Productivity Change in Microfinance Institutions in Sarrc Region: A Malmquist Productivity Index Approach

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Abstract

Microfinance Institutions (MFIs) play vital role in developing countries. This study is dedicated to inspect the productivity change in microfinance Institutions (MFIs) in the SAARC region. A panel of 85 MFIs with five diamond information status from 2003 to 2011 with annual frequency is investigated in the analysis. Inputs and outputs used in the study are selected on the basis of double bottom line objective of MIF; s. the methodology which we adopt is Malmquist index through DEA software. The study will be helpful to find that whether the MFIs of SAARC countries effectively manage cost efficiency, technical efficiency and scale efficiency? Also the study will guide the MFIs to remove the deficiency (If any) in the above said forms of efficiencies. Also the total productivity change with respect time and country is investigated in the analysis. On average a positive TFP growth of MFIs in the SAARC region is documented except from 2005 to 2006 and 2007 to 2009. The efficiency of these MFIs will be helpful for completion of the financial sector and will improve the overall competence and growth. The study will be helpful for both welfarist and institutionalisms to achieve their objectives. We found many article related to measure the productivity change in different region but there is limited articles and research work related on SARRC region. This study has been carried out to find either Micro finance institutions are working efficiently or not.

Introduction

Microfinance organizations (MFIs) are considered important especially for developing countries. They give a variety of monetary (financial) facilities to the world low income family units and entrepreneur persons. This not only fills the gap in the financial sector but also provide credit access to the ignored segment of society. MFIs two fold objective of welfare and sustainability [1], which revolve around two approaches or paradigms first is institutionist paradigms and other one is welfarist paradigms. The "institutionist paradigm", which encourage MFIs to produce enough returns to cover their operational and financial expenses (sustainability) and on other side welfarist paradigm which stick to the objective of poverty reduction and depth of outreach and attaining financial sustainability [2]. In the same context, [3] argues that MFIs need to generate high profit, but at the same time, they are required to balance the social objectives of reaching low-income entrepreneurs with generating an effective return for their investors.

Microfinance has three types of sources formal institutions such as rural banks and co-operatives, semi-formal institutions, such as nongovernment organizations (NGOs) and informal sources such as money lenders and shopkeepers. Microfinance provides two types of services "financial services" and "non-financial services". Financial services include saving, microcredit, money transfer, micro insurance etc. Non-financial services include training, counseling, education, health etc. In both type of microfinance the common object is the creation of employment opportunities for the poor people and also indicts decrease poverty. Microfinance has come to be regarded as an important vehicle to reduce the incidence of poverty. An increasing proportion of the poverty in many developing countries needy people receive lone from microfinance institutions (MFI, s).

Many significant studies are conducted by different researchers to estimate the performance of MFIs in different region, in recent years some studies are conducted by [4-15].

However according to our knowledge very limited literature is available to investigate the productivity change in micro finance insinuation in SARRC countries but as a whole SARRC region we never found any single study so far, so this study is aims to fill this gap by investigating the productivity change in MFI, s of SAARC region during the time period of 2003 to 20011 by applying Malmquist index and aiming that it is valuable contribution to literature in areas of MFIs.

The remaining paper is arranged in following pattern In Section 2 gives brief Overview of origin of microfinance industry in SAARC region, Section 3 consist of literature review, Section 4 describe the data and methodology, Section 5 presents results and discussions. Finally, Section 6 ends up with conclusions.

Overview of origin of microfinance industry in SAARC region

The birth of 'modern' micro-finance in developing countries is said to have occurred in the mid-1970s by Muhammad Yunus, who developed it as a way to get rid of poverty in his home country Bangladesh. In 1983, he Founded Grameen Bank, the first institution which introduced this concept and started to Operate in the micro finance business in the proper sense. The Grameen Bank project, which translates literally as "Village Bank", was born, and today works in over eighty-thousand villages with more than six million borrowers. In 2006 both Yunus and Grameen were awarded the Nobel Peace Prize for their

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work with the poor. Although there have been many other organizations engaged on offering loans and saving opportunities to needy people before, Grameen Bank is known for successfully implementing the system of group lending. In particular, it has proposed a number of indicators to measure the impact of poverty elimination methods. These consider primarily basic needs similar to the definition of the International Labor Organization in 1976 and the financial situation of the poor. Together, Yunus and Grameen Bank were awarded with Nobel Peace Prize in 2006 for their efforts through Microcredit to create economic and social development from below" [16].

The idea of micro finance institutions meets the two bottom line concept requirements. They provide access to capital on smallest scales, and ideally act as social businesses realizing economic behavior improved by social preferences. They enable poor people to engage in productive economic activities and thus contribute to development in low income population but still to measure the performance of MFIs is very critical in order to provide continuous financial and social support to the poor. Despite social goals attempted by the MFIs, the self-sustainability objective is to exit from the permanent subsidies recipient group [17]. This objective can be achieved through good performance practice, critical to ensure nonstop operations of MFIs in providing services.

The performance of MFIs is therefore very critical in order to provide continuous financial and social support to the poor. Despite social goals strived by the MFIs, the self-sustainability objective is key to exit from the permanent subsidies recipient group [17]. This objective can be achieved through good performance practice, critical to ensure continual operations of MFIs in providing services.

Literature Review

Based on a longitudinal and geographical wide study from 1995-2010 by Goswami [17], introduced a new conceptual model of performance assessment for MFIs. Eight dimensions of performance (efficiency, productivity, sustainability, social, institutional characteristics, outreach governance and financial) are proposed to be the more holistic view of MFIs performance [18]. Our study will focus two dimensions suggested by Goswami [17], which are productivity and efficiency. Efficiency analysis will provide information specifically related to use of resources and magnitude of wastes while Productivity analysis will provide information specifically relate to a vital performance indicator which help the institutions to restructure its operations by calculating its cost of output. This paper looks at efficiencies of MFI, s in South Asia Traditionally, to evaluate the performance of MFI,s there are different method which provide information but that is not as much use full because its provide only partial measures of efficiency and remaining partial efficiency may be ambiguous When we describe conclusion on the overall efficiency of MFIs. Here is some of literature related to topic [8].

Uses borrower per staff and saver per staff to check efficiency level and recommended that in MFI, s high productivity level of the staff help in achieving MFI, s double bottom line objective.

Farrington [19] identifies a number of accounting variables to reflect the efficiency of MFIs. These accounting variables are administrative expense ratio, number of loans per loan officer and loan officers to total staff, portfolio size, loan size, lending methodology, source of funds and salary structure as the efficiency drivers and hence as the measurements for MFI efficiency.

By utilizing cost per borrower and cost per saver as a measure of effectiveness [20] find that formal micro finance institution have greater efficiency then semi formal MFI,s in African and in formal MFI,s, cooperative MFIs are the least effective. Also, [20] differentiate on the basis of efficiently cost management (cost for every borrower and expense for every saver.) Africa is the most beneficial MFI, s region then different areas.

Examine the efficiency of micro financial institution in Africa Asia and Latin America by using production approach and result revile that non-governmental MFI,s are working most efficiently than others to achieve dual objective. On the other way, bank micro finance institutions also outperforming efficiently under intermediate approach. So in financial intermediaries banks have access to the local market. Most probably in future bank also performs as a non-governmental micro finance institution [21].

Using both production and intermediation approach. So by status show that NGOs and NBFIs were the best performers in both production and intermediation efficiency. The findings of this study is different from findings in most of efficiency studies in MFIs which report the presence of higher inefficiency in both production and intermediation efficiency [22] measure the Efficiency and Sustainability of Micro Finance Institutions in South Asia and concluded that When the scale efficiency were superior than the pure efficiency its indicate that most of inefficiencies are either due to improper allocation of input resources or operation at inappropriate scale opposite to most empirical results which indicate that most of inefficiencies in MFIs were technical in nature [21,23].

Ahmad [23] Use combination of input and output and result indicate that MFI, s is specialized (technical) in nature which is essential requirement for any micro money related establishment achievement.

Which revealed that the classical ratio analysis is not efficient like DEA efficiency, by examining the performance and productivity changes of MFBs, the study noticed a steady growth in the operations of the MFBs but there are lots of opportunities for progress? The performance indicators of the MFBs shows that return on assets (ROA) and return on equity (ROE) of the MFIs were beneficial indictor for any MFI but at high interest rates [24]. The Malmquist productivity index showed variation in the technical and technological changes as the MFIs had more distinct changes in their technical productivity changes than their technological productivity changes. It was revealed that the MFBs experienced technological productivity decline. Overall, the MFBs had alternating progress and deterioration all over forms of the constituents of their Total Factor Productivity Changes but had the best tendency in their scale efficiency change [2].

Tahrim [25] investigate the efficiency and productivity change of microfinance institutions by data envelopment approach (DEA) with dynamic malmquist productivity index (MPI) and concluded that technological change have strong impact on the productivity change which eventually improve the efficiency.

Using the malmquist productivity index (MPI) to calculate the productivity of MFI, s and result of study indicated that MFI, s have practiced an augmentation of pure technical efficiency (advancement in management practices) instead of a change in ideal size. So in order to meet double bottom line objective they need to seek a technological advancement [10].

Ahmed [26] Examines the specialized productivity level of microfinance establishments and result demonstrates that there

few microfinance foundations are working effectively and its show experience (Age) of the microfinance institution is very important determinants to measure efficiency. Additionally mean efficiency of microfinance establishments are low which demonstrates that microfinance foundations can build their output by the same measure of inputs and Innovation.

Siti Nurzahira [27] Examine the effectiveness of microfinance organization by Using a nonparametric methodology which empowers to recognize technical efficacy along with pure and scale efficiencies. Result shows that the Technical efficiency of the microfinance institutions is moderately higher than the other counterpart. Then again, amid this study pure technical efficiency is lower than the scale efficiency that shows the microfinance institution has been inefficient in controlling their expenses as opposed to working at the wrong scale...

Ines Ben Abdelkader [12] Assess the execution of microfinance organizations by applying non parametric DEA methods. The assessed results demonstrate that efficacy level in most of countries decreased during the study period and it indicated that the efficiency level in NGO, s are greater than Nonbank financial institutions NBFIs.

As indicated by assess the general proficiency by utilizing Data envelopment analysis (DEA). All of these efficiencies (Technical, Pure Efficiency and Scale Efficiency) are build by diverse models on basis of size as well as location And result conclude that the geographical locations have significant differences in their efficiency. And an interesting face is observed that the efficiency of banks is closely associated with size of the banks.

Moreover Eric Fosuoteng Abayie [13] use stochastic frontier approach to measure the economic effectiveness of microfinance organization and logical that the main source of inefficiencies in the microfinance division are because of the variety in management practices and specialized limits (both in training and portfolio quality). We additionally require an adaptable approach that will take into account all micro finance foundations to have the capacity to get deposits from clients.

In the same way, Oteng-Abayie [28] applied a Cobb–Douglas Stochastic frontier model for Ghana MFIs for the period from2007 to 2010. They found an average economic efficiency of average; And identify some of key significant determinants of economic efficiency which are cost per borrower and age and saving are key indicator of outreach and productivity.

Ahmad [23] use the DEA efficiency analysis and consider 25 MFIs, that is functioning in Pakistan, India and Bangladesh which is part of SAARC region on efficiency scores and result concluded that most of inefficiency is technical in nature so MFI, s related to these three SARRC nation should enhance the managerial expertises and technology utilized as a part of offering service in order to improve their efficiency level.

Similarly, Ferdousi [9] Findings exposed that among the three countries, MFIs in Bangladesh are enjoying comparatively greater economies of scale. On the other hand average source of inefficiency was purely technical in nature than to the scale inefficiency for all the countries. Therefore, improved management skills are required in order to ensure the efficiently utilization of available input resources to enhance increased outreach and performance of MFIs. However, size of MFI, s are also vital factor for determination MFIs efficiency. Secondly MFIs return on assets (ROA) should be positive, otherwise it becomes inefficient.

The assessment of effectiveness of MFI, s in the Mediterranean nations [7] utilizing Malmquist productivity index approach. The determination of inputs and output are on the premise of the dual objectives concept of MFIs achieving self-sufficiency by taking care of its expenses and arriving at numerous poor customers (outreach). The result demonstrated that MFIs have encountered mainly an addition of pure technical efficiency (improvement in management practices) Instead of a change in ideal size. Overall, an essential strategic implication for the micro finance industry is that they need innovative progress to meet the double objective reaching the poor people and financial sustainability.

Mamiza Haq [21] Examine cost efficiency of MFI, s in Africa, Asia and Latin America with both production and intermediate approaches. So result shows that under production approach non-governmental institute are more efficient and under intermediate approach banks MFI, s are more efficient and it is possible in long run banks may performing as non- governmental microfinance institution in lone run.

Furthermore idea that the impact of subsides relies on upon their intensity [29]. On one hand, the subsides play very important role to increase MFI,s efficiency, by providing the liquidity to develop the human and physical infrastructure. This effect dominant at lower levels of subsidy intensity which in turn lend to uphold the "smart subsidies" idea, that take into account the intensity and magnitude of the subsidies.

The most notable researches conducted on MFIs and Non-Bank Financial Institutions (NBFIs) productivities are by [30,31] and using the Malmquist productivity index approach and suggesting that pure technical efficiency has largely contributed to MFI and NBFI technical efficiency progress.

Data and Methodology

MFIs in the SAARC region are investigated in the study. In SAARC region most of the countries are developing where the poor is in need of microfinance. Also the idea of microfinance is originated from SAARC region which makes it a more localized concept. So the selection of SAARC region will be sagacious criteria for sample selection. The MFIs level variables are gathered from MIX data base, a nongovernmental association whose objective is to advance the exchange of information on the microfinance sector around the world. This database gathers data on 85 MFI, s working according to international standards from six countries of SAARC (Afghanistan, Bangladesh, India, Nepal, Pakistan and Sri Lanka). The most recent information for the selected MFI, s dates from 2003 to 2011.

The Malmquist productivity index

In the academic financial literature, there are number of different methods like Fisher index, Tornqvist index and the Malmquist Index are adopt to compute the productivity changes but The Total Factor Productivity (TFP) Index is commonly used to evaluate the productivity and efficiency level.

Lovell [32] Identify that the Malmquist index has three fundamental benefits as compare to the other index. Firstly, the institutionist paradigm approach (profit maximization, or the cost minimization, assumption) is not compulsory. Secondly, information related to input and output prices are not required. Finally, in this index researcher use panel data, it allows the decomposition of productivity changes into two components firstly technical efficiency change, and secondly technical change. Its main disadvantage is it's required to compute the distance functions.

However, the Data Envelopment Analysis (DEA) technique can overcome this problem efficiently. Due to following three basic reasons, we have selected the malmquist productivity index (MPI) to examine productivity change in SAARC MFIs and also estimation the productivity change of decision making units (MFI, s examined) between two time periods.

Selection variables

Production function basic purpose is to indicate the maximum amount of output firm can deliver from by use a defined set of inputs efficiently and other applicable variables that may clarify the amount of output produced. We adopt, output-oriented Malmquist Productivity Change Index, which emphasize on the equi-proportionate increase of input and output [33]. This methodology is select on the basis of dual objective which is depth to outreach and financial stability by offering loan to the poor people and collect revenue from the lender which not only fulfil their social objective as well their organizational objective (financial stability). Additionally they not only take up an imperfect economic environment as the markets for MFIs but also developed as the conventional banking sector and these MFI, s have limited resources (money, human resource) which they spend on commercial banks to generate revenue from shareholders [34].

On the basis of literature and Pattern (which we followed of [24] and [1] we select two input and two output.

Results and Discussion

By following the Malmquist total factor of productivity (FTP) change index has been calculated [33]. The basic rule that is followed for evaluation is if the total factor of productivity index is more than one it means micro finance institution are working efficiently But if the value of TFP is less than one that means efficiency is declining during the study period.

The Table 1 and Figure 1 of Malmquist Index Summary of Annual Means and chart of TFP shows that overall, microfinance industry has reported general productivity regress during the study period despite the fact that all the SAARC MFI,s have positive TFP development except for the year 2005-2006, 2007-2008, 2008-2009. Furthermore, the result shows that the average technical efficiency annual rate is 3.9% while there is alarming indication for technological change so attention is required.
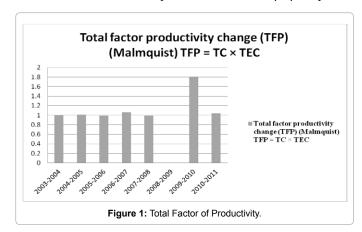
Furthermore, Table 2 of malmquist index summary of firm means result demonstrate that 65 out of 85 MFI,s (around 76%) has indicated change in specialized productivity changes. Interestingly, just 21 out of 85(25%) MFI,s have indicated change in innovative (technological) change and study recommended that there has been a decline in the execution of the best rehearsing micro fund organizations and overall

only 45 out of 85 microfinance institutions shows positive total factor of productivity index (TFP) growth. Now If the technical efficiency change is decompose into pure technical efficiency and scale efficiency result illustrate that during study time frame, pure technical efficiency increased by 0.7% while scale efficiency Contributed on average 0.11% increase and subsequently recommended that amid the study period the SAARC MFI,s have encountered predominantly an augmentation of pure technical efficiency improvement in management practices) instead of change in optimum size (scale efficiency change).

Conclusion

The present study was conducted to examine productivity change in south Asian MFIs over the period of 2003–2011 using the Malmquist productivity index and a balanced panel dataset of 198 observations from 85 MFIs. The selection of inputs and outputs is selected according to the dual objectives of MFIs: achieving self-sufficiency by covering its costs and reaching many poor clients (outreach). Therefore, we specify number of employees, and operating expenses as inputs and gross loan portfolio and as number of loans outstanding. The exact discoveries of the study demonstrate that the microfinance business has reported general productivity regress in the study period despite the fact that all the SAARC MFI,s have positive TFP development except for the year 2005-2006, 2007-2008, 2008-2009.

Furthermore, our study indicates that the main wellspring of total factor of productivity TFP development for the MFI,s was ascribed to the technical efficiency change (3.9 percent increment) as the result demonstrate that 65 out of 85 MFI,s (around 76%) has indicated change in specialized productivity changes. Interestingly, just 21 out of 85(25%) MFI, s has indicated change in innovative (technological) change and study recommended that there has been a Decline in the execution of the best rehearsing micro fund organizations. furthermore the result demonstrated that pure technical efficiency by 3.1 percent

Figure 1: Total Factor of Productivity.

Years	Technical efficiency change TEC=TE×SE	Technological change (TC)	Pure technical efficiency Change TE)	Scale efficiency change (SE)	Total factor productivity change TFP = TC × TEC
2003-2004	1.046	0.962	0.915	1.143	1.006
2004-2005	1.134	0.891	1.194	0.950	1.010
2005-2006	1.120	0.886	1.056	1.060	0.992
2006-2007	0.815	1.303	0.876	0.930	1.062
2007-2008	1.103	0.900	1.107	0.996	0.992
2008-2009	0.794	0.000	0.861	0.922	0.000
2009-2010	1.2784	1.809	1.195	1.0694	1.809
2010-2011	1.125	0.922	1.111	1.013	1.038
Mean	1.039	0.000	1.031	1.008	0.000

Table 1: Malmquist Index Summary of Annual Means.

Firms	Technical efficiency change	Technological change (TC)	Pure technical efficiency Change (TE)	Scale efficiency change (SE)	Total factor productivity change TFP=TC×TEC
1.	0.986	0.908	1.000	0.986	0.895
2.	0.866	0.971	0.834	1.038	0.840
3.	1.084	0.926	1.119	0.969	1.004
4.	1.019	0.943	1.048	0.972	0.961
5.	1.087	0.929	1.096	0.992	1.011
6.	1.042	0.923	1.045	0.996	0.962
7.	1.019	0..919	1.007	1.011	0.936
8.	1.114	1.040	1.164	0.957	1.158
9.	1.055	0.969	1.054	1.001	1.022
10.	1.075	1.012	0.991	1.085	1.089
11.	0.992	1.014	1.000	0.992	1.006
12.	1.069	0.966	1.100	0.972	1.033
13.	1.037	0.884	1.034	1.003	0.917
14.	1.059	0.926	1.076	0.984	0.981
15.	0.840	0.920	0.908	0.926	0.773
16.	1.083	0.943	1.051	1.031	1.022
17.	1.026	1.004	1.008	1.017	1.030
18.	0.945	0.988	0.942	1.003	0.934
19.	0.994	0.915	0.925	1.075	0.910
20.	1.105	0.963	1.172	0.943	1.064
21.	1.187	1.019	1.228	0.967	1.210
22.	1.016	1.015	1.000	1.016	1.032
23.	1.049	0.989	0.999	1.050	1.038
24.	1.076	0.996	1.146	0.938	1.072
25.	0.927	0.968	0.919	1.009	0.897
26.	1.041	0.989	0.991	1.051	1.030
27.	0.986	1.022	0.954	1.033	1.007
28.	1.055	0.901	1.060	0.996	0.951
29.	0.993	0.965	0.906	1.029	0.900
30.	0.982	0.965	0.967	1.015	0.947
31.	1.022	0.941	1.012	1.010	0.962
32.	0.991	0.945	0.984	1.007	0.936
33.	1.114	1.035	1.060	1.051	1.153
34.	0.975	0.999	0.961	1.014	0.974
35.	0.978	0.965	0.979	1.000	0.944
36.	1.078	0.959	1.092	0.987	1.034
37.	1.000	0.964	1.000	1.000	0.964
38.	1.034	0.963	1.103	0.938	0.996
39.	1.075	1.001	1.111	0.968	1.077
40.	1.159	1.025	1.110	1.044	1.188
41.	1.041	0.949	1.000	1.041	0.989
42.	1.128	1.008	1.215	0.928	1.137
43.	1.033	0.987	1.029	1.003	1.020
44.	0.973	0.991	1.001	0.972	0.964
45.	1.008	0.910	1.004	1.005	0.917
46.	1.046	0.967	1.026	1.020	1.012
47.	1.077	1.027	1.111	0.969	1.105
48.	1.105	0.970	1.121	0.986	1.072
49.	1.000	0.915	1.000	1.000	0.915
50.	1.012	0.999	0.995	1.016	1.010
51.	1.109	0.949	1.000	1.109	1.053
52.	0.987	0.954	0.983	1.005	0.942
53.	1.103	0.980	1.122	0.983	1.080
54.	1.110	1.017	1.112	0.998	1.129
55.	1.010	0.911	1.014	0.997	0.920
56.	1.046	0.991	1.040	1.005	1.036
57.	1.043	0.995	1.069	0.976	1.037
58.	0.998	0.923	0.968	1.031	0.921
59.	1.003	1.017	0.978	1.026	1.019

60.	1.042	0.969	1.000	1.042	1.009
61.	1.028	NaN	1.050	0.979	NaN
62.	1.091	0.964	1.018	1.072	1.053
63.	1.023	0.935	1.014	1.008	0.956
64.	1.043	1.008	1.064	0.980	1.051
65.	1.046	0.978	1.070	0.978	1.023
66.	1.020	1.013	1.000	1.020	1.033
67.	1.433	1.036	1.419	1.010	1.485
68.	1.013	0.974	1.000	1.012	0.986
69.	1.147	1.011	1.156	0.992	1.160
70.	0.987	0.949	1.038	0.951	0.937
71.	1.026	1.003	0.997	1.029	1.029
72.	1.030	0.956	1.027	1.003	0.984
73.	1.105	0.965	1.073	1.030	1.066
74.	0.952	0.962	0.939	1.014	0.916
75.	1.089	0.976	0.971	1.121	1.062
76.	0.962	0.940	0.960	1.002	0.904
77.	1.003	0.974	0.974	1.030	0.977
78.	0.991	0.900	0.964	1.027	0.891
79.	1.151	0.947	1.100	1.046	1.090
80.	1.067	1.001	1.039	1.026	1.067
81.	1.044	0.953	1.038	1.005	0.995
82.	1.018	0.952	0.893	1.140	0.969
83.	1.098	0.988	1.080	1.017	1.085
84.	1.022	1.013	0.982	1.041	1.035
85.	1.044	0.947	1.032	1.012	0.989
Mean	1.039	NaN	1.031	1.008	NaN
	65/85	21/85	59/85	55/85	45/85

Table 2: Malmquist index summary of firm means.

while scale effectiveness helped generally 0.8 percent expansion and subsequently recommended that amid the study period the SAARC MFI,s have encountered mostly an augmentation of unadulterated specialized productivity (change in administration hones) instead of a change in ideal size(scale productivity change). For the most part, a paramount ramification for the SAARC micro money industry is that they have to seek after a mechanical advancement to meet the double bottom line objective of reaching many poor people and budgetary maintainable quality.

Our discovery lends solid backing to past studies directed by many scientists and purposing that [2,10,11,31,34]. Generally, a vital implication for the SAARC micro finance industry is that they have to increase technological progress to meet the dual objectives of reaching many poor people to reduce the poverty elevation as well to contribute the economy by providing loan to needy people to start up their entrepreneurial activity which is welfarist side and financial sustainability which is survival of any MFIs.

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