# Does Competition in the Microfinance Industry Necessarily Mean Over-borrowing?

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## Abstract

In this paper we test the hypothesis of whether the presence of increasing number of microfinance institutions leads to over-borrowing. Some recent theoretical literature suggests that, in a joint liability setting, borrowers are more likely to borrow from multiple sources – without increasing their loan size – in order to better manage their risk due to partner default. Here, we test this hypothesis by utilizing a unique primary dataset generated through comprehensive surveys conducted in eight districts of Andhra Pradesh. Results suggest that over-borrowing and multiple loans are not necessarily synonymous. More broadly, as the number of credit agencies in a village increases, the average loan burden of villagers need not increase. Furthermore, there is an evidence of substitution from informal sources of credit to formal ones. Such substitution is greater with addition of microfinance institutions than with the addition of other formal lending agencies. Finally, we also find that the joint liability setup ensures that individuals at a greater risk of non-repayment are discouraged from obtaining MFI loans.

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## I.    Introduction

Microfinance refers to the institution that provides loans to low-income households that are traditionally considered non-bankable by the traditional banks.  While strictly speaking, the other financial services like micro savings, micro insurance etc, fall under the canopy of microfinance, the microfinance institutions (MFIs) are primarily considered as lending institutions that operate on the principle of joint liability. Microfinance originated with the benevolent intention of uplifting the welfare of the poor who, due to lack of collateral, could not obtain loans from banks. Overtime, however, the industry has seen an entry of, and subsequent dominance of firms with the more commercial motivation of maximizing profit. For example, in India, self help groups (SHGs), which are not-for-profit, have been in existence since the early 1990s (Bansal, 2003).  On the other hand, commercial MFIs started operations from the late 1990s, but picked up momentum since the early 2000s (Intellecap Report, 2010) to the extent that they have now replaced SHGs as the primary sources of microcredit (Srinivasan, 2010).

This change in orientation of the industry and subsequent proliferation of MFIs has led to several concerns in India.  For example, it has been argued that as the number of MFIs increases, obtaining credit becomes easier, which leads to clients obtaining multiple loans from the MFIs. This, in turn is supposed to lead clients to over-borrow and fall into debt trap.[4] In fact, such concerns are not restricted to India. There have been reports of adverse consequences allegedly due to over-borrowing from MFIs in Bangladesh and African countries.[5] Anecdotal reporting aside, there is also sound empirical evidence that the increase in the number of MFIs does lead to multiple borrowing, also known as "multiple dipping", on the part of borrowers. For example, McIntosh et al (2005) shows that in the Ugandan microfinance case, as the number of MFIs increased, the number of loans a person obtained from MFIs increased.

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[4] http://www.bbc.co.uk/news/world-south-asia-11997571

[5] For example see, http://microfinanceafrica.net/news/a-case-of-multiple-borrowings/  and http://www.guardian.co.uk/katine/2008/jun/03/livelihoods.projectgoals1  for similar concerns expressed about microfinance sectors in Africa and Bangladesh respectively.

However, a more significant question that such more popular concerns miss is whether multiple borrowing is necessarily synonymous with over-borrowing. This is because by conflating multiple borrowing and over-borrowing, one questions the fundamental rationality of the borrowers. It seems to suggest that it is the availability of credit, and not the necessity, that influences loan taking on the part of borrowers. This interpretation that borrowers obtain loans simply because loans are available, and not because they need a loan, is not restricted to the popular press. Even the Government of India, in deference to this viewpoint, is contemplating regulating the operation of MFIs to prevent over-borrowing. The Malegam committee, constituted by the Reserve Bank of India, has recommended that there be a cap put on number of loans a borrower is entitled to, and number of groups a person can be a part of.[6]

However, some recent theoretical literature (Lahkar and Pingali, 2012) suggests an alternative explanation of multiple borrowing. Using a model of rational, risk averse individuals, the authors show that borrowers may take multiple loans as a more efficient risk diversification measure without necessarily increasing her loan burden. In a joint liability setting, there is always an inherent risk of partner default, which increases the expected loan burden of the borrower. In order to mitigate this risk, a borrower can divide the same total loan into several small portions, and borrow each portion with a completely different group from a different MFI. This strategy enables a borrower to diversify the risk of a single partner defaulting on a big loan into several partners defaulting on smaller loans. For a risk averse individual, this is a welfare improving measure. This theory, therefore, provides a rational explanation of multiple borrowing and suggests that it is not necessarily the same as over-borrowing.

This theoretical explanation of multiple borrowing suggests some hypotheses which we can empirically investigate. First, to rule out over borrowing, we should find that an increase in the number of formal lending agencies[7] should not lead to more borrowing. Secondly, even if there is no over borrowing, there is multiple borrowing in the form of multiple group membership. Using a survey data set compiled by the Centre for Microfinance (CMF) at IFMR in Chennai, we seek to verify these hypotheses. The survey comprises detailed information on the access to finance of the rural households, including access to

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[6] For full details of the report, see: http://rbidocs.rbi.org.in/rdocs/PublicationReport/Pdfs/YHMR190111.pdf
[7] We refer to MFIs, SHGs, banks, agricultural cooperatives, and registered chit funds as formal sources of credit. Lending sources like friends and relatives, and money lenders are regarded as informal sources of credit.

saving and borrowing. It also contains questions on consumption activities of the rural households.

Our results show that as the number of formal credit institutions in the village increases, the average loan size of a household in the village does not increase. This, indeed, suggests that over borrowing is not happening. However, as the number of formal credit agencies increases, the amount of loans taken from these agencies increases. This indicates that even without over borrowing, borrowers are substituting formal sources of credit for informal sources like moneylenders. As a further insight, we find that the substitution to formal sources of credit is greater with the microfinance institutions as compared to other formal sources of credit. Therefore, while borrowers seem to generally prefer formal agencies over informal ones as a source of credit, within formal ones, their preference seem to be stronger for microfinance. Our final set of results show that there is significantly positive correlation between the number of groups a person is associated with and the number of microfinance institutions that are present in the village. This is evidence that borrowers do indulge in multiple borrowing. Therefore, our empirical results seem to support the theoretical argument in Lahkar and Pingali (2012) that multiple borrowing does not necessarily imply over borrowing. Instead, there seems to be some other motive for multiple borrowing. Risk diversification can be one of those motives, but data restrictions do not allow us to test this explanation explicitly.

Apart from the main question of distinguishing multiple borrowing from over borrowing, our empirical results also shed some light on the motives behind borrowers seeking credit. We find that the number of times a household incurs non-routine or unexpected expenditure has a direct and significant bearing on the loan burden of the villagers. A substantial part of this non-routine expenditure is on seeking medical treatment for a family member, buying agricultural equipment or marriage.[8] Since such expenditure involves a sacrificing present consumption, taking loans to cope with such expenses suggests that these loans are meant for consumption smoothing, which is welfare enhancing.

However, while loans for non-routine expenses are positively related to formal sector loans, we also find that the average loan size from MFIs decreases with the increase in number of times a household incurs such non-routine expenditure. This suggests that the microfinance loans are being used mostly for more productive activities when compared to other formal sector loans. We can speculate on the reason why borrowers do not use

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[8] Roughly 70% of non-routine expenditure falls under this category. Source: Access to Finance in Rural Andhra Pradesh, 2010.

microfinance loans to meet unexpected expenditure. One reason could be that borrowers are generally not interested in partnering with individuals that seem to have too much unplanned expenditure. If this is so, then the joint liability mechanism, which is supposed to put a check on moral hazard in the form of indiscriminate loan taking, seems to be doing its job.

Our results have significant policy implications. First, it is wrong to assume that multiple group membership and over-borrowing are synonymous. Moreover, there is a likelihood that the multiple group membership is probably due to better risk management than vehicles to over-leverage resulting from myopic behaviour on the part of borrowers. Since borrowers are probably using microfinance as a means to substitute their borrowing requirements, any regulation that attempts to curtail the loan taking behaviour can be counter-productive. Further, any policy that impedes multiple group formation, and defines group composition might result in significant loss of welfare.

The roadmap for the rest of the paper is as follows: next section outlines some theoretical arguments and sketches out the main hypotheses we want to test in this paper. The subsequent section outlines the data and presents some summary statistics. Next, we present our empirical model and present the results. In the final section we conclude with some thoughts on probable extensions of the paper.

## II.  Hypotheses

Joint liability refers to the institution where potential borrowers organize themselves into groups and obtain loans as a group. While loans are given to the individual members, the group as a whole is responsible for repayment of every loan. This mechanism is expected to trigger monitoring of individual behaviour by other group members, thereby substituting for the role collateral conventionally plays in combating moral hazard and adverse selection. That is, this mechanism acts as a deterrent against excessive risk taking, slacking of efforts, indiscriminate borrowing, etc.

A loan in the joint liability setting carries the additional risk of partner default. In order to illustrate the nature of the risk a borrower needs to bear, let us consider a simple scenario where a group consists of two members. If borrowers are restricted to a single group, then every borrower has a unique partner. Both members of a group obtain one unit of a loan through membership in their group. In that case, apart from repaying her own one unit loan, every borrower also has the obligation to repay her partner's loan in case the partner fails to repay. Therefore, every borrower bears the additional risk of one unit loan.

However, suppose borrowers can be members of two groups. In that case, a borrower can split her total loan requirement of one unit loan equally between two groups, obtaining half the total loan requirement through each group. The borrower then has two partners, one in each group. Each of those two partners themselves obtain half their loan requirement through their association with the particular borrower we are considering, obtaining the other half through membership in another group. The total additional liability for our borrower is still one unit of the loan. But the key difference from the earlier situation of a single group membership is that the total liability is now split between two partners. Therefore, she now needs to repay the additional unit of the loan only if both her partners fail to repay simultaneously. This is an event of a much lower order of likelihood than the single partner defaulting when she was restricted to only one group. Therefore, the probability of the large adverse shock of having to repay the entire one unit of the loan is much lower. For a risk averse individual, this is a preferable outcome. Of course, multiple group membership adds a new risk of having to repay half a unit of the loan when any one of the two partners fails to repay. But this is a smaller risk than having to repay the entire unit of the loan. For a risk averse individual, substituting a smaller risk for a larger one is a welfare enhancing alternative.

We, therefore, argue that risk averse borrowers seek multiple group membership not to indulge in over borrowing but as a rational measure to diversify the risk of their partners' default. This argument that multiple-dipping is a rational response on the part of borrowers has certain implications that we seek to test. First, we must observe that the total loan burden of the village should not increase with increase in the number of credit agencies in the village. That is, people do not borrow indiscriminately, but borrow based on their perceived requirement. Second, as number of MFIs in the village increases, the new borrowers should be borrowing from multiple sources while keeping the loan size constant. Moreover, the number of people they are associated with via joint liability groups should also increase significantly. In short, same groups should not be replicated across different loans.

Data restrictions do not allow us to explicitly test the two hypotheses mentioned above. Instead, we attempt to look at it in a more roundabout way. Our first hypothesis aims at showing that the total loan size is invariant to the number of formal loan agencies in a village. The second hypothesis aims at showing that as the number of formal credit agencies increase, loan burden from those agencies increases. This necessarily implies that access to formal sources of credit allows greater flexibility to borrower, and she is substituting the loan requirements with formal lending sources. Finally, we hypothesize that such substitution is

more with the microfinance institutions when compared with other formal sources of credit. Moreover, a borrower tends to associate herself with more joint liability groups as the number of MFIs in the village increases. To complete the argument on risk management, we need to also show that the groups are as distinct as possible; but the available data does not allow us to test this hypothesis. Formally, the hypotheses we intend to test in this paper are:

**Hypothesis 1:** As the number of credit agencies in the village increases, average loan outstanding in the village remains constant.

**Hypothesis 2:** As the number of formal credit agencies in the village increases, average loan outstanding from the formal credit agencies increases.

**Hypothesis 3:** As the number of MFIs in the village increases, average loan outstanding with the MFIs increases. Moreover, average loan outstanding with MFIs increases faster than when compared to increase in formal credit agencies.

**Hypothesis 4:** There is a positive correlation between number of microfinance institutions in a village and number of JLGs a resident of the village is a part of.

## III.    Data

Primary source of data for this paper is a survey based dataset, 'Access to Finance in Rural Andhra Pradesh,' collected by Centre for Microfinance (CMF) at Institute for Financial Management and Research, (IFMR) in Chennai. CMF has surveyed close to two thousand households across sixty four villages in the state of Andhra Pradesh in between June 2009 and January 2010. The survey is rather comprehensive, and collects data on several factors like formal and informal sources of loan, amount of loan outstanding, sources of income for the households, and major sources of expenditure.[9] We also augment this dataset with the 2001 census data by the Indian Government for demographic information.

The microfinance revolution in India is concentrated, to a larger extent in South India and to a lesser extent in the East. There is also some sporadic presence of microfinance in the remaining part of India. Even among the South Indian states, Andhra Pradesh is the state

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[9] The dataset is publicly available and can be accessed at: http://www.ifmr.ac.in/cmf/resources.html

with largest penetration of microfinance.[10]  Moreover, the MFI crisis in Andhra Pradesh was the trigger point for claiming that unbridled competition among MFIs has led to over-indebtedness on the part of borrowers.  Therefore, if we show that, even in Andhra Pradesh, access to formal lending institutions does not necessarily increase borrowers' loan size it can be generalized to the overall country. We, therefore, believe that using this dataset is appropriate to answer the research questions we have raised.

The survey design has also been developed with a view to provide representation to all segments of rural population in the state.  The survey stratifies the districts of Andhra Pradesh into four different segments based on poverty index and penetration of microfinance, with two districts being selected from each stratum randomly.[11]  From each selected district, the survey further stratifies all the villages into four different segments based on the distance to the bank, and from each such stratum two villages have been picked at random.  The idea behind such stratification is that the distance from bank can serve as a proxy for availability of alternative sources of credit.  Finally, from each village, thirty households were selected at random and were interviewed using a questionnaire.

Out of the total of sixty four villages in the sample, forty nine villages had at least one microfinance institution within their boundaries in 2009.  A total of six microfinance institutions serve these forty nine villages.  Table I presents the details on how many villages these six MFIs have their presence.  As expected, India's leading MFI (both in terms of loan outstanding and number of borrowers), SKS, has large presence even within our sample.

**Table I**

| MFIs | No of Villages present in 2009 |
|---|---|
| Asmitha | 18 |
| Basix | 9 |
| L&T | 2 |
| SKS | 32 |
| Spandana | 19 |
| Share | 33 |
| Total No of Villages covered by All the MFIs | 49 |

*Source: Access to Finance dataset*

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[10] For more details on state-wide penetration of microfinance, see Microfinance India, State of Sector Report, 2011.

[11] Due to factors beyond control of CMF, Krishna District of AP could not be included in the population.

Among the one thousand nine hundred and twenty two households interviewed, around 11% of the population has some part of their loans outstanding with an MFI. The penetration is on the higher side, but that is only expected, given that AP is a leading state in MFI penetration. Several households also borrow from formal sectors like banks, and informal sectors like relatives and friends, and chit funds, along with the microfinance loans. Table II presents the details on various sources of loans available to the households that were observed in the sample:

**Table II**

| Source | % Households with debt outstanding | Median Debt outstanding (INR) |
|---|---|---|
| **Formal** | | |
| *Banks* | 36% | 20,000 |
| *MFIs* | 11% | 7,640 |
| *SHGs* | 54% | 4,000 |
| **Informal** | | |
| *Moneylender* | 17% | 20,000 |
| *Landlord* | 21% | 30,000 |
| *Friends/Relatives/Neighbours* | 63% | 25,000 |
| *Employer* | 3% | 10,000 |
| All sources | 93% | 41,680 |

*Source: Access to Finance dataset*

## IV.    Empirical Specification and results

In order to test Hypothesis 1, we need to be able to show that as the total number of formal credit agencies in the village increases, the average loan burden does not. For this purpose, we regress average loan size in a village on the number of formal credit agencies in the village and some demographic characteristics that influence the amount of loan taken. Formally, the equation we intend to estimate is:

$$ln(L_i) = \beta_0 + \beta_1 FSC_i + \beta_2 X_i + \epsilon_i \qquad (1)$$

where *ln(L$_i$)* represents natural log of average loan size in the ith village, and FSC represents the count of formal sources of credit in the village, which includes banks, MFIs, SHGs, chit agencies and cooperative societies. Let X be the vector comprising demographic characteristics that influences average loan size. The key parameter of interest in this equation is $\beta_1$, which represents the percentage change in average loan size if the number of

formal sources of credit changes by one unit. Therefore, for the first hypothesis to be true we must observe that the estimated value of $\beta_1$ is insignificant (i.e. not different from zero).

Individual loan size in a village is computed as total loan of the individual from all formal sources of credit, viz., banks, microfinance institutions, self-help groups, chit agencies, and cooperative societies. Average loan size in the village is calculated as the simple mean of all the individual loan sizes of all the thirty households interviewed in the village. The next variable of interest is formal sources of credit. Just counting the number of formal sources of credit that exist within a village's boundaries significantly under measures the number of formal credit sources a villager has access to. This is because, given that the villages are small, it is often the case that the residents of a village avail of the services of lending agencies in neighbouring villages. In order to address such concern, we measure formal sources of credit an individual has access to as the maximum number of loans taken by any resident in the village (from the sample) from formal sources. For example, in order to determine number of banks a village has access to, we look at the number of bank loans each respondent in the village has taken, and obtain the maximum.

We also include several demographics characteristics that influence loan size in a village. One of the primary reasons for taking a loan is to invest in agriculture and related activities. Therefore, we include per-capita irrigable land as a controlling factor. Also, another primary reason for taking a loan could be to cover for healthcare related expenditure. Therefore, we include a dummy that takes value 1 if the village surveyed has a primary health centre within its boundaries. Another motivation for obtaining the loan is unforeseen/ non-routine expenditure that a borrower may incur from time to time. Therefore, we also include a variable to capture such expenditure. This variable is the average number of times a respondent in a village has had to incur unexpected expenditure six months preceding the survey. Finally, in order to proxy for accessibility to a village, we include distance to the nearest town as another controlling factor. Table (III) presents the results of Equation (1).[12]

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[12] We have run several alternative specifications. Results are available upon request.

## Table III

| VARIABLES | log(total loan outstanding) |
|---|---|
| Total number of formal financial institutions in the village[13] | -0.000685 |
|  | (0.0112) |
| 2001 census population | -3.11e-06 |
|  | (1.12e-05) |
| Per capita irrigated land in 2009 as per CMF Vill survey | 0.256 |
|  | (0.157) |
| Distance to the nearest town as per Census 2001 | 0.000994 |
|  | (0.00437) |
| Primary health care centre in the village (in 2009 as per CMF Vill survey) | -0.0599 |
|  | (0.107) |
| Average number of times a household incurred non-routine expenditure in the village in six months prior to survey | 0.290*** |
|  | (0.0898) |
| Constant | 10.11*** |
|  | (0.217) |
| Observations | 61 |
| R-squared | 0.158 |
| N | 61 |
| F | 3.475 |
| P | 0.00562 |

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

All the variables show the expected sign. Moreover, the 'F-statistic' is high enough suggesting that the model does a good job in explaining average loan size in the village. Presence or absence of primary health care centre does not play a significant role in explaining the average loan size of a village. Accessibility to the village, as measured by the distance to the nearest town also does not seem to explain the loan taking behaviour significantly. A primary determinant of loan size is the number of occasions a household had to incur non-routine expenditure. This value is, as expected, positive and significant. As explained earlier, this can be interpreted as households seeking loans primarily due to consumption smoothing activities. Given the volatile agri-based incomes, these loans act as an insurance against lean periods. More importantly, however, the variable of interest – number of formal lending institutions – does not seem to have any bearing on the total loan obtained by the households. If the hypothesis of indiscriminate borrowing were true, we must observe that the coefficient is positive and significant. However, the results presented in Table III suggest that, indeed this is not the case. An increase in one credit agency leads to

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[13] This variable is defined as total number of Banks, MFIs, SHPIs, chit agents, agricultural cooperative credit societies and non-agricultural cooperative credit societies.

very small percentage change in the overall loan obtained by the individual, but however such effect is neither economically nor statistically different from zero.

In order to prove Hypothesis 2, we need to show that as total number of formal credit agencies increases in the village, average loan size from such institutions increases. Given the results in Table III, if Hypothesis 2 is true, we can infer that as the number of formal credit institutions increases, borrowers are substituting loans from informal sources with the formal sources of credit. For that purpose we estimate the following equation:

$$ln(FL_i) = \gamma_0 + \gamma_1 FSC_i + \gamma_2 X_i + \epsilon_i \qquad (2)$$

where $ln(FL_i)$ represents natural log of average loan size from formal sources in village i. Rest of the variables remain as defined previously. The key parameter of interest in this equation is $\gamma_1$. If the formal sources are indeed beneficial, we must observe that $\gamma_1$ is positive and significant. Table (IV) presents the results for Equation (2).

**Table IV**

| VARIABLES | log (loans from formal lending agencies) |
|---|---|
| Total number of formal financial institutions in the village | 0.0292** |
|  | (0.0143) |
| 2001 census_population | -1.65e-05 |
|  | (1.05e-05) |
| Per_cap_irri_land in 2009 as per CMF Vill survey | 0.553*** |
|  | (0.205) |
| Distance to the nearest town as per Census 2001 | 0.000989 |
|  | (0.00339) |
| Primary health care center in the village (in 2009 as per CMF Vill survey) | 0.0627 |
|  | (0.141) |
| Average number of times a household incurred non-routine expenditure in the village in six months prior to survey | 0.215** |
|  | (0.0958) |
| Constant | 8.573*** |
|  | (0.319) |
| Observations | 61 |
| R-squared | 0.167 |
| N | 61 |
| F | 2.774 |
| p | 0.0200 |

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

The dependent variable in Table IV is log of total loan outstanding from formal lending agencies. Average loan size in a village is significantly dependent on per capita irrigable land in the village, suggesting that the formal loans are obtained for productive purposes. An increase in one acre of irrigated land increases the loan size by roughly 0.48%. Neither the accessibility of the village, nor the presence of primary health centre seems to influence the loan size statistically significantly. As in the previous case, the number of occasions a household incurs non-routine expenditure seems to influence the average loan burden of the village significantly.

More importantly, the variable of interest – number of formal financial institutions in the village – positively influences the total formal loan size in the village. Our results show that if the number of formal credit institutions a village has access to increases by one, then average formal loan size increases by 3%. When compared with the previous results in Table III, it yields a more powerful insight. The overall loan burden of the village is not dependent on the number of formal financial institutions; however, loan from formal financial institutions is directly dependent – and significantly so – on number of formal institutions the village has access to. This seems to suggest that as the accessibility of credit from formal sources increases, people are tending to substitute formal sources for informal sources. Therefore, simple revealed preference theory suggests that the formal sources of credit are indeed welfare enhancing.

Results in Table (IV) clearly show that people tend to substitute formal sources for informal ones when the access to formal sources of credit increases. To establish that the microfinance institutions are indeed more preferred, we need to show that as microfinance institutions increase, people prefer to borrow more from MFIs. Moreover, if MFIs are more preferred than other formal sources of credit, the percentage increase in MFI loans should be greater with addition of another MFI than the percentage increase in formal loans with the addition of another formal lending source. For this purpose we estimate the following equation:

$$ln(ML_i) = \delta_0 + \delta_1 MFI_i + \delta_2 X_i + \epsilon_i \qquad (3)$$

where, ML represents average loan from microfinance institutions or self-help groups and MFI represents number of SHGs/ MFIs located in the village. The other variables remain the same when compared to the previous equations. The key parameter of interest is $\delta_1$. If MFIs

are indeed perceived more preferred, $\delta_1$ should be positive and significant. Moreover, $\delta_1$ should be greater than $\gamma_1$ in the equation (2). Estimation results of (3) are presented in Table V.

**Table V**

| VARIABLES | log (loans from MFI and SHG) |
|---|---|
| | |
| Total number of  MFI & SHG Promoting Institutions in the village | 0.111*** |
| | (0.0389) |
| 2001 census_population | -1.78e-06 |
| | (1.94e-05) |
| Per_cap_irri_land in 2009 as per CMF Vill survey | 0.0721 |
| | (0.272) |
| Distance to the nearest town as per Census 2001 | -0.00361 |
| | (0.00401) |
| Dummy for having a primary health center in the village in 2009 as per CMF Vill survey | -0.0289 |
| | (0.158) |
| Average number of times a household incurred non-routine expenditure in the village in six months prior to survey | -0.215** |
| | (0.106) |
| Constant | 8.419*** |
| | (0.353) |
| | |
| Observations | 61 |
| R-squared | 0.152 |
| N | 61 |
| F | 2.548 |
| p | 0.0303 |

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

The dependent variable is the natural log of loans taken by households from an MFI. In Table V it is clear that all the demographic controls, other than number of occasions a household indulged in non-routine expenditure, seem to be insignificant. The coefficient on non-routine expenditure is negative and significant. This seems to suggest that the individuals that have greater non-routine expenditure obtain lesser amount of loans from microfinance. This can be interpreted as follows: microfinance/ SHG loans are based on the principle of joint liability. In such a setting, every group member is cognizant of the repayment capacity of other group members. Since individuals that incur greater amount of non-routine expenditure are always at a greater risk of non-repayment, loan seekers might be

verse in partnering with them.[14]  This finding also supports the claim, frequently made, that MFI loans are primarily meant for productive purposes.

However, the variable of interest – number of MFIs and SHGs in the village ($\delta_1$) – is positive and significant.  Moreover, the coefficient is greater than the similar coefficient estimated in Table IV.  Under the assumption that $\delta_1$ and $\gamma_1$ are statistically independent of each other, we can even establish that the value of $\delta_1$ is statistically greater than the value of $\gamma_1$ at 90% significance.

We can now combine the results in Tables III, IV and V to draw the following conclusions: The overall loan size is independent of number of formal sources of credit, but loan size from formal sources of credit is dependent on number of formal sources of credit. This suggests that with the increase in formal sources of credit, people tend to make more use of formal sources of credit to meet their loan requirements.  Moreover, loan size from MFIs seems to increase faster with the increase in number of MFIs than loan size from formal credit sources with the increase in number of formal sources of credit.  Therefore, even within the formal sources, borrowers tend to approach MFIs more to obtain credit.

Finally, we seek to establish that borrowers do resort to multiple borrowing as the number of MFIs in a village increases. We measure the prevelance of multiple borrowing by the total number of groups a resident of the village is a member of.  In order to test that group membership increases with number of MFIs, we calculate the correlation coefficient between number of MFIs in the village and average number of groups a resident of the village is a part of.  These results are reported in Table VI.

**Table VI**

|  | Correlation Co-efficient | t-stat for significance of correlation |
|---|---|---|
| Correlation between total number of  MFI & SHGs in the village and average number of JLG memberships of a household | 0.6678 | 6.89 |

From the results presented in Table VI, it is clear that the correlation between number of MFIs/ SHGs in a village and the number of groups a borrower is a part of are positively correlated, and that correlation is statistically significant. We, therefore, find support for our

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[14]In theory, joint liability mechanism is meant to curb moral hazard problems on the part of borrowers that arise due to slacking of effort, excessive risk taking, excessive borrowing etc. (Ghatak, 2000).  Since a borrower is likely to have more information about other borrowers in the village than a lending agency, she can monitor (and be monitored) other group members more effectively than an MFI.

hypothesis of multiple borrowing. However, as our previous set of results suggest, multiple borrowing happens without an increase in the aggregate loan size of borrowers. Instead, it seems that multiple group membership allows individuals to access a greater number of MFIs in order to substitute microfinance loans for informal sector loans.

As we argued in the Introduction, risk diversification can also be a motivation for multiple group membership. However, the calculation in Table VI is not sufficient to support this hypothesis. Instead, another condition that is required for risk diversification is that the groups that an individual is a member of should be sufficiently diverse. This is because risk diversification requires that along with total loan size remaining unchanged, default by one group partner in one group should not be correlated with default by another partner in another group. But if the same group is being mostly replicated, this condition is not satisfied. Unfortunately, data restrictions do not allow us to test whether groups an individual is associated with is indeed sufficiently diverse or not.

## V.    Conclusion

In this paper, we show that an increase in number of lending agencies need not necessarily mean over-indebtedness.  We also show that people tend to borrow less from informal sources of credit (local money lenders, friends and relatives, etc.) when access to credit from more organized sources is available.  Our data also shows that people tend to prefer MFI loans over loans from other sources available to them.  Also, we show that people who incur lots of unplanned expenditure (and are likely to have greater amounts of loans) are obtaining lesser amount of loans.  This is probably because the mechanism of joint liability is able to curb the phenomenon of moral hazard in the form of excessive borrowing. Given that, in joint liability, a borrower has to cover for a partner default, she may be less inclined to partner with someone who already has substantial loan burden.  Therefore, the joint liability setup seems to curb one aspect of moral hazard: controlling indiscriminate borrowing. We also show that as the number of microfinance institutions increase in a locality, people tend to associate themselves with more and more groups.

These results have significant policy implications. We argue that the regulation that puts a limit on amount of loans a person can obtain from MFIs or the number of groups a person is a part of, can be counterproductive in terms of welfare.  While we do not have direct evidence to prove that such regulations indeed harm welfare, through this paper we argue that further empirical work needs to be carried out before such regulations are enacted. On the similar lines, any regulation that puts restrictions on the interest rates MFIs can charge

can also be counterproductive. As Lahkar and Pingali (2012) point out, artificially capping interest rates can exclude MFIs from serving certain segments of population, and impose substantial costs on the remaining borrowers. Since MFIs are the more preferred means to borrow, such exclusion may lead to loss of welfare.

This is not to say that some other regulations are not required. Most of the theoretical arguments we have sketched hold true under the condition that the MFIs do not use coercive tactics when it comes to loan repayment. If such tactics were employed, the risk diversification mechanism we have outlined in Sections 2 and 4 would not work. Any anticompetitive behaviour on the part of MFIs, in the form of collusion can also lead to loss in welfare. Therefore, a regulation that actively controls such behaviour on the part of households needs to be encouraged. However, in order to frame appropriate regulation, further empirical evidence is required before we conclude that multiple borrowing is indeed synonymous with excessive borrowing.

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