	57
273	0.78	19	72	55	31%	20	61
310	0.82	20	77	52	48%	19	61
312	0.90	21	86	59	45%	22	68
122	1.02	22	100	66	52%	21	66

* Migration history index is the average cumulative trips of migration in the village negatively weighted by its variation, scaled to 0-100 range. Migration prevalence ratio is the percentage of individuals who have ever migrated.

Table 2. CUMULATIVE MIGRATION EXPERIENCE (Data collected from 13-41 year olds in 22 villages in Nang Rong, Thailand in 1984-2000)

	MIGRATION HISTORY IN COMMUNITY				
Quintiles	**I**	**II**	**III**	**IV**	**V**
Prevalence ratio (%):					
Males	17%	27%	35%	45%	56%
Females	12%	22%	32%	40%	50%
All	15%	24%	34%	43%	53%
Cumulative migrant trips in village					
Males	20	35	48	58	61
Females	12	27	44	55	59
All	32	63	92	113	120
Inequality in distribution of cumulative trips (0-10)					
Males	4.9	3.1	2.2	1.5	0.8
Females	7.4	3.9	2.5	1.8	1.1
All	5.7	3.4	2.3	1.6	0.9
Destination for Male Migrants:					
Bangkok (%)	30%	41%	46%	45%	38%
Bangkok Metropolitan Area (%)	6%	9%	11%	14%	20%
Eastern Seaboard (%)	6%	9%	10%	12%	15%
North East (%)	42%	30%	23%	20%	19%
Other (%)	15%	12%	10%	9%	8%
Diversity (above groups, n = 5)	84	87	87	88	93
Destination for Female Migrants:					
Bangkok (%)	44%	51%	51%	47%	40%
Bangkok Metropolitan Area (%)	6%	11%	16%	20%	29%
Eastern Seaboard (%)	4%	6%	7%	9%	11%
Northeast (%)	37%	24%	20%	20%	17%
Other (%)	9%	8%	6%	4%	3%
Diversity (above groups, n = 5)	77	81	81	84	85
Community-years (N)	75	75	75	75	74
Years covered	1984-1993	1984-1997	1986-2000	1991-2000	1993-2000

Table 3. EDUCATION, DEMOGRAPHICS, AND WEALTH OF MIGRANTS AND THE OVERALL SAMPLE (Data collected from 13-41 year olds in 22 villages in Nang Rong, Thailand in 1984-2000)

	MIGRATION HISTORY IN COMMUNITY				
Quintiles	**I**	**II**	**III**	**IV**	**V**
Female (%)					
Migrants	37%	43%	45%	47%	49%
Overall	46%	48%	48%	50%	51%
Migrants/Overall	0.81	0.91	0.93	0.96	0.98
Mean Age of Males:					
Migrants	20.3	21.5	22.9	24.7	26.3
Overall	20.8	22.3	23.8	25.8	27.9
Migrants/Overall	0.98	0.96	0.96	0.96	0.94
Mean Age of Females:					
Migrants	19.6	20.8	21.9	23.8	25.6
Overall	20.1	21.4	23.1	25.3	27.7
Migrants/Overall	0.98	0.97	0.95	0.94	0.92
Married (%) among Males:					
Migrants	20%	25%	35%	46%	53%
Overall	30%	38%	45%	53%	61%
Migrants/Overall	0.65	0.67	0.78	0.86	0.87
Married (%) among Females:					
Migrants	26%	30%	37%	50%	58%
Overall	37%	43%	52%	63%	73%
Migrants/Overall	0.71	0.70	0.72	0.80	0.79
Mean Education of Males (in years):					
Migrants	6.3	6.6	6.8	7.0	7.5
Overall	5.7	6.0	6.2	6.6	6.7
Migrants/Overall	1.10	1.09	1.09	1.07	1.11
Mean Education of Females (in years):					
Migrants	5.9	6.4	6.5	6.7	7.2
Overall	5.3	5.7	6.0	6.3	6.5
Migrants/Overall	1.11	1.11	1.10	1.07	1.11
Land Owned by Males' Households (in rai):					
Migrants	24.1	22.5	22.3	22.0	20.3
Overall	26.9	24.5	23.3	22.4	19.7
Migrants/Overall	0.90	0.92	0.96	0.98	1.03
Land Owned by Females' Households (in rai):					
Migrants	21.5	21.4	21.1	21.6	20.5
Overall	27.5	24.5	23.3	22.1	20.0
Migrants/Overall	0.78	0.87	0.91	0.98	1.02
Sample Size					
Migrants	4,119	6,176	8,205	8,458	7,715
Overall	17,806	iv 21,799	24,443	25,192	22,428
Years covered	1984-1993	1984-1997	1986-2000	1991-2000	1993-2000

Table 4. RANDOM EFFECTS LOGISTIC ESTIMATION OF ODDS OF BEING A MIGRANT IN A YEAR MODELS BY QUINTILES OF THE MIGRATION INDEX[a] (Data collected from 13-41 year olds in 22 villages in Nang Rong, Thailand in 1984-2000.)

	MIGRATION HISTORY IN COMMUNITY				
Quintiles	**I**	**II**	**III**	**IV**	**V**
Individual Characteristics					
Age	1.15 ***	1.09 # ***	1.03 # ***	0.98 # **	0.90 ***
Sex (Male=1)	2.74 ***	1.95 # ***	1.60 ***	1.34 # **	1.23 #
Education (in years)	1.48 ***	1.50 ***	1.44 # ***	1.43 # ***	1.50 # ***
Married	0.10 ***	0.13 # ***	0.18 # ***	0.24 # ***	0.46 # ***
Land (in rai)	0.98 ***	0.98 ***	0.99 # ***	0.99 # **	1.00 #
Village Characteristics					
Village Remote?	0.63 **	1.05	1.06	1.10	1.39 # **
Migrant follow-up rate	1.06 ***	1.03 ***	1.05 ***	1.05 ***	1.03 *
Migration Context of the Community					
Migrant trips in the community	1.89	2.82 # *	2.69 **	1.89	2.58 # ***
Inequality of migrant trips	0.76	0.40 **	0.75	0.30 **	0.19 ***
Thai Economic Context					
Unemployment rate (%)	1.18	0.95	1.05	0.73 ***	0.61 ***
Annual GDP growth (%)	1.01	1.00	1.03 **	1.03	1.12 ***
Productivity-wage gap in agriculture (%)	1.00	1.00	1.01 **	1.03 ***	1.05 ***
Wage ratio (Bangkok/Northeast)	1.53	1.20	2.78 ***	5.63 ***	45.56 ***
Employment in manufacturing (%)	1.08	0.90	1.53 ***	1.38 ***	1.62 **
Wald chi-square	6600 ***	7951 ***	9098 ***	10593 ***	9663 ***
N (person-years)	17806	21799	24443	25192	22428

*p<.1,**p<.05, ***p<.01

#p<.1 (test of difference between coefficients of subsequent quintile models)

[a] Year and constant are included in all models. Results are presented in odds ratios. Migration experience and inequality are standardized to mean 0, standard deviation 1.

Table 5. RANDOM EFFECTS LOGISTIC ESTIMATION OF ODDS OF BEING A MIGRANT IN A YEAR - INTERACTION MODELS[a] (Data collected from 13-41 year olds in 22 villages in Nang Rong, Thailand in 1984-2000)

Individual Characteristics	**Model 1**	**Model 2**	**Model 3**	**Model 4**
Age	1.03 ***	1.06 ***	1.06 ***	1.32 ***
Sex (Male=1)	1.32 ***	1.33 ***	1.34 ***	1.75 *
Education (in years)	1.35 ***	1.27 ***	1.27 ***	1.82 ***
Married	0.33 ***	0.25 ***	0.25 ***	0.49 **
Land (in rai)	0.999 *	0.996 ***	0.996 ***	0.973 ***
Village Characteristics				
Village Remote?	1.06 **	1.02	1.01	1.03
Migrant follow-up rate	1.02 ***	1.02 ***	1.03 ***	1.02 ***
Migration Context of the Community				
Migrant trips in the community	2.11 ***	27.11 ***	19.90 ***	5.60 ***
Inequality of migrant trips	0.83 ***	1.29 ***	0.90	0.94
Thai Economic Context				
Unemployment rate (%)	0.89 ***	0.93 ***	0.93 ***	0.93 ***
Annual GDP growth (%)	1.01 ***	1.00	1.00	1.00
Productivity-wage gap in agriculture (%)	1.02 ***	1.01 ***	1.01 ***	1.01 ***
Wage ratio (Bangkok/Northeast)	2.38 ***	1.58 ***	1.54 ***	1.21 ***
Employment in manufacturing (%)	1.38 ***	1.20 ***	1.19 ***	2.07 ***
Interactions b/w Ind Char and Migration Experience				
Age*Trips		0.92 ***	0.92 ***	0.95 ***
Sex*Trips		0.80 ***	0.89 **	0.94
Educ*Trips		1.00	1.02 **	1.08 ***
Married*Trips		0.91 ***	0.79 ***	0.87
Land*Trips		1.00 ***	1.01 ***	1.01 ***
Interactions b/w Ind Char and Inequality of Mig Experience				
Age*Inequality			1.00	0.99
Sex*Inequality			1.14 **	1.15 **
Educ*Inequality			1.03 ***	1.02 *
Married*Inequality			0.85 **	0.84 **
Land*Inequality			1.01 ***	1.01 ***
Interactions b/w Ind Char and Economic Context				
Age*Employment in manuf.				0.98 ***
Sex*Employment in manuf.				0.98
Educ*Employment in manuf.				0.97 ***
Married*Employment in manuf.				0.94 **
Land*Employment in manuf.				1.00 ***
Wald chi-square	40435 ***	41847 ***	41846 ***	41909 ***
N (person-years)	111668	111668	111668	111668

*p<.1,**p<.05, ***p<.01

[a] Year and constant are included in all models. Results are presented in odds ratios. Migration experience and inequality are standardized to mean 0, standard deviation 1.

Figure 1. Migration Prevalence in 22 Villages in Nang Rong, Thailand
Lines for three villages with the maximum, median and minimum prevalence in 2000 are shown separately.

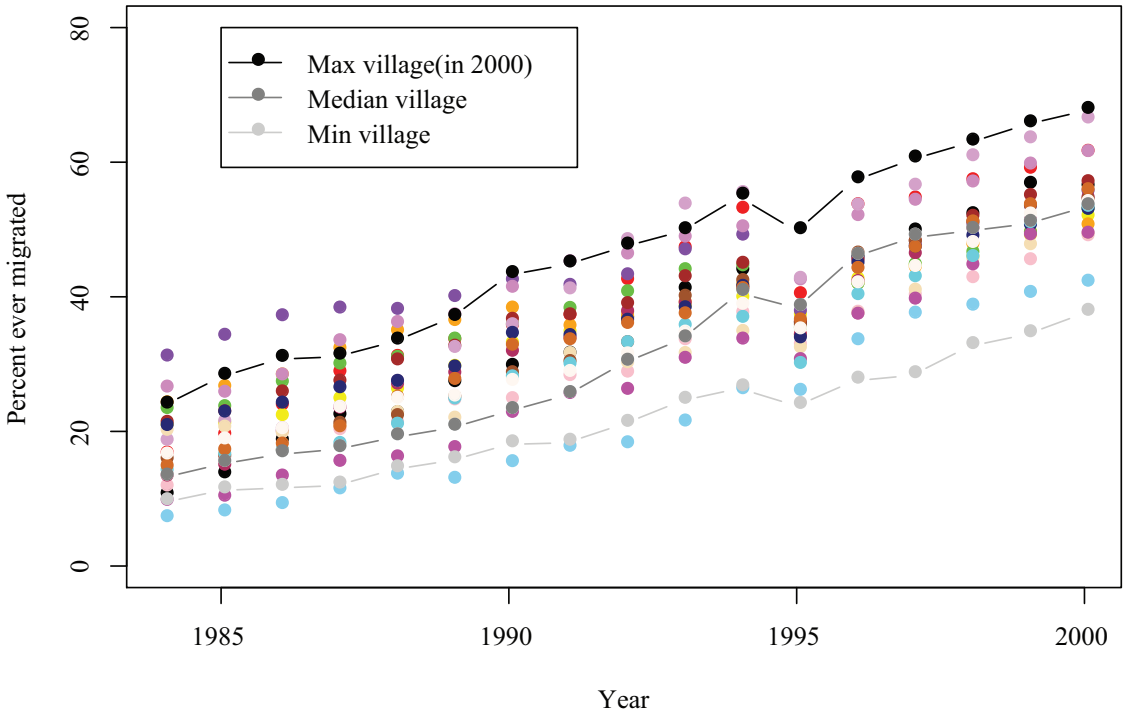
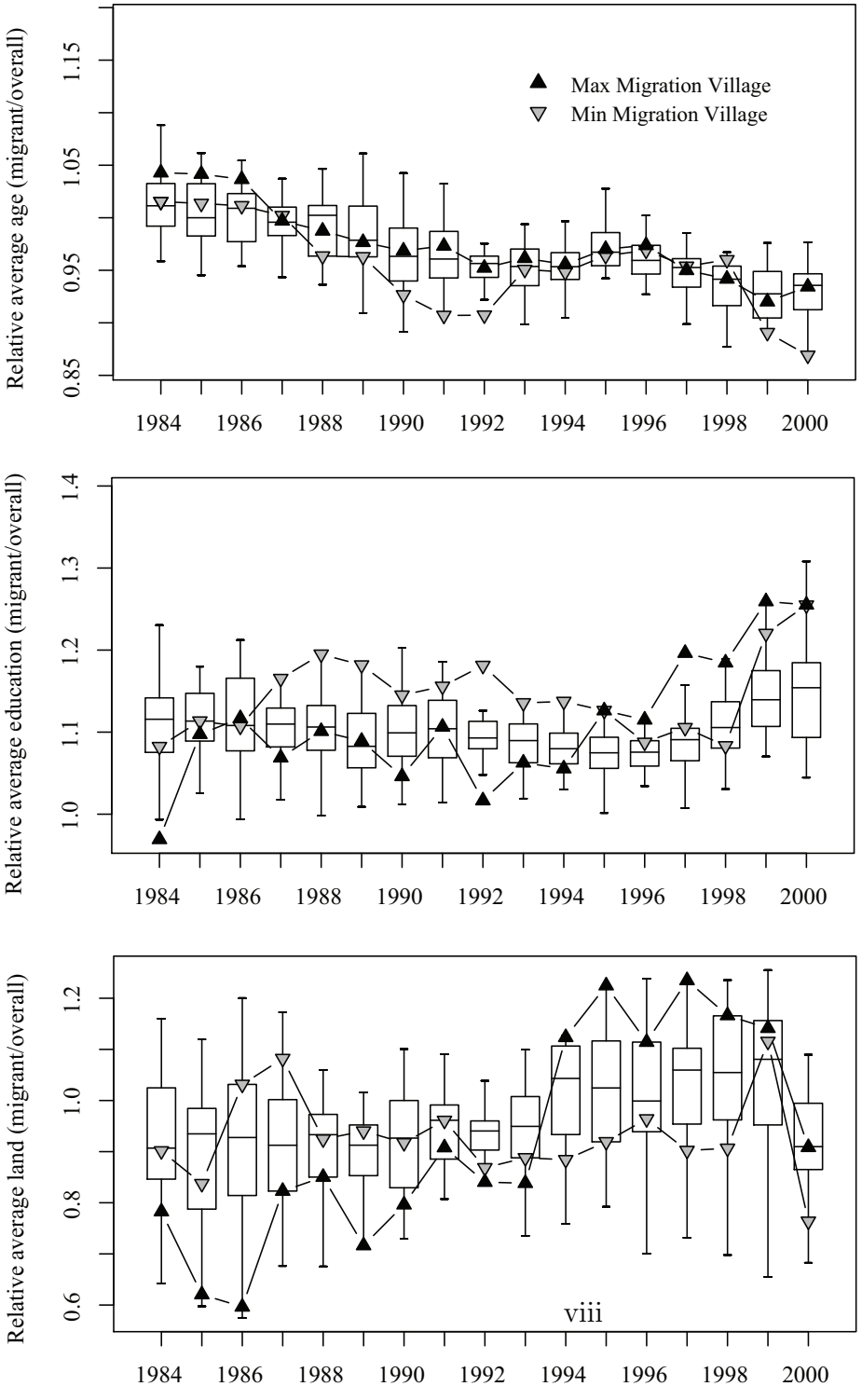


Figure 2. Trends in Migrant Selectivity in Villages over Time

Box plot shows the distribution of migrants' characteristics compared to the overall population across villages. The lines for the minimum and maximum migration history villages are shown separately.



Appendix Tables

Table A1. DESCRIPTIVE STATISTICS (Data collected from 13-41 year olds in 22 villages in Nang Rong, Thailand in 1984-20

	Mean	Standard Deviation	Minimum	Maximum
Individual Characteristics				
Age	23.99	6.99	13.00	41.00
Sex (Male=1)	0.51	0.50	0.00	1.00
Education (in years)	6.14	2.77	0.00	19.00
Married	0.50	0.50	0.00	1.00
Land (in rai)	23.22	24.60	0.00	912.00
Village Characteristics				
Village Remote?	0.37	0.48	0.00	1.00
Migrant follow-up rate	55.36	7.95	39.71	69.51
Migration Context of the Community				
Migrant trips in the community	0.43	0.19	0.08	1.02
Inequality of migrant trips	2.61	1.61	0.00	10.00
Thai Economic Context				
Unemployment rate (%)	2.98	0.84	1.51	4.37
Annual GDP growth (%)	6.39	5.49	-10.51	13.29
Productivity-wage gap in agriculture (%)	-3.66	10.51	-22.48	11.77
Wage ratio (Bangkok/Northeast)	2.20	0.27	1.62	2.54
Employment in manufacturing (%)	11.36	2.03	7.80	14.50
N (person-years)	111,668			

Table A2. RANDOM EFFECTS LOGISTIC ESTIMATION OF ODDS OF BEING A MIGRANT IN A YEAR - INTERACTION MODELS with ALTERNATIVE SAMPLES[a] (Data collected from 13-41 year olds in 22 villages in Nang Rong, Thailand in 1984-2000)

Individual Characteristics	**All Sample**	**Follow-up > 65 %**	**18-25 year olds**
Age	1.32 ***	1.16 **	0.97
Sex (Male=1)	1.75 *	30.41 ***	6.20 ***
Education (in years)	1.82 ***	1.72 ***	1.28 ***
Married	0.49 **	2.86	0.44 **
Land (in rai)	0.97 ***	0.99	0.97 ***
Village Characteristics			
Village Remote?	1.03	0.81 ***	0.83 ***
Migrant follow-up rate	1.02 ***	0.89 *	1.04 ***
Migration Context of the Community			
Migrant trips in the community	5.60 ***	2.99 **	0.91
Inequality of migrant trips	0.94	0.42 **	0.91
Thai Economic Context			
Unemployment rate (%)	0.93 ***	0.94 **	0.92 ***
Annual GDP growth (%)	1.00	1.00	1.02 ***
Productivity-wage gap in agriculture (%)	1.01 ***	1.00	1.02 ***
Wage ratio (Bangkok/Northeast)	1.21 ***	1.26	2.76 ***
Employment in manufacturing (%)	2.07 ***	1.87 ***	1.29 *
Interactions b/w Ind Char and Migration Experience			
Age*Trips	0.95 ***	0.94 ***	0.99
Sex*Trips	0.94	1.69 ***	1.02
Educ*Trips	1.08 ***	1.13 ***	1.05 **
Married*Trips	0.87	1.25	1.40 **
Land*Trips	1.01 ***	1.01 ***	1.00
Interactions b/w Ind Char and Inequality of Mig Experience			
Age*Inequality	0.99	1.03 *	0.97
Sex*Inequality	1.15 **	1.76 ***	1.22
Educ*Inequality	1.02 *	1.01	1.03
Married*Inequality	0.84 **	0.88	1.38 **
Land*Inequality	1.01 ***	1.01 ***	1.00
Interactions b/w Ind Char and Economic Context			
Age*Employment in manuf.	0.98 ***	0.99	1.01
Sex*Employment in manuf.	0.98	0.76 ***	0.88 ***
Educ*Employment in manuf.	0.97 ***	0.97 ***	1.00
Married*Employment in manuf.	0.94 **	0.81 ***	0.96
Land*Employment in manuf.	1.00 ***	1.00	1.00 **
Wald chi-square	41909 ***	8566 ***	15470 ***
N (person-years)	111668	21779	44142

*p<.1,**p<.05, ***p<.01

[a] Year and constant are included in all models. Results are presented in odds ratios. Migration experience and inequality are standardized to mean 0, standard deviation 1.