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Abstract

The rural northwestern districts of Bangladesh, home to 10 million people, experience a pre-harvest seasonal famine, locally known as *Monga*, with disturbing regularity. Surprisingly, out-migration from the Monga-prone districts is not all that common. This research tests whether migration could play any role in Monga mitigation. We implemented a randomized intervention that provided monetary incentives to individuals in Monga-prone regions to seasonally out-migrate during the pre-harvest season. We experimentally varied the conditionalities attached to the incentives, such as a requirement to form a group and migrate jointly (as opposed to migrating individually), sometimes assigning migration partners and the destination, and varying group size. This paper reports just the first stage results of this randomized intervention project, where we focus on household responsiveness to our incentive offers in terms of their decision to migrate. Our cash and credit incentives had a very large effect on migration propensity: over 40% of those receiving an incentive choose to migrate, whereas only 13% of control households do. This large effect is consistent with the presence of savings or borrowing constraints for these households, since providing information on wages and employment conditions at destinations only has a negligible 2 percentage point impact on the propensity to migrate relative to the control group.

Keywords: Monga, famine, Bangladesh, migration.

1 Introduction

While Bangladesh as a whole is on target to achieve the primary United Nations Millennium Development Goal of halving its 2000 level of extreme poverty by the year 2015, certain regions of the country lag well behind in economic opportunities and outcomes. In the greater Rangpur districts of the Northwestern region (NW) the incidence of poverty remains unusually high and chronic food shortages and hunger remain enduring phenomena of rural life.[1] These districts[2] experience seasonal deprivation and a famine-like situation, known locally as Monga, with disturbing regularity. Although the occurrence of Monga is quite predictable - described as a routine crisis (Rahman 1995) - and its effects widely chronicled in the local media, it hits Rangpur households year after year as though it were an unanticipated shock. Roughly 7 percent of the total population in Bangladesh (about 9.6 million people) inhabits these districts and about 5.3 million of those live below the poverty line.[3] The suffering during Monga thus is not limited to a small pocket of households. This is a major failure of public policy in a country that, while desperately poor, has made impressive strides in other aspects of development.

It is common for agricultural laborers in other regions of Bangladesh to either

[1]Calculations from the Bangladesh HIES (Household Income and Expenditures Survey) 2005 show that, the poverty headcount rate (defined as the fraction of the population living under the upper poverty line) for the entire country was 40 percent; in comparison, in the greater Rangpur districts in the NW, poverty rates were 57 percent. Extreme poverty rates (defined as population living under the lower poverty line, i.e., individuals who cannot meet the 2100 calorie per day food intake even if they spend their entire incomes on food purchases only) were 25 percent nationwide, as opposed to 43 percent in the Rangpur region.

[2]Kurigram, Gaibandha, Lalmonirhat, Nilphamari and Rangpur

[3]Population figures are based on projections from the 2001 Census data and poverty figures are from the HIES 2005.

switch to local non-farm labor markets or to migrate to urban informal labor markets in search of higher wages and employment opportunities in response to price hikes and wage drops during the pre-harvest season. Surprisingly, despite the absence of local non-farm employment opportunities, out-migration from the Monga prone districts is not all that common even during periods of severe Monga (according to a nationally representative survey, only 5% of households in Rangpur receive domestic remittances, while 22% of all Bangladeshi households do). The primary objective of our research is to understand the constraints to temporary seasonal migration using a randomized intervention study, where we experimentally vary incentives to out-migrate during Monga season across households living in 100 villages in two Monga districts named Kurigram and Lalmonirhat. We also experimentally vary the conditions attached to the monetary incentives, such as a requirement to form a group and migrate or a requirement to migrate to a specified destination. These interventions thus create randomized variation in both the migration decision as well as conditions relevant to the migration experience, such as risk sharing or job information sharing across members of a migrant group, or the presence of a pre-existing social network at the destination.

These interventions test whether integration of labour markets through migration could play any role in Monga mitigation. We primarily seek to understand why Monga-affected workers appear hesitant to seasonally migrate to better employment opportunities. Given the constructed variation in incentives and conditionals, we are also in a position to identify (a) the causal effect of migration of one family member on the poverty status and other welfare outcomes for the household, (b) the role of networks and kinship in supporting migrants, and (c) whether promoting migration is a cost-effective policy response to mitigate the severe welfare consequences of Monga. While the experimental variation in the interventions and conditions can thus be used to causally identify both the causes and consequences of seasonal migration (or lack thereof), we will limit our focus to only the decision to migrate in this paper. The interventions were implemented in September 2008 on a randomly chosen subset of 1900 households, and thus far we have conducted a baseline survey on all households, and tracked the migrants either at the destinations or back at their origin (for those who have returned). We therefore have data on the households response to our offer in terms of their migration decision, but it is still too early to track secondary outcomes such as changes in poverty and welfare. Our data analysis therefore focuses on the determinants of the migration decision.

In our major experimental treatment we offer a random subset of households a monetary incentive to migrate either in the form of cash or credit, which distinguishes them from others receiving only information about employment and wage conditions at certain destinations or nothing at all. A random subset of those receiving a monetary incentive are required to migrate in groups of either 2 or 3 as a condition of receiving our money, and a fraction of those groups were specified by us, while for the rest the households had some choice regarding whom to migrate with from a limited set of options. Destinations are also specified for a random subset of the households receiving an incentive, while the rest could choose from a limited set of cities where we had offices and enumerators stationed (to help track the migration experience) and still take advantage of the subsidy. To understand and interpret the potential effects of any of these incentives or conditions, we first theorize about the conditions under which households would react to our experiments. We note that a household that has freedom of movement would only be swayed by our offer of cash or credit if they are constrained in their ability to save or to borrow. Our theory also notes that if households share a valuable service (e.g. information about jobs, risk sharing or fixed cost sharing) when migrating in pairs, then a requirement to form a group can have an ambiguous effect on their propensity to migrate. The basic intuition is that while households benefit by smoothing outcomes, a weaker partner may reduce the net benefits on migrating. Somewhat counter-intuitively, a restriction on migration choices here can actually increase the amount of migration for weaker agents. Finally, our theory shows that a restriction on choices of destination will weakly reduce the migration rate.

Empirically, our experimental incentives have a very large effect on households propensity to out-migrate from monga-prone areas. Just over 40% of households receiving our monetary incentive choose to migrate, while about 13% of control group households do. This nearly three-fold increase in migration is consistent with the presence of savings or borrowing constraints for these households, since providing information on wages and employment conditions at destinations only has a negligible (statistically insignificant) 2 percentage point impact on the propensity to migrate relative to the control group. Consistent with our theoretical predictions, the group formation requirement does not deter migration, but requiring migrants to go to a specified destination does.

2 Treatment Description and Experimental Design

This section describes the project design in greater detail. The project can be described as a randomized field experiment where incentives to promote seasonal out-migration of one household member during the Monga period was randomly allocated across households. We conducted a census of 100 villages in Lalmonirhat and Kurigram (two districts in the Monga-prone regions of north-western Bangladesh) in June

2008 to identify households at greatest risk and identified all households in these villages that met two pre-determined eligibility criteria (based on landownership and food availability during the last Monga season) for an intervention. We surveyed a random sub-sample of 1900 eligible households during the pre-monga season in July 2008 (baseline survey). In August, 2008 we randomly assigned all households to a variety of incentives and conditions which are described in more detail below. The random assignment was conducted using a pure random number generator in Stata by the first two authors (Chowdhury and Mobarak) without any input from the village residents or the NGOs who subsequently implemented the interventions. The NGOs were trained on the implementation procedure by Chowdhury and Mobarak in August 2008, and the incentives were implemented during the 2008 Monga season starting in September.

Of the 100 villages, 16 (consisting of 304 sample households) were randomly assigned to form a control group. A further 16 villages (consisting of another 304 sample households) were placed in a job information only treatment. These households were given information on types of jobs available in four pre-selected destinations, the likelihood of getting such a job and approximate wages associated with each type of job and destination. The details of the destination selection are discussed below.

The remaining 1392 households were provided monetary incentives to seasonally out-migrate, and their treatment and conditions varied along the following dimensions:

- Type of Incentive (Cash or Credit)
- Individual migration versus a group formation requirement
- Group formation method (Assigned or Self Selected)

- Group Size
- Destination (Assigned a particular city, or self-selected from a limited set)

Incentives: The 68 remaining villages (consisting of 1392 households) were randomly assigned to either receive (a) job information and cash transfers conditional on migration, or (b) job information and an equivalent amount of credit conditional on migration. Under the cash incentive, the 703 sample households in 37 randomly selected villages were offered cash of Taka 800 (US11.50), $ofwhichTaka600(\ US$8.50) was offered at origin conditional on migration and Taka 200 at the destination once the migrant reported to our office at the destination. In both the cash and credit treatments we provided exactly the same information about jobs and wages as in the information-only treatment. Under the credit incentive, 589 households in 31 randomly selected villages were offered a loan of Taka 800 conditional on migration, of which Taka 600 was given at origin and Taka 200 at destination. Households were told that they would have to pay back the loan at the end of the Monga season. Detailed descriptions of the information and instructions provided with these incentives are in the Appendix. Note that the randomization of incentives was administered at the village level, whereas all other conditions described below can vary (randomly) within each village.

Individual versus Group Formation Requirement and group formation method: One of the treatment conditions that we implemented was encouraging individuals to migrate (treatment A) versus encouraging group migration, where the groups were in one case assigned by us (treatment B) and in another case self-formed (treatment C) subject to constraints we imposed (such as a constraint on group size discussed in the next paragraph). The total number of households that were offered incentives under treatment A, B, and C were 476, 408 and 408, respectively.

Group size: For the households that were offered incentives under group treatments, one of the additional constraints that we imposed was group size that varied between two and three. The total number of households that were offered incentives under group size two and group size three were 420 and 396, respectively.

Destinations: : Under the destination dimensions, all treated households were randomly assigned into one of the two groups:

1. in one case, destinations were assigned by us, and

2. in another case, households could choose among four possible destinations.

The total number of households in each treatment was 646. We preselected four possible migration destinations based on the history of our sample households past migration destination choices as reported in the baseline survey (popular versus not so popular), ii) the size of the urban area (large versus small) and (iii) distance from the origin (relatively close versus relatively far from the origin).

PKSFs partner organizations, POs, (NGOs, PKSF calls them POs) that have operations in those areas collected information from all four selected destinations on types of jobs available (sector/job title), the likelihood of getting such a job (high, moderate, low), and approximate wages associated with each type of job. The table below provides the destination specific information given to households.

In the baseline survey conducted in July 2008, households were asked about their networks (number of friends) within and outside their village including migration destinations. We expect that among the assigned households, in some cases migrants were assigned to destinations where they have a network and in other cases theyre not.

Table 2 shows the distribution of households under the randomization dimensions discussed above.

Steps we followed in the randomization process were:

Step 1: For each village, we randomly assigned surveyed households into two different subcategories of 7 and 12 households.

Step 2: In the first sub-category, we offered one of the incentives (information/ cash/ credit). The household decided if to accept to our offer and whom to send and how to go (individually or in group).

In the second sub-category, we offered incentives as above conditional on forming self-selected groups (either 2 or 3) and migrating in groups. Alternatively, we offered incentives conditional on migrating in groups where we randomly assigned households in groups (either 2 or 3).

In each village there were two treatments individual treatment and one of the group treatments (self-formed or assigned group). Incentives offered in a village remained same.

In the case of cash or credit, Taka 600 was given once the offer, conditional on constraints, was accepted by the households. The remaining cash or credit of Taka 200 in destination was provided only if an individual migrated to our preferred destinations. They collected the cash/credit from our project officer there. This also ensured that we could keep track of them.

Individuals/groups who decided to migrate to other destinations reported to the project officer in origin (we provided project officers cell phone number).

Individual/groups who did not migrate returned the incentive package to the project officer in origin.

Step 3: Individuals/groups who had migrated to our selected destination were interviewed by our project officer on job search, networks etc. Individuals/groups those who had migrated to other destinations were interviewed at origin upon return.

Step 4: Household survey round 2 conducted in December 2008 after the Monga season collected information on migration and remittance in addition to consumption and welfare indicators.

Figure 1 in Appendix shows the randomization process.

3 Theoretical Framework

In this section we present a theoretical framework that helps to understand constraints on the migration decision, and the potential impact of our intervention. It should be seen as providing a background to our intervention and the types of behavior that we are interested in investigating. We model the decision to migrate as a three period investment problem. In time period 1, an agent receives income y and decides on a mount of consumption c, saving the remainder at rate of interest r. In time period 2 the agent receives no income and can decide to migrate or not; migration requires a fixed cost F. Income available for consumption in period 2 is then $r(y - c) - F$. If the individual decides to remain at home, period 3 expected utility is $u(h)$ while if the agent decides to migrate period 3 expected utility is $u(m)$. We assume throughout that $u(m) > u(h)$ and that the agent is a discounted expected utility maximize with discount rate δ, but also consider the possibility and implications of hyperbolic discounting.

Implicitly we are assuming that there is no ability to save between periods 2 and 3, and at this stage we ignore the prospect of borrowing. These simplifying assumptions allow us to concentrate on the migration decision without worrying about income smoothing, but our main results would not be affected by altering these assumptions.

Our analysis proceeds in several steps. First, we treat $u(m)$ and F as given and consider the saving decision which allows agents to cover the fixed costs of migration in the absence of credit. Second, we informally discuss the role of credit in our setting and argue that our empirical results imply that there are strong credit constraints, which justify our assuming no borrowing when thinking about saving. Third, we consider the possibility that agents can share the fixed costs of migrating and argue that this possibility gives rise to a coordination game between potential migrants. Fourth, we consider the determinants of $u(m)$. We argue that the possibility that migrants: share, and compete for, job information; and engage in risk sharing, imply that $u(m)$ will depend on the identity and location choice of other migrants and that this may be an impediment to migration. Finally, we consider the impact of these observations on the decision to migrate in our experiment.

3.1 The Saving Decision and Saving Constraints

We say that a potential migrant is saving constrained if she does not migrate, but would have migrated if she had the ability to save at the market interest rate. The literature considers three sources of such constraints:[4] low access to formal saving facilities; time inconsistency; and social norms of income redistribution. We consider

[4]See for example, Armendariz de Aghion and Morduch (2005).

here the impact of the first two on the migration decision.

First, suppose that for an exogenous reasons there are two types of agents, those for whom $r = 1$ and those for whom $r = \bar{r} > 1$, where $\bar{r}$ is the market interest rate on saving. For an exponential discounter the optimal saving problem is solved backward. In period 2 the agent will choose to migrate if

$$u(r(y-c)-F)+\delta u(m)\geq u(r(y-c))+\delta u(h).$$

The solution to this problem defines a cutoff value of $c(r)$ such that if $c > c(r)$ the agent will not migrate in period 2 and if $c < c(r)$ the agent will migrate in period 2. It is clear that $c(r)$ is a decreasing function of r, so that agents with $r = 1$ must save more in order to migrate.

In period 1 the agent will choose c knowing the cutoff value $c(r)$. As the amount of saving required to migrate is decreasing in r, agents that have a higher r are more likely to migrate. Our definition of savings constraints is then that an agent with $r = 1$ does not migrate, but would have if $r = \bar{r}$.

Next we turn to a different form of saving constraints coming from the possibility that agents have hyperbolic preferences. We consider a model in which the agent has a $\beta < 1$ but is naive about this fact, believing that $\beta = 1$. Under this assumption the second period decision becomes, migrate if

$$u(r(y-c)-F)+\beta\delta u(m)\geq u(r(y-c))+\beta\delta u(h).$$

Define $c(r,\beta)$ to be the cutoff value of c below which migration takes place. It is clear that $c(r,\beta)$ is increasing in β and therefore those with higher β require less saving in order to migrate. If an agent is naive with respect to β then it is possible to undersave in period 1 and therefore not have enough money to invest in period 2.

3.2 Borrowing Constraints

As noted above, our experiment allows us to directly test for borrowing constraints. A random selection from our sample were offered credit to allow them to migrate. The difference in takeup in this group compared to the control group identifies the impact of borrowing constraints.[5] Our empirical analysis below strongly supports the argument that there are borrowing constraints, household given credit were much more likely to migrate, and there is little difference in migration rates between those offered credit and those offered cash. However, this finding is also consistent with saving constraints and begs the question as to why households which face the potential for Monga every year have not been able to accumulate the assets to deal with this regular event? We will consider this issue in more detail in future work.

3.3 The Sharing of Fixed Costs

In this section we extend the model to allow for two kinds of costs to migration, an individual specific cost F_I and a shareable fixed cost F_S. The shareable cost can be split between the two individuals if they migrate to the same location. We also introduce a second location choice so that the utility away from home is either $u_i(a) = w_i^a$ in location a for agent i or $u_i(b) = w_i^b$ for location b where w_i^j is simply the wage in location j for agent i.

Ignoring the saving and borrowing decision, an individual, deciding whether to migrate alone will migrate if

$$\max\left\{w_i^a) - F_I - F_S, w_i^b - F_I - F_S\right\} \geq w^h$$

[5]Incorporating borrowing constraints in to the formal model is straight forward and shows that agents with borrowing constraints are less likely to migrate.

and will migrate to the location in which the wage rate is highest. Next consider the joint migration decision of two individuals. First, $w_1^a > w_1^b \Rightarrow w_2^a > w_2^b$, then the two individuals will always migrate to location i and the decision to migrate will be determined by

$$w_1^a + w_2^a + 2F_I + F_S \geq 2w^h.$$

This implies that migration is more likely in the case where there is the potential for cost sharing.

Second, consider the case where $w_1^i > w_1^j$ but $w_2^j > w_2^i$, then as a group, the two will migrate if

$$\max\left\{w_i^a + w_i^b - 2F_I - F_S, w_j^a + w_j^b - 2F_I - F_S\right\} > u(h)$$

this implies that there is the potential that one of the individuals will migrate to a location that they less prefer in order to share the costs of migration.

The implication of this simple model are two fold. First, individuals are more likely to migrate when they can find an individual to migrate with, who has similar preferences in terms of migration location and second, individuals will potentially migrate to a different location in order to share costs.

As noted above, the potential for the sharing of fixed costs also gives rise to the possibility of a coordination game. Consider again the saving decision. If an agent is not able to save enough to migrate alone, but can save enough to migrate in a pair, then it is only worth saving if another agent has also saved. Thus migration in this case will requires that agents coordinate on a saving decision. While we are not able to test directly for this, empirical evidence in favor of cost sharing will tend to support this argument.

3.4 Group Determinants of $u(m)$

In this section we discuss how the identity and characteristics of migrating individuals will affect the return to migration. Specifically we discuss the impact of job information sharing and risk sharing, and show that both may have either positive or negative impacts on the decision to migrate.

3.4.1 Job Information Sharing

In this section we discuss the implications of social networks for job finding and migration. The presence of network effects in the labor market is a possible explanation for the low level of migration during Monga. Calvo-Armengol and Jackson (2004), for example, argue that labor market dropout has a contagion effect through social networks, leading some groups to have persistently lower participation rates. In our context, participation in the urban labor market requires migration, and the presence of strong network effects provides a possible rationale for the low migration levels of the subset of Bangladeshi's living in the Monga prone regions. In the Calvo-Armengol and Jackson model a small difference in the initial quality of the social network can lead to sustained differences in participation, and therefore migration levels. There is a small empirical literature that considers the impact of social networks on the job opportunities of permanent migrants. Munshi (2004) shows that Mexican migrants with exogenously larger social networks have a higher probability of employment while Beaman (2008) shows that competition within networks can mean that larger networks are not always beneficial.

In our application the impact of social networks comes through both the choice of migration partner and the quality of the network already existing at the destination. To model this situation simply, consider the migration decision of two individuals,

$i = 1, 2$. We assume the existence of two individuals from the same region as 1 and 2 at the migration destination and we label these individuals a and b. The friendship level between each pair can be summarized by a number c_{ij} where $c_{ij} = c_{ji}$.

Consider the following employment dynamics. Prior to the migration decision, $t = 0$ agents 1 and 2 are either employed $e_i^0 = 1$ or unemployed $e_i^0 = 0$. After migration there is one period $t = 1$ in which the new migrants (1 and 2) can become employed or not. In period $t = 1$ each individual hears about the existence of a job with probability π. If agent i hears about job information then, if he is unemployed he takes the job for himself. If he is currently employed he passes the job information to agent j where $j = \arg\max_{l \in U_i} c_{il}$ and U_i is the set of unemployed workers known to i. If all of the acquantances of i are employed, then the job information is transfered to an acquaintance of j by the same rule. Any individual that receives job information will then be employed in the next period.

To map this situation back to our overall framework, the probability of getting a job is a key determinant of $u(m)$. This section therefore analyses the determinants of $u(m)$ arguing that it will be higher the better the network available to the migrant at her destination, but will also depend on the characteristics of others migrating at the same time.

In this framework it is clear that the amount of migration depends on the quality of the network, in the sense that 1 and 2 have a higher chance of gaining employment if a and b are already employed. It will also be the case that the larger the network at the destination, the more likely is migration - a point that is borne out in our empirical analysis. However, the probability of migration is not monotonic in the strength of connections of the other migrating agent. To see this second claim, consider the migration decision of agent 1. We first show that increasing the connections of agent 2 may increase the probability of 1 migrating.

Example 1 *Suppose that* $c_{1b} = c_{1a} = 0$ *and that* $c_{21} > c_{2a} = c_{2b} = c$. *Consider first the case in which* $c = 0$. *Then the probability of* 1 *getting a job in period 1 at the destination is* π. *On the other hand, suppose that* $c > 0$ *and that both* a *and* b *are employed in period* 0. *Then the probability of* a *finding a job is* $\pi + (1-\pi)(\pi(1-(1-\pi^2)) + (1-\pi)\pi^2)$. *Which shows that in this example the probability of getting a job in period 1 is increasing in the connections of* b. *In this example, agent 1 benefits from the possibility that agent 2 will pass on job information.*

Next we show that it is possible that increasing connections can decrease the amount of migration.

Example 2 *Suppose that* $c_{1a} = c_{1b} = c_1 > 0$ *and that* $c_{21} > c_{2a} = c_{2b} = c_2$. *Suppose first that* $c_1 < c_2$. *Then the probability of* a *getting a job in the first period is* $\pi + (1-\pi)(1-(1-\pi)^2)$. *Next consider the case in which* $c_b > c_a$, *then the probability of* a *getting a job is* $\pi + (1-\pi)\pi^2$ *which shows that the probability of getting a job decreases as the connections of agent* b *increases.*

The non-monotonicity occurs in these examples because in example 2 agent 2 overtakes agent 1 as the preferred person to pass jobs to, while in example 1 he does not. We conclude that migration will be increasing in the quality of the network at the destination, but that there is competition between migrating agents for the services of the existing network. This highlights the fact that the network can only support a limited amount of migration in any time period.

In terms of the decision to migrate in our experiment, this discussion implies that there are both negative and positive externalities between agents and as we show in section 3.5, this implies that there may be either costs of benefits to requiring agents to migrate in groups in our experiment. We discuss this implication further below.

3.4.2 Risk Sharing

In this section we consider the possibility of sharing the risks of migrating. We model the possibility of risk sharing very simply to highlight that the possibility of risk sharing may have a positive or negative impact on the amount of migration. Within our basic framework consider two individuals that are considering migrating. We suppose that there is only one period of migration and that each individual is either employed or not employed. Therefore there are four states of the world $(e,u),(e,e),(u,e),(u,u)$ where (e,u) indicates that agent 1 is employed while agent 2 is unemployed. We assume that agent i has probability p_i of finding employment.

We follow Ambrus, Mobius and Szeidl (2009) in assuming that there is a risk sharing contract which specifies for each of the possible states of the world a transfer between the parties. This contract is enforced through the existence of social collateral. Specifically the value of the relationship between agent 1 and agent 1 is c, and we assume that if a transfer required under the risk sharing contract is not made the friendship is severed. Utility is given by $u(y,c) = u(y+c)$ where y' is income net of transfers and c is the value of social connections. In this context assume that the wage when employed is w^m, then the risk sharing contract specifies that in state (e,u) a transfer of $\min\{w^h/2, c\}$ from agent 1 to agent 2.

Again this discussion allows us to better understand the determinants of $u(m)$, while ignoring the saving and borrowing decision.

Within this context we show that the presence of risk sharing can be either beneficial or detrimental to migration. Suppose that two agents are characterized by a pair (w_i^h, p_i) where w_i^h is the wage at home and p_i is the probability of finding a job after migrating. We assume that $w_i^h > w_j^h$ implies $p_i > p_j$ so that there is some measure of underlying quality of the worker. The following example shows that depending on the value of parameters, risk sharing might have a positive or a negative effect on migration.

Example 3 *Assume that $w_1^h > w_2^h$ and that $w_1^h < p_1 w^m - F$ so that agent 1 wishes to migrate individually, but that $w_2^h > p_2 w^m - F$ so that agent 2 does not wish to migrate individually. Suppose that $c \geq w^m/2$ so that there will be perfect risk sharing, then the payoff to agent i of migrating is*

$$p_i p_j w^m + (1 - p_i)p_j w^m/2 + (1 - p_j)p_i w^m/2 = (p_1 + p_2)w^m/2.$$

therefore so long as $p_1 > p_2$ risk sharing increases the payoff to migration for player 2 but decreases the payoff to player 1. Given this observation, it is possible that

$$w_2^h < (p_1 + p_2)w^m/2 - F$$

and

$$w_1^h < (p_1 + p_2)w^m/2 - F$$

in which case both will migrate and there is a positive impact of risk sharing on migration. On the other hand, it is possible that

$$w_2^h < (p_1 + p_2)w^m/2 - F$$

and

$$w_1^h > (p_1 + p_2)w^m/2 - F$$

in which case, agent 2 would like to migrate so long as agent 1 will migrate, but agent 1 does not wish to migrate if agent 2 migrates.

This highlights the possible negative impact of risk sharing - the fact that agent 1 will have to look after agent 2 implies that it is not worthwhile for agent 1 to migrate. This example also indicates that the effect of an increase in social connectedness is ambiguous. To see this, suppose that we are in the case in which risk sharing increases migration, then there exists a cutoff value $\bar{c}$ past which both agents will migrate. However, in the other case there exists $\underline{c}$ above which neither agent will migrate.

To what extent does this provide a rationalization for the observation that there is low migration in the monga season? One possible impact of Monga is that it increases the gap in wages for those who remain at home. In the example above this will tend to lead to low quality workers having a low wage which will imply that the second scenario, in which high quality workers must subsidise low quality workers at the destintion, is more likely to occur.

Similar to the sharing of job information, risk sharing implies that agents will care who they migrate with, and will be key to understanding migration decision in our experiment.

3.5 The Migration Decision in Our Experiment

In this section we discuss the implications of the above discussion on the migration decision in our experiment. The experiment randomly allocates different individuals to have to migrate in specific groups and therefore the key issue we wish to understand is how this will affect the probability that agents migrate and also the identify of migrating individuals.

We model as situation in which an agent wishing to migrate must decide on a location and also who to migrate with. We assume that there are N possible individuals to migrate with and L possible locations (we assume that N is even throughout as it will be in our empirical setting). Individuals derive utility from both the location they migrate to and the group of people they migrate with and we denote $u_i(S, l)$ the utility agent i derives from migrating to location l with group $S \subseteq \{0, \ldots, N\}$. The utility from migrating as a group varies because there is the possibility to share fixed costs, job information and risk, as discussed above. Finally, we denote $u_i(0, l)$ as the utility from migrating alone to location l and $u_i(0, 0)$ as the utility from remaining at home.

In the context of our model above, we are again discussing the determination of $u(m)$ and how it will be affected by the migration decisions of other agents. We place no restrictions on the form that these utilities can take. Obviously, different individuals will have different preferences over migration location. Further our discussion above outlines several reasons why $u_i(j, l) > u_i(0, l)$. For example, if the two individuals are able to share the costs of transport, or lodging at the destination or if the two are able to share risk and job information at the destination. However, we also outlined situations in which $u_i(j, l) < u_i(0, l)$. For example, agent i may have an obligation to share risk with agent j, and if agent j has a low probability of finding a job, the relationship may be a burden on i so that she would prefer to locate individually.

We wish to understand how different restrictions on the location and partner choice will affect the amount of people that choose to migrate. To do this we model the situation as a non-cooperative game. The game simply requires that each agent announce a choice $l \in \{0, 1, \ldots, L\}$. It is then assumed that agents migrate according to their announcement. Within this context we consider three progressive restrictions on the decisions of the players:

1 Group Required: In order to migrate players must form a group of 2 or more individuals and migrate to the same location;

2 Group Specified: Individuals must migrate in specific groups of 2; and

3 Location Specified: Individuals must migrate in specific groups of 2, and the location of migration is specified.

Our main result is that the move from no restrictions to restriction 1 (adding the group migration requirements) has an ambiguous effect on the amount of migration, as does the move to restriction 3 from 2 (specifying the makeup of the group), while the move from 2 to 3 (specifying the destination) leads to a decrease in the amount of migration. First we provide an example in which requiring group migration increases the amount of migration:

Example 1: *Assume that the utility of* 1 *and* 2 *are dependent and so are the utility of* 3 *and* 4 *but that there are no interactions across these pairs. So for example, because 1 does not know* 3*:* $u_1(S \cup 3, l) = u_1(S, l)$*. Consequently denote* $u_1(\{1, 2, 3\}, l) = u_1(2, l)$*. Assume also that there are two locations,* A *and* B*. Next assume for* $i = 1, 3$*;* $u_i(0, A) = u_i(0, B) > u_i(i + 1, A) = u_i(i + 1, B) > u_i(0, 0)$ *and for* $j = 2, 4$*;* $u_j(j - 1, A) > u_j(0, 0) > u_j(j - 1, B) > u_j(0, A) = u_j(0, B)$*. Then the equilibrium without restrictions is that agent 1 migrates to location* B *and agent 2 does not migrate and likewise agent* 3 *migrates to location* B *while agent* 4 *does not migrate. The equilibrium under restriction 1 however, implies that all agents migrate to location* B*. Therefore, in this example, the restriction to migrate to the same location increases the amount of migration.*

Example 1 is somewhat counterintuitive, implying as it does that a restriction on migration choices can lead to more migration. The reason this can occur is that agent 2(4) imposes an externality on agent 1(3). So, for example, agent 2 might be a low quality worker and have a very low probability of finding a job after migration. If there is a risk sharing norm in place that requires agent 1 to help agent 2, then agent 2 will be a burden on agent 1, implying that she will try to avoid migrating with agent 2. This example suggests that *if* there is an increase in the amount of migration in the move from no restriction to restriction 1, it should come through the creation of groups that have a high level of social connection and should increase the migration levels of "low skill" agents. We will test for this heterogeneous treatment effect in our empirical work. Next we provide an example in which the restriction leads to a reduction in migration:

Example 2: *We again assume that the utility of agents* 1 *and* 2 *are not affected by the choice of* 3 *and* 4 *and vice versa. Therefore we consider only the choices of agents* 1 *and* 2*. Suppose that* $u_1(0, A) = u_1(0, B) > u_1(0, 0) > u_1(2, A) > u_1(2, B)$ *and* $u_2(1, A) > u_2(0, 0) > u_2(1, B) > u_2(0, A) = u_2(0, B)$*. Then the equilibrium without restrictions is that agent 1 migrates to location B and agent 2 does not migrate. The equilibrium under restriction 1 implies that neither agent migrates. Therefore, in this example, the restriction to migrate to the same location decreases the amount of migration.*

Again, agent 1 does not wish to migrate with agent 2, and so the equilibrium without restrictions implies that only one of the agents migrates. However, agent 1 strictly prefers to stay home than to migrate with agent 2, therefore the restriction on the migration decision implies that agent 1 does not migrate in equilibrium. In contrast to example 1, the intuition in this example implies that it will be those agents that are "high skill" that are likely to be pushed out of migration by the intervention. We will again test for this in the empirical section. Overall, we also note that the requirement to coordinate with others on a destination will tend to reduce migration as the number of restrictions increase. We record the observations from example 1 and 2 as proposition 1.

Proposition 1 *The amount of migration under restriction 1 may be greater than or less than the amount of migration without restrictions.*

Next we turn to the impact of specifying the makeup of groups. Building on the intuition of examples 1 and 2 it is easy to see that this restriction need not lead to a reduction in migration. Again, we first provide an example in which the restriction increases the amount of migration. Without formalizing the utility levels, it is easy to see that there exists an equilibrium under restriction 1 such that $\{1, 2\}$ is a migrating group and 3 and 4 choose to not migrate. For example, this structure would be implied by preferences where 1 and 2 prefer to migrate to location A, but 3 and 4 will only migrate to location B and will only migrate there if one of 1 and 2 choose to migrate to B. Then, under restriction 2, the randomization is equally likely to generate each of the following migrating groups: $\{(1, 2), (3, 4)\}$; $\{(1, 3), (2, 4)\}$; and $\{(1, 4), (2, 3)\}$. It is easy to see that one can construct preferences such that all individuals migrate in all but the first case. Therefore, under restriction 3, expected migration is $10/3$ but expected migration under restriction 1 is only 2. As above, it is expects that agents that are induced to migrate will be of "low skill" and will be socially connected to others that are migrating.

Next we consider whether it is possible that specifying the makeup of groups decreases the amount of migration. Again it is simple to construct an example in which this is the case. Suppose that under restriction 1 pair $\{1, 2\}$ migrate to location A and always receive 0 utility from migrating to location B and pair $\{3, 4\}$ migrate to location B and receive 0 utility migrating to location A. Then expected migration under restriction 1 is 4, while under restrictoin 2 it is 4/3. As above, we might expect this restriction to impact the high skilled who would have migrated anyway to a greater extent. We collect these simple observations as proposition 2.

Proposition 2 *The amount of migration under restriction 2 may be greater than or less than the amount of migration under restriction 1.*

Finally, we consider the impact of specifying the location of migration. In this case we can show that the restriction will weakly reduce the amount of migration.

Proposition 3 *The amount of migration under restriction 3 is weakly less than the amount of migration under restriction 2.*

We outline a sketch of the proof of this fact. Let l be the imposed location decision for any two agents and suppose that they decide to migrate. This implies that migrating to location l must be preferred to not migrating by both agents and this in turn implies that migrating to l must either be an equilibrium under restriction 1, or migrating to location $-l$ must have an even higher payoff. Hence migration must have been optimal under restriction 2. Therefore if migration is optimal under restriction 3, it must also be optimal under restriction 2 and we therefore conclude that there will be weakly less migration under restriction 3.

4 Empirical Results

We focus our data analysis on examining the household migration response to our randomly allocated incentives and conditions. An examination of averages of household and village characteristics confirms that we achieved balance across treatment conditions. In other words, the randomization was applied correctly and our sample size was large enough that other relevant differences across treatment villages were within noise of each other. We therefore present mostly statistical tests of mean comparisons across randomization conditions without adding covariates to the analysis. We later address the fact our incentive treatment was implemented at the village level by clustering standard errors by village in regression analysis. We also examine heterogenous treatment effects (by non-random baseline characteristics) in these regressions.

The dependent variable in all analysis reported is whether the household migrated in the 3 month period following the implementation of our incentives. Table 3 examines this out-migration propensity across the four groups created by the village-level randomized incentives: Cash, Credit, Information or a Control. Just over 40% of Cash and Credit recipients migrated after the incentive was offered, while only 14Table 4 shows that adding a group formation requirement to the monetary transfer has no detectable effect on households propensity to migrate. Simply requiring households to form a group does not affect the migration rate, while assigning specific migration partners reduces the rate by over 4 percentage points, although this effect is small and not statistically distinguishable from zero. Our theory predicted that these effects would be ambiguous. Table 5 shows that requiring a larger group (3 rather than 2) reduces migration propensity by almost 6 percentage points, and that this effect is marginally statistically significant. Larger groups may imply a different set of coordination problems and a different dynamic with respect to risk sharing and job information sharing, which we have not modelled. Table 6 shows that this negative effect of larger groups is somewhat heterogenous with respect to whether we required the potential migrants to choose specific partners or gave them the choice to form their own groups within a limited set of people. When partners are assigned, the larger group reduces migration propensity by only 3 percentage points whereas in self-chosen groups, the larger group reduces migration propensity by almost 9 percentage points. This suggests that coordination issues with respect to forming groups, and finding the right set of partners may be important.

Table 7 shows that when households are required to migrate to specified destinations, their take-up of our incentive is reduced by 7.4 percentage points. Our theory predicted that this is a requirement that would reduce the probability of migrating, unlike the group formation requirement. The difference between assigned and chosen destinations is statistically significant, and is retained in the regressions even after we control for additional covariates and cluster standard errors. Table 8 shows that this destination effect varies by the identity of the particular city that is specified. Distance from the origin to the destination matters a lot. Bogra and Tangail are similar sized cities with comparable market opportunities, except that Tangail is much farther away. Our sample households have a 12 percentage point greater likelihood of migrating to the closer city Bogra than to Tangail. The size of the labor market seems to matter as well. Migrants are 6 percentage points more likely to take-up our offer when Dhaka is specified as the destination compared to when a nearby smaller town, Munshiganj is offered. This difference is not statistically significant when a Bonferroni multiple comparison test is used.

Finally, Tables 9 and 10 turn to regression analysis to more formally explore some of these statistical differences. Beginning with table 9, specification 1 shows that the 26 percentage effect on migration of providing a monetary incentive is highly statistically significant even after errors are conservatively clustered by village, which is the level at which this randomization was applied. Specification 2 shows that the assignment of destination is also statistically significant, and it leads to a 7.5 percentage point decrease in the propensity to migrate. Not imposing a requirement to form a group or allowing a choice of partners when the group requirement is applied increases the chances of migration slightly, but these differences are not statistically distinguishable from zero. Specification 3 shows that requiring households to form larger groups of 3 (rather than pairs) has a statistically significant reduction in migration probability of 6.1 percentage points.

Specification 4 adds household characteristics and we find that wealthier households are less likely to migrate. We use a proxy for wealth based on the type of home the household resides in. We also control for households subjective expectations of future events, taking advantage of survey questions where we asked households to assign probabilities to future events on a 0-100 scale. Households that placed a 10 percent higher probability on Monga occurring this year when they were asked at our baseline survey (in July 2008, two months prior to the Monga season) were 12 percentage points more likely to actually migrate during the monga season. Households that placed a 10 percent higher probability on receiving help from friends and relatives in Dhaka if they migrated there were about 8.4 percentage points more likely to actually migrate subsequently. Finally, households that place a 10 percent higher likelihood on random strangers being trustworthy are 7.4 percentage points more likely to migrate.

We find weak evidence that controlling for income, literate households are more likely to migrate, but the 4 percentage point effect of being literate is not statistically different from zero. This is coupled with weak evidence that literate households respond differentially to our incentive that they are less likely to be swayed by the offer of cash or credit. There is no evidence of a heterogenous treatment effect with respect to income.

In Table 10 we explore the migration responsiveness of households who were randomly placed in the group conditions as a function of the characteristics of their potential partners or assigned partners. Overall we find that the observable characteristics of either potential, or assigned group members do not have a large impact on the migration decision.

Specification 1 considers the impact of the characteristics of potential group members (i.e. when group membership was not assigned). While most characteristics have the intuitive sign, the effects are generally small, and not statistically significant. For example, the average wealth of potential group members lowers the likelihood of migration, reflecting our earlier finding that those with higher wealth are less likely to wish to migrate. The one exception is the impact of literacy amongst potential group members, which lowers the probability of migration by 18 percentage points. This potentially refects the fact that literate households were less likely to respond to the incentives offered, and may, therefore, have been less likely to be willing to form groups in order to receive incentives.

The remaining three specifications consider the impact of the characteristics of an assigned migration group, with specification 2 considering income, specification 3 adding the impact of literacy and specification 4 the impact of education. The coefficients are in general small and insignificant, with the exception of the impact of income and the standard deviation of schooling. Interestingly we find that when groups are assigned, migration is more likely when group members are wealthier. This suggests that the negative effect of wealth when groups are not assigned comes form coordination problems. Finally, an increase the standard deviation of education within the group leads to a large and statistically significant. This observation provides some evidence that heterogenous groups find group migration less advantageous, and suggest that households did take in to account the characteristics of their migration partners.

5 Conclusion

Our work contributes to the design and implementation of policies and programs that aim to address severe malnutrition, poverty and hunger. Our work also contributes to the literature on urban-rural migration that views migration as both an income maximization and risk minimization decision (Sjastaas 1962, Todaro 1969, Harris and Todaro 1970, Stark and Levhari 1982, Stark and Bloom 1985). By examining the costs and incentives necessary to promote migration, the research helps to identify the non-pecuniary components of the migration decision, including psychological costs (Carillo et al 1999), and the kinship and networks pull (Banerjee 1984, Carrington et al 1996, Massey et al 1993, Munshi 2003, Myrdal 1944).

The empirical results presented in this paper show that credit or saving constraints have a first order effect in reducing migration, and thereby demonstrate the possibility that migration is a useful method to help smooth consumption during Monga. Our theoretical framework and empirical results regarding the impact of groups on the migration decision, however imply that there are potentially complicated social constraints on migration. Our experiment will allow for a fuller analysis of these constraints, and allow us to unpack the causes of low migration during Monga.

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7 Appendix

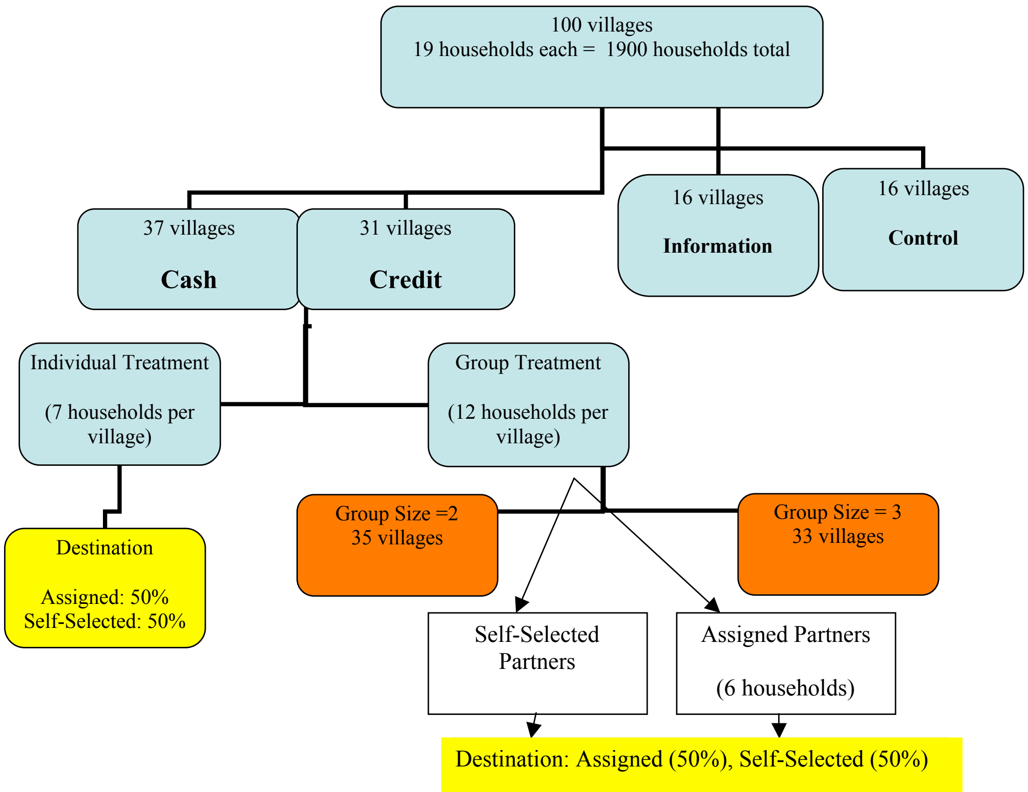

Figure 1: Randomization

8 Tables

Table 1: Information on jobs, job availability, wage rate for selected destinations

Urban area	Sectors /Jobs title	Likelihood of getting such a job	Average daily wage (in Taka)
Bogra	a) rickshaw pulling	Moderate	150 to 200
	b) construction work	Moderate	120 to 150
	c) agricultural labour	Moderate	80 to 100
Dhaka	a) rickshaw pulling	High	250 to 300
	b) construction work	High	200 to 250
	c) day labour	High	150 to 200
Munshigonj	a) rickshaw pulling	High	150 to 200
	b) land preparation for potato cultivation	High	150 to 160
	c) agricultural labour	High	150 to 160
Tangail	a) rickshaw pulling	Moderate	200 to 250
	b) construction work	Moderate	160 to 180
	c) day labourer in brick fields	Moderate	150 to 200

Table 2 Distribution of households under different randomization dimensions

Group nature:	A. Individual		B. Assigned group				C. Self-formed group				Total
Group size:			Two		Three		Two		Three		
Destination type:	Assigned	Chosen	Assigned	Chosen	Assigned	Chosen	Assigned	Chosen	Assigned	Chosen	
Incentives:											
a) Information only											**304**
b) (a) + conditional cash transfer	133	126	66	48	54	54	66	48	60	48	**703**
c) (a)+ conditional credit	105	112	42	54	42	48	42	54	36	54	**589**
Control group											**304**
Total # of households	**238**	**238**	108	102	96	102	108	102	96	102	**1900**

Table 3. The Effect of Randomized Incentives on the Migration Decision

Condition	Migration R	Std. Dev.	SE(mean)	No. of Obs.
Cash	40.3%	0.491	0.019	703
Credit	40.6%	0.491	0.020	589
Information	16.8%	0.374	0.021	304
Control	13.8%	0.346	0.020	304
Total	32.4%	0.468	0.011	1900

Analysis of Variance Across Conditions

Source	SS	df	MS	F	Prob > F
Between groups	26.197	3	8.732	42.48	0
Within groups	389.737	1896	0.206		
Total	415.934	1899	0.219		

Bartlett's test for equal variances: chi2(3) = 74.5193 Prob>chi2 = 0.000

Bonferroni Multiple Comparison Test

	Cash	Control	Credit
Control	-0.264		
	(0.00)		
Credit	0.003	0.268	
	(1)	(0.00)	
Information	-0.235	0.030	-0.238
	(0.00)	(1)	(0.00)

T-test for the Effect of Monetary Incentives (Cash or Credit)

Group	Obs	Mean	Std. Error	Std. Devia	[95% Conf.	Interval]
Control or Information	612	15.7%	0.015	0.364	0.128	0.186
Received Cash or Credit	1292	40.4%	0.014	0.491	0.377	0.431
Combined	1904	0.325	0.011	0.468	0.304	0.346
Difference (Control - Money)		-0.247	0.022		-0.291	-0.203

t-value for Difference = -11.094
Degrees of Freedom = 1898
Pr(|T|>|t|)=0.000

Table 4. The Effect of Group-Formation Requirements on the Migration Decision

Condition	Mean	Std.	se(mean)	Freq.
Individual (No Group Requirement)	41.4%	0.493	0.023	476
Self-Formed Group	42.2%	0.494	0.024	408
Assigned Partners	37.5%	0.485	0.024	408
Total	0.404	0.491	0.014	1292

Analysis of Variance Across Conditions

Source	SS	df	MS	F	Prob>F
Between Conditions	0.515	2	0.258	1.07	0.344
Within Conditions	310.584	1289	0.241		
Total	311.099	1291	0.241		

Bartlett's Test for Equal Variances: Chi^2(2) = 0.189, Prob>Chi^2=0.91

Bonferroni Multiple Comparison Test

	Assigned Partner	Individual
Individual (No Group Requirement)	0.039	
	[0.722]	
Self-Formed Group	0.047	0.008
	[0.527]	[1]

Table 5. The Effect of Group Size on the Migration Decision

Condition	Obs	Mean	Std. Error	Std. Dev.	[95% Conf. Interval]	
Group Size = 2	420	42.6%	0.024	0.495	0.379	0.474
Group Size = 3	396	36.9%	0.024	0.483	0.321	0.416
Combined	816	39.8%	0.017	0.490	0.365	0.432
Difference		0.058	0.034		-0.010	0.125

Two-sample t-test for Difference Between Assigned vs. Chosen Destinations

Diff = Mean(Group Size 2) - Mean(Group Size 3)
Ho: Diff=0, Ha: diff!=0
t - -2.727
Pr(|T|>|t|)=0.094
Pr(T>t)=0.046
degrees of freedom = 1290

Table 6. Effects of Group Type X Size Requirements on the Migration Decision

Condition	Mean	Std. Dev.	SE(mean)	No. of Obs.
Assigned Group, Size 2	39.0%	0.489	0.034	210
Assigned Group, Size 3	35.9%	0.481	0.034	198
Formed, Size 2	46.2%	0.500	0.034	210
Formed, Size 3	37.9%	0.486	0.035	198
Total	39.8%	0.490	0.017148	816

Analysis of Variance

Source	SS	df	MS	F	Prob>F
Between	1.250	3	0.417	1.74	0.157
Within	194.308	812	0.239		
Total	195.558	815	0.240		

Bartlett's Test for Equal Variances: Chi^2(3) = 0.323, Prob>Chi^2=0.96

Bonferroni Multiple Comparison Test

	Assigned, Size 2	Assigned, Size 3	Formed, Size 2
Assigned, Size 3	-0.032 [1]		
Formed, Size 2	0.071 [0.81]	0.103 [0.20]	
Formed, Size 3	-0.012 [1]	0.020 [1]	-0.083 [0.52]

Table 7. The Effect of Destination Choice on the Migration Decision

Variable	Obs	Mean	Std.Error	Std. Dev	[95% conf interval]	
Destination was Specified	646	36.7%	0.019	0.482	0.330	0.404
Household could Choose one of 4 Destinations	646	44.1%	0.020	0.497	0.403	0.480
Combined	1292	0.404	0.014	0.491	0.377	0.431
Difference		-0.074	0.027		-0.128	-0.021

Two-sample t-test for Difference Between Assigned vs. Chosen Destinations
Diff = Mean(Assigned) - Mean(Chosen)
Ho: Diff=0, Ha: diff!=0
t - -2.727
Pr(|T|>|t|)=0.006
degrees of freedom = 1290

Table 8. The Effect of Specifying Particular Destinations on the Migration Decision

	Mean	Std. Dev.	SE(mean)	No. of Obs.
Bogra	43.4%	0.497	0.039	159
Dhaka	39.0%	0.489	0.038	164
Munshiganj	33.1%	0.472	0.037	160
Tangail	31.3%	0.465	0.036	163
Total	36.7%	0.482	0.019	646

Analysis of Variance

Source	SS	df	MS	F	Prob>F
Between Groups	1.483	3	0.494	2.14	0.0944
Within Groups	148.568	642	0.231		
Total	150.051	645	0.233		

Bartlett's Test for Equal Variances: chi2(3) = 0.915, Prob>chi(2) = 0.822

Bonferroni Multiple Comparison Test

	Bogra	Dhaka	Munshiganj
Dhaka	-0.044		
	[1]		
Munshiganj	-0.103	-0.059	
	[0.342]	[1]	
Tangail	-0.121	-0.077	-0.018
	[0.146]	[0.879]	[1]

Table 9. Migration Decision as a Function of Randomized Incentives and Household Characteristics

	(1)	(2)	(3)	(4)	(5)	(6)
	Did Anyone from the Household Migrate After August 2008?					
Cash Incentive	0.264***	0.003	-0.014	0.267***	0.307***	0.310***
	(5.62)	(0.06)	(0.41)	(5.73)	(5.64)	(5.70)
Credit Incentive	0.268***			0.269***	0.309***	0.313***
	(5.09)			(5.12)	(5.32)	(5.30)
Information about Wages and Employment at Destinations	0.030			0.035	0.038	0.038
	(0.64)			(0.79)	(0.85)	(0.84)
Destination was Assigned		-0.075**	-0.120			
		(2.25)	(3.51)			
Individual (No Group Formation Requirement)		0.039				
		(1.29)				
Required to Form Group, but had Choice of Partners		0.047	0.047			
		(1.37)	(1.37)			
Larger Group Size (3 rather than 2)			-0.061*			
			(1.79)			
Someone in Household Can Read and Write				0.006	0.043	0.042
				(0.24)	(1.34)	(1.29)
Literate Household Receiving Incentive					-0.055	-0.053
					(1.25)	(1.20)
Household has Pucca Walls (Proxy for Wealth)				-0.043*	-0.043*	-0.032
				(1.70)	(1.70)	(0.95)
Household with Pucca Walls Receiving Transfer						-0.015
						(0.31)
Do you Believe that a Random Stranger is Trustworthy? (0-100 scale)				0.001*	0.001*	0.001*
				(1.80)	(1.78)	(1.78)
Subjective Expectation: Monga Occurrence this year (0-100)				0.001**	0.001**	0.001**
				(2.05)	(2.08)	(2.07)
Subjective Expectation: Can Send Remittance from Dhaka (0-100)				0.000	0.000	0.000
				(0.23)	(0.20)	(0.20)
Subjective Expectation: Will get Social Network Help in Dhaka (0-100)				0.001*	0.001*	0.001*
				(1.80)	(1.83)	(1.85)
Constant	0.138***	0.411***	0.595*	-0.028	-0.057	-0.059
	(4.86)	(7.95)	(6.95)	(0.46)	(0.91)	(0.94)
Observations	1900	1292	816	1900	1900	1900
R-squared	0.06	0.01	0.02	0.07	0.08	0.08

Robust t statistics in parentheses
* significant at 10%; ** significant at 5%; *** significant at 1%
Errors Clustered by Village

Table 10. The Group Migration Decision

	(7)	(8)	(9)	(10)
	Did Anyone from the Household Migrate After August 2008?			
Destination was Assigned	-0.123***	-0.0471	-0.0445	-0.0630
	(0.0346)	(0.0484)	(0.0486)	(0.0565)
Required to Form Group, but had Choice of Partners	0.0414			
	(0.0342)			
Household has Pucca Walls (Proxy for Wealth)	-0.0265	-0.104	-0.105	-0.113
	(0.0419)	(0.0700)	(0.0703)	(0.0825)
Median Wealth (Pucca Wall?) Among Potential Group Members	-0.0707			
	(0.0596)			
Std. Dev.of Wealth (Pucca Wall?) Across Potential Group Members	0.110			
	(0.0911)			
Median Wealth (Pucca Wall?) Among Assigned Partners		0.0739	0.0693	0.0585
		(0.0828)	(0.0834)	(0.0958)
Std. Dev. Of Wealth (Pucca Wall?) Across Assigned Partners		-0.00129	-0.00206	-0.0199
		(0.0829)	(0.0827)	(0.0957)
Someone in Household Can Read and Write	-0.0148		0.00532	
	(0.0387)		(0.0661)	
Average Literacy Among Potential Group Members	-0.186**			
	(0.0939)			
Std. Dev.of Literacy Across Potential Group Members	-0.147			
	(0.121)			
Median Literacy Among Assigned Partners			-0.00657	
			(0.0817)	
Std. Dev. Of Literacy Across Assigned partners			0.0952	
			(0.0820)	
Years of Schooling Completed by Most Educated Household Member				0.00587
				(0.0134)
Median Education (Max. Schooling) Among Assigned Partners				0.00152
				(0.0184)
Std. Dev. Of Education (max schooling) Among Assigned Partners				-0.0310*
				(0.0184)
Constant	0.657***	0.434***	0.381***	0.489***
	(0.120)	(0.0463)	(0.0783)	(0.0920)
Observations	816	408	408	292
R-squared	0.027	0.011	0.013	0.034

*** p<0.01, ** p<0.05, * p<0.1
Standard errors in parentheses