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LOCATION DECISIONS OF MICROFINANCE INSTITUTIONS OF BANGLADESH

Syed Naimul Wadood¹ and Chowdhury Shameem Mahmoud²

Abstract

The microcredit programs have expanded rapidly in Bangladesh in recent times. A recent phenomenon is that a large number of small and localized micro-finance institutions are operating side by side with established national-level institutions in the local-level microfinance markets. Here we examine the recent data from the Pathrail union of the Tangail district, one of the old places of microcredit, and we find interesting features regarding entry and operations of microcredit activities. One clear finding is that large and small micro-finance institutions tend to choose economically more prospective locations as their choices of destinations and in turn do have a tendency to ignore economically less prospective regions. We specify a panel data probit regression framework and the results derived are consistent with our casual observations of the data.

Key Words: Microcredit, Location, Entry, Random Effects Probit Estimation

JEL Classification: L130, L110, L310, C510

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Section 1: Introduction

The microfinance industry in Bangladesh has expanded rapidly in recent years. With a background of four decades of experiences already by this time, this industry has gained a worldwide reputation in targeted poverty alleviation initiatives, skill development and training, entrepreneurial development, etc. As an indication of the scale of this industry, we can cite Microcredit Regulatory Authority (2008) that a total number of 4236 NGO-MFIs had applied to MRA by 2006 for obtaining obligatory license to run microcredit activities in the country. Interestingly there are wide variations within these MFIs, whereas a few of these MFIs are truly gigantic in size, such as serving more than one million borrowers; on the other hand, there is a large number of MFIs who operate only a few offices and have borrowers not more than one thousand. One question that emerges is that how do firms with quite large differences in size and financial strength exist side by side in this microfinance market. What are the factors that a large MFI firm takes into

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consideration while deciding to enter a locality? The same question can be asked about the small MFI firms as well.

Section 2: Background and Motivation

The location decision by Microfinance Institutions (MFIs) have a host of implications for the microfinance industry in general. By 'location decision' we mean a lender's choice to place its business in a village as opposed to others. Microfinance institutions, primarily in the business of extending microcredit loans and generating micro savings, can loosely be divided into two types, namely, for profit and not for profit MFIs (Cull, Kunt and Morduch (2009)). The not for profit MFIs do not necessarily mean that their revenue is less than operational costs. The difference lies with the source of capital, which is social capital based and the profit earning is primarily due to keeping the program sustainable. Understanding of location decisions in the midst of operation by both of these types of organizations, more accurately in the face of increasing competition between these microlenders is of paramount importance. The importance lies with plausible implications that these decisions can bring about. Before that, we need a clear understanding of the discernible factors that keep the system sustainable.

Microcredit programs in Bangladesh started as a group based activity. How the group based activity as a strategy addresses the adverse selection and moral hazard problem has long been established (see de Aghion and Morduch (2005)). In the last two decades, however, microcredit activities and even the Grameen Bank (GB) which purports to be the inventor and the pioneer of group-based activity have shifted away from sticking to it while extending loans. It was realized that the dynamic incentive to get a loan in future serves the purpose of addressing any moral hazard problem in repaying loans. To maintain the cash-flow, recurrence of investment or expansion of income generating activities keeps the need for loan ever important to the borrowers. Simply to ensure access to future loan a borrower keeps away from default.

The dynamic incentive may, however, weaken in face of competition (see de Aghion and Morduch (2005)). The key factor here is the information regarding previous repayment status of the borrowers. If it is part of common knowledge that poor repayment or default history of a borrower is inaccessible to lenders then it is plausible

that some borrowers may create moral hazard problem and shirk on repayment. Competition among the lenders brings options for the borrowers. If one lender refuses to extend new loan as a response to poor repayment by a borrower then the borrower can move to someone else. The possibility of weakened dynamic incentive, if perceived as important by the lenders, can play a role in location decision of the MFIs. The MFIs may therefore try to skip locations where there is too high a competition in the microcredit market. On the other hand, each of the MFIs needs to decide whether to locate their program in a specific location or not. On that account, an MFI may observe other competing firm's decision. Economically prosperous areas are lucrative locations for microcredit, for that matter, any credit operation. This way MFIs have strong reasons to disburse their resource in economically prosperous areas, on the other hand since these same locations typically may have a higher degree of competition in the market this may reduce the dynamic incentive on the part of the borrowers so vital for successful microcredit operations. We note that some other factors may also play their respective roles. McIntosh et. al. (2005), for example, found that district characteristics suggestive of higher existing lending activities are factors driving micro-credit organizations in Uganda to locate themselves in such places.

Another interesting feature of this location decision is the aspect, *the decision is by whom?* A relevant issue is that how costly is it to enter a local microcredit market? What constitutes a situation when an MFI considers the earlier decision of entering a locality a successful one or an unsuccessful one? Surely future implications are taken into consideration when an MFI takes a decision provided the decision itself is an expensive one. While a large MFI may find it easier to experiment with a new locality a small MFI may not find it that easy on financial grounds. An important part of this issue can be that large MFIs may have different situations and perspectives as compared to the small MFIs. It is also possible that while a large MFI may not have to bother about if a small MFI already exists in the locality that it wants to enter-- the same may not apply to a small MFI. The latter may have reasons to bother if there are strong incumbent firms already in the local market.

The organization of the paper is as follows. Section 1 is the introduction whereas Section 2 is the background and motivation. Section 3 specifies the research question.

Section 4 discusses the overview of the literature. Section 5 discusses the data and analyzes the data, while Section 6 discusses an econometric analysis. And finally, Section 7 concludes.

Section 3: Research Question

The objective of the paper is to examine *the location and continued operation decision of microfinance institutions in specific areas, and their determinants*. The paper examines the data collected from a locality which has a long record of microfinance activities in the background, and investigates the way the entry decision is made, taking into consideration population and physical characteristics of the locality, characteristics of the NGO-MFI itself, level of activeness of the microfinance market, etc.

Section 4: Overview of Literature

The only existing literature that deals with the placement decisions of the MFIs, is McIntosh C. et. al. (2005). The paper is mainly about borrowers' responses in presence of competition among lenders, but the paper in a segment also deals with the question of placement determinants for the lending organizations in Uganda.

The microfinance activities in Uganda gained momentum in the nineties and by the end of that decade the lending organizations found themselves in a competitive situation; they extended their activity more in overlapping regions. The authors wanted to find how the group members of FINCA, a large widely spread MFI in Uganda, responded in the face of multiple borrowing options due to the presence of other MFIs in proximity. The FINCA in their conduct of credit activities faced competition from Village Banks (VB), Solidarity Groups (SG) and Individual lenders. VB and SG provide loans to groups of people and uses joint liability as a way to address the moral hazard problem. The group sizes of VB borrowers are larger than those of SG. Village banks are not the same as solidarity groups; they provide collateral-free loans, depend less on the individual screening of the borrowers compared to SG and provide the least size loans among the three. The individual lenders, on the other hand, provide loans to individuals only. They provide collateralized loans, follows the rigorous screening and charges high-interest rates and their loans' sizes are the largest of all. So in all respect SG are in between the

VB and the individual lenders in the dimensions mentioned. FINCA faces competition in the micro-credit market in Uganda from all three types of lenders. The paper constructs a subjective definition of competition whereby it is defined as the presence, number or distance of the other lending organizations from the group activities of FINCA. The paper estimates the change in the number of lending organizations near FINCA groups in between 1998 through 2001 as the change in the level of competition faced by FINCA as a function of group and district characteristics. The group characteristics include the presence of commercial banks and whether the FINCA group is rural or urban. The district characteristics include average level of education of the groups in a district, MFI penetration in the district, the proportion of the population having access to bank account, among others as the district level explanatory variables. The paper found that in their location decision MFIs do respond to district level characteristics. MFIs tend to locate in places with a higher level of existing lending activities both by commercial banks and micro-credit institutions and tend to locate more in rural districts.

This result suggests that MFIs in Uganda tend to locate in places of higher economic activity and the level of maturity in micro-credit activity is also important in their placement decisions.

The current paper is an addition to this line of investigation where we look into village level characteristics as potential determining factors of MFI activities in Bangladesh.

Section 5: Data

5.1 Data from the Pathrail union, Tangail

Palli Karma Shahayak Foundation (PKSF) and Institute of Microfinance (InM) jointly conducted a census of microcredit borrowers at Pathrail union in Delduar *upazila* (sub-district) of Tangail district in the months of March and April in 2007-- the objective of the census was to examine overlapping pattern among the microcredit borrowers. There was a specific reason why the borrower census survey was conducted in the Tangail district. This district is one of the earliest locations of microcredit operation in Bangladesh where the program started as early as in the late 1970s. We, therefore, expect that the local microcredit market has taken a matured shape by this time. Examination of data from here, therefore, would provide valuable insights into the

functioning of this market more specifically our own queries (see Mahmoud, Khalily and Wadood (2009)).

5.2 Structure of Data

We analyze data from the PKSF-InM jointly conducted census of Pathrail union microcredit borrowers. We note that Pathrail union has a total of 23 villages, of different population sizes. The census had four modules of the questionnaire. The first module is administered for every single household in the union for listing purposes, asking basic information with regards to landholding, NGO-MFI membership status, etc. (*Module 1: listing questionnaire*). The second module is a village survey questionnaire, administered in focus group discussions held in each village in order to reach a consensus opinion-- questions were mostly on physical infrastructure of the villages and distance from important locations, e.g., paved road, post office, *union parishad* headquarters, *upazila parishad* headquarters, school, bank, college, health center, *bazaar*, etc. (*Module 2: village questionnaire*). The third module is administered among branch managers and field workers of NGO-MFIs-- questions mostly on the issues of competition practices of MFIs and overlapping situation (*Module 3: NGO-MFI questionnaire*). The fourth module was a detailed household questionnaire, only for households who are members and/or borrowers of NGO-MFIs (*Module 4: household questionnaire*). A total of 4,496 household interviews were recorded with Module 4.

This fourth module includes a listing of all NGO-MFIs and loan types that household members have taken a loan from since inception of microcredit in this area in 1979. For every single NGO-MFI loan taken by the household, the questionnaire records details of loan amount demanded, loan amount disbursed, the purpose of the loan, utilization of loan, date of loan sanctioning, the name of MFI-NGO from which loan has been taken, etc. Since *Module 4* has NGO-MFI loan history of all the households in the village who ever participated in the microcredit market-- it is possible to construct a village-level panel data set from combining household information up to the village level. Since concerns may arise regarding the correctness of long recall, we analyzed the data only within a specific time frame-- years 2000 to 2006 (household interviews were conducted on March-April of 2007, so this year was yet to get completed, therefore we did not include this year in our analysis).

The list from Module 4 includes formal sources such as banks and MFIs and informal sources such as commercial money lenders, neighbours and rich farmers in the village. We selected a total of 43 NGO-MFIs from among 65 numbers of sources of credit funds for household (not selected are categories outside the scope of microcredit market). We classified MFIs in two size

categories: “large” and “small”. We consulted PKSf documents for years 2000 to 2006 to ascertain which MFI would be placed in which category. We placed 8 MFIs as “large” ones (namely BRAC, ASA, Proshika, Grameen Bank, BRDB, PDBF, SSS and BURO Tangail) and the remaining 35 MFIs as “small” ones (these did not receive funds from PKSf till then, and typically these were small in size and local in terms of microcredit operations). We defined “market share of borrowers” as the share of the village microcredit borrowers that went to a particular MFI in a given year. Combining all the market shares of a particular MFI across all the villages in terms of borrowers and loan amount disbursed, we have conducted the Herfindahl index for microfinance market of borrowers for each village in each year.

In order to understand the location decision, we have constructed a dummy variable *yes/no* (value of 1 if the MFI operates in the village in that particular year and 0 if otherwise). As we have 23 villages, 43 NGOs and 7 years of information (from 2000 to 2006), we have constructed a balanced panel dataset of the short time length of 6923 data points. An important variable that is useful is *avgIndisb*, average loan disbursed by NGOs in the villages in a particular year. A one year lagged variable *avgIndisblag1* was also useful in econometric analysis. We have also examined average nominal interest rates charged by MFIs, the percentage of loans for handloom categories in the MFI loan disbursement portfolio, etc.

5.3 Analysis of Data

All village discussion

Pathrail union has 23 villages. Villages are not similar in importance and in terms of the scale of economic activities. Factors such as differences in size of population, remoteness of placement from near city centers, backwardness in infrastructure (roadways, electricity, access to energy and clean water etc.), more proneness to natural disasters (river erosion, flood etc.) can cause MFIs to rank villages in terms of being lucrative places for loan extension. If MFIs were solely guided by the aim of reducing poverty and therefore targeting vulnerable people then many of the factors mentioned above would not matter to distinguish between households. In reality, the buoyancy of economic activity of a place can matter for MFIs.

Table 1 Physical and Market Characteristics of Survey Villages in Pathrail union

village	2006						
	borrmem	pctuseeler	dispakara	disunionp	disupzsad	disbank	disbazar
Nolshuda	286	90	0.5	0.5	6.5	0.5	4
Shuvki	303	96	0	2.5	8	2.5	4
Bishnupur	138	90	0	2	7	2	4
Tarini	365	70	0.25	2	4	3	6
Bakultola	53	70	0.05	6	15	9	10
Arra	23	85	2	3	3	3	13
Narunda	471	85	0.25	3	9	3	4
DeoJan	490	80	0	0.25	6	0.25	0.25
Borotia	215	90	1	2.5	12	2.5	1.5
Kumuria	164	80	1	5	10	5	1
Gadtola	114	92	0.75	1.5	5.5	1.25	1
Bandabari	108	40	0	4	10	4	2.5
Parijatpur	127	75	1	4	9	4	9
Chandi	408	70	0	0.5	7	0.5	4
Doshokia	156	70	0.5	3	8	3	8
Chinakhola	247	80	0.5	1	4	1.5	1
Ar-Alea	40	98	0.25	4	10	2.5	6
Akondopara	84	99	0.125	3	12	3	4
Paikpara	65	90	2	2	12	2	3
Koijuri	247	80	0	2	9	2	3
Gopalpur	137	75	1	1.5	7	1.5	1.5
Pathrail	1030	95	0	0	6	0	5
Mongolhor	500	90	0	1.5	7	1	1

Source: Mahmoud, Khalily and Wadood (2009)

The MFIs are not homogeneous in terms of their goal and strategies in pursuing their business. Some of them incorporate more importance to the target of poverty alleviation, whereas others can be mostly profit oriented. Still for both a common tendency can be to place themselves near centres of economic activity putting less importance to villages in remote areas. The reason is that at such a place an MFI can find more potential customers who albeit being poor are relatively less likely to default. Trades are found to be higher in scale, and traders in higher numbers, around places of higher economic activity.

Therefore, villages which are near the district union parishad or near to large markets may enjoy a higher level of MFI participation than other villages away from such centres.

In order to facilitate the discussion, we classify the villages into three size distributions: small, medium and large. ‘Small’ villages are those with a number of borrowing member household less than 100, ‘medium’ villages have this number in between 100 and 300, and ‘large’ are those that exceed 300. According to this classification, we have here 7 small villages, 11 medium villages and 5 large villages (see

Table 1). We, therefore, have two classifications to facilitate the discussions: a set of two categories “large” and “small” for NGO-MFIs, and a set of three categories “large” “medium” and “small” for villages.

The existence of overlapping and its extent can play an important role for MFIs to make their placement decisions. Depending on differences in aims, a commensurate policy can cause different MFIs to take opposite decision with regard to their placements. Overlapping may bring different signals to different types of MFIs. If an NGO is social capital based, non-profit and driven by the sole aim of poverty alleviation then its target would be to extend credits to maximize the number of households served. Selecting most profitable members is likely to bear relatively less importance to it due to its aim of alleviation of poverty. A local, small and profit-oriented MFI may, however, prefer households who are relatively better off. To such an MFI a trader who has just started a small business is less important than a trader who has successfully gone through a number of times of loan receipt and repayment and their by increased his scale of business and therefore, also have become less vulnerable to fail and default. If overlapping is caused by insufficient capital from one source of fund to meet investment demand to reach higher scale or higher productive activity, then the latter type of MFI would prefer to engage in such villages. The profit motive, however, does not need to be specific to the small ones, it is quite possible, in fact, likely that large MFIs are also driven by it. Martin (undated) observed that a common claim of the small MFIs in his study area was that large MFIs pursued predatory strategies and engaged in overlapping.

Table 2 exhibits names of all the NGO-MFIs who operated in Pathrail union in between 2000 and 2006. A number of MFIs mostly national-level and large in size measurements were already running their operations in 2000. In fact, Grameen Bank introduced its credit activity in 1979 in Pathrail union from one village, which by now covers all 23 villages in the union.³ But a new trend and major proliferation occurred from around the end of the last decade and continued till 2007 when the survey was conducted; during this period a large number of new and small-sized MFIs started their

³ Note that in Table 1, pale blue indicates incumbency, and the number is of villages that were being operated on by the MFI.

operations in different villages.⁴ Some of these MFIs had much faster expansion than others. For example, ASA a leading MFI in Bangladesh was operating in only four villages in 2000 and increased their operations in 18 villages by 2006. Similar trends are observed for relatively small MFIs too. JOJONA and NIRAPAD SAMAJ expanded their loan operations from only four and one villages, respectively to 13 and nine villages, respectively in between the same period as ASA. SRABONTI did not have any existence as a micro-credit provider and only started in 2002 and by the period of the current survey, it cast its network in 13 villages. Contrast to this rapid expansion across villages, incumbent firms in 2000 were largely expanding only gradually to previously uncovered villages. A number of factors may have played a decisive role in leading to such development. For one thing, through gradual expansion of microfinance activity, many other places have become saturated and causing new entrants to flock to same places. The fund availability for microfinance operations has also increased due to government's active initiatives; the markets have also become mature and by now people are familiar enough about costs and benefits of micro-credit borrowing and also the business opportunity of such activity has also triggered many to get into the lending business. One important aspect and interesting question to ponder over is in their expansion path where do the MFIs prefer to locate first. Is it the cases that MFIs, large and small, see all villages with the same interest or do they discriminate among them? Answers to this question depend on the motive of the MFIs, are they purely profit-oriented or poverty alleviation is the main goal pursued. We have no way to observe their motives but we can look into the determining factors of placement decisions of MFIs and on the basis of that may get closer to the answers to the question posed. We believe that to address this question, PKSf-InM overlapping data set of 2007 is most suited.

Although convenient as an introduction, the all village combined discussion fails to reach the heart of the issue (this includes our analysis up till Table 2). Up till now what we have discussed is only some distance measurement of villages and operation records of NGO-MFIs. In order to examine the issue more thoroughly, we need to see detail in the village as well as the NGO-MFI entry and operations records.

⁴ In Table 1, sky blue indicates entry, and the corresponding numbers against years are of villages being operated on.

Table 2. Operations of NGO-MFIs in number of villages in Pathrail union, 2000-2006

		2000	2001	2002	2003	2004	2005	2006
SSS	<i>Incumbent</i>	16	16	18	18	19	20	20
SATU	<i>Incumbent</i>	16	18	19	21	21	21	21
DORP	<i>Entrant</i>	0	0	0	0	1	1	1
ASA	<i>Incumbent</i>	4	6	11	13	16	17	18
BRAC	<i>Incumbent</i>	15	15	18	19	20	22	22
Grameen Bank	<i>Incumbent</i>	22	22	22	22	22	23	23
PROSHIKA	<i>Incumbent</i>	4	4	3	5	5	8	8
BRDB	<i>Incumbent</i>	8	9	11	13	14	15	15
PDBF	<i>Incumbent</i>	2	1	2	1	3	3	7
AGAMI UNNAYAN SOCIETY	<i>Entrant</i>	0	0	0	0	0	0	1
BURO TANGAIL	<i>Incumbent</i>	20	20	22	23	23	23	23
PAD	<i>Entrant</i>	0	0	0	1	1	1	1
SONALY VOBESSOT	<i>Incumbent</i>	1	0	2	1	2	3	3
SUCHONA	<i>Entrant</i>	0	0	0	0	0	1	1
ONUKUL	<i>Entrant</i>	0	0	0	0	0	0	1
ONORD	<i>Entrant</i>	0	0	2	3	6	6	5
SHEBA ARTHO	<i>Incumbent</i>	1	2	1	3	5	8	8
SHEKOR	<i>Entrant</i>	0	0	0	0	1	1	2
ANANDA	<i>Incumbent</i>	2	4	4	4	5	5	6
PROFULLO	<i>Entrant</i>	0	0	0	0	4	5	5
CHIRUTSHREE	<i>Entrant</i>	0	0	0	0	2	6	5
JOJONA	<i>Incumbent</i>	4	5	8	11	12	13	13
NIRAPOD SOMAJ	<i>Incumbent</i>	1	1	1	1	1	2	9
SAMAJIK DAYITTO	<i>Incumbent</i>	1	0	2	2	2	4	4
NOTUN SATHI	<i>Entrant</i>	0	0	0	0	0	0	2
SPD	<i>Entrant</i>	0	0	0	0	0	0	1
SRABONTI	<i>Entrant</i>	0	0	1	4	6	7	13
SOBUJ CHATA	<i>Entrant</i>	0	0	0	0	0	2	2
SHANTI UNNAYAN	<i>Entrant</i>	0	0	0	0	0	0	3
ANANTA	<i>Entrant</i>	0	0	0	1	1	1	3
SHAMAJIK SHEBA	<i>Incumbent</i>	5	6	7	8	10	11	13
DELDUAR UPAKENDRO	<i>Entrant</i>	0	1	1	1	0	1	0
TOMA	<i>Entrant</i>	0	0	1	0	0	0	0
POROSH	<i>Entrant</i>	0	0	1	1	1	2	2
MAUSH	<i>Entrant</i>	0	0	0	0	0	0	2
USHA	<i>Incumbent</i>	4	3	4	3	5	5	6
AGRONI SOMAJ	<i>Entrant</i>	0	0	0	0	1	0	2
TAT SHILPI KALYAN	<i>Entrant</i>	0	0	1	3	2	4	6
BESHDO	<i>Entrant</i>	0	1	1	1	1	1	0
UNNMESH	<i>Entrant</i>	0	0	0	1	2	2	2
BRISTI	<i>Entrant</i>	0	0	0	0	0	1	1

SOMONNITO UNNAYAN	<i>Entrant</i>	0	0	0	0	1	1	2
SHUCHI O ECONOMIC BANKING	<i>Entrant</i>	0	0	0	0	0	0	2

Source: Pathrail Census (2007); Note: Pale Blue: Incumbent in 2000, Sky Blue: Entry

Entry and Operations Records of NGO-MFIs

In this section, we examine the entry and operations records of MGO-MFIs. As specific examples out of total 43 NGOs, we have selected four of them, two from the large MFI categories, and two others from the small MFI categories.

In Table 3 we see the records of a large national-level MFI: SSS. We note that in the Pathrail data set the principal emphasis was on the household questionnaire interview of borrower households. The major strength of the Pathrail data is that it covered every single client of the local microcredit market thus it is possible to construct the entire village market supply information from aggregating demand-side information at the household level. We know from our constructed information records that SSS had a strong presence in the union-level microcredit market. Most of the villages have seen activities of SSS way back in the 1990s. Most probably fund for further expansion into this area was not much of a problem for a large MFI like SSS, therefore, we see not much selection is being applied in the location decision. Yet we notice that while SSS as a much covered all ‘large’ villages (with borrowed member size to be above 300 by the year 2006), it did not feel much obligated to cover smaller villages with the same level of urgency. Even there are some small villages (in terms of potential borrowed member number) which have been ignored by SSS till 2006. A plausible explanation could be that SSS local administration did not consider these ‘small’ locations worthwhile in terms of resource expenditure, so to speak to bring only selected number of members under its umbrella. Although this is simply a case discussion we may think that one explanation for this lack of enthusiasm for the small market is the need for spending some minimum aggregate cost to enter into them which may not be economically interesting for MFIs even in the absence of fund constraints.

Table 3. Entry and operations record of a large NGO-MFI: SSS

ago name	name of village	type of village	2000 frsyrop	2001 year	2002 year	2003 year	2004 year	2005 year	2006 year
SSS (large ngo)	Narunda	large	1994	2001	2002	2003	2004	2005	2006
	DeoJan	large	1992	2001	2002	2003	2004	2005	2006
	Chandi	large	1990	2001	2002	2003	2004	2005	2006
	Pathrail	large	1990	2001	2002	2003	2004	2005	2006
	Mongolhor	large	1995	2001	2002	2003	2004	2005	2006
	Nolshuda	medium	1990	2001	2002	2003	2004	2005	2006
	Shuvki	medium	1990	2001	2002	2003	2004	2005	2006
	Bishnupur	medium	1990	2001	2002	2003	2004	2005	2006
	Tarini	medium	1985	2001	2002	2003	2004	2005	2006
	Borotia	medium	1999	2001	2002	2003	2004	2005	2006
	Kumuria	medium	1998	2001	2002	2003	2004	2005	2006
	Gadtola	medium			2002	2003	2004	2005	2006
	Doshokia	medium	1998	2001	2002	2003	2004	2005	2006
	Chinakhola	medium			2002	2003	2004	2005	2006
	Koijuri	medium	1994	2001	2002	2003	2004	2005	2006
	Gopalpur	medium	1993	2001	2002	2003	2004	2005	2006
	Bakultola	small							
	Arra	small							
	Bandabari	small						2005	2006
	Parijatpur	small					2004	2005	2006
Ar-Alea	small								
Akondopara	small	1990	2001	2002	2003	2004	2005	2006	
Paikpara	small	2000	2001	2002	2003	2004	2005	2006	

In Table 4 we have the record of a large national-level NGO-MFI: ASA. It has a more varied record in the sense that it has entered the villages in a scattered fashion within the framework of a number of years. The pattern is such that as if ASA had chalked out detailed plans of which of the villages that it would need to bring into its cover in which of the years. The expansion was gradual; it did not happen that all villages were targeted at the same time. Even though this looks scattered at the beginning, we still notice that there is a systematic pattern that is noticeable: all large villages have been covered, but expansion has not yet been done to include all medium and small category villages.

Table 4. Entry and operations record of a large NGO-MFI: ASA

ago name	name of village	type of village	2000 frsyrop	2001 year	2002 year	2003 year	2004 year	2005 year	2006 year
ASA (large ngo)	Narunda	large				2003	2004	2005	2006
	Deojan	large						2005	2006
	Chandi	large			2002	2003	2004	2005	2006
	Pathrail	large	1997	2001	2002	2003	2004	2005	2006
	Mongolhor	large			2002	2003	2004	2005	2006
	Nolshuda	medium	1998	2001	2002	2003	2004	2005	2006
	Shuvki	medium		2001	2002	2003	2004	2005	2006
	Bishnupur	medium		2001	2002	2003	2004	2005	2006
	Tarini	medium					2004	2005	2006
	Borotia	medium	1996	2001	2002	2003	2004	2005	2006
	Kumuria	medium							2006
	Gadtola	medium							
	Doshokia	medium				2003	2004	2005	2006
	Chinakhola	medium					2004	2005	2006
	Koijuri	medium	1997	2001	2002	2003	2004	2005	2006
	Gopalpur	medium			2002	2003	2004	2005	2006
	Bakultola	small							
	Arra	small							
	Bandabari	small							
	Parijatpur	small					2004	2005	2006
Ar-Alea	small								
Akondopara	small			2002	2003	2004	2005	2006	
Paikpara	small			2002	2003	2004	2005	2006	

In Table 5 we examine the entry and operations records of a small NGO: Shamajik Sheba. Similarly to ASA, Shamajik Sheba has entered the Pathrail union villages in a sporadic fashion. Still, we notice that this NGO has made sure that large villages are covered while it could wait on medium and small villages. We note that we do not have any internal information specific to the NGO, such as cost and output, or revenue assessment. This hinders to have a clear-cut assessment of the NGO's decision regarding entering a village or continuing operation in that village. Nonetheless, the entry record that has been constructed here gives us a useful idea of how the firms tend to spread their operations over time.

Table 5. Entry and operations record of a small NGO-MFI: Shamajik Sheba

ago name	name of village	type of village	2000 frsyrop	2001 year	2002 year	2003 year	2004 year	2005 year	2006 year
SHAMAJIK SHEBA (small ngo)	Narunda	large			2002	2003	2004	2005	2006
	Deojan	large		2001	2002	2003	2004	2005	2006
	Chandi	large			2002		2004	2005	2006
	Pathrail	large	1997	2001	2002	2003	2004	2005	2006
	Mongolhor	large				2003	2004	2005	2006
	Nolshuda	medium		2001	2002	2003	2004	2005	2006
	Shuvki	medium							2006
	Bishnupur	medium							
	Tarini	medium							
	Borotia	medium						2005	2006
	Kumuria	medium							
	Gadtola	medium	2000	2001		2003	2004	2005	2006
	Doshokia	medium					2004	2005	2006
	Chinakhola	medium							
	Kojjuri	medium						2005	2006
	Gopalpur	medium		2001	2002	2003	2004		2006
	Bakultola	small							
	Arra	small							
	Bandabari	small							
	Parijatpur	small	1999	2001	2002	2003	2004	2005	2006
	Ar-Alea	small							
	Akondopara	small							
	Paikpara	small							

In Table 6 we have the entry and operations record of a small MFI: Jojona. Even though Jojona is not present in the national records we notice that it has a regular presence in the local level microcredit market. Jojona's selection of villages indicates that it has given the large villages a priority over all others. Once it has already covered large villages, it has gradually expanded into medium and small villages.

Table 6. Entry and operations record of a small NGO-MFI: Jojona

ngo name	name of village	type of village	2000 frsyrop	2001 year	2002 year	2003 year	2004 year	2005 year	2006 year
JOJONA (small ngo)	Narunda	large				2003	2004	2005	2006
	Deojan	large		2001	2002	2003	2004	2005	2006
	Chandi	large		2001	2002	2003	2004	2005	2006
	Pathrail	large	2000	2001	2002	2003	2004	2005	2006
	Mongolhor	large			2002	2003	2004	2005	2006
	Nolshuda	medium	2000	2001	2002	2003	2004	2005	2006
	Shuvki	medium			2002	2003	2004	2005	2006
	Bishnupur	medium	2000	2001	2002	2003	2004	2005	2006
	Tarini	medium						2005	
	Borotia	medium							
	Kumuria	medium							
	Gadtola	medium					2004	2005	2006
	Doshokia	medium				2003	2004	2005	2006
	Chinakhola	medium				2003	2004	2005	2006
	Koijuri	medium							
	Gopalpur	medium			2002	2003	2004	2005	2006
	Bakultola	small							
	Arra	small							
	Bandabari	small							
	Parijatpur	small							
Ar-Alea	small								
Akondopara	small							2006	
Paikpara	small								

So far we have examined the records of NGO MFIs. As per the arbitrarily set classification of “large” and “small” MFIs, we notice that pattern of expansion for both types of MFIs is the same. Initially, the operation starts in one or two locations. After then the operations expand into other neighbouring locality. Irrespective of the MFI being large or small, the first selection is towards the ‘large’ villages (economically more prospective locality) and maybe sometimes some “medium” villages. It does not happen that a large MFI has started out at a small village first, and then has moved on to larger locations later. Small MFIs, because of resource constraint, has to be more observing before making a move into a village. Yet we notice that small MFIs also prefer large villages to start their business.

In the following sub-section, we will examine the record from another angle: from the point of view of the villages.

Entry and Operations Records of NGO-MFIs: From Village Perspectives

We examined records of MFI-NGOs operating in the villages in this sub-section. We have selected three villages for discussion; namely the village Narunda as a “large” village, the village Nolshuda as a “medium” village and the village Parijatpur as a “small” village.

A common feature of all three villages is that large MFIs tend to enter the village microcredit market early. In the case of the village Narunda, large MFIs entered mostly before 2000 and small MFIs followed through after 2000. Alternatively, we can state that small MFIs have waited for a while before entering this large village. We do not find indications that small MFIs actively competed with large MFIs to enter this village. Within the village, we find that the average loan amount disbursed by large MFIs is higher than those by small MFIs and this statement is true for every year of the record. On the other hand, the records say that the average interest rates charged by the small MFIs are higher as compared to those charged by large MFIs.

A slightly more interesting case occurs in the case of the village Nolshuda, which is a medium category village. We notice that small MFIs have competed more vigorously in this village compared to the case of the large village Narunda. Interestingly small MFIs have offered larger average loan amounts in some years whereas it is the large MFIs who typically provided the larger average loan amounts. In the case of the interest rates charged small MFIs have charged higher loan amounts.

Finally, we examine the entry and operations records of a small village, Parijatpur. This is a small village in the sense that the potential market for microcredit is small. We do not find much activity in this market. Only the large MFIs have extended operations into this village, in addition to only a few small MFIs. In some of the years, average loan disbursed by small MFIs have exceeded that offered by the large MFIs.

Table 7. Entry and Operations Record of a Large Village: Narunda

village	name of Ngo	type of ago	2000 frsyrop	2001 year	2002 year	2003 year	2004 year	2005 year	2006 year
Narunda (large village)	SSS	big	1994	2001	2002	2003	2004	2005	2006
	ASA	big				2003	2004	2005	2006
	BRAC	big	1994	2001	2002	2003	2004	2005	2006
	Grameen	big	1981	2001	2002	2003	2004	2005	2006
	PROSHIKA	big							
	BRDB	big	1980	2001	2002	2003	2004	2005	2006
	PDBF	big							
	BURO	big	1995	2001	2002	2003	2004	2005	2006
	SATU	small	1996	2001	2002	2003	2004	2005	2006
	DORP	small							
	AGAMI U.	small							
	PAD	small							
	SONALY V.	small							
	SUCHONA	small							
	ONUKUL	small							
	ONORD	small					2004	2005	
	SHEBA AR.	small							
	SHEKOR	small							2006
	ANANDA	small							
	PROFULLO	small							
	CHIRUTSHREE	small					2004	2005	2006
	JOJONA	small				2003	2004	2005	2006
	NIRAPOD S.	small							
	SAMAJIK D.	small			2002	2003	2004	2005	2006
	NOTUN SATHI	small							
	SPD	small							
	SRABONTI	small							2006
	SOBUJ CHATA	small							
	SHANTI UN.	small							
	ANANTA	small							
	SHAMAJIK SH.	small			2002	2003	2004	2005	2006
	DELDUAR UPA.	small							
	TOMA	small							
POROSH	small						2005	2006	
MAUSH	small								
USHA	small								
AGRONI SOMAJ	small								
TAT SHILPI KAL.	small								
BESHDO	small		2001	2002	2003	2004	2005		

UNNMESH	small				2003	2004	2005	2006
BRISTI	small						2005	2006
SOM. U.	small							
SHU. O ECO.	small							
avg. loan disb.	all	5182	5973	6710	7470	8532	9530	11080
	large	5255	6099	6906	7600	8735	10068	11520
	small	4250	4917	5583	6630	7216	7307	9245
avg. interest rate	all	13.58	13.83	14.79	15.38	15.36	15.21	15.18
	large	13.29	13.36	13.37	13.67	13.50	12.73	12.79
	small	15.00	15.00	16.56	17.08	16.75	16.69	16.61

Table 8. Entry and Operations Record of a Medium Village: Nolshuda

village	name of Ngo	type of ngo	2000 frsyrop	2001 year	2002 year	2003 year	2004 year	2005 year	2006 year
Nolshuda (medium village)	SSS	big	1990	2001	2002	2003	2004	2005	2006
	ASA	big	1998	2001	2002	2003	2004	2005	2006
	BRAC	big	1998	2001	2002	2003	2004	2005	2006
	Grameen	big	1980	2001	2002	2003	2004	2005	2006
	PROSHIKA	big						2005	2006
	BRDB	big							
	PDBF	big					2004		2006
	BURO	big	1993	2001	2002	2003	2004	2005	2006
	SATU	small	1993	2001	2002	2003	2004	2005	2006
	DORP	small							
	AGAMI U.	small							
	PAD	small							
	SONALY V.	small							
	SUCHONA	small							
	ONUKUL	small							
	ONORD	small				2003	2004	2005	2006
	SHEBA AR.	small					2004	2005	2006
	SHEKOR	small							
	ANANDA	small							
	PROFULLO	small					2004	2005	2006
CHIRUTSHREE	small						2005		
JOJONA	small	2000	2001	2002	2003	2004	2005	2006	
NIRAPOD S.	small							2006	
SAMAJIK D.	small								
NOTUN SATHI	small								
SPD	small								

SRABONTI	small					2003	2004	2005	2006
SOBUJ CHATA	small								
SHANTI UN.	small								
ANANTA	small								
SHAMAJIK SH.	small		2001	2002	2003	2004	2005	2006	
DELDUAR UPA.	small								
TOMA	small								
POROSH	small								
MAUSH	small								
USHA	small	1997	2001	2002	2003	2004	2005	2006	
AGRONI SOMAJ	small								
TAT SHILPI KAL.	small				2003			2005	2006
BESHDO	small								
UNNMESH	small					2004	2005	2006	
BRISTI	small								
SOM. U.	small								
SHU. O ECO.	small								
avg. loan disb.	all	6297	8444	7593	8582	10025	11997	11287	
	large	6469	9000	8526	9150	10476	11862	11376	
	small	5200	6222	5375	7348	9027	12243	11121	
avg. interest rate	all	16.22	15.97	16.18	16.72	15.73	15.82	15.42	
	large	15.02	15.14	14.92	14.79	14.35	13.50	13.51	
	small	18.20	17.37	17.76	18.33	16.76	17.08	16.63	

Table 9. Entry and Operations Record of a Small Village: Parijatpur

village	name of ngo	type of ngo	2000 frsyrop	2001 year	2002 year	2003 year	2004 year	2005 year	2006 year
Parijatpur (small village)	SSS	big					2004	2005	2006
	ASA	big					2004	2005	2006
	BRAC	big	1992	2001	2002	2003	2004	2005	2006
	Grameen	big	1988	2001	2002	2003	2004	2005	2006
	PROSHIKA	big	1990	2001		2003	2004	2005	2006
	BRDB	big	1998	2001	2002	2003	2004	2005	2006
	PDBF	big							
	BURO	big	1994	2001	2002	2003	2004	2005	2006
	SATU	small	1994	2001	2002	2003	2004	2005	2006
	DORP	small							
	AGAMI U.	small							
	PAD	small							
	SONALY V.	small							
SUCHONA	small								

ONUKUL	small								
ONORD	small								
SHEBA AR.	small								
SHEKOR	small								
ANANDA	small								
PROFULLO	small								
CHIRUTSHREE	small								
JOJONA	small								
NIRAPOD S.	small								
SAMAJIK D.	small								
NOTUN SATHI	small								
SPD	small								
SRABONTI	small								
SOBUJ CHATA	small								
SHANTI UN.	small								
ANANTA	small								
SHAMAJIK SH.	small	1999	2001	2002	2003	2004	2005	2006	
DELDUAR UPA.	small								
TOMA	small								
POROSH	small								
MAUSH	small								
USHA	small								
AGRONI SOMAJ	small								
TAT SHILPI KAL.	small								
BESHDO	small								
UNNMESH	small								
BRISTI	small								
SOM. U.	small								
SHU. O ECO.	small								
avg. loan disb.	all	5607	6243	6738	6283	6244	7549	8976	
	large	5870	6483	7059	6295	5931	7264	8353	
	small	4400	5375	5375	6222	7857	9312	11520	
avg. interest	all	14.64	14.53	14.51	14.55	13.91	13.48	13.15	
rate	large	14.00	13.96	13.87	13.93	13.60	13.04	12.61	
	small	16.25	15.98	15.78	16.12	15.00	15.00	15.03	

Section 6: Econometric Analysis

Section 6.1 Economic Model

We want to model the location decision of MFIs in the Pathrail union villages within the time frame of 2000 to 2006. We have constructed a data set for this purpose-- the range is in between 2000 and 2006. The idea is based on the concept of a pair of identifications, one of a village and the other one of an MFI. Therefore the village *i* is combined with an MFI *j*, so the identification of the observation is (village *i* and MFI *j*). We have 43 MFIs, 23 villages and 7 years of information, so we have 6923 observations. As mentioned earlier, we have a variable “yesno”: each year if an MFI operates in a particular village, we have a value of one for this, otherwise, the value is zero.

Table 10. Summary Information regarding the Variable “Yesno”

Information regarding the variable “yesno”:

In the year 2000, out of a total of 989 observations, 121 were “yes”, others were “no” (12.23%)

In the year 2001, out of a total of 989 observations, 130 were “yes”, others were “no” (13.14%)

In the year 2002, out of a total of 989 observations, 161 were “yes”, others were “no” (16.28%)

In the year 2003, out of a total of 989 observations, 174 were “yes”, others were “no” (17.59%)

In the year 2004, out of a total of 989 observations, 208 were “yes”, others were “no” (21.03%)

In the year 2005, out of a total of 989 observations, 240 were “yes”, others were “no” (24.27%)

In the year 2006, out of a total of 989 observations, 273 were “yes”, others were “no” (27.60%)

We notice that every year the probability of the presence of MFIs is increasing. One explanation could be that microfinance operations once started have a tendency to reinforce themselves over the following years. As for example, first, some potential client becomes the member of the MFI. The following year the client expects some amount of loan to be disbursed. Upon satisfactory performance on the earlier loan, the member now expects a larger amount of loan the following year. Therefore the tendency of a typical microfinance operation is that once started in a locality it will exhibit a tendency to grow over time.

Table 11. Further Breakdown of Information on Variable “Yesno” by Year and Village Type

Tab Operate or Not	Village Type						Total	
	Small		Medium		Large			
2000								
(Yes=1)	24	7.97	61	12.90	36	16.74	121	12.23
(No=0)	277	92.03	412	87.10	179	83.26	868	87.77
2001								
(Yes=1)	25	8.31	65	13.74	40	18.60	130	13.14
(No=0)	276	91.69	408	86.26	175	81.40	859	86.86
2002								
(Yes=1)	30	9.97	81	17.12	50	23.26	161	16.28
(No=0)	271	90.03	392	82.88	165	76.74	828	83.72
2003								
(Yes=1)	32	10.63	88	18.60	54	25.12	174	17.59
(No=0)	269	89.37	385	81.40	161	74.88	815	82.41
2004								
(Yes=1)	38	12.62	102	21.56	68	31.63	208	21.03
(No=0)	263	87.38	371	78.44	147	68.37	781	78.97
2005								
(Yes=1)	42	13.95	123	26.00	75	34.88	240	24.27
(No=0)	259	86.05	350	74.00	140	65.12	749	75.73
2006								
(Yes=1)	47	15.61	136	28.75	90	41.86	273	27.60
(No=0)	254	84.39	337	71.25	125	58.14	716	72.40

In order to investigate the operations variable more effectively, we have classified the 23 villages into three categories (as mentioned earlier). An interesting observation is released here as we notice small category villages are those which have experienced the lowest rates of microcredit operations expansion and it is the large category villages where this has been the highest. In the year 2000, only in 24 out of a possible 301 of cases of the small villages, there were microcredit operations. By the year 2006, this number has increased up to a total of 47 cases out of the possible 301 cases. In contrast, there were 36 cases out of a possible 215 cases of large villages in 2000. This number increased up to a total of 90 cases by the year 2006. So we see that the numbers of operations are higher for large villages and the pace of expansion is faster. In contrast, the numbers of operations are lower for the small villages and the pace of expansion is also lower. The medium villages are placed somewhere in between.

We examine another record for the performances of the village microfinance market, which is the record of the average loan amount disbursed in the village micro credit market during the previous year. This lagged performance variable is an indicator of how much vibrant is the rural micro credit market. Here the observation is that it is difficult to make comments on any particular village category. Within the large village categories, there are villages with only a growth of 6.70 per cent over six years of time whereas there is another large village where this growth is of 83.91 per cent. The highest growth that has been registered is a medium category village with growth figures above 91 per cent. The small category villages have registered moderate rates of growth.

Table 12. The variable *avglndisblag1* for villages throughout the years 2001 to 2006

2001	2002	2003	2004	2005	2006	village type	growth
7277.78	7692.31	8064.1	8741.26	7891.67	8000	large	9.92
9013.72	9645.27	9870.47	11013.89	10465.02	11774.22	large	30.63
6857.14	7148.94	7723.08	7737.37	8423.66	9239.28	large	34.74
9780.7	9813	9686.04	9660.55	9711.78	10435.77	large	6.70
5181.82	5973.45	6709.88	7470.3	8532.49	9529.87	large	83.91
6297.3	8444.44	7592.59	8582.19	10025.21	11997.22	medium	90.51
6750	8663.46	8625	9202.9	9231.89	8056.08	medium	19.35
6880	6920	7375	6034.25	7021.01	8983.43	medium	30.57
8955.88	10198.72	11077.78	11023.58	9339.42	9969.54	medium	11.32
5875	7148.94	5909.09	6455.36	6471.26	7301.43	medium	24.28
6181.82	7939.39	7853.66	7631.58	6687.5	7203.54	medium	16.53
6800	6304.35	7156.25	7000	8179.1	9180.18	medium	35.00
6186.04	6740	7692.31	7981.93	7714.26	8750.7	medium	41.46
8521.74	8529.33	9768.68	8778.23	9299.9	11546.13	medium	35.49
9800	10564.1	9644.44	11298.25	11555.56	13915.18	medium	41.99
7814.81	8382.35	9403.53	9067.23	9239.26	10838.27	medium	38.69
7687.5	9625	8352.94	8750	8423.08	9549.02	small	24.21
9200	9757.58	10256.41	10120	11178.12	11417.91	small	24.11
6166.67	6777.78	6833.34	8750	9650	9275.86	small	50.42
5607.14	6243.24	6738.09	6283.02	6244.19	7548.87	small	34.63
6647.06	6043.48	5560	6675.67	7973.21	8027.78	small	20.77
0	0	4666.67	6166.67	6833.33	6708.33	small	
7666.66	7812.5	7882.35	9791.67	11161.29	12000	small	56.52

From the above discussion, we can infer that MFIs do have a tendency to concentrate in generally larger villages in terms of activeness and prospects of the local microcredit market. We can keep this factor in our model selection while we try to construct econometric specifications.

Section 6.2 Econometric Specifications

We specify a random effects probit specification for our discussion. We have a balanced panel of short time span. Every year an MFI decides whether to operate in a particular location (village) or not. If the decision is yes, then we have the dependent variable “yesno” value taking one, and zero otherwise. We try to determine the factors behind this zero or one.

The panel data probit model specifies the following model:

$$P(y_{it}=1 | x_i, c_i) = P(y_{it}=1 | ex_{it}, c_i) = \Phi(x_{it} \beta + c_i), t=1, \dots, T^5 \dots \dots \dots (1)$$

-- here c_i is the unobserved effect and x_i contains x_{it} for all t (see Wooldridge (2002)). The basic assumption of this model of unobserved effects probit model under strict exogeneity assumption is that the set of explanatory variables x_{it} is strictly exogenous conditional on the unobserved effect c_i ; once c_i 's are controlled for, the only x_{it} is there in the response probability at time t . This assumption basically rules out lagged dependent variables or types of explanatory variables whose future movements may depend on the current and future outcomes of y 's.

An additional assumption is that the outcomes are independent conditional on (x_i, c_i) :
 $Y_{i1}, Y_{i2}, \dots, Y_{iT}$ are independent conditional on (x_i, c_i) $\dots \dots \dots (2)$

For the unobserved effects probit model, we have to make another assumption about the relationship between c_i and x_i , that is,

$$c_i | x_i \sim \text{Normal}(0, \sigma_c^2) \dots \dots \dots (3)$$

The last assumption implies that c_i and x_i 's are independent and that c_i has a normal distribution. This assumption is stronger than simply assuming that c_i and x_i 's are uncorrelated, or that $E(c_i|x_i)=0$.

⁵ Since MFIs typically continue to operate in a locality once they start operations, their decision to operate or not can alternatively be viewed as a dynamic panel problem, where current outcomes depend on the realization during the past time periods. This alternative specification can turn out to be difficult to interpret, and value addition could small in terms of our understanding of the decision making process. Therefore in this exercise we have relied on a simpler exposition.

Based on the discussions so far, we propose the following specification for our econometric exercise.

$$\begin{aligned}
 & [\text{Operate at village: Yes}=1, \text{ or No}=0] \text{ (at year } t \text{ and village-MFI combination } vm) = \\
 & \beta_0 + \\
 & \beta_1 [\text{physical distances from bazaar, bank or paved road}] + \\
 & \beta_2 [\text{average loan disbursed at the village micro credit market (one year lagged value)}] + \\
 & \beta_3 [\text{Herfindahl index for village micro credit member market (one year lagged value)}] + \\
 & \beta_4 [\text{target covered of the potential micro credit borrower market (one year lagged value)}] + \\
 & \beta_5 [\text{if any large MFI were present (during the last year), dummy variable}] + \\
 & \beta_6 [\text{if any small MFI were present (during the last year), dummy variable}] + \\
 & \beta_7 [\text{large village, dummy}] + \\
 & \beta_8 [\text{medium village, dummy}] + \\
 & \beta_9 [\text{dummy for year 2001}] + \\
 & \beta_{10} [\text{dummy for year 2002}] + \\
 & \beta_{11} [\text{dummy for year 2003}] + \\
 & \beta_{12} [\text{dummy for year 2004}] + \\
 & \beta_{13} [\text{dummy for year 2005}] + \\
 & \beta_{14} [\text{dummy for year 2006}] + \\
 & \text{error term} \dots\dots\dots(4)
 \end{aligned}$$

Table 13. Estimation Results from Random Effects Probit Estimation

<i>Random Effects Probit Estimation</i>		
Number of Observations:	5805	
Number of Groups:	989	
Group Identification:	villngoid	
Observations per Group:	min:	3
	avg.:	5.9
	max:	6
Wald Chi-square(14): 414.59		
Prob>Chi-Sq: 0.00		

Log Likelihood: -1193.40

dependent variable:

yesno

independent variable(s):

<u>Variable</u>	<u>Coefficient</u>	<u>Standard Error</u>	<u>z</u>	<u>Pr> z </u>
disbazar	0.03	0.06	0.57	0.57
disbank	-0.15	0.10	-1.61	0.11
dispakarasta	-0.03	0.28	-0.11	0.91
vilavglndisblag1***	0.00	0.00	2.93	0.00
hhimemlag1	-0.52	1.20	-0.44	0.66
targetcoveredlag1	-0.01	0.01	-0.88	0.38
ifsmallngolag1	0.17	0.43	0.39	0.70
largevill ***	1.29	0.54	2.39	0.02
medvill	0.32	0.38	0.83	0.41
d2006 ***	3.85	0.83	4.64	0.00
d2005 ***	3.10	0.53	5.88	0.00
d2004 ***	2.21	0.34	6.47	0.00
d2003 ***	1.28	0.26	4.91	0.00
d2002 ***	0.88	0.22	4.07	0.00
constant ****	-11.30	0.92	-12.32	0.00
<i>sigma_u</i>	8.41	0.35		
<i>rho</i>	0.99	0.00		

Likelihood-ratio test of rho=0: chibar(2) (01): 3233.31

Prob.> Chi-sq bar (2): 0.000

Joint significance test of

disbazar, disbank and
dispakarasta (chi-sq (3) at 2.67
and p-value at 0.45)

Joint significance test of

largevill and medvill (chi-sq (2) at
6.64 and p-value at 0.04)

Note: **** implies statistically significant at 1% level, ** implies statistically significant at 5% level and * implies statistically significant at 10% level.

Table 14. Marginal Effects (at Mean) from Random Effects Probit Estimation

Random Effects Probit Estimation (Marginal Effects at Mean after Estimation)

dependent variable:

yesno

independent variable(s):

<u>Variable</u>	<u>Coefficient</u>	<u>Stan. Error</u>	<u>z</u>	<u>Pr> z </u>	<u>X-bar</u>
disbazar	0.03	0.06	0.57	0.57	4.01
disbank	-0.15	0.10	-1.61	0.11	2.47
dispakarasta	-0.03	0.28	-0.11	0.91	0.45
vilavglndisblag1***	0.00	0.00	2.93	0.00	8393.57
hhimemlag1	-0.52	1.20	-0.44	0.66	0.19
targetcoveredlag1	-0.01	0.01	-0.88	0.38	41.53
ifsmallngolag1 ^D	0.17	0.43	0.39	0.70	0.96
largevill ^D ,***	1.29	0.54	2.39	0.02	0.22
medvill ^D	0.32	0.38	0.83	0.41	0.49
d2006 ^D ,***	3.85	0.83	4.64	0.00	0.17
d2005 ^D ,***	3.10	0.53	5.88	0.00	0.17
d2004 ^D ,***	2.21	0.34	6.47	0.00	0.17
d2003 ^D ,***	1.28	0.26	4.91	0.00	0.16
d2002 ^D ,***	0.88	0.22	4.07	0.00	0.16

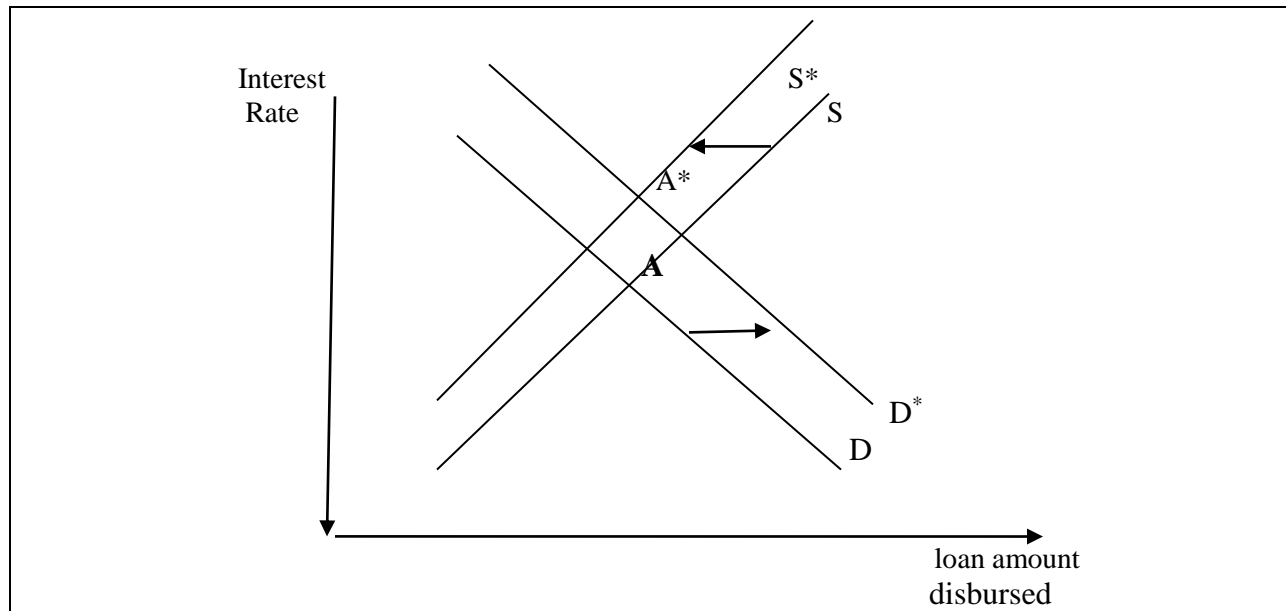
Note: **** implies statistically significant at 1% level, ** implies statistically significant at 5% level and * implies statistically significant at 10% level. And the superscript notation D is for dy/dx for a discrete change in the dummy variable from 0 to 1

Section 6.3 Econometric Results

We notice that the panel data probit estimation results are as expected (see Table 13 and 14). The distance variables (distance from the bank, from the bazaar and from the paved road (*pucca rasta*)) did not register that much of a difference in terms of statistical significance in the MFI's decision regarding starting of operations or not. A plausible explanation for this is that the physical distance variables are being taken care of by some other variables such as a large village or a medium category village, so one thing that we find it that the physical distance variables did not register that much statistical significance. We nonetheless assume that the physical characteristics do play some role in MFI's decision to enter and operate or not. Yet one can argue that since these characteristics do not change over time, they do not have much to offer as explanations for MFIs to decide to operate or not. The joint significance test results of variables distances from banks, bazaars and paved roads also did not exhibit statistical significance. The only point that is to be noticed is that the "distance from the bank" variable is close to significant at near to 10% level. And the interesting finding is that the further away from a bank, the lower is the likelihood of an MFI to operate in that particular village over time, this controlling for other variables and time dummies within the panel data random effects framework.

The most prominent result that emerges is that the likelihood of an MFI to operate in a village is larger, the larger was the amount of average loan disbursed in the village microcredit market during the previous year. We can infer that the average loan disbursed is the key variable that contains the most important news of the village micro credit market in a summary form. An average loan amount disbursed is actually a bargaining outcome out of both the demand side for credit and the supply side of credit.

Table 15. Average Loan Disbursed of a Village Micro credit Market-- A Hypothetical Construct



(In Table 15, we draw a hypothetical demand curve for credit and a supply curve of credit in a village microcredit market. The “price” in this market is the (nominal) interest rates being charged for microcredit loans and the “quantity” demanded and supplied is the amount of loan amount that is being disbursed. Suppose that initially, the equilibrium point in the market is at point A, at this point, we have a combination of the number of interest rates being charged and the amount of loan being disbursed. Now if there is an increase in the amount of loan disbursed, this implies that either the demand curve for loan amount has shifted rightward, or the supply of loan amount has shifted leftward, in other words, either the demand for loan has increased over time in this specific village market, or the supply of loan has decreased. For an outside observer MFI taking time to decide whether to enter this market or not, a higher amount loan amount is probably an indication that there is a larger capacity of loan disbursement in this village compared to other villages, and thus this is a good location to start operations. We can argue that the MFI may actually observe not only the average loan amount disbursed in only one time

period, but rather may observe over a number of years in order to have a better assessment of the market).

The estimation results did not find much statistical significance for variables such as the market concentration index (one year lag) or the target of the potential member market that has been covered (one year lag). Neither was it found to be significant that whether small MFIs already started their business earlier in the market or not. Almost all villages had had large MFIs operating during the previous year, so the dummy variable whether the large MFI was operating or not was turning out to be much closer to constant term, so the regression analysis did not take this variable.

A different set of variables have turned out to be quite important in terms of MFI's decision to operate or not. That is the set of dummies: the dummy for a large village, the dummy for the medium village and the dummy for a small village. We find that a typical MFI has a tendency to operate in a large village, holding other variables constant, and this is a panel data probit setup. For example, marginal effects estimation tells us that if the village is a large village, there is a 1.29% higher probability that a typical MFI will operate in that village in a particular year, holding for all other variables and the unobserved effects constant (this is in comparison to a village of small size). Similarly as compared to a small village, there is a 0.32% of higher probability that a medium village will have a typical MFI operation. The two village size variables such as the *largevill* and the *medvill* have been found to be statistically jointly significant at the 5% level.

The year dummies have turned out to be highly statistically significant; all these areas compared to the base year(s) of 2000 and 2001. The joint statistical significance test of five year dummies such as 2002, 2003, 2004, 2005 and 2006 have come up with a value of 56.36 (value of chi-sq (5)) and a p-value of 0.00. For example, as compared to the bases of 2000 and 2001, there is a 3.85% higher probability that a typical village will have a particular MFI operation (village and MFI combination) going on in that village by the year 2006. This signifies that MFI operations are rapidly expanding over time, and this is being captured in the high values of coefficients for time dummies.

Section 7: Conclusions

In this paper, we study in detail the data from the Pathrail union, one of the earlier locations of microcredit operations. The objective of the examination was to understand the decision-making process of microfinance institutions with regards to their entry and proliferation decisions in particular localities.

We find evidence that MFIs, small and large alike, do have a tendency to locate themselves in localities which they deem to be economically more perspective in some measurement, such as the location may be the centre of economic activities themselves or potential market for microfinance is larger, etc. In addition to this, there has been a strong tendency for MFIs to expand in recent times, which is evident in prime locations such as in Pathrail union.

An additional point we find is that there has been a rapid proliferation of small, local MFIs in recent years. In most of the cases, the small MFIs have a tendency to wait to observe how the other players are operating in the market. The small MFIs have not exhibited much tendency to experiment much on their own, at least this is the observation that we find in the Pathrail data. The common tendency for the small MFIs is to enter a village where there are already some big MFIs who have operated for a number of years, so the small ones are economizing on information collection cost by observing the large one's behaviour pattern. In contrast, large MFIs have typically started out in these regions a long time ago and so there is little scope for proliferation for them for now. In recent times the large MFIs have expanded only selectively to some new localities. The data reveals that their location decision may not be much dependent on observing other players' behaviour, rather than a common rule to bring under coverage the remaining areas of the locality. For both categories of MFIs, the common tendency is to operate in more prospective localities, mostly ignoring the less prospective regions.

There is a cause of concern for the microfinance industry in Bangladesh. Even though there has been a proliferation of MFIs in recent times in the market, which is encouraging since a large number of players are now offering a large number of products, there is still a strong tendency that economically less prospective regions are not being covered. This evidence is even more remarkable since we have examined data from a densely populated (microfinance market-

wise) locality with very long traditions and as such still, there are pockets of locations which have been ignored by the microfinance institutions.

Therefore we may infer that microfinance institutions cannot be fully relied on as simply poverty reduction instruments and they will be careful of their own financial sustainability (or some would simply say profits). On their own as long as the profit motive is strong the MFIs would continue to ignore remote areas or economically less prospective areas. In order to address the situation, special incentives have to give to the MFIs to expand their operations in economically backward regions.

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Annex

Annex Table 1. Summary Statistics of Variables Used for the Econometrics Exercise

Variable	Observation	Mean	Std. deviation	Min.	Max.
yesno	6923	0.19	0.39	0	1
disbazar	6923	4.21	3.18	0.25	13
disbank	6923	2.48	1.87	0	9
dispakarasta	6923	0.49	0.59	0	2
vilavglndisblag1	5934	8244.92	1969.11	0	13915.18
hhimemlag1	5805	0.19	0.11	0.04	0.55
targetcoveredlag1	5934	40.72	23.04	0	104.35
ifsmallngolag1	5934	0.94	0.23	0	1
ifbigngolag1	5934	0.99	0.12	0	1
largevill	6923	0.22	0.41	0	1
medvill	6923	0.48	0.50	0	1
d2006	6923	0.14	0.35	0	1
d2005	6923	0.14	0.35	0	1
d2004	6923	0.14	0.35	0	1
d2003	6923	0.14	0.35	0	1
d2002	6923	0.14	0.35	0	1
d2001	6923	0.14	0.35	0	1