The Logic of Letting Go:
Family and Individual Migration from Matlab, Bangladesh

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I. Introduction

In their attempts to unify the patterns and determinants of migration under one theoretical umbrella, demographers and economists often seem to ignore the heterogeneity in motivation for migration that exists in almost any sending population. So, too, do they ignore heterogeneity in the ties that bind migrants to their origin communities. It sometimes becomes clear, especially from qualitative research, that different processes may be at work in sub-groups of a potential migrant population. The two major demographic/microeconomic models of migration, the Neoclassical and the New Economics of Labor Migration, have historically only been tested separately. More recently, researchers (e.g. Massey and Espinosa 1997) have shown that a single migration system can demonstrate aspects of both models. There is, however, no evidence on what distinguishes those households, within the same population, that represent each of the two models.

In rural Bangladesh, qualitative research suggests that two flows of urban-bound migrants coexist. The history of the modern period of Bangladeshi rural-urban migration[1] has likely been dominated by young males (and more recently females as well) moving individually to cities, as is typical throughout Asia. But for some time, nuclear families have been moving to cities in considerable numbers, particularly to slums. While individual migrants may maintain close ties with their origin families, often depending on informal security mechanisms and mutual cooperation, *migrant families* often break ties with their past, establishing independent economic units in the city.

This paper will explore the hypothesis that individual migration occurs in ways consonant with the New Economics of Migration while family migration better fits the Neoclassical model. While the data available do not permit an examination of specific events or constraints that might affect immediate decisions, the paper will establish that the two flows of migration include dissimilar populations and often occur in different community settings. The quantitative analysis

tests two broad hypotheses: 1) individual-migrant sending households possess greater rural economic options than family-migrant sending households; and 2) a social or geographical unit's past experience with one form of migration leads to continued participation in that same flow but is unrelated or has a negative association with participation in the other flow. The next section of this paper will discuss the theoretical contrasts between the two forms of migration and the circumstances under which each type of migration might hold. After introducing the setting and data in Section III, Section IV will use results from qualitative fieldwork to explore differences between family and individual migration which make them representative of the two theoretical frameworks. Having established a meaningful dichotomy between family and individual migration, Section V will use regression analysis to test the two hypotheses described above and determine the economic, social, and structural characteristics of households likely to participate in the two migration flows.

II. Theoretical Background

The Neoclassical model of migration can be viewed as a *self-oriented model*, taking migration as a response to a utility-maximizing decision by the migrating unit (Todaro 1969; Sjaastad 1962). Migration is considered a response to a positive differential between expected income in the destination area and current income in the origin area for those members of the migrating unit who earn income, a decision that does not consider the utility of the household or family from which the migrant emerges. In such a world, migration only benefits those left behind indirectly, through increased compensation for resources and employment (Lewis 1954; Ranis and Fei 1961). .

In the Neoclassical model, it is assumed that migration typically involves the complete economic separation of the migrant from his/her origin household or community, and that there is no utility the migrant might gain from cooperating or sharing with the origin family. In the

absence of community utility considerations, the model ignores remittances, relegating them to motivations such as altruism or guilt. Further, it ignores the possibility that the migrant might move for the express purpose of raising money for a household of which he still remains a member, one to which he might return some day. In the neoclassical world, return migration can only occur if the income differential between origin and destination areas reverses.

The New Economics of Labor Migration emerged as a way to address the neoclassical model's failure to accommodate community welfare and return migration. The New Economists argue that migration decisions do not occur in a world of perfectly-functioning markets, a world in which the economic potential of all households is fully realized. Migration is often a means to diversify a family's economic "portfolio" in response to an inability to fully realize economic potential in the face of certain market failures (Stark 1982; Stark and Bloom 1985). If an extended family needs to insure its joint agricultural activities against crop failures but cannot access insurance markets, then it can send a member to an area where incomes are uncorrelated or negatively correlated with local incomes. If it needs investment capital but cannot access banks, then a member of the family can live cheaply in the city and remit surplus income. Migrants remain active members of the household economy, sending remittances for the purpose of investment or crisis alleviation. In return, migrants may also be the beneficiaries of assistance from the household, for instance in cases of illness or job change.

The New Economics focuses specifically on the role of migration in coping with market failures that prevent adequate investment and insurance. More generally, other theoretical perspectives have stressed the importance of continued economic cooperation between migrant and origin household. Migration can enable rural households that cannot invest to maintain their economic positions or pay for yearly agricultural inputs with remittances rather than depending on credit. Marxist sociologists have stressed the importance to urban migrants of "informal security mechanisms" which act as a "wage subsidy" in the face of low urban wage that do not permit

savings (Shaw 1988; Portes and Walton 1981; Das Gupta 1987; Lipton 1980). Rural origin households often supply migrants with fresh produce, a place to stay during vacation, a haven in times of illness or unemployment, and a place to live upon retirement.

These two competing theories of migration have been supported in different populations but have rarely been discussed in the same population. The threat of separation by a rural-urban migrant from his origin household serves as one of the engines for fertility decline and family change in Taiwan (Thornton et al. 1994), among other settings and serves a role in Caldwell's theory of fertility decline (Caldwell 1982). The self-oriented model seems to hold in Latin America, where the rapid post-War urbanization generally involved the migration of families that substituted strictly urban security mechanisms for rural-urban ties (Portes and Walton 1981). The New Economic perspective, on the other hand, has been frequently cited for its role in international migration from Mexico to the United States (Taylor and Wyatt 1996) and clearly plays a role in Becker's *quantity-quality tradeoff* model of fertility behavior (Becker 1981). At issue in this paper is, under what circumstances would rural households in the same population be more likely to participate in one flow versus the other?

New Economics researchers have stressed the importance of migration as an economic tool for landed households, particularly households with small land holdings. These households would be more likely to need insurance and credit than landless households, which have few assets to insure or improve, and than large land holders, who can self-insure and self-finance. Small land holding households have been found to use migration as a tool for raising investment capital (Taylor and Wyatt 1996; Lindstrom 1996; Massey and Parrado 1994). Stark and his colleagues have also shown that migrants are more likely to send remittances to households where there is a possibility to inherit land or cattle (Lucas and Stark 1985; Stark and Lucas 1988), particularly when those assets are threatened by an economic crisis. These findings stress that in rural households which have land and other assets, migration is often a temporary process

designed to improve the financial position of both migrant and origin household.

Self-oriented migration, which involves a migrant who does not cooperate with his origin household, is likely to occur when the migrant either does not need help or cannot get help from his household. If a migrant's urban earnings allow the purchase of land or a flat in the city and his employment or city residence offers benefits like pension or health care, then the migrant is unlikely to need informal security arrangements with the village household. Thus those migrants with the most potential for earning, such as those with the most education, may be more likely to separate from their origin households.

Some households, on the other hand, cannot gain any assistance because their origin households simply have nothing to offer. A landless origin household, particularly one with no access to land even through rental arrangements, has little ability to provide short-term informal assistance, offers no land for the migrant to inherit in the long term, and cannot effectively invest a migrant's remittances. For a migrant from a landless household, there may be no incentive to send remittances, maintain ties, or return to the village. In many countries, migrants who separate in this way substitute for these rural security mechanisms by participating in strictly urban support networks (Portes and Walton 1981). This loosening of familial bonds in the absence of assets is also discussed in the literature on household fragmentation and poverty, which finds that landless households in joint family societies such as Bangladesh are much quicker to fragment into separate households. This is thought to result from 1) the lack of any business or operation around which the household can unify, 2) the lack of heritable assets to reinforce filial loyalty, and 3) conflicts resulting from the monetization of the household economy due to increased labor force participation (Caldwell et al. 1988; Cain 1978; Jensen 1987). Family migration in rural Bangladesh may often serve as an event leading to household fragmentation.

III. Setting and Data

The data for the quantitative analyses come primarily from the period 1974-1987 in Matlab, a rural thana in Chandpur District, in the southeast of Bangladesh.[2] Matlab is located on the Dhonnogoda River, in the flood plain of the Meghna River. Most households depended historically on underwater cultivation of rice during the flood season (June-September) for their primary staple crop. Almost all land outside of the densely settled areas of elevated homesteads was submerged throughout the flood season, inducing extreme yearly cycles in nutrition, labor, and prices (Chen et al. 1979). During the floods, as in much of Bangladesh, many small landholders and sharecroppers were forced to purchase grain at high prices on credit before repaying the debt to wealthy villagers at lower, post-harvest grain prices (Jensen 1987; Jahangir 1979). This cycle of debt leaves a shadow of default, land mortgage, and land loss over most small land holders. For landless or near landless households, the flood is a time of underemployment and under-nutrition, placing pressure on remaining assets.

Matlab is only 50 kilometers from Dhaka, but by road (in the dry season only) or by boat, it takes about six hours to the capital, prohibiting a daily or, for most, even a weekly commute. Because of its proximity to Dhaka and its location in the major industrial belt along the Dhaka-Chittagong Highway, Matlab is a major source of migrants to Dhaka as well as to Chittagong, the second largest city and major port (eight hours away), Comilla, the closest city (three hours away), Narayanganj, the historic center of the Bangladeshi textile industry (five hours away), and Chandpur, the district headquarters and a historic river port. Migration has had a major role in slowing population growth, and therefore population pressure on land, as can be seen in Table 1. Between mid-1982 and 1996, migration removed a net total of 40,327 people, of which 25,598, or 63% of this number, was due to migration to cities. The net urban migration over this period counterbalanced 40% of the substantial natural increase and migration generally counteracted 62% of the natural increase. Even by the end of 1987, when the analysis period for this paper ended and migration was at a less advanced stage, 35% of natural increase since 1982 had been

counteracted by urban migration and 56% by migration more generally.

Matlab has been a field site of the International Centre for Diarrhoeal Disease Research, Bangladesh (ICDDR,B) since 1962 and has been the site of the ongoing Demographic Surveillance System (DSS) since 1966. ICDDR,B's operation in Matlab later expanded to include a hospital for diarrhoeal diseases and, in 1979, an intensive maternal/child health and family planning (MCH/FP) experiment (Fauveau 1994). In the experiment, intensive family planning services were introduced to half the population of the DSS, which led to a faster pace of fertility decline in this MCH-FP area (Phillips et al. 1988) relative to the remaining, comparison, area (which received the standard government services). While the family planning experiment might be expected to affect investments in human capital and eventually migration patterns in the MCH-FP area (Foster and Roy 1992), changes in migration would not be expected until the children born after 1979 were old enough to work.

The DSS collects monthly information on every birth, death, marriage, divorce, and migration (of 6 months or longer) for every household in the 149 villages that comprise the MCH-FP and comparison areas. Prior to 1982, only the cause of migration was recorded; subsequently destination was included. In 1982, a comprehensive census collected demographic, occupation, and education data from individuals and socio-economic data from households. Households included in the census constitute the study population for the quantitative analysis.

The qualitative data also originate primarily in Matlab, but were collected more recently. The Matlab Health and Socioeconomic Survey (MHSS) was carried out in 1997. Interviews were conducted with members of over 5000 households and, in addition, a random subset of 600 migrants from those households who had remained in Bangladesh and could be traced to their current residences. During the first half of 1998, a team of six field workers and the author collected extensive data on migration behavior, social networks, remittances, and rural/urban ties, first from a random sample of the urban migrants who had participated in the MHSS.

Subsequently, the origin households of these respondents were contacted. This began a three month process of interviews and informal conversations with relatives and other members of the social circle of these original households. These data on families that originated in Matlab were supplemented by a series of interviews with family migrants from other parts of Bangladesh to slums near the Buriganga River in Dhaka.

The qualitative interviews gained viewpoints on family migration from a variety of urban migrant families, including those which moved as a unit, and those which sent a scout before the rest of the family followed. The quantitative analysis in this paper, however, focuses only on the migration of a *family unit at the same time*. This type of migration is a discrete event, one which surely involves a great degree of separation between the migrants and their former household. It also is determined purely by rural factors, rather than factors that emerge after a scout moves to the city. The dissertation project from which this paper originates will subsequently examine permanent settlement and spousal unification in the city, which complete the picture of urban settlement and family migration.

IV. Individual versus Family Migration: Qualitative Impressions

Migrant *families* clearly fit the mold of the neoclassical migrant. The migrant family shifts not only its economic production to the city, but also the consumption of the spouse and children, thus directing its resources almost exclusively to urban consumption. Family migrants become permanent urban residents, often forming support networks with households near them in the city rather than maintaining close security arrangements with people from their village. These urban networks can include people from the same origin community or from other areas.

In qualitative interviews, very few migrants with families in the city sent money to the village, even if their parents were still alive. Most had gone through separation (Bangla word?), a very common, simple, and unceromonious process that absolves the separating household head of

any official obligations to his parents (Caldwell et al. 1988; Foster 1993; Barkat-e-Khuda 1985). When a family migrant in the sample sent any remittances at all to his origin household, it was usually only 50-200 taka ($1.00-$4.50) at most every few months, or an item of clothing sent infrequently, perhaps during an annual festival. Such transfers, either in cash or in kind, are helpful to the origin household head, but by no means serve as a major source of income unless the household is truly destitute. Migrants who brought their families to the city after an initial period alone or who moved when single and subsequently married in the city report limiting the amount they transfer to the village following unification with their family.

Family migrant household heads report a difficult time paying for their families to live in the city on salaries which are generally intended primarily to support family members living at a lower cost of living in the village. They keep their families in the city, however, for a variety of reasons: 1) It is cheaper to live in slums in the city together than to maintain separate urban and rural residences; 2) the family would be unsafe or unsupported living in the village; 3) no extended family remain in the village to assist spouse and children; 4) the family had a quarrel with others in the village; 5) the spouse and children were more likely to find work in the city. Most family migrant household heads work in the informal sector, particularly in jobs that require no training or contacts and do not involve having an immediate employer, such as rickshaw puller or hawker. These jobs, which can be gained quickly and achieve their maximum wage earning potential immediately, are ideal for a migrant whose family cannot afford the period of training and low salary that many better jobs in Bangladesh require. Migrant families experience much more difficulty finding housing, since transitional living arrangements (living as an extended member in a relative's home or in a shop house, factory floor, or hostel) are usually limited to the lone male migrant.

Family migrants also rarely visit their origin villages. Many go only once a year for a major festival; some have not returned for years. Although many of the family migrants entertain

the notion of buying land in their village and retiring there, very few have opportunities to purchase any land or have many contacts for gaining access to land. Fewer still stand to inherit any significant amount of land. Returning to the village for most would be an act of final resignation, done only after they had exhausted all urban income-earning opportunities and are unable to afford even slum living. Many of these people would be forced to live on the support of urban-resident children or relatives in a village they have not lived in for years. It remains unclear how many of these family migrants will return to the village upon retirement since many are still too young to retire. In 1993, in a population of slums served by ICDDR,B (where over 80% of new migrants move as families), 7% of the entire population and 9.5% of the non-urban-born population was over the age of 50. While this is lower than the 13.6% over 50 in Matlab in the same year, it is still a sizeable proportion of the population.

Family migration often involves a socially isolated population. Migrant families are likely not only likely to be poor and to have faced a crisis like loss of land, flood, or debt default, but to be from households with the fewest social support options in the village. Landless households that have the support of a wealthy relative or patron may be able to find a way to send a scout to the city, who would live there for a few months or years before having the entire family join him.

The isolation of the family migrant experience was illustrated strikingly in our field work. As described earlier, we started with a subsample of the households in the MHSS that were known to have had urban migrants. When we traced their social networks and asked about migrants, *only* individual migrants were named; this process yielded not a single family migration unit. These village informants were aware of the process of family migration but, even when pressed, could not name any family migrants except for a few wealthy individual migrants who had brought their families to the city later. Only when we began to name specific ones known to us from the MHSS and DSS did villagers recognize any of these family migrants. Even then, only people such as shopkeepers, who have contact with every villager, could identify these migrants.

Family migrants are often clustered, sometimes in notably depressed areas. In one DSS village, most of the more recent family migrants had lived in an area where crop land had been lost through inundation caused by construction of a major embankment. In this area, which resembled a rural version of a slum, some had moved out immediately after the embankment was built, but others trickled out over a period of years.

While family migrants exist in isolation from their origin villages, individual migrants have stronger contact with their origin villages as well as connections to the mainstream of village social life. Unmarried individual migrants typically visit their parents' households at least once every two months. Married individual migrants visit their spouse, children, and parents even more frequently, returning not only for social visits but also to conduct important household functions like monthly shopping, planting, and harvesting. During harvests, most individual migrants who come from landed or sharecropping families take weeks off at a time to work in the fields. Many migrants specifically look for jobs with flexible schedules, which have become a common feature of urban jobs. In this way, the household can continue to benefit from the migrant's labor during the most important time in the agricultural year and avoid having to hire laborers.

An individual migrant in the city typically lives in transitional housing in order to maximize the income he sends home. Often jobs in factories or established shops will come with housing provided by the owner. Individual migrant household members also frequently swap roles, with a migrant moving back to the village to be replaced by another sibling (usually a brother), but perhaps returning to the city later. Interviews yielded different configurations of brothers, either married or single, alternating roles in the city. One common example involves an older brother moving to the city to pay for the education of his younger brothers. When the younger brothers reach college or work age, they move to the city while the migrant returns home to get married and work with his father. Most individual migrants initially reported an intention to return to the village, although some who are more successful or whose village households have difficulty

supporting the migrant's family eventually bring them to the city.

In Bangladesh, the stark economic landscape, even in Dhaka, adds a particular urgency to the need for maintaining strong rural ties. In qualitative interviews, migrants repeat the refrain that unless your family has high-level contacts, there is no chance of getting good jobs, typically those in the government and development sectors. Migrants from middle income village families claim that they could never save enough money to settle in the city with their wives and children. This rings true even for white collar migrants earning 10-20 times the yearly per capita income. While upper middle income migrants might bring their families to the city for a fixed period, their ability to settle and retire in the city hinges on purchasing land or a flat, an opportunity which has been priced out of the reach of most people.[3] The poorest migrants solve this problem by living in low cost rental housing in slum conditions or by squatting on unoccupied land, but migrants in the middle may be unwilling to do this. For those migrants, the best option is to migrate alone, leaving the rest of the conjugal family in the village with or next to the family of the migrant. These migrants eventually return to the village permanently.

V. Quantitative Analysis

Expectations for the Quantitative Analysis

Based on the theoretical background, family migration is expected to be associated with limited ownership of land and other productive assets, both in terms of ownership and rental access. Individual migration is expected to occur in a more diverse group of households but to be more likely among landed households. The type of migration a household undertakes is also expected to depend on family structure. Since individual migration is postulated to be part of an effort to diversify a household's economic activities, households that have more people, particularly adult males, who can fill the work void left by the migrant, are considered more likely to send this type of migrant. Family migration, on the other hand, is likely to result from the

absence of anyone who could easily move to the city individually, such as single adult males.

Education has often been found to have a positive effect on migration, and is expected to do so in this analysis. Although qualitative interview respondents cite family connections as the most important way to get a secure job in the city, they also say a certain degree of education is essential. To the extent that family migrants are poorer and have fewer economic options than individual migrants, they may also be likely to have less education. But controlling for economic status (measured here as land holdings), it is expected that the education a household was able to give to its most educated member (the measure used here) has as strong a positive effect on family migration. Since some family migrants leave the village because they are economically secure and self-sufficient, family migration should actually be more responsive to the highest levels of education than individual migration.

The two flows of migrants are also expected to be unrelated to one another: past experience with one form of migration in a group should not encourage, and perhaps may discourage, the other form of migration. In addition, we expect the level of each type of migration in one period to be related to the future levels of that type. These expectations come about because individual and family migrants appear, based on the qualitative interviews, to operate in separate social networks. Individual migrants are likely to move in a chain, with a past migrant helping future migrants as soon as he becomes established in the city, offering work and transitional housing. Past individual migrants are expected to be less likely to help *families* because 1) family migrants are unwilling to take jobs that require an initial period of apprentice-level wages, 2) it is impossible to offer transitional housing to the whole family and 3) potential family migrants generally exist outside of the social networks of successful past migrants.

Family migrants do not seem to provide as much assistance to later migrants because 1) they have limited resources and work in jobs where they wield little power, 2) they do not maintain close ties to many people in the village, and 3) many of the people they might want to

assist would also be family migrants, for whom they are unable to provide housing. Past family migration from an area is still likely to be associated with future family migration because so many family migrants tend to be clustered in the same villages and sections of villages, but this association would likely diminish over time.

Because of the isolation of the networks for the two flows of migrants, it is also likely that past experience in a village with one flow may actually make a household *less likely* to participate in the other flow. Negative associations or non-associations should be found between past migration of one type and current migration of the other type, although the greater ability of past individual migrants to provide assistance should make their effect on current family migration less negative than the converse effect.

The Model

The quantitative analysis uses information on the households recorded in the 1982 census which were then followed until the end of 1986 in the DSS to determine all migration events for that household in that period. The followup was limited to four years because all individual and household characteristics are reported only in the census and, therefore, may become less accurate over time.

A household-year observation was created for each of the years 1983-1986. In addition to 1982 census data, the observation records whether the household had participated in individual or family migration to a city during the given year, but only if that migration involved a male. (Note that a migration event is recorded in the DSS only if the person(s) left the household for at least 6 months). This restriction is applied because, in the mid-1980s, nearly all migration of single women was for marriage and very few wives migrated without their husbands, except for family reunification. Migration of female-headed families is also rare and introduces complexities which cannot be fully addressed in this paper, although the processes are likely to be similar.

A migration event was coded as a family migration if a group of household members,

including at least one married adult woman and one married adult man (over the age of 10), moved on that day.[4] An individual migration episode is coded if at least one male over the age of 10 moved to the city unless the reason for migration is listed as "Marriage" or "To join with parents," in which case no migration was coded.

Multinomial logistic regression models were developed in which the dependent variable had three categories: the household experienced individual urban migration, family urban migration, or no urban migration in that year. A multinomial logistic regression model predicts the odds of each migration event occurring relative to the possibility of no event occurring in that household-year. The tables presented in the text show the coefficient, which indicates the effect that a given variable has on the natural log of the odds (p/(1-p))of having a specific event. While there are observations for multiple years per households, this is not an event history analysis *per se* as a household can have an event in multiple years and a few households may have participated in each flow during the same year. A household is censored (no observation is included for any subsequent year) only if the *entire household* migrates as a unit in that year, to any location, thus dissolving the household.

Because a few households participated in *both* migration flows in a given year (by virtue of having both an individual *and* a family migration event in the same year, initial models tested the *independence of irrelevant alternatives* (Greene 1997). Using a Hausmann specification test, the coefficients and standard errors were compared for individual logistic regression models, one of which had only three possible outcomes (individual or both individual and family migration, family migration only, no migration) and one which had four possible outcomes (individual migration but no family migration, family migration but no individual migration, both family and individual migration, no migration). Households that practice both forms of migration are coded with the individual migrant-sending households in the three outcome model because they are diversifying their household in the same way an individual migrant household is. The Hausmann

test for each model found no significant difference between the coefficients for individual migration whether or not households which sent both types of migrants were included in the same category. Therefore I include households that practice both forms of migration in the individual migration category.

Another problem, an issue of selection, had to be dealt with before we could proceed in developing models. All households with an adult male, single or married, are eligible for individual migration while only those households that have a married male present are eligible for family migration. In a model predicting family or individual migration for all households with an adult male, we are not able to disentangle the predictors of family migration (conditional on having a married male present) from the predictors of merely having a married male present and thus being at risk.

The simplest way to deal with this selection issue is to exclude all households with no married adult males present from the data set used in the multinomial model, but this solution is only appropriate if the predictors of individual migration do not differ between those households that have married males present and those that do not. We therefore estimated two binomial logistic models in which the outcomes were individual migration and no migration from the household. One model used the specified covariates alone, while the second used the same covariates plus interactions between every covariate and a dummy variable indicating whether the household has a married male present. If the second model fits the data significantly better than the first, then we have established that there is a difference between individual migration in households with and without married males present. The results of the chi-square tests for each set of covariates we use are displayed at the bottom of each model specification in Tables 4-6; in each case the interactions have no significant differential effect on the likelihood of individual migration. Therefore we have established that it is reasonable to include only households with married males present.

Predictor variables for the models come from the 1982 census and from DSS migration records from mid-1974 to mid-82 and from 1983 to 1985. Household-level variables include household land holdings per person; access to land; household size and structure; religion; and education of the most highly educated household member. Additionally, village-level variables were created. Village population growth 1974-1982 was calculated from the village populations in the censuses of those years. From the information on each household in a village, we calculated the 1982 proportion of landless households. For each of the years 1984-1986, we created two measures of village migration in the previous year from the household observations for the previous year: the proportion of households in the village that sent an individual migrant in the previous year and the proportion that sent a family. A second pair of variables is designed to measure the long-term importance of past migration through the proportion of households in the 1982 census that practiced family or individual migration during the period from 1974-82. The DSS records for those years were searched to identify these migration records. During this period, surveillance did not include a variable for migrant destination, so these variables indicate family or individual migration to *any location, either rural or urban,* and are thus likely to understate the true effects of urban migration on later urban migration. Finally, the two sets of migration measures were calculated for each bari, which is the kin-connected cluster of households around which rural Bangladesh social life is organized. The variables are described in Table 2.

After 1982 census records, 1983-86 migration data, and 1974-82 migration data were matched, excluding households that were not in the 1974-82 files or the 1983-86 files, 31,798 households were available for analysis. For these households, three records were generated, one for each year from 1984 to 1986. The year 1983 was used only to generate the migration in the previous year measures, since comparable data for 1982 were not available. Records subsequent to the dissolution of a household were removed, numbering 164 following 1984 and 161

following 1985. There were, as a result, 94,905 records to be analyzed. Of those household-year observations, 2,825, or on average 3.0% of households, participated in individual migration. Another 527, or 0.55%, migrated as entire households. Fourteen households that participated in both forms of migration in the same year were coded only as sending individual migrants.

The number of households sending family migrants (531) was far smaller than the number sending individual migrants (2931), as shown in Table 3, but the family groups were larger; therefore over 40% of people leaving the DSS area in 1984-86 did so in family units.[5] The modal family migrating unit was four people, with a mean size of 4.12. Among individual migrants, 91% of the migrating units are in fact single persons; the mean unit size was 1.10 people. The age distributions in Figure 1 show a wide range of ages for family migrants, with the modal age group being children five to nine years old. Among individual migrants, a large majority (77%) are between ages 15 and 29. Given the restriction requiring at least one male in each migrating unit, individual migrants are almost entirely males (98%, the exceptions being unmarried women who moved with male migrants) while family migrating units have a fairly even split between males (52%) and females (48%).

Figure 2 shows the association between the village proportion of households practicing family migration and the proportion practicing individual migration in the 149 DSS villages during a given year. The association between the two forms of migration is small ($r^2 = .03$) but significant, suggesting that some of the same root structural causes, such as economic penetration, communications, and population density may lead to both forms of migration. Clearly, however, other factors may help explain the occurrence of each form of migration. The household level analysis will look at the effects of *past migration* of each form on current migration, thus accounting for aspects of both spatial autocorrelation and social network effects. This type of analysis may better represent numerical associations at the population level, which were washed out by giving only one observation to each village regardless of size.

Household Level Analysis

Table 4 begins the presentation of multinomial logit models predicting migration by type from a household in a given year. The predictors in the first models are household characteristics, primarily household structure and wealth. Household structure is measured here as the combination of the number of single (0, 1, 2, or 3+) and married (1, or 2+) adult males living in the household, with adults being those 10 years old or older.[6] The categorization for married males corresponds to a distinction between nuclear and joint households. (The lines in the tables corresponding to joint households are shadowed).

Household structure is an important predictor of the type of migration a household will undertake. In particular, the presence of single males has a differential effect on family and individual migration (Table 4, Columns i-ii). The likelihood of individual migration increases strikingly with the number of single males. The more single males a household has, the more able it is to fill more economic roles, especially those vacated by a migrant. The household is more likely to be able to effectively diversify economically, productively use the migrant's remittances, and eventually send more migrants or have one household member replace the migrant in the city. Having an additional married male (and, therefore, an extended household) makes individual migration only slightly more likely. These differences probably reflect the fact that the large majority of individual migrants are single (81%).

The odds of family migration are much lower than for individual migration, regardless of household structure (Table 4, columns iii-iv) and the presence of single males affects nuclear and extended households differently. In nuclear households, as the number of single males increases, the likelihood of family migration decreases. This finding suggests both that households with additional single males may be better able to send individual migrants and that households with no single males may be forced to migrate as a unit, perhaps because there would be no one remaining in the household to protect the spouse and children of the migrant. Extended family households

are considerably more likely than nuclear households to send a family unit, suggesting that family migration often is the partition of a joint household, with members of one conjugal unit moving to the city and the remainder staying behind in the village. A point worth noting is that the odds of family migration are higher when there are only married males present in the household than when there is also one single male. The odds of family migration then increase with additional single males.

The estimates in Table 4 confirm the crucial and differential role of land holding in migration. The most important aspect of the rural economic opportunity hypothesis states that land deprivation, particularly total landlessness without access to any land, is a strong positive determinant of family migration while households with some small land holdings are likely to practice individual migration. The land holding coefficients show that individual migration is more likely among households that have some, compared to no, land (Table 4, columns i-ii). Family migration, on the other hand, is much more likely among landless households, with landless households having over 50% higher odds ($e^{.413)}$ of sending family migrants than each of the other three land categories (Table 4, columns iii-iv). Households that have access to land through rental or sharecropping arrangements also have a low likelihood of family migration that is very close to the likelihood for landed households. Owning additional cattle has a slight negative effect on individual migration but it has very large negative effect on family migration. Thus assets clearly have a differential effect on family and individual migration before we control for education and village characteristics. Hindu households and households where the head's occupation is fishing are also much less likely to migrate.

The second model in Table 4 adds the educational attainment of the most educated household member as a predictor of migration. While this measure indicates the household's ability to generate human capital and probably is the education of the person most likely to migrate, it is limited in that it cannot capture intra-household differences in education which,

consequently, cannot be accommodated in a household level model. This education variable has similar effects on both individual and family migration. There is no difference in the likelihood of participation in either migration flow between households where the highest level of education is 0-4 years and those where there is no education (Table 4, columns v-viii). There is a significant positive effect of 5-9 years of education of about the same magnitude for both flows. While there is an increment between 5-9 years and 10+ years for both flows, the increment is much larger for family migration. Households in which is a member has passed his 10th year (Secondary School Examination Pass) have over 2.5 times higher odds of sending a family migrant than households with no educated members (Table 4, columns vii-viii). Thus, while family migration is usually selective of the economically disadvantaged, it is an opportunity often taken by migrants who have higher education and thus potential for economic success that may obviate any need for support from a rural household.

Inclusion of education changes the estimated effects of land holding. None of the coefficients for individual migration is significant in this model (Table 4, columns v-vi). Thus, the positive association between land holdings and individual migration appears to have operated through the higher education of landed households. (While it seems likely that the direction is that landed households are able to provide more education to their members, this remains speculation until we can carry out further analyses). The negative association between land holdings and family migration actually becomes much stronger (Table 4, columns vii-viii): Family migration decreases with increasing land holdings, but the greatest difference remains that between the first two quartiles: those who have no access to land and those who have some.

The next set of models adds two village level variables, the proportion of households in the village who have no land and the population growth in the village during the previous intercensal period. Households in villages with a high proportion of landless households are, on average, much less likely to participate in the individual migration flow (Table 5, columns i-ii).

The likely explanation for this is that networks for individual migration developed much more slowly in villages with high proportions landless since qualitative research suggests that the landless traditionally were the last households to migrate. Another possible story suggests that less migration occurs in villages with high levels of landlessness because these villages are dominated by large land owners who maintain the allegiance of most landless households and provide them with employment. If either of these stories held, we would expect the proportion landless effect to have a much stronger impact on those households who are themselves landless. This assertion can be tested by including a variable in the next model that interacts the proportion landless variable with a dummy term for whether the household has *any land* (meaning households in the top three quartiles of the land holding variable).

When interactions between the land ownership dummy and the proportion landless in the village are included, the following changes emerge in the predictors of individual migration (Table 5, columns v-vi): 1) the main effects for land holdings become significant, with negative coefficients for increased land holdings; 2) the main effect for proportion landless becomes more strongly negative; and 3) these effects are mediated by a positive interaction between land ownership and proportion landless, supporting the hypothesis that landed households are much less responsive to the effect of proportion landless in the village than landless households. While this finding could support either of the above stories, qualitative study finds little support for the notion that large landowners, in the face of diminishing patron-client ties, would hold such a strong influence over the migration patterns of the landless households in their village in the face of extreme poverty. Additionally, a variable measuring the proportion of a village's land owned by those households in the top 10% of land holdings, which would be a better indicator of the influence of large land owners, shows no significant negative effects on individual migration (model not shown). Qualitative and quantitative findings therefore suggest that the presence of many landless households leads to a lag in the development of migrant networks, an effect which

is much more important for the landless themselves but which also effects the network development for the whole village. While the coefficients for the effects of land holdings and proportion landless on family migration show a qualitatively similar change when the household land holding / village proportion landless interaction is included, this change is far from significant (Table 5, columns vii-viii).

Appendix Table 1 displays the risk ratios of individual migration for households in the different land holding categories under a variety of scenarios for proportion landless in a village, numerically demonstrating the effects of the significant interaction between landlessness at the village and household levels. The numbers in the table represent the ratio of the odds of individual migration given a certain household land holding quartile and one of the five quantiles of proportion landless (5^{th}, 25^{th}, 50^{th}, 75^{th}, 95^{th}), relative to the odds of individual migration for a *landless household* in a village with the median (50^{th} percentile) proportion landless. This table shows that households in the landed categories experience a 22% decrease in the likelihood of individual migration when the proportion landless in the village is increased from 11% (5^{th} percentile of proportion landless) to 47% (95^{th} percentile), whereas landless households experience a decrease in migration likelihood of 57%. This differential effect makes landless households the *most likely* to practice individual migration in villages with low levels of landlessness, where these poor households would be able to take advantage of well-functioning migrant networks, but the least likely to do so in villages with high rates of landlessness. The association between landlessness and individual migration still remains far weaker than for family migration.

Returning to the models in Table 5, the other village level variable of interest is the annualized rate of population growth in the village during the period from 1974 to 1982. While past population growth might be expected to cause an increase in current migration because it would create population pressures, both forms of migration have *negative* coefficients for past

population growth (Table 5, columns i-iv). The logical explanation for this negative coefficient is that current migration is likely to occur in villages with a high rate of past out-migration, which would also be the villages with lower population prior growth because migration had been removing people from the population. If this were true, then we would expect that including controls for past migration experience in the village, as shown in the final model in Table 6, would eliminate much of the association between past population growth and each type of migration to the extent that that association was operating through the pathway of past migration.

In columns iii-iv of Table 6, the coefficient associating past population growth and family migration, which was highly significant without migration experience controls (Table 5, columns iii-iv), is reduced and is no longer significant. The coefficient associating population growth and individual migration, although much smaller than the family migration coefficient when no migration controls are included (Table 5, columns i-ii), retains most of its power when migration controls are included (Table 6, columns i-ii). This suggests that migration, at least dating back to the period from 1974 to 1982, served as an important mechanism for easing population pressures. More importantly, family migration played a much more important role in limiting population growth, suggesting that family migration is more likely in situations of high population pressure and/or family migrants don't return to the village as much or as quickly, thus increasing its impact on cross-sectional population estimates. This last possibility would fit with the framework laid out in the background section, which suggests that family migrants would be less likely to return to the village because of their greater self-orientation.

The variables indicating past migration experience have a strong effect on current migration, as would be expected from theories of social networks, cumulative causation, and migration. As expected, however, these positive associations only link past migration of one type to current migration of the same type, which will be referred to as *within-flow effects*. *Cross-flow effects,* which refers to an association between past migration of one type and current migration

of the other, are all either not significant or negative. Table 6 shows the results of the final multinomial regression model and Appendix Table 2 shows the standardized impact of the migration experience variables (based on the specification in Table 6) on the likelihood of each form of migration across a range of values for each variable. Three of the four within-flow effects for individual migration are significant, even though the previous year's variables operate with only a one year lag and the variables for the previous inter-censal period also include migration to non-urban destinations (Table 6, columns i-ii). Family migration in the previous year in the village, on the other hand, actually makes a household in that village significantly less likely to practice individual migration. Past family migration experience at the village level makes a household much more likely to practice family migration. The effects of past family migration at the village level suggest that it perpetuates only more family migration and discourages future individual migration even though there is a slight positive relationship between the village level flows of family and individual migration in the same year (as in Figure 2). Past family migration experience in the same bari in the previous year is also associated with current family migration as is family migration at the village level between 1974 and 1982. The results of the migration experience variables strongly support the notion that a households in villages or baris with past experience of one type of migration will be likely to perpetuate that pattern, but no more likely or less likely to practice the other type of migration. Appendix Table 2 shows the impact of the migration experience variables (based on the specification in Table 6) on the likelihood of each form of migration across a range of values for each variable. In each case, the odds of a particular type of migration was calculated holding the predictor at its median, and then at the 75th percentile and at the 95th percentile. The ratios of the latter two odds to the median are given, showing the magnitude of the negative cross-flow effects.

VI. Discussion and Conclusion

The preceding analysis has introduced a natural test of the differences between households in the same population that practice migration in the manner of the two prominent microeconomic models of migration, the New Economics of Labor Migration (community-oriented) and the Neoclassical model (self-oriented). Contrasts between these two models have previously been drawn only when comparing differing societies, for instance when comparing Latin America to Asia and Africa. This paper is the first attempt to predict a household's *predisposition* to community-oriented or self-oriented migration. Past quantitative evidence of the economic and social relationships between migrants and their origin households has only come from the analysis of post-migration events such as return migration and remittance-sending. While analysis of these events may shed some light on a household's *initial approach to migration*, post-migration factors (human capital accumulation, urban earnings, rural shocks) confound the relationship between the original intentions underlying a rural-urban move and these subsequent events.

While the quantitative analysis here has not addressed explicit decision-making processes or proximate events, it has established firmly that economic options and village setting condition the types of migrants a household sends. A number of important findings emerge from the analysis: 1) The asset variables show that family migration is more likely than individual migration or no migration when the origin household has no productive assets and thus little ability to provide long- or short-term security to the migrant. 2) The education variables show that, though family migration is often a result of economic insufficiency, some migrants from *highly educated households* also bring their families with them, presumably using their education to get jobs whose high salary and benefits preclude the need for rural security measures. 3) Household structure variables show that a household is likely to send an individual member to the city when it has other members who can fill the void left by the migrant while family migration is likely when these economic and social roles cannot be filled. 4) Models with village-level variables show that, in villages with high levels of landlessness, landless households are much less likely than landed

households to send individual migrants, suggesting that the economic and social structure of a village may distort a household's ability to adopt individual migration as an economic option. 5) The analysis of migration experience variables shows that households in communities with past experience of one type of migration will tend to practice that same type of migration but not the other type (eg. households in villages with high levels of past individual migration are likely to send individual migrants rather than family migrants or no migrants). 6) The findings on past population growth indicate the important role that family migration plays in permanently separating people from their villages for long periods of time, thus easing population pressures in specific villages.

While the theoretical distinction and the empirical differences between family and individual migration found in this paper add to the empirical and theoretical literature on migration, the results also bear on specific empirical and policy issues in Bangladesh. The sending of individual versus family migrants must be considered when modeling the determinants of remittance value and return migration, which in turn begs a reconsideration of migration's impact on investment, economic development, and rural inequalities. This is especially important considering that family migration, which is likely to generate little remittance income, occurs primarily among the very poorest segments of the population. Future work should test the importance of the link between migration (family vs. individual) and the value of remittances using data from the Matlab Health and Socioeconomic Survey (MHSS).

The notion of family migration also creates a need to reconsider predictions of the age/sex/socioeconomic distributions of urban populations. Family migration brings women and children to the city even though migration is viewed as primarily a working-aged male process in Bangladesh. These family migrants may also stay in the city for a much longer time than individual migrants, a notion that will be tested in another paper stemming from this dissertation. If family migration gains prevalence as rural population pressure increases, additional women and

children might be expected in the city, particularly those who are poor, rootless, and unable to access typical security mechanisms . With additional women comes a need for maternal health services, family planning, and possibly informal employment. With additional children comes a need for education and child health services. The potential for lower rates of return migration among family migrants also introduces the possibility that the elderly population of Bangladeshi cities will continue to grow, a shift which would also primarily occur among the poorer segments of the population.

The unique situations of family migrants and their potential to stay in the city permanently create a changing list of needs for Bangladeshi urban planners and service providers. Family migration creates a large urban population of families ill-equipped to succeed in the city, lacking access to urban social networks, unable to use the village as a source of rural security, and primarily settled in slums on the geographic, social, and economic peripheries of cities. Population projections for Dhaka in 2025 suggest a population of 21 million people compared to perhaps 9 million in 1998. While the raw numbers alone are overwhelming, the age, sex, social background, and economic outlook for a growing number of Bangladesh's new urbanites gives even greater cause for concern and preparation.

Footnotes

1. Bangladesh has been urbanizing rapidly since the early 1960's, with acceleration following liberation in 1971. During the 18th century, however, Dhaka had a population of 400,000 (cite), which fell to as low as 60,000 following British colonization and the demise of the handloom cotton trade in centered on Dhaka.

2. The thana is literally the police stand, but it serves as the sub-district level of political organization. There are 490 thanas in Bangladesh. Matlab itself is a small town, the political headquarters for a group of about 300 villages surrounding it. When people in the area say they are going to Matlab, they mean they are going to the town, otherwise they will say the name of the specific villages. Matlab Thana had approximately 450,000 people in 1991, with slightly over half of that area covered by the surveillance data (Bangladesh Bureau of Statistics 1995).

3. In one area where qualitative fieldwork was conducted in 1998, land prices in 12 years had increased by a factor of 40 in taka terms and by a factor of 20 in dollar terms. That's a sustained 35% yearly increase in land prices in a previously unsettled area 15 miles from the city center and only barely accessible by rickshaw or motorbike. The current price of land per acre in this area is around $100,000 per acre compared to a typical lower middle class income of $500-$2000 per year according to the fieldwork estimates.

4. All models in the results section were also tested using a definition of migration as multiple members with at least one adult woman and at least one child requirement, and the results were robust to this definition change.

5. These tables represent more migrating units than households who sent migrants in the regression analyses because some households sent multiple migrants of either type during the same year.

6. Very few married males would be less than 20 years of age. At that time the median age of marriage for men was 25 years.

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Tables

Table 1:
Comparison of Crude Rates of Net Out Migration with Natural Increase
Matlab 1982-1996

Year	Starting Population	CRNI	NOMR	NUOMR	NUOMR % of CRNI	Pop w/o Any Migration	Pop w/o Urban Migration
1982	186695	16.4	3.7	0.5	2.9%		
1983	189064	24.3	11.4	8.7	35.9%	189751	189153
1984	191506	18.8	20.0	10.3	54.6%	194352	193248
1985	191278	26.5	18.4	9.3	35.3%	197946	194984
1986	192828	25.8	13.4	9.2	35.6%	203015	198322
1987	195233	26.6	10.8	10.4	39.2%	207996	202502
1988	198303	25.9	15.3	11.9	45.8%	213181	207602
1989	200417	23.8	14.8	7.3	30.6%	218325	212074
1990	202234	24.6	16.5	10.9	44.4%	223103	215354
1991	203869	20.0	15.1	8.2	41.0%	228076	219198
1992	204868	19.2	15.0	12.1	62.8%	232159	221872
1993	205730	18.3	10.7	5.1	27.7%	236096	225205
1994	207292	19.2	14.5	9.1	47.4%	239859	227809
1995	208258	18.7	10.4	7.3	39.1%	243836	230659
1996	209990	16.7	12.3	8.0	47.7%	247730	233912
1997	210918					251245	236516

Sources: 1982 population - ICDDR,B Matlab Census;
1982-1996 vital rates - Demographic Surveillance System: 1982-1996

CRNI = Crude Rate of Natural Increase = (Births + Deaths) / (Starting Population)
NOMR = Net Out Migration Rate = (Out Migrants - In Migrants) / (Starting Population)
NUOMR = Urban Out Migration Rate = (Urban Out- Urban In) / (Starting Population)
Pop w/o Any Migration =
(Beginning surveillance population - prior total net out-migration since 1982) =
(1982 population + births since 1982 - deaths since 1982)
Pop w/o Urban Migration =
(surveillance population - prior total net *urban* out-migration since 1982) =
(1982 pop + births since 1982 - deaths since 1982 - net non-urban out-migration since 1982)

Table 2: Variables Included in Predictive Models: Definitions, Means, Standard Deviations				
Source* and Variable		Description	Mean	SD
Household variables				
2. Migration in year		0 = No migrant left household during year		
		1 = Individual migrant left household during year	0.030	0.171
		2 = Family migrating group left household or dissolved	0.006	0.075
1. Household Structure -- Males				
Sing Male = 0	Marr Male= 1	No single males and 1 Married Male Present	0.306	0.461
=	=	No single males and 2 Married Males Present	0.063	0.243
=	=	1 single male and 1 Married Male Present	0.227	0.419
=	=	1 single male and 2 Married Males Present	0.069	0.253
=	=	2 single males and 1 Married Male Present	0.150	0.357
=	=	2 single males and 2 Married Males Present	0.052	0.221
=	=	3 single males and 1 Married Male Present	0.094	0.291
=	=	3 single males and 2 Married Males Present	0.039	0.195
1.Land Per Household Member		Acres of land per person in household.	0.177	0.323
1. Rent/Share Land		Self-report - household currently rents or sharecrops land	0.050	0.218
1. Head of Cattle		Number of cows owned by household		
1. Hindu		Household practices Hindu religion	0.142	0.350
1. Head Job Fishing		Household head's primary occupation is fishing	0.048	0.214
1. Top Educ	= 0	No one in household has formal education.	0.373	0.484
	= 1-4	Most educated member has 1-4 years of schooling.	0.229	0.420
	= 5-9	Most educated member has 5-9 years of schooling.	0.289	0.454
	= 10+	Most educated member has 10+ years of schooling..	0.108	0.311
Village-level variables				
1&3. Pop Growth (74-82)		Annualized village-level population growth rate between	1.123	0.071
1. Proportion Landless Village		Proportion of households in village holding no land	0265	0.110
2. Village Prev Year Family		Proportion of households in village sending family migrant	0.007	0.007
2. Village Prev Year Individual		Proportion of households in village sending individual	0.026	0.019
2. Village 1974-82 Family		Proportion of households in village sending family migrant	0.113	0.053
2. Village 1974-82 Individual		Proportion of households in village sending individual	0.302	0.096
Bari-level variables				
2. Bari Prev Year Family		Proportion of households in bari sending family migrant in	0.006	0.036
2. Bari Prev Year Individual		Proportion of households in bari sending individual	0.026	0.077
2. Bari 1974-82 Family		Proportion of households in bari sending family migrant	0.112	0.180
2. Bari 1974-82 Individual		Proportion of households in bari sending individual	0.302	0.321

* Source: 1 = 1982 Census; 2 = DSS annual records for households in 1982 census; 3 = 1974 Census

Table 3a
Number of Individuals in Migrating Unit
Family Migrants

Number of Migrants	Number of Groups	Number of Migrants	Percentage of Households	Cumulative Percentage of Households	Percentage of Migrants	Cumulative Percentage of Migrants
2	93	186	12.66	12.66	8.50	8.50
3	116	348	26.76	39.42	15.90	24.39
4	126	504	28.21	67.63	23.02	47.42
5	90	450	15.54	83.17	20.56	67.98
6	60	360	10.10	93.27	16.45	84.42
7	31	217	4.17	97.44	9.91	94.34
8	12	96	2.08	99.52	4.39	98.72
9	2	18	0.32	99.84	0.82	98.72
10	1	10	0.16	100.00	0.46	99.54
Total	531	2189	100.00	100.00	100.00	100.00
Migrants Per Unit	4.12					

Table 3b
Number of Individuals in Migrating Unit
Individual Migrants

Number of Members	Number of Households	Number of Migrants	Percentage of Households	Cumulative Percentage of Households	Percentage of Migrants	Cumulative Percentage of Migrants
1	2684	2684	87.45	87.45	82.89	82.89
2	201	402	9.06	96.51	12.42	95.31
3	41	123	2.22	98.73	3.80	99.10
4	3	12	0.76	99.50	0.37	99.47
5	2	10	0.36	99.86	0.31	99.78
6	0	0	0.09	99.95	0.00	99.78
7	1	7	0.05	100.00	0.22	100.00
Total	2932	3238	100.00	100.00	100.00	100.00
Migrants Per Unit	1.10					

Source: DSS Migration Histories (1984-7)

Table 4
Multinomial Logistic Regression Model: Households With At Least One Married Male
Individual Migration or Family Migration vs. No Migration in Given Year
Household Level Variables Only

	Household Structure & SES				Education Added			
	Individual Mig		Family Mig		Individual Mig		Family Mig	
	(I)	(ii)	(iii)	(iv)	(v)	(vi)	(vii)	(viii)
	Coeff.	S.E.	Coeff.	S.E.	Coeff.	S.E.	Coeff.	S.E.
Household Structure - Males								
Single Married								
0 1	---	—	—	—	—	—	—	—
0 2	0.999*	0.142	0.509#	0.161	0.939*	0.143	0.415+	0.162
1 1	1.380*	0.097	-0.253+	0.123	1.372*	0.097	-0.255+	0.123
1 2+	1.847*	0.112	0.243	0.181	1.847*	0.112	0.243	0.181
2 1	2.051*	0.095	-0.440#	0.161	2.016*	0.095	-0.481#	0.162
2 2+	2.281*	0.111	0.453+	0.198	2.196*	0.112	0.333	0.200
3+ 1	2.597*	0.095	-0.769#	0.243	2.517*	0.096	-0.884*	0.244
3+ 2+	2.731*	0.111	0.548+	0.232	2.603*	0.112	0.338	0.235
Land - 1st Quartile	—	—	—	—	—	—	—	—
2nd Quartile	0.169+	0.076	-0.417*	0.124	0.132	0.077	-0.461*	0.125
3rd Quartile	0.208#	0.077	-0.482*	0.132	0.085	0.080	-0.643*	0.137
4th Quartile	0.234#	0.081	-0.413#	0.140	0.016	0.085	-0.751*	0.150
Rent/Share Land	0.057	0.119	-0.464+	0.207	0.050	0.119	-0.475+	0.208
Head of Cattle	-0.082*	0.014	-0.350*	0.048	-0.085*	0.014	-0.355*	0.048
Hindu	-0.648*	0.085	-0.338+	0.155	-0.708*	0.086	-0.431#	0.156
Occ Head = Fishing	-1.249*	0.221	-1.604*	0.400	-1.153*	0.221	-1.445*	0.400
Top Education 0	—	—	—	—	—	—	—	—
1-4	—	—	—	—	-0.028	0.066	-0.033	0.132
5-9	—	—	—	—	0.313*	0.060	0.315#	0.120
10+	—	—	—	—	0.578*	0.072	1.044*	0.139
Constant	-5.062	0.098	-4.238	0.094	-5.102	0.100	-4.312	0.101
Events	2845			516	2845		516	
Observations	94902			94902	94902		94902	
Log Likelihood Chi-Sq	1838.9				1989.6			
DF	28				34			
Selection Chi-Sq Test	15.2				19.3			
DF	12				15			

+ = Variable Significant at p<0.05 Level
# = Variable Significant at p<0.01 Level
* = Variable Significant at p<0.001 Level

Table 5
Multinomial Logistic Regression: Households With At Least One Married Male
Individual Migration or Family Migration vs. No Migration in Given Year
Village Level Variables Added

	Village Variables - Main Effects				Add Land* Prop Landless Interaction			
	Individual		Family		Individual		Family	
	(i)	(ii)	(iii)	(iv)	(v)	(vi)	(vii)	(viii)
	Coeff.	S.E.	Coeff.	S.E.	Coeff.	S.E.	Coeff.	S.E.
Household Structure - Males								
Single Married								
0 1	—	—	—	—	—	—	—	—
0 2	0.944*	0.143	0.415+	0.162	0.947*	0.143	0.417+	0.162
1 1	1.375*	0.097	-0.257+	0.123	1.377*	0.097	-0.255+	0.124
1 2	1.808*	0.113	0.186	0.182	1.811*	0.113	0.188	0.182
2 1	2.024*	0.095	-0.483#	0.162	2.026*	0.095	-0.482#	0.162
2 2	2.221*	0.112	0.355	0.200	2.221*	0.112	0.351	0.200
3 1	2.536*	0.096	-0.877*	0.244	2.538*	0.096	-0.880*	0.244
3 2	2.642*	0.112	0.370	0.235	2.643*	0.112	0.367	0.235
Land - 1st Quartile	—	—	---	—	—	—	—	—
2nd Quartile	0.077	0.078	-0.455*	0.127	-0.412+	0.174	-0.789#	0.266
3rd Quartile	0.016	0.081	-0.636*	0.139	-0.469#	0.174	-0.966*	0.269
4th Quartile	-0.047	0.086	-0.736*	0.153	-0.532#	0.177	-1.067*	0.277
Rent/Share Land	0.021	0.120	-0.450+	0.208	-0.026	0.120	-0.475+	0.209
Head of Cattle	-0.089*	0.015	-0.430*	0.157	-0.089*	0.015	-0.353*	0.048
Hindu	-0.648*	0.086	-0.355#	0.048	-0.635*	0.086	-0.419#	0.157
Occ Head = Fishing	-1.027*	0.222	-1.351#	0.400	-0.996*	0.222	-1.328#	0.400
Top Education 0	—	—	—	—	—	—	—	—
1-4	-0.032	0.066	-0.048	0.132	-0.030	0.066	-0.044	0.132
5-9	0.294*	0.060	0.282+	0.121	0.302*	0.060	0.290+	0.121
10+	0.562*	0.072	0.996*	0.140	0.571*	0.072	1.006*	0.140
Pop Growth 1974-82	-1.428*	0.299	-2.494*	0.541	-1.453*	0.301	-2.578*	0.549
Proportion Landless	-1.382*	0.219	-0.466	0.420	-2.765*	0.507	-1.136	0.638
Any Land*Prop Landless	—	—	---	—	1.718#	0.558	1.171	0.822
Constant	-3.105	0.358	-1.398	0.643	-2.679	0.383	-1.106	0.676
Events	2845		516		2845		516	
Observations	94902		94902		94902		94902	
Log Likelihood Chi-Sq	2066.6				2078.4			
DF	38				40			
Selection Chi-Sq Test	20.8				21.7			
DF	17				18			

+ = Variable Significant at p<0.05 Level
# = Variable Significant at p<0.01 Level
*= Variable Significant at p<0.001 Level

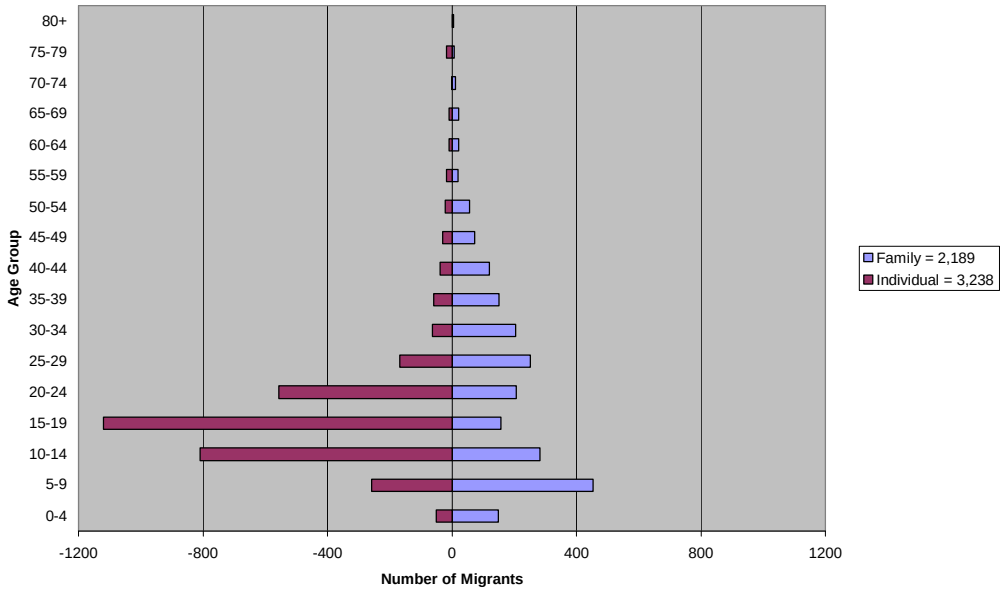
Table 6
Coefficient Estimates for Multinomial Logistic Regression
Individual Migration or Family Migration vs. No Migration in Given Year
Final Model with Past Migration Variables Included

		Individual		Family	
		(I)	(ii)	(iii)	(iv)
		Coeff.	S.E.	Coeff.	S.E.
Household Structure - Males					
Single	Married				
0	1	—	—	—	—
0	2	0.941*	0.143	0.408+	0.162
1	1	1.369*	0.097	-0.264+	0.124
1	2	1.808*	0.112	0.177	0.182
2	1	2.025*	0.095	-0.476#	0.162
2	2	2.226*	0.112	0.340	0.200
3	1	2.546*	0.096	-0.883*	0.244
3	2	2.646*	0.112	0.359	0.235
Land - 1st Quartile		—	—	—	—
2nd Quartile		-0.373+	0.173	-0.795#	0.268
3rd Quartile		-0.431+	0.174	-0.966*	0.271
4th Quartile		-0.498#	0.176	-1.073*	0.278
Rent/Share		-0.011	0.121	-0.486+	0.209
Head of Cattle		-0.087*	0.015	-0.351*	0.048
Hindu		-0.497*	0.089	-0.348+	0.160
Occ Head = Fishing		-0.947*	0.222	-1.313#	0.400
Top Education 0		—	—	—	—
1-4		-0.036	0.066	-0.051	0.132
5-9		0.276*	0.060	0.296+	0.121
10+		0.539*	0.072	1.016*	0.141
Pop Growth 1974-82		-1.116#	0.365	-0.677	0.681
Proportion Landless		-2.346*	0.512	-1.801#	0.673
Any Land *Prop Landless		1.666#	0.557	1.194	0.830
Prev Year's Individ - Village		5.883*	1.166	-0.049	2.600
Prev Year's Family - Village		-4.596+	1.847	7.830#	2.653
Prev Year's Individ - Bari		0.715*	0.225	0.630	0.522
Prev Year's Family - Bari		-0.476	0.499	1.498+	0.621
1974-82 Individ - Village		1.167*	0.254	0.584	0.543
1974-82 Family - Village		0.023	0.546	1.967+	1.000
1974-82 Individ - Bari		0.043	0.063	-0.149	0.147
1974-82 Family - Bari		-0.495*	0.134	0.313	0.232
Constant		-3.629	0.491	-3.634	0.908
Events		2845		516	
Observations		94902		94905	
Log Likelihood Chi-Sq		2230.4			
DF		56			
Selection Chi-Sq Test		31.2			
DF		26			

+ = Variable Significant at p<0.05 Level
# = Variable Significant at p<0.01 Level
* = Variable Significant at p<0.001 Level

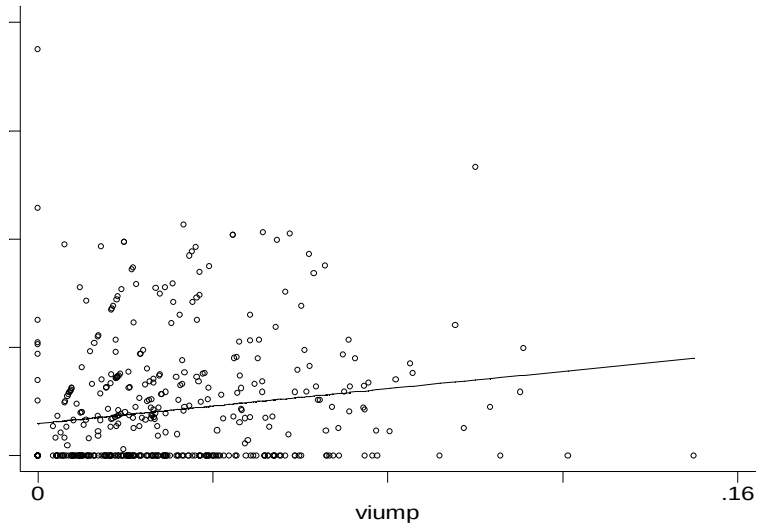
Figures

Figure 1:
Age Distribution of Individual and Family Migrants



Source: DSS Migration Histories (1984-87)

Figure 2: Plot of Yearly Individual Vs. Family Migration Proportion: All Villages 1984-1986



$b = 0.05$

$R^2 = 0.0285$

Source: DSS Migration Histories (1984-87)

Appendix

Table A.1
Sensitivity Analysis of Village/Household Landless Interaction Effect
Effect of Selected Increments in Proportion Landless on
Individual Migration Odds Given Different Land Holdings

	Proportion Landless Quantile				
	Q(.05) =11.3%	Q(.25) =18.8%	Q(.50) =25.1%	Q(.75) =32.4%	Q(.95) =47.2%
Land - 1st Quartile	1.384	1.159	1.000	0.843	0.595
Land - 2nd Quartile	1.150	1.092	1.046	0.996	0.900
Land - 3rd Quartile	1.085	1.030	0.987	0.939	0.849
Land - 4th Quartile	1.014	0.964	0.923	0.879	0.794

Notes:

Q(X) = Xth Percentile Value of Proportion Landless
Values show odds of individual migration for households in the given land holding category in villages with given proportion landless relative to the reference category (land holding 1st quartile, Q(.50) proportion landless).
Results are based on the model in Table 5, columns v-vi, which includes a land holding variable in quartiles, a linear term for proportion landless, and an interaction between proportion landless and a collapsed categorical variable indicating any land holding (quartiles 2, 3, and 4).

Table A.2
Sensitivity Analysis of Past Migration Variables' Effect on Dependent Variables
Effect of Selected Increments on Odds Ratios

Variable	Individual Migration		Family Migration	
	Odds Ratio Q(.75)/Q(.50)	Odds Ratio Q(.95)/Q(.50)	Odds Ratio Q(.75)/Q(.50)	Odds Ratio Q(.95)/Q(.50)
VillagePrev Year Individual	1.084	1.270	n/s	n/s
Village Prev Year Family	0.971	0.874	1.052	1.259

Bari Prev Year Individual	n/d	1.127	n/s	n/s
Bari Prev Year Family	n/s	n/s	n/d	1.171
Village 1974-82 Individual	1.060	1.200	n/s	n/s
Village 1974-82 Family	n/s	n/s	1.073	1.223
Bari 1974-82 Individual	n/s	n/s	n/s	n/s
Bari 1974-82 Family	0.921	0.794	n/s	n/s

Notes:
n/s = Coefficient not significant for given variable
n/d = Given variable shows no change in value between given quantiles
The values in the table indicate the effect on the relative odds of the given type of migration of a change in the given variable from its median value to its 75th and 95th percentile value.
Results are based on models in Table 6, columns i-iv, which adds migration experience variables.