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NEXUS BETWEEN OUTREACH AND EFFICIENCY: THE CASE OF MICROFINANCE INSTITUTIONS

Abstract

This paper attempts to empirically scrutinize the relationship between the efficiency of microfinance institutions and outreach to the poor, over the period 2000 to 2014. By using the stochastic frontier analysis the study concluded that micro finance institutions having low average loan balance are less efficient outreach to the poor. Moreover, group and all types of panels confirm the significant negative effect on efficiency. Further, gross loan portfolio and salary have a significant positive association with cost frontier. Gross loan portfolio and salary caused to increase the cost of microfinance institutions. Our dataset is significantly larger and covers a longer time period than any of the previous study in the field of microfinance and specifically focusing on sustainability; applying SFA technique for measuring the cost efficiency of MFIs, Hence, we believe this study will be a major contribution to the literature regarding the conversation about tradeoff between efficiency and outreach.

JEL CLASSIFICATION: C33, C55, D01, D24, D61,; E43, G21, G23, N26, N16.

KEYWORDS: MICROFINANCE, STOCHASTIC FRONTIER ANALYSIS, EFFICIENCY, OUTREACH, GROSS LOAN PORTFOLIO, SALARY, TRADE OFF, SUSTAINABILITY.

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1. Introduction

Micro finance institutions (MFls) work to facilitate the poor by providing them with credit that can help to reduce their poverty. These people have no access to the commercial banks, therefore, they try to get loans from MFIs but, this is very costly as they charged a certain amount that is most of the time not payable for the poor people who need loans to set up their own income generating businesses. The literature in this paper will focus on the general outreach of the loan offered by MFIs. Some NGO and western donors are supporting MFIs by offering them loans at low interest rates so that MFIs can help to the poor by providing them these loans appropriate low interest rate. These loans also sourced to small the companies.

Now, the attention seems to be shifted from subsidizing MFIs to making them financially stable and efficient to reduction the cost of lending. The importance is being laid on reduction the cost of lending money that will be generated after the loan is transferred. Developments in microfinance institutions have encouraged competitions among MFIs, as a result, the expansion of their services, fetched technological changes, financial liberalization and regulation of polices which made by the government (Rhyne & Otero, 2006).

Environments are shaped in which provision of loans and access of these loans for everybody made convenient & easier. Compatible objectives introduced that will certainly contribute in making MFIs resourceful and improve its stability. Financial sustainability of MFIs is significantly imperative which could help to provide loans to more people and enlarge the amount of loans. Moreover, the commercialization of microfinance support to increase commercial funds and transmitting of these funds for commercial purpose. Implications of financial market policies that focusing on strengthen the market forces and stability progression ensure the access of poor people to the MFIs. Not only this, it also support to the outreach aim of MFIs, consequently, generating more financial resources.

Lending of the money is therefore not easier as financial sustainability is compatible or the struggle of outreach become debatable and hinders for the reach of a common man. The issues must be investigated in the light of studies being conducted earlier or those studies which were piloted on that phenomenon but unfortunately many new studies are presented and investigated on that issue in an unsystematic way, most studies have also provided with anecdotal evidences and used either short data sets or plain analysis except for Cull, Dimirgic-Kunt, and Murdoch(2007).

This research study is based on two aims; first is the investigation on the potential compatibility between efficiency of MFIs and their outreach. To analyze this, a detailed dataset will be studied that contains information collected for a large number of MFIs over a longer period of time. The studies done previously in this field were not in detailed at all. Secondly, different measures of sustainability would be used focusing by applying different statistical techniques that have not been used before, these are at extensively rich, such as SFA which stands for stochastic frontier analysis. SFA will help us to measure the efficiency of MFI, s and furthermore assist us to find the outreach status of MFI, s. Data from 2000-2014 obtained from mix market will be used which will cover approximately 467 MFIs.

The literature (section 2) of the paper will discuss the relationship between financial sustainability; outreach and efficiency of MFIs .Section 3 of the paper will explain SFA through research methodology, whereas, section 4 continues with dataset. Section 5 will show the discussion of estimation and section 6 will brief the main research and will conclude what has been derived from analysis.

2. Review of Literature

New challenges faced by MFIs have affected them in doing their businesses, the basic reason of which; is the competition between MFIs that has increased rapidly (Rhyne & Otero, 2006). Reasons for this competition hype; when some of the MFIs started offering low interest rates and costs. Those MFI, s tried to be more efficient and introduced new financial services of saving account and insurance services. One of the countries that have experienced an increase in the competition since 1990s, in the microfinance industry is Bolivia. Bolivian MFIs lower down the interest rates from 30% in 1998 to 21% in 2005.In addition to this, it increased its range of financial services making it better and more convenient for its clients (Ryne & Otero, 2006).

Though there are developments being done to improve the efficiency and sustainability of MFIs, still the amount of transaction for lesser loans is more as compared to the larger ones. These transaction costs include, screening, administration costs and monitoring for each loan (Conning 1999; Hulme & Mosley , 1996; Lapenu & Zelley 2002; Paxton & Cuevas , 2002) . Hence, a trade-off between efficiency and outreach is lowering down the goals of many MFIs which needs to provide money to the poor. There has been long debates on the issue of tradeoff between efficiency and outreach among the welfare entities whom put forward the idea of dominance of outreach objective (Hashimi & Rosenberg, 2006; Montgomery & Weiss, 2005: Woller, 2002).Some of scholars, (Christen, 2001:Isern & Porteus,2005; Ryne,1998) also stressed upon the significance of efficiency and sustainability. Both camps have different point of views however, they have somehow on the same common conclusion; i.e. under specific conditions, sustainability and outreach may be compatible (Morduch, 2005).

Schreiner M. (1999) concluded study in which the agreement of microfinance institutions and welfare of poor were not relatively matched to achieve the expected objectives. Likewise; author proposed an agenda for outreach and microfinance social advantages in the shape of six facets, such as; depth, breadth, length, scope, worth and cost. That phenomenon incorporated the both aspects properly, approach of self-sustainability and poverty tactic to microfinance. On the one hand, poverty approach shoulder that high profundity of outreach could reimburse for slender extent, tiny length and restricted scope. On the other hand, approach of self-sustainability pleasantly presumed that breadth at wide level, extensive length, and abundant scope could reward for trivial depth.

Ledgerwood, J. 1998 described in the handbook, fetch composed in a solitary source, supervisory doctrines and tools which will endorse viable microfinance and craft worthwhile institutions. It offers an inclusive foundation for the scheme, execution, assessment, and administration of microfinance undertakings. Author fundamentally concentrated on viability of microfinance institutions to ripe the results.

This competition among MFIs has stimulated the commercial banks to initiate their own micro financing schemes as past history has shown that the commercial banks brought success and profitable businesses whereas, in some countries, the government has stimulated the commercial banks to initiate microfinance schemes. K-REP in Kenya and the commercial bank of Zimbabwe are a good example of these. All these moves have pressured the MFIs to lower their interest rates and costs to increase their efficiency. New banking technology such as ATM , use of cell phones and the internet has been involved in the business of MFIs to help make the delivery of services better (Kapoor, Ravi &Murdoch, 2007; Rhyne and Otero; 2006). Mc Intosh, De Janvry and Sadoulet (2005) concentrated on increasing effects of the competition among the MFIs. In this research studies which conducted by them, they evaluated that the poor are not able to benefit more from MFIs and on the other hand; the number of borrowers who are wealthier benefitted from these loans exceedingly. They claimed that the outreach is severely hurt by the pressure of competition that has built up on the MFIs. The real purpose of launching MFIs has been lessened and therefore it has deviated from the policies which used to follow for movement. On the other hand, Gonzalez Rosenberg (2006) suggested that nothing seems to be against each other, neither the financial sustainability nor the outreach.

Developing countries have taken a few productive measurements in liberalizing financial markets that will help to stabilize the microfinance business. Change in policies will sustain the efficiency of microfinance and their progression (Hartarska and Nadolynak, 2007). MFIs are now being supported by various banks and investors, especially the bank from developing countries are launching microfinance divisions, supporting activities of microfinance industry. City group, Deutsche Bank, HSBC are even involved in it. These commitments, in some way also helps these financial institutions to show their CSR (corporate social responsibility). The banks have their interest due to ' double bottom line' as they call it, providing attractive risk return profiles (Deutsche Bank Research 2007). The first capitalization of MFIs with the creation of an investment fund called Profound in 1995. It almost collected $ 23 million to support Latin American MFIs. In the year 2006 MIV's (microfinance investment vehicle) held MFIs shares portfolio that was of $2.3 billion (CGAF, 2007). The need of MFIs has increased with increasing curiosity for commercial banks making them sustainable, financially stable and efficient.

Surprisingly in few studies, we found some careful investigations studied by Cull et al. (2007) which were founded to be the most appropriate. The authors investigated 124 MFIs in 49 countries using measures of profitability and outreach; then compared to one another. His new and extensive study suggested that MFIs focus more on group clients that are wealthier as compared to poor male and female clients .Targeting wealthier individuals as borrowers is called" mission drift" which is not as strong for the group based MFIs. Therefore, Cull et al. (2007) did find out the evidence that showed a trade-off between efficiency and outreach. It was noted that the MFIs are gaining good profits focus on providing loans to individuals. Various measures were used, the loan size was considered to be the depth and the numbers of borrowers were regarded as the breadth. Calculating them, strong evidence was found for a trade-off between sustainability, outreach and efficiency. Using loan size as depth and number of borrowers as breadth of the outreach, authentic proofs were founded for the trade –off between sustainability, outreach and efficiency. They presented this theory by viewing the data of 2,600 MFIs in 2004. Though it seems to be correct but since the data was based on self-reports, therefore it won't be appropriate to regard it as accurate or near to accurate (Cull et al., 2009).

Keeping the factual studies in our mind, we can clearly state that the evidences found are less and not sufficient enough to prove the compatibility or trade-off in terms of sustainability and outreach. Most the analysis made in a simple way. A few recent studies by Qayyum and Ahmad (2006) showed that not looking at the undermined elements involved and just focusing on the efficiency, the MFIs can easily achieve their goal. They put forward this theory after measuring the efficiency of 19 MFIs in the three South Asian Countries. According to Cull et al. (2007), the observational study by him are important in the terms that the datasets used are large and contains the data that has been collected extensively considering many MFIs. To find out about the cost function, we will use the SFA (Scholastic Frontier Analysis).The focus will be more on the cost efficiency but not on the profit efficiency. The final aim of the MFIs is to decrease poverty. MFI, s can only achieve this goal if their emphasis will be more on the cost efficiency.

3. Methodology

In our annotations, cost efficiency of an MFI is measured as how adjacent the real cost of loaning to the best practice MFI ,if both are giving alike output under identical circumstances. Cost efficiency refers to the lowest cost of lending of an MFI if it is apparently and theoretically efficient. Since the functions of cost cannot be experimented directly, therefore, efficient cost frontier is used to calculate inefficiency of cost. Data envelopment analysis (DEA) and stochastic frontier analysis (SFA) are techniques used to measure the efficiency of cost. Aigner et al (1977) developed the SFA model techniques in a formulation format, that was based on an equation shaped as:

$$y = \beta' x + v - u \qquad (a)$$

In eq. (a) the model originally originated where y=pragmatic outcomes and the other part of equation $\beta' x + v - u$, considered as optimum frontier objective. $\beta' x$ is the fixing fragment of the frontier as well as v ~ N [0,σ2v] is the stochastic slice. We are inclined to use SFA model as it is liable to control the measurement errors and other casual effects.

The study incorporated the model developed by Aigner et al (1977); Sealey and Lindley (1977); Kumbhakar and Knox Lovell (2000), to elaborate the cost function. They affirm that a financial institution works as a midway amid lenders and debtors. We considered Interest expense on deposit per unit and labor cost per unit as Input prices of MFI, whereas output of MFI is calculated by gross loan collection of MFI. We standardized the cost function by taking natural logarithm.

The model is as follows

$$\begin{aligned}
\ln COST_{i,t} &= a_0 + b_1 \ln(SLRY_{i,t}) + b_2 \ln(I_{i,t}) + b_3 \ln(GL_{i,t}) + d_1 \ln(SLRY_{i,t})^2 \\
&+ d_2 \ln(I_{i,t})^2 + d_3 \ln(GL_{i,t})^2 + g_1 \ln(SLRY_{i,t}) x \ln(I_{i,t}) + g_2 \ln(SLRY_{i,t}) x \ln(GL_{i,t}) \\
&+ g_3 \ln(I_{i,t}) x \ln(GL_{i,t}) + j_1 YEAR_t + j_2 YEAR_t^2 + j_3 YEAR_t (SLRY_{i,t}) + j_4 YEAR_t (I_{i,t}) \\
&+ \sum_{k=5}^{8} j_k MFITYPE_{i,t} + c_1 EA_{i,t} + c_2 LL_{i,t} + m_{i,t} + u_{i,t} \qquad (1)
\end{aligned}$$

In Eq. (1) total cost is represents by COST, SLRY shows the cost of labor per year. I present the interest expense on deposit per unit. Whereas, GL is the portfolio of gross loan for MFIs, MFITYPE interpret the types of MFIs. COST is calculated by adding up the aggregate overheads of an MFI; SLRY is incorporated as total operating cost per worker of MFI; I is the measurement of MFI's aggregate monetary cost per dollar of credits; and GL is incorporated as gross loan assortment of an MFI. The function of cost consist of input and output variables individually, mixtures of these variables, and the square of these variables. All variables balance per borrower (in US dollars). We also take YEAR (a year dummy), which runs from 1 to 15, the square of the year dummy, and its connections with the input variables to account for expertise changes over time.

(MFITYPE), a vector of dummies is added to control the cost function that varies in different types of MFIs. Subsidies obtained by these institutions at different levels are main cause of difference in cost between types of MFIs. We need to add a control variable for MFIs type, as our data do not offer thorough information regarding expected subsidies. We use variables dummy for non-banking financial institutions (NBFI), banks (BANK), rural banks (RLBANK), cooperatives (CO), non-governmental organizations (NGO), and other organizations (OTHER). The variable OTHER is skipped from analysis for the motives of individuality.

We also include some other control variables. First, to measure the level of risks in different MFIs we incorporate (EA), equity to total assets proposed by, Grigorian and Manole (2006), Lozano-Vivas, Pastor, and Hasan (2001) Dietsch and Lozano-Vivas (2000), and Berger and De Young (1997).As risk taking strategies are different among MFIs, to control this factor, we add (LLR); loan loss reserves (Fries & Taci, 2005; Lensink, Meesters, & Naaborg, 2008).

As mentioned earlier, the significant purpose of this paper is to examine the relationship between efficiency and outreach of microfinance institutions. In our framework *mi,t* used to measure the inefficiency of microfinance business. To investigate the association between efficiency and outreach we identify a model, in which inefficiency is a dependent variable and for outreach, we have a lot of measures. In addition, a number of control variables that may influence the inefficiency are also included.

The inefficiency equation is as follows:

$$m_{i,t} = a_0 + a_1 ALB_{i,t} + a_2 WOM_{i,t} + a_{j=3,4,5,6} LT_{i,t} + a_7 AGE_{i,t} \qquad (2)$$

In above equation m is the first driver of inefficiency of MFI I at time t. MFI is likely to be inefficient if this movement is higher. ALB and WOM are the measures of outreach that are generally accepted. If the value of

ALB is higher, the depth of outreach will be lesser, which means MFI is estimated to offer rarer loans to poor clients. WOM is the fraction of female clients in the aggregate loan portfolio of a MFI. Higher value of WOM shows more depth of outreach, because lending to female clients is linked with lending to poor clients.

We concede that our procedures are possibly provide irregular estimates of outreach. Because these only wrap-up one portion or measurement, that is, the depth of outreach. As Schreiner (2002) discussed, outreach have a number of magnitudes, i.e. Importance of MFI loan for borrower, the cost of loan to borrower, breadth, length and scope of outreach, and most of these are hard to measure. This is the reason why we use a huge data-set of MFI in this paper. Paxton (2003) discussed that size of loan is associated with loan type or, it can be correlated with lending policy of MFI. MFIs which focus on activities related to agriculture need bigger loan size on average, this is the reason that MFIs which focus on activities related to trade and services have better outreach than others. However, by considering the data limitations we can conclude that using large dataset, average loan size, and loan to female clients are clearly the finest methods we can use, as these methods are also used in many other studies.

Before giving our remarks related to trade-off between efficiency and outreach, we again stress that dependent variable in Eqn. (2) calculate the point where an MFI is inefficient. It means we expect coefficient for WOM is significantly positive, while the coefficient for ALB is significantly negative. The other variables used in Eqn. (2) are control variables. LT is a dummy variable representing the category of loans an MFI primarily provides. Inefficiency of microfinance business depends upon the kind of loans it mostly provides. We use four different dummy variables demonstrating that the microfinance institutions primarily offers village loans (VILLAGE), individual loans (IL), group loans (GROUP), and individual, village, and group loans (ALLTYPE).Those Institutes which are not incorporated in any of the above dummy variables are those MFI which do not make civic their primarily loan type. AGE is the number of years an MFI establish. This variable helps to examine the hypothesis that older microfinance institutions are more efficient. An alternative hypothesis is that, newly build MFIs are more efficient than older because, they learn from their knowledge and established more efficiently. The acceptance of first hypothesis is indicating that AGE is statistically significant and negative. While in second case, AGE is significant and positive**.**

4. Data

The microfinance data is collected from Mix Market database, a well-known source of microfinance institutions. We filter the data on such conditions: (1) the MFIs without last three years data are eliminated from the dataset. (2) Those MFIs stopped working with the selected time period are also eliminated. After filtering the MFIs, the data consists of 467 MFIs with the time period of 15 years (2000-2014).

Table 1. Number of MFIs

Year	No of MFIs
2000	34
2001	63
2002	119
2003	183
2004	237
2005	289
2006	291
2007	13
2008	32
2009	48
2010	106
2011	96
2012	183
2013	198
2014	203
Total	**2095**

Table 2. Region wise MFIs

Region	Individual	Mixed	Solidarity	Village	Total
South Asia	6	38	9	11	64
Africa	27	86	49	2	164
East Asia and the Pacific	46	41	3	1	91
Latin America and the Caribbean	93	21	2	1	117
Eastern Europe and Central Asia	11	13	4	3	31
Total	**183**	**199**	**67**	**18**	**467**

Table 1 displays the number of MIFs per year used for econometric analysis. Table 2 shows the type of loans given to different regions of country; individual, mixed, solidarity, village loans. For the case of South Asia, Africa and Eastern Europe, mixed lending is higher than other kind of landings. Whereas, East Asia & Pacific, Latin America & Caribbean are mostly focus on the individuals for lending.

Descriptive statistics are given in table 3; the findings indicate that MFIs focus on individuals with mean value of 1,135. The mean value of mixed lending is at number second with 563. The mean value of village is 81, which indicating that the least focus of MFIs is in villages. Moreover, the statistics of percentage loans below US$300, percentage WOM borrowing, Average savings balance per saver (US$) and percentage clients in bottom half of the population are given in table 3.

Table 3. Descriptive statistics

	Individual	Mixed	Group	Village	Total
			Average loan balance per borrower		
Mean	1,135	563	119	81	719
St. dev.	909	797	41	43	863
Obs	211	254	71	18	554
			% loans below US$300		
Mean	51	63	97	92	79
St. dev.	23	38	16	6	23
Obs	34	51	19	17	121
			% WOM borrowers		
Mean	47	69	61	93	53
St. dev.	28	21	24	5	22
Obs	146	171	84	19	420
			Average savings balance per saver (US$)		
Mean	1,896	2,339	30	27	1,755
St. dev.	10,413	26,401	69	36	18,419
Obs	184	197	69	23	431
			% clients in bottom half of the population		
Mean	16	11	0.3	54	14
St. dev.	18	9	-	0.7	18
Obs	7	26	4	7	44

5. Estimating Strategy and Results

Outcome of the relationship between outreach and efficiency is incorporated in table 4.Estimated results are produced by using the following procedure. As it is stated earlier that SFA (stochastic frontier analysis) uninterruptedly evaluates the inefficiency and cost frontier. Specification of Eqn. (1) excluding (columns [1–3]), including the Year dummy and input variables (columns [4–8]) are used for the Estimations of cost.

Table 4. Estimation results

Panel A – The cost frontier								
SLRY	1.981***	2.119***	2.112***	2.026***	2.129***	2.121***	2.131***	2.016***
I	-0.147**	-0.100	-0.241***	-0.135*	-0.022	-0.193**	-0.180**	-0.198**
GL	0.697***	0.662***	0.642***	0.694***	0.679***	0.621***	0.676***	0.711***
SLRY * I	0.018**	0.019	0.021***	0.010*	0.002	0.029***	0.025**	0.027**
I * GL	0.05	0.004	0.009	0.09	0.007	0.006	0.009	0.001
SLRY - GL	-0.023***	-0.028***	-0.011**	-0.020***	-0.021***	-0.012*	-0.013**	-0.04
SALARY2	-0.069***	-0.089***	-0.088***	-0.077***	-0.082***	-0.081***	-0.081***	-0.087***
GLP2	0.011***	0.018***	0.017***	0.016***	0.011***	0.019***	0.010***	0.002**
R2	0.008	0.007	0.007	0.007	0.008	0.007	0.007	0.007
BANK	-0.455***	-0.306*	-0.477***	-0.408***	-0.211	-0.402***	-0.377**	-0.387**
CO	-1.003***	-0.896***	-1.009***	-0.947***	-0.797***	-0.927***	-0.919***	-0.959***
NBFI	-0.701***	-0.516***	-0.736***	-0.657***	-0.411**	-0.653***	-0.623***	-0.649***
NGO	-0.709***	-0.471**	-0.759***	-0.659***	-0.349*	-0.661***	-0.661***	-0.700***
RLBANK	-0.956***	-0.845***	-0.988***	-0.881***	-0.719***	-0.899***	-0.901***	-0.989***
LL	2.581***	2.533***	2.409***	2.601***	2.469***	2.397***	2.341***	2.341***
EA	-0.391***	-0.242***	-0.342***	-0.392***	-0.251***	-0.347***	-0.287***	-0.294***
YEAR				-0.199***	-0.201**	-0.163**	-0.153**	-0.139*
YEAR2				0.003***	0.004***	0.003***	0.004***	0.003***
SLRY-YEAR				0.002	0.005	0.005	0.005	0.002
I - YEAR				0.005	-0.005	-0.002	-0.002	-0.003
Constant	-8.419***	-8.039***	-8.789***	-7.801***	-7.162***	-8.099***	-8.483***	-8.201***
Obs.	1,304	1,061	1,061	1,304	1,061	1,061	1,061	1,061

As it is stated above, specification of cost frontier is not our major emphasis; rather it is the specification of inefficiency equations and particularly the tradeoff between efficiency and outreach. In inefficiency equation (2) specific to general method is followed (Brooks, 2002). This permits us a thorough examination of the effects of trade-off between efficiency and outreach with regard to diverse specifications of inefficiency equation. Examination of inefficiency equation is started by individually considering the two of Outreach variables in it. Then we take into account both of these variables of outreach together into one regression. Columns [1–6] Panel B of Table 5 is incorporated with the results of these three different specifications. The results of cost function are incorporated in columns [1–3] not including the year dummy variables. The result of three different specifications of cost frontier is presented in columns [4–6] after including the year dummy variables. Our analysis is mainly based on these six different specifications.

Table 5. Estimations

Panel B – The inefficiency equation								
ALB	-0.211***		-0.181***	-0.217***		-0.185***	-0.189***	-0.195***
WOM		0.409***	0.145**		0.519	0.131**	0.146**	0.134**
INDIVIDUAL							0.076	0.079
GROUP							-0.202***	-0.190***
VILLAGE							0.049	0.3
ALLTYPE							-0.081*	-0.070*
AGE								0.002***
Constant	2.043***	0.120	1.918***	2.011***	-0.478	1.947***	2.009***	1.899***
Obs.	1,304	1,061	1,061	1,304	1,061	1,061	1,061	1,061

In columns [7-8], diverse groups of control variable is added in relation with three different specifications of cost frontier presented in columns [4–6]. As our data set is in group form so, our all estimated results are incorporated after using pooled regressions. Estimation outcomes of cost frontier are presented in panel A of table 4. In most cases of cost function the estimation results are appears to be same as expected: the coefficients of

GL and SLRY are positive and significant. The coefficient of I is contrary to our expectation and is negative. As many of quadratic terms and interactions are positive and significant so it's really hard to immediately monitor the minimal effect of I on total cost. Marginal Average minimal effect of I on total cost is calculated by using so-called delta method, which tells us that minimal effect is positive and significant. After critically analyzing we can wrap-up that our estimated results are in line with previous literature. All risk taking variables I.e. LL, EA, and all dummy variables used in this study related to MFI type are statistically significant for all specifications presented in table 4 that shows cost frontier is affected by type of MFI and risk taking policy.

The coefficient of year dummy is provided in columns [4–8], which is significant and shows that total cost is concentrated with time; we can say it is the results of some technical change. This can be described as learning curve effect: due to the world-wide expansion of MFI business, sharing technology and knowledge are making people more capable under the supervision of MFI.

The estimated results of efficiency and outreach to poor are presented in columns [1–6] of table 5 of panel B. The results show there is a tradeoff between these two. Estimated results for the coefficient of ALB are unconstructive and statistically significant. The results show that those MFIs who focus more on lending to poor are less efficient. Since the coefficient of WOM is statistically significant and constructive in most of the cases, so we can conclude that those MFIs are less efficient which focusing to provide loans for female borrower. The estimated results for the variables of outreach do not change even after the inclusion of control variables. Estimated results for coefficient for ALB are negative and statistically significant and it is unchanged for all the specifications in columns [7] and [8].

The estimated results for WOM are also unchanged in all different specifications. Estimated results of control variables presented in panel B of Table 5 is as follows. Firstly Loan type dummy variable is incorporated in the analysis, Columns [7-8] shows there is a statistically significant and negative coefficient for ALLTYPE and GROUP variables. It shows those MFIs which focus on combine lending, group lending, village lending and individual lending are more proficient. Particularly the estimated results related to GROUP are really charming.

The above discussion postulate that as information cost is less in group lending so; it is cheaper than individual lending. These results are also been studies in a paper on the determining factor of cost efficiency of Microfinance institution (Caudill et al., 2009).Column [8] shows the coefficient of AGE is statistically significant and positive which mean newer MFIs are more efficient than older. Our estimated results are in line with the past literature and show that more lately reputable MFI gain profit from the information with sanction of microfinance practices, built-up throughout the past decades. As we have some missing values in our data for few MFIs, to avoid this situation that our estimated results are influenced by this, we apply the models in which use at least five year observations. Author robust his estimated results for these subsamples. The coefficient of ALB still remains highly significant and negative, while coefficient of WOM remains highly significant and positive.

Shortening the consequences in Table 4, we find that in our sample there is a tradeoff between efficiency and outreach .Even after the addition of control variables, our estimated results remains the same. Our estimated results are in line with the findings of Cull et al. (2007), who did experimental analysis on the relationship between efficiency and outreach. Cull et al. (2007) suggest MFIs which are more profitable have less female clients and poor borrowers. Moreover, as they gradually grow to be larger, they have more affluent clients, which show "mission drift."

Our dataset is significantly larger and covers a longer time period than any of the previous study in the field of microfinance. Furthermore our measures for sustainability are different than any of the previous studies; specifically we apply recent technique, SFA while measuring the cost efficiency of MFIs. Therefore, we believe this study will be a major contribution to the literature regarding the conversation about tradeoff between efficiency and outreach.

5. Conclusion

This paper has found out the trade–off between efficiency of MFIs and outreach to the poor through the methodology of SFA. A sample of more than 1300 observations was estimated and investigated, which provided evidences showing a negative relationship between the efficiency of MFIs and the outreach to poor. Investigation also showed that the lower the amount of the loan given by MFIs, which is considered as the depth, the lower is the efficiency to transfer the funds. Similarly the efficiency of MFIs is also low where the clients are women. The results were carried out thoroughly having added different controlled variables. The MFIs being commercialized are not of much help to the real targeted audience; that is, the poor. But on the other hand, commercialization has provided them reasons to be more efficient and alert in their field. Though they have become more efficient but the focus is less on the outreach of poor as it was before. But the results of the investigations do not gives the idea that MFIs being more efficient and concentrating less on poor is bad. Zeller and Johannsen (2006) stated that the score of MFIs being low on outreach to poor may in a way cause higher poverty reduction but more at a macro level. So, it can be assumed that MFIs are helpful in making the economic conditions better in the society, especially at the regional and country level.

Efficient MFIs are playing a better role in the society than the ones which focus more on the outreach, ignoring the efficiency factor. The factual and observational studies so far have shown the effects of MFIs on both the regional and country level. But the evidences collected to view the results are not enough and more detailed readings must be noted to come up with more authentic results. The issue still needs more research so, it can be examined more carefully and so better results can be derived from the data that will be collected through some other individual countries or regions. The behavioral aspects of microfinance could be more focused in future so, the governmental decisions and policies proposes to get the basic aim of MFI, s to provide loans to poor for their betterment. The future implication of research not generalized some other regions in the same style for policy making but it could be helpful employing some other statistical techniques for research studies then results could be more interesting and as predictable.

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