

Microfinance: Impact on Clients, an Empirical Study

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ABSTRACT

Microfinance, as a source of finance for small and poor borrowers has come of age in many developing countries with different models and approaches. Various studies point out about success and failures of microfinance in different settings. The real image of microfinance practice can be gauged in terms of impact on borrower. The impact of microfinance on the poor has spurred on two factions. One faction of researchers believes in the positive impact of microfinance, whereas the other contended and stresses on the negative impact. The present paper tries to examine the impact of microfinance on income, welfare on the basis of primary data collected for the purpose. The paper uses participant – non-participant approach. The paper used ANNOVA and OLS regression form to find the objectives. The analysis shows that due to participation in microfinance, consumption expenditure and income of the participant comparatively appears to be better than non-participant. ANNOVA analysis hints positive impact on welfare of borrowers, it is difficult to confirm the result. As such, regression analysis has been followed, the result of which infer that increase in expenditure is due to programme participation is not substantiated.

Keywords: *Microfinance, impact, ANNOVA, OLS*

1. INTRODUCTION

Microfinance, as a source of finance for small, poor and needy borrowers has come of age in many developing countries with different models and approaches. A number of studies point out about success and failures of microfinance in different settings over different time periods. The real image of microfinance practice can be gauged in terms of impact on borrower. There are a plethora of studies on the impact of microfinance, which demonstrate that in the presence of a supportive environment targets like millennium development goals are achievable even through commercially-oriented microfinance (Montgomery and Weiss, 2011). Besides, most of them broadly cover empowerment, socio economic impact and impact on poverty. The impact of microfinance on the poor has spurred on two factions. One faction of researchers believes in the positive impact of microfinance, whereas the other contended and stresses on the negative impact.

Brau and Woller (2004) found in a comprehensive review of over 350 articles that ten of these studies assess microfinance programs in Bangladesh, which shows program participation could exert a large positive impact on self-employment profits. Moreover credit has a significant impact on the well-being of poor households. In Bangladesh, referring to the study of Khandker (2003) it is found that program participation has positive impacts on household income, production, and employment, particularly in the rural non-farm sector,

and that the growth in self-employment was achieved at the expense of wage employment, which implies an increase in rural wages. Authors had also considered impact studies in Bolivia, Ecuador, Ghana and South Africa, Guatemala, Honduras and Ecuador, Indonesia, Peru, Thailand, Uganda, Zambia and in multiple countries. It was found that findings of those studies vary considerably from study to study, which indicates impacts are highly contextually specific. Based on a review study of 32 research and evaluation reports on impact of micro enterprise credit, Sebstad and Chen (1996) found positive effects from 26 of the 32 studies. Moreover, there are evidence of positive impacts of MEC on enterprise income, Sebstad and Chen (1996). Similarly, Hulme and Mosley (1996) also found that both incomes of borrowers and control group of non-borrowers increased, but the increase in income of borrower was more than non-borrowers. Chen and Snodgrass (1999) also evinced positive impact of microfinance where borrower households' mean income is higher than non-member households, while savers' incomes were 12 percent higher than non-members.

There also exists evidence of mixed impact of microfinance. As for example, (Rooyen et al. 2012) found in sub Saharan Africa that that microfinance does harm, as well as good, to the livelihoods of the poor. Similarly, microfinance possibly results in increased total short-term credit, consumption, agricultural investment, income growth, but decreased overall asset growth (Kaboski and Townsend, 2012).

Apart from positive impact of microfinance on the poorest, some researchers criticize the way as microfinance works and termed popular faith as misconception (Scully, 2004). This is because; over-exaggeration to the power of micro enterprise credit and related assistance may possibly create ignorance on some more pertinent key structural issues to the long-term problem of women and poverty.

Hermes and Lensink (2007) comprehensively reviewed both the positive and negative kind of impact in different perspective and they were blurred whether microfinance substantially contributes to a reduction of world poverty and urged for solid empirical research.

The extant sources of literature therefore, depict a mixed response to the key issues of microfinance, which way out some critical questions on the holistic performance of microfinance sector. With this backdrop, the present paper tries to examine the impact of microfinance on welfare of borrower, where income and expenditure are considered as proxy of welfare. The motivation of the paper is guided towards understanding of real image of microfinance repayment performance in view of its impact. The paper is divided in five sections. Apart from background and objective in section 1, section 2 depicts data and methodology. Section 3 elaborates empirical framework, which is followed by results and discussion regarding impact of microfinance in section 4. Finally, section 5 concludes the paper.

2. DATA AND METHODOLOGY

The present study uses primary data to examine the impact of microfinance. In this connection a field study was conducted. A semi-structured interview schedule is administered for data collection. During the data collection, 414 borrowing members and 155 non-borrowing members were interviewed.

To address the empirical objective in this paper, experiment is conducted in two stages.

- A) In the first stage, it is examined whether access to credit makes any difference to income and expenditure of the borrower's household along with some other control variables. In this endeavour, the experiment considers 414 borrowing members and 155 non-borrowing members of both the sample MFIs to examine the difference. Further, to compare both the group representatively, only those members are selected, who under the category of marginal land size holder. Since different asset base impact income level differently, therefore only one category of land holding size is considered in this analysis. Therefore, adjusting for land size, finally 392 out of 414 borrowing members and 139 out of 155 non borrowing are considered. Analysis of variance (ANOVA) is applied to examine the differences.
- B) In the second stage of experiment, it is tried to examine impact of microfinance on welfare of borrowing members and thus family expenditure of the borrower's household is taken as a proxy against the variable. The experiment considers 414 borrowing members, which were interviewed.

3. EMPIRICAL FRAMEWORK

The paper develops two different but related empirical framework to evince impact of microfinance on economic welfare.

3.1. Impact of Microfinance: A Participant- Non participant Approach

The empirical strategy is adopted to examine the difference of selected socio- economic variables between the borrowing members (participant) and non-borrowing members. The motive behind this strategy is to analyse whether participation in microfinance programme make difference to socio-economic conditions of borrowing members. In this attempt, Analysis of Variance (ANOVA) is applied to test the difference between the groups.

In general, ANOVA is a collection of statistical models used to examine the difference between group means and their related procedure. The concept has a varied use and interpretation (Gelman, 2005). ANOVA can be performed with several procedures such as one way ANOVA, Multifactor ANOVA, Variance Component Analysis and General Linear Model. Basically the difference between means is calculated in terms of F statistic. The general formula for F Test is:

$$F = \frac{\text{Explained Variance}}{\text{Unexplained Variance}}$$

The F statistic is based upon comparison between and within sums of squares (BSS and WSS). Some statisticians also take into account degrees of freedom for the test (Barrow, 2006). Therefore, considering degrees of freedom to adjust for the number of observations and for the number of factors, the formulae for F Test is:

$$F = \frac{BSS/(k - 1)}{WSS/(n - k)}$$

Formally, the test statistic is which has $k - 1$ and $n - k$ degrees of freedom. k is the number of factors

In this estimation, seven instrument variables are tested against participation type. Participation type indicates participation in borrowing programme. Participation type is a dummy variable, where 0 indicates for non-participant members and 1 for participant

members. Further, type of participation is derived from amount of micro loan received by the members. If a member received a loan amount from MFI then it is coded as 1 and 0 otherwise. The estimation of ANOVA involves six independent variables, such as average education level (MEDU), land size (LANDTOT), net agricultural income (AGRINET), total volume of debt (DEBTOT), total income (YTOT) and total expenditure (XTOT) of borrower's household.

3.2. Impact of Microfinance on Welfare of Borrowers

Welfare is a complex concept to comprehend, which is broadly categorised into social and economic welfare. The present study limits its sphere only to economic welfare, where consumption is taken as proxy to gauge the impact. The empirical strategy starts with categorizing members of MFI as borrowing and non-borrowing members. In this framework at first a comparison of income and expenditure between borrowing and non-borrowing member groups is made. Since, both income and expenditure of borrowing members group is relatively more than non-borrowing member group, therefore it implies positive impact of microfinance on the borrowers. But the critical question is whether impact is due to microfinance or some other factors. Therefore, a simple regression analysis is run to examine the factors affecting expenditure. Impact of microfinance is a multidimensional facet. Because it may affect a number of areas related to welfare, income generation, reduction of inequality, providing better education and health and so on. This study is limited only to welfare impact of microfinance, where it is per capita expenditure proxies as an indicator of welfare. In this connection a cross section data is considered.

The present study used Ordinary Least Square (OLS) estimation. The econometric framework is deviate from Coleman (2006). While Coleman uses log linear model in his estimation, the present study uses simple OLS model. Since, the motivation of present study is to estimate the impact of microfinance on borrower's consumption level, therefore a linear relationship is assumed between the regressand and regressor. The basic model is depicted in equation 1 (Gujrati and Sangeetha, 2007).

$$Y = \alpha + \beta_0 X + u \dots\dots\dots [1]$$

In equation 1, Y is the dependent variable of the model and X is the independent variable (s) of the model. Besides, α is the constant term of the function, β 's are coefficient to be estimated and u is random error term of the function. Equation 1 can be extended to the estimate the impact of micro loan amount on consumption. The OLS regression form of the model is constructed in the following way:

$$PCX_i = \alpha_i + \beta_0 PCI_i + \beta_1 LNSZ_i + \beta_2 VOLCOV_i + \beta_3 AGE_i + \beta_4 SEX_i + \beta_5 DEPEND_i + \varepsilon_j \dots\dots\dots [2]$$

Equation 2 contains six independent variables along dependent variables. PCX_i is the dependent or explained variable of the model. PCX_i is used as proxy for welfare, which indicates monthly per capita expenditure of borrowing household members.

PCI_i is an independent variable of the model, which indicates monthly per capita income of borrowing household members. The variable bears a linear relationship with the dependent variable and thus a positive relationship is assumed in this estimation.

Loan size ($LNSZ_i$) is also an independent variable of the model. It indicates amount of loan received by a borrower. The use of loan dictates the relationship with expenditure. If loan is use in productive activity, it generates income and thus it may increase family expenditure. On the other hand, if it is used in non-productive use; it does not generate income, but for a certain period of time increases expenditure. In this regard the present model assumes positive relationship with dependent variable.

Estimated amount of loss due to covariant risk ($VOLCOV_i$) is a control variable of the model. Idiosyncratic or covariant risk, such as natural calamities, death of some relatives, etc. make leakage to the income flow of a household. Because, it entails a cost of rehabilitation in subsequent period and thus working capital is affected, which in a later stage effect income generation. Thus, a negative relationship is assumed in this analysis.

$DEPEND_i$ is also an independent variable of the model. It is a ratio level variable, which is calculated as a ratio between non-earning members of borrowing household to total number of members.

AGE indicates mean age of borrower's household. It is assumes that as age of the family members increases, it demands a variety of requirements mainly in terms of consumption expenditure. Therefore a positive relationship is assumed in this analysis.

SEX indicates mode sex of borrower's household, which is basically a dummy variable. In this estimation it is assumed that expenditure of a male dominant household is comparatively more than female dominant household. The model is tested and adjusted for multicollinearity and heteroscedasticity.

4. RESULTS AND DISCUSSION

4.1. Impact of Microfinance: A Participant- Non-Participant Approach

It is tried to understand whether participation in microfinance leads to increased expenditure and increased income. The summary of descriptive statistics and ANOVA is presented in table 1.

Table: 1: Comparisons of Descriptive Statistics and ANOVA between Participant and Non-Participant Members

Variable	Participant		Non- Participant		ANOVA
	Mean	Std. Dev.	Mean	Std. Dev.	F Statistic
MEDU (year)	6.57635	2.347614	5.26942	3.989427	20.179***
LANDTOT (bigha)	5.8771	3.996732	3.13566	3.623789	44.716***
AGRINET (₹)	9937.08	10568.05	4910.72	9930.021	23.330***
DEBTOTPM (₹)	1461.75	947.9119	729.317	1695.81	36.760***
YTOT (₹)	24306.6	33519.95	18173.9	16925.59	4.225**
XTOT(₹)	21079.7	31551.7	15924.7	15856.66	3.372*

***= significant at 1 % level; **= significant at 5 % level; *= significant at 10 % level;

Source: Field Study

Table 1 above indicates that due to the participation in microfinance, consumption expenditure and income of participant is comparatively appears better than non- participant. The above table reveals that mean size of land is significantly differs from participant to non-participant and statistics indicates that it is due to programme participation. Similarly, mean size total debt is significantly differs from participant to non-participant as indicated by F statistic.

The results depicted in table 1 indicate all instrument variables differ positively for participant relatively to non-participant. Considering welfare level variable such as total family expenditure, it is observed that mean family expenditure of participant household is higher by on an average amount of Rs. 5155. Therefore, it is an indication of economic welfare and in view of present analysis; this is due to programme participation.

Although, the analysis hints positive impact on welfare of borrowers, but with the only use of ANOVA, it is difficult to confirm the result. It thus demands econometric treatment to examine the affect. The subsequent section, analyses this vary aspect of the issue.

4.2. Impact of Microfinance on Welfare of Borrowers

Discussion above indicates programme participation make a positive change on the welfare of participant members. Since, ANOVA alone cannot confirm a relationship, therefore in this section; the relationship of expenditure is examined with six independent variables including loan size (LNSZ). The descriptive statistics of variables used in the model is depicted in table 2.

Table 2: Descriptive Statistics for Regression Variable on the Impact of Welfare

Variable	Description	Unit	Mean	Std. Dev
PCX _i	Per capita expenditure of borrowing household per month	Rs	4743.78	5069.894
PCI _i	Per capita income of borrowing household per month	Rs	5560.28	5450.784
LNSZ _i	Amount of MFI loan	Rs	12106.28	5468.227
VOLCOV _i	Amount of loss due to covariant risk	Rs	16828.74	53265.91
AGE _i	Age of borrower	In years	33.95	11.03
SEX _i	Sex of borrower is a dummy variable. (1=male, 0= female)	Number	0.47	0.49
DEPEND _i	Dependency ratio, which is defined as number of dependent divided by total number of family member.	Ratio	0.68	0.14

Source: Field Study

Table 2 reveals that mean PCX_i is calculated at Rs. 4743.78 with a higher degree of dispersion. Similarly, mean PCI_i is Rs. 5560.28 with a higher variation. The average loan size is Rs. 12106.28, which indicates that on an average the borrowers on 3rd cycle of loan.

Estimated amount of loss due to covariant risk (VOLCOV_i) is a control variable of the model. The descriptive statistics indicates that mean amount of covariant loss is widely dispersed. Similarly, AGE and SEX are also independent variables of the model, which indicate age and sex of borrowing members respectively. The descriptive statistics indicates

that the average numbers of borrowers are in the young age bracket and most of the borrowers are female. $DEPEND_i$ is also an independent variable of the model. The descriptive statistics indicate that dependency is more among the sample borrowers, but with lower degree of variation. It indicates the large presence of non-earners.

The regression result is depicted in table 3. The result indicates that all the variables except loan size (LNSZ) and mean age of borrower's household (AGE) are in the line of expectation.

Table 3: Determinant of Family Expenditure

Linear regression (Robust, hc3)	Number of obs = 414 F(6, 407) = 13803.91 Prob > F = 0.0000 R-squared = 0.9800	
Dependent Variable= PCX		
Explanatory Variable	Coefficient	t-value
PCY	0.906362***	171.6
LNSZ	-0.039793***	-6.13
VOLCOV	0.002101***	5.32
AGE	-24.39516***	-4.87
SEX	490.395***	6.01
DEPENDENCY	2898.824***	6.01
CONS	-1224.668***	-4.53

*** = Significant at 1 percentage level;

Source: Field Study, 2009

It is found in the estimation that increase of loan amount by Rs.1000 decreases per capita expenditure by Rs.397. However, the relationship of increase in per capita income is linear to per capita expenditure. Besides, table 3 depicts that increase in dependency considerably increases per capita expenditure.

The regression test is adjusted for heteroscedasticity and multicollinearity. Table 4 portrays test of multicollinearity among the independent variables and confirms lesser degree of the presence of multicollinearity among the explanatory variables. In addition, heteroscedasticity is adjusted by considering robust estimation using hc3 command in STATA 11 version.

Table 4: Test of Multicollinearity among explanatory variable

Variable	VIF	Tolerance (1/VIF)
SEX	1.43	0.699732
LNSZ	1.31	0.761326
VOLCOV	1.21	0.826048
AGE	1.18	0.849163
YPAD	1.13	0.887633
DEPENDENCY	1.05	0.953055
Mean VIF	1.22	0.8196

Source: Calculation done by author

The results depicted in table 3 indicate that participation in microfinance programme has a negative impact on the expenditure of borrowers' family. Therefore, it may be maintained that microfinance is not able to increase the level of welfare in terms of consumption. However the traditional relationship of income with expenditure is maintained in this analysis.

5. CONCLUSION

Microfinance now-a-days is treated as strategic policy importance as development tool coupled with the limited availability of funds for financing the unbanked and productive poor. The paper investigates the impact of access to credit among the borrowing members as well as non-borrowing members. As a test of causal difference, ANOVA technique is devised in addition to OLS estimation. The results and discussion reveal that expenditure, which is considered as proxy of economic welfare differs positively in case of participant than to non-participant. Similarly ANOVA also indicates the due participation in the programme; there exist positive difference to borrower's expenditure in compare to non-borrower. But the regression analysis rejects the notion that increase in expenditure is due to programme participation.

Therefore, in view of the results discussed in this paper, it may be concluded that microfinance may make a positive impact on some socio-economic variable of borrower's household, but the impact on welfare of cilents is statistically insignificant.

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