Factors Affecting Financial Sustainability of Microfinance Institutions

Anand K. Rai (Corresponding author)
Army Institute of Management and Technology,
Plot M-1, Pocket P-5, Greater Noida (U.P.), India.
Tele: 91-9811743141 E-mail: anandleo19@hotmail.com

Sandhya Rai
Institute of Management Studies, C 238,Bulandshar Road
Lal Quan   Ghaziabad (U.P.) India.
Tele: 91-9278221238 E-mail: raisandhya@gmail.com

Abstract
Millions of people in developing countries have been given access to formal financial services through microfinance programs. Nevertheless, millions of potential clients still remain un-served and the demand for financial services far exceeds the currently available supply. Given significant capital constraints, expansion of microfinance programs remains a formidable challenge facing the microfinance industry. Moreover, it is observed that microfinance organizations have had various degrees of sustainability. One such sustainability is the financial sustainability. Financial sustainability has been defined by various researchers differently. As such there is no clear cut definition of the word financial sustainability. The MIX Market and various other agencies like ACCION, Women's World Banking etc. have attempted to define the term financial sustainability in their own limited way. Therefore this paper attempts to find out the factors which affect the financial sustainability and thereafter propose a more comprehensive and representative model for financial sustainability and create an index to observe the financial performance of microfinance sector. The financial data of microfinance institutions from India and Bangladesh suggests that the capital/ asset ratio, operating expenses/loan portfolio and portfolio at risk> 30 days are the main factors which affect the sustainability of microfinance institutions.
Keywords: Microfinance, Financial Sustainability, Portfolio at Risk>30 days, Capital to Asset ratio, Operating expenses to Loan portfolio

1. Introduction:
Millions of people in developing countries have been given access to formal financial services through microfinance programs. Nevertheless, millions of potential clients still remain un-served and the demand for financial services far exceeds the currently available supply. Given significant capital constraints, expansion of microfinance programs remains a formidable challenge facing the microfinance industry. Moreover, it is observed that microfinance organizations have had various degrees of sustainability. One such sustainability is the financial sustainability. Financial sustainability has been defined by various researchers differently. As such there is no clear cut definition of the word financial sustainability. The MIX Market and various other agencies like ACCION, Women's World Banking etc. have attempted to define the term financial sustainability in their own limited way.

The Financial Self Sufficiency is an approximate indicator of the impact of subsidies on an organization's sustainability. In an environment where grants represent less than 1% of the sources of funds of MFIs (Microfinance Institutions) the FSS calculation is no longer relevant. Since profit rates are also running at quite high levels and very few MFIs are now making losses, the Operational Self Sufficiency too is not a very interesting indicator. Therefore this paper attempts to propose a more comprehensive and representative model for financial sustainability and create an index to observe the financial performance of microfinance sector.

2. Research Objectives:
The study is focused on achievement of following two objectives:
1. To study the factors affecting financial sustainability of microfinance institutions.
2. To create a financial sustainability index for the microfinance sector.

3. Literature Review:
Different literatures noted that financial sustainability is one of the areas that we need to look at to assess the performance of micro finance institutions.
The MIX Market defines the term financial sustainability as having an operational sustainability level of 110% or more, while operational sustainability is defined as having an operational self-sufficiency level of 100% or

more. The operational self-sufficiency measure is defined as: total financial revenue /financial expense + operating expense.

Yeron in 1992 discussed that the two most important objectives for a rural financial institutions to be successful are financial self-sustainability and more outreach to the target rural population. Financial self-sustainability is said to be achieved when the return on equity, net of any subsidy received, equals or exceeds the opportunity cost of funds.

According to Khandker et al. (1995), the concept of sustainability of microfinance can be divided into four interrelated ideas; namely, financial viability, economic viability, institutional viability and borrower viability. Financial viability relates to the fact that a lending institution should at least equate the cost per each unit of currency lent to the price it charges its borrowers (i.e. the interest rate). Economic viability relates to meeting the economic cost of funds (opportunity cost) used for credit and other operations with the income it generates from its lending activities.

Regarding indicator of financial sustainability, Khandker et, al. (1995) pointed out that loan repayment (measured by default rate) could be another indicator for financial sustainability of MFIs; because, low default rate would help to realize future lending.

Meyer (2002) noted that the poor needed to have access to financial service on long-term basis rather than just a onetime financial support. Short-term loan would worsen the welfare of the poor (Navajas et al., 2000).

Meyer (2002) also stated that the financial un-sustainability in the MFI arises due to low repayment rate or un-materialization of funds promised by donors or governments.

Meyer (2002) indicated, "Measuring financial sustainability requires that MFIs maintain good financial accounts and follow recognized accounting practices that provide full transparency for income, expenses, loan recovery, and potential losses."

ACCION and Women's World Banking have also given some popular tools for the performance indicators and standards for MFIs. Similarly Women's World Banking categorized performance indicators into qualitative and quantitative parameters. The emphasis is on MFIs achieving minimum agreed performance standards and taking significant incremental steps to improve performance.

4. Research Methodology: In this section a brief overview of various dimensions of the research, tools and techniques and methods used to achieve two research objectives has been discussed.

4.1 The Data:

The research is analytical and empirical in nature and makes use of secondary data. The population for the study is all MFIs of India and Bangladesh. The data has been sourced from Microfinance Information Exchange, USA (www.mixmarket.org). The sample period undertaken for the first objective is from the year 2005-06 to 2009-10. For the second objective, the data is taken for the year 2009-10.

4.2 The Sample:

4.2.1 Sample Frame:

The sample frame is the list of target population. The sample frame in this study is all those MFIs of India and Bangladesh which are reporting their performance data to Microfinance Information Exchange (MIX) USA.

4.2.2 Sample Size:

Further to do a regression analysis, the data on 26 microfinance institutions (MFIs) of India and 26 microfinance institutions of Bangladesh are collected from the Microfinance Information Exchange (or the MIX), a not-for-profit   private organization that aims to promote information exchange in the microfinance industry. The database contains observation per institution from the Year 2005-06 to the Year 2009-10 for both the countries.

4.2.3 Sampling Technique and Procedure:

The institutions selected, are based in large part on the quality and extent of their data. The quality of the MFIs have been seen and judged on the basis of their legal form, their age and the frequencies with which theses MFIs are reporting data to MIX. Some of the MFIs belong to NBFC category while others belong to NGO category. Similarly, MFIs can also be categorized as Young, Mature and Old.

Simple random sampling is chosen for analyzing the performance of MFIs of India and Bangladesh. In order to choose 26 MFIs from India and 26 MFIs from Bangladesh, all MFIs reported their data from 2005-06 to 2009-10 to MIX were listed down. In case of India, 70 such MFIs were found while in case of Bangladesh, 26 MFIs reported their data for the said period. Each of these 70 Indian MFIs were then given a unique number. Twenty six MFIs were then chosen by simple random sampling method. Same procedure is adopted for the selection of sample for MFIs of Bangladesh.

4.3 Models and Techniques:

4.3.1 Multiple Linear Regression Analysis:

To Find out the factors affecting   Financial sustainability a Multiple Linear Regression analysis is carried out in respect of Indian MFIs and Bangladesh MFIs for data of 5 years i.e. from 2005-06 to 2009-10.

  A multiple regression equation can be expressed as:

$$Y = \alpha_i + \beta_1 X_{1it} + \beta_2 X_{2it} + \beta_3 X_{3it} + \beta_4 X_{4it} + \beta_5 X_{5it} + \beta_6 X_{6it} + \beta_7 X_{7it} + \beta_8 X_{8it} + \varepsilon_i \text{ --------------- (1)}$$

Where:

Y = dependent variable {(Operational Self Sufficiency (OSS) in percentage for firm 'i' during time period 't')}

α_i = Constant

β_1 = Regression coefficient of Capital/Assets ratio

X_{1it} = Independent variable Capital/Assets ratio for firm 'i' during time period 't'

β_2 = Regression coefficient of Number of active borrowers

X_{2it} = Independent variable Number of active borrowers for firm 'i' during time period 't'

β_3 = Regression coefficient of Yield

X_{3it} = Independent variable Yield firm 'i' during time period 't'

β_4 = Regression coefficient of Operating expense/loan portfolio

X_{4it} = Independent variable Operating expense/loan portfolio for firm 'i' during time period 't'

 β_5 = Regression coefficient of Portfolio at risk> 30 days

X_{5it} = Independent variable Portfolio at risk> 30 days for firm 'i' during time period 't'

β_6 = Regression coefficient of Women borrowers

X_{6it} = Independent variable Women borrowers for firm 'i' during time period 't'

β_7 = Regression coefficient of Debt Equity ratio

X_{7it} = Independent variable Debt Equity ratio for firm 'i' during time period 't'

β_8 = Regression coefficient of Inception

X_{8it} = Independent variable Inception for firm 'i' during time period 't'

ε_i = Error term

In order to develop the financial sustainability index model, the outcome of multiple linear regression is used along with scaling and weighted average.

5. Findings and Results:

5.1 Financial Factors Affecting Sustainability of Indian MFIs:

The value of adjusted R square explains that 50.2 percent of the variation in dependent variable i.e. Operational Self Sufficiency (proxy for sustainability) is due to variations in independent variables taken together namely Number of Active Borrowers, Percent of Women Borrowers, Age of MFIs, Debt/Equity ratio, Capital/Assets ratio, PAR>30 days, Borrower per Staff Member, ROE and Yield (Table-5.1). This leaves 49.8 percent unexplained. The value of R square is significant, indicated by p value (0.000) of F statistics as given in ANOVA Table-5.2. This informs that the independent variables, taken together as a set, are significantly related to dependent variable. The multiple correlation is therefore highly significant.

Table-5.3 shows that the values of p are 0.008, 0.000, 0.000 and 0.000 for the indicators: Number of Active Borrowers, Capital/Assets ratio, Yield and Operating Expense/Loan Portfolio respectively. These values are less than the level of significance (0.05). Therefore, the null hypotheses are rejected and, it can be concluded that these indicators influence the dependent variable OSS. Other independent variables are not significant thereby not making a significant contribution to the prediction.

5.2 Financial Factors Affecting Sustainability of the MFIs of Bangladesh:

The value of adjusted R square explains that 54 percent of the variation in dependent variable i.e. Operational Self Sufficiency (proxy for sustainability) is due to variations in independent variables taken together namely Number of Active Borrowers, Percent of Women Borrowers, Age of MFIs, Debt/Equity ratio, Capital/Assets ratio, PAR>30 days, Borrowers per Staff Member, and Yield (Table-5.4). This leaves 46 percent unexplained. Value of R square is significant, as indicated by p value (0.000) of F statistics shown in ANOVA Table-5.5.

This informs that the independent variables, taken together as a set, are significantly related to dependent variable. The multiple correlation is therefore highly significant.

Table 5.6 shows that the values of p are 0.004, 0.017, and 0.000 for the indicators PAR>30 days, Operating Expense/Loan Portfolio, and Capital/Assets ratio respectively. These values are less than the level of significance

(0.05). Therefore, the null hypotheses are rejected and it can be concluded that these indicators influence the dependent variable OSS.

Now, it can be observed that the factors common to both these countries that affect the financial sustainability are Capital/ asset ratio and Operating expenses/Loan Portfolio. Therefore these indictors have been included along with Operational Self Sufficiency to create Sustainability index. Many researchers like Khandelkar, Yeron etc. have suggested to include repayment rate for the checking the sustainability of MFIs. Therefore Portfolio at Risk is taken as proxy for repayment rate and included in creation of sustainability index.

5.3 Methodology to Develop the Financial Sustainability Index: In order to develop a model for financial sustainability index, following steps are involved.

Step-1: The model for financial sustainability will be developed by using four financial indicators. These are
Indicator-1 Portfolio at risk>30 days Past Due
Formula: Unpaid principal balance of past due loans (with overdue > 30 days) / Total Gross outstanding portfolio
Standard: PAR > 30 days at less than 10%
Indicator-2 Capital to Asset Ratio
Formula: Capital / Total Assets
Standard: Capital Adequacy at more than 15%
Indicator-3 Operating expense/loan portfolio
Formula: Total Operating Cost / Average outstanding Portfolio
Standard: Operating cost ratio at less than 20%
Indicator-4 Operational Self sufficiency
Formula: Operating income (Loans + Investment) / Operating Cost + Loan Loss Provisions + Financing Cost
Standard: Operating Self- sufficiency at 100%
These indicators have been chosen based on literature review and the results of regression analysis of factors affecting sustainability of Indian MFIs and Bangladesh MFIs.

The standards of each of the above parameters are taken from secondary source ACCION, RBI and Sa-Dhan.

Step-2: In the second step, a weight is assigned to each of these financial indicators. The weight has been assigned analyzing the importance of indicators used by different microfinance research agencies worldwide.

It has been found, as shown in Table-5.9 that the indicator PAR> 30 days is most important as it is used by all 6 agencies. Similarly, the other indicators like Capital/ Assets ratio and Operational Self Sufficiency have got the least importance as four out of six agencies are using them for the performance evaluation. Table-5.7 shows the weight of each indicator.

Step-3: In the third step, each indicator has been given a range. These indicators have to be converted into same scale so that a common measurable score, based on the financial performance of an MFI   may be given to each of these indicators for a particular year. The score of standard of each indicator has also been calculated based on the scale.

Table-5.8 shows the range of indicators and the score of standards.

One year data on four indicators for the MFI have been collected and then converted into a common measurable scale. This is necessary to give a score to an MFI on these indicators. A score to the standards of these financial indicators will also be set.

Scaling for PAR: Since the standard is less than 10% and trend is decreasing therefore (100 – PAR) will be considered for converting the data from 0 to 100 scales.

The same procedure will be applicable for Operating Expense to Loan Portfolio.

For other two indicators the scaling will be used as per normal standard as has been shown in Fig-5.1.

Step-4: In the fourth step, the total score of the standards is calculated by multiplying indicator's weight with score of indicator's standard and adding it. The total score of the standards is considered as sustainability index for the base year.

Total score of the standards = 90*W (PAR) +15* W (C/A ratio) + 80*W (Operating Expenses/Loan Portfolio) + 50* W (OSS) = 90*0.32+15*0.21+80*0.26+50*0.21 = 63.25 (score for the sustainability index for the base year 2010); Where W is weight

Step-5: In the final step, the sustainability score for Indian MFIs for the year 2010, using the sustainability index model, is calculated. Top 10 MFIs of India, which contributes 80% of the total loan portfolio, have been taken for the calculation of sustainability index (refer Table-5.10). The weight has been assigned to each of these companies, based on their Gross Loan Portfolio. The weighted averaged sustainability index comes out to be 75.34 for the year 2010. It can also be used on single MFI to check whether, the MFI is financially sustainable or not.

Significance of the Model: This model of financial sustainability Index for microfinance institutions is more comprehensive. With the help of this model, the MFIs can quantify the level of financial sustainability. This will also be used to create a sustainability index for various countries and help the regulator identifying the strong and weak areas of the sector. In addition, the existence of new model is also expected to facilitate MFIs to access to capital markets. Having access to sustainability information may reduce some of the transaction uncertainty. This model may be considered as one more step in the process of the emergence of the microfinance standards.

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Fig: 5.1 Scale of Financial Indicators:

PAR> 30 days

0 -------------------------------90---------100

Capital to Assets Ratio

0------15-----------------------------------100

Operating expense/loan portfolio

0---------------------------80-------------100

Operational Self Sufficiency

0-------------------50---------------------100

Table- 5.1: Model Summary of Linear Regression for Sustainability of Indian MFIs

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.729[a]	.531	.502	21.80319	2.113

a. Predictors: (Constant), Debt/Equity, PAR, BPSM, ACTB, WB, CA, YIELD, ROE, OELP
b. Dependent Variable: OSS

Table-5.2: ANOVA (b)

	Model	Sum of Squares	df	Mean Square	F	Sig.
1	Regression	76518.310	9	8502.034	17.885	.000[a]
	Residual	67503.808	142	475.379		
	Total	144022.119	151			

a. Predictors: (Constant), Debt/Equity, PAR, BPSM, ACTB, WB, CA, YIELD, ROE, OELP

b. Dependent variable: OSS

Table-5.3:   Coefficients (a) of Financial Factors affecting Sustainability of Indian MFIs

Model	Un-standardized Coefficients		Standardized Coefficients			Co linearity Statistics	
	B	Std. Error	Beta	t	Sig.	Tolerance	VIF
(Constant)	106.797	13.341		8.005	.000		
ACTB	6.743E-6	.000	.160	2.710	.008	.945	1.058
WB	-.086	.132	-.039	-.647	.519	.886	1.129
PAR	-.486	.485	-.059	-1.002	.318	.958	1.043
ROE	.034	.018	.139	1.915	.058	.624	1.603
BPSM	-.011	.009	-.080	-1.254	.212	.808	1.238
CA	.705	.175	.275	4.026	.000	.705	1.419
YIELD	1.914	.276	.470	6.926	.000	.718	1.393
OELP	-2.789	.268	-.787	-10.417	.000	.578	1.731
Debt/Equity	.032	.043	.057	.740	.460	.564	1.773

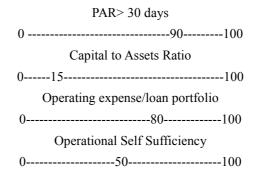a.   Dependent Variable: OSS

Table-5.4: Model Summary of Linear Regression for Sustainability of Bangladesh MFIs

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.768(a)	.590	.540	20.97656

a   Predictors: (Constant), Debt/Equity, ACTB, C_A, Inception, PAR, YIELD, OELP, WB

b   Dependent Variable: OSS

Table-5.5: ANOVA (b)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	41748.144	8	5218.518	11.860	.000(a)
	Residual	29041.049	66	440.016		
	Total	70789.194	74			

a Predictors: (Constant), Debt/Equity, ACTB, C_A, Inception, PAR, YIELD, OELP, WB

b Dependent Variable: OSS

Table-5.6:   Coefficients (a) of Financial Factors affecting Sustainability of Bangladesh MFIs

Model		Un-standardized Coefficients		Standardized Coefficients	t	Sig.	Co linearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	70.949	682.482		.104	.918		
	Inception	.055	.351	.014	.158	.875	.744	1.344
	ACTB	5.01E-007	.000	.035	.381	.705	.730	1.370
	WB	-.835	.553	-.152	-1.510	.136	.612	1.634
	PAR	-.493	.164	-.290	-3.002	.004	.664	1.506
	OELP	-1.466	.598	-.235	-2.451	.017	.674	1.483
	C_A	.778	.193	.400	4.024	.000	.629	1.591
	YIELD	1.126	.643	.163	1.752	.084	.718	1.394
	Debt/Equity	.109	.223	.045	.488	.627	.737	1.358

a   Dependent Variable: OSS

Table-5.7: Weight for the Indicators

S. No.	Indicators	No. of agencies using Indicators	Final weight
1	PAR>30 days past due	6	0.32
2	Capital to Assets ratio	4	0.21
3	Operational Self Sufficiency	4	0.21
4	Operating expense/loan portfolio	5	0.26

Table-5.8: Indicators Range and standard

Indicators Range	Standards	Score of Standards
PAR>30 days 0 – 100 %	Less than or equal to 10%	90
Capital to Assets ratio 0 – 100 %	More than or equal to 15 %	15
Operational self sufficiency 0 - 200 %	Above 100%	50
Operating expense/loan portfolio 0 – 100 %	Less than or equal to 20%	80

Table-5.9: Common measures of Financial Performance used by different agencies

Indicators	ACCION	MIX	Planet Rating	SEEP Network	WOCCU	WWB
OUTREACH						
1. No. of Active borrowers		YES		YES	YES	YES
2. No. of women borrowers		YES				YES
PORFOLIO QUALITY						
1. Repayment rate						YES
2. Portfolio at risk	YES	YES	YES	YES	YES	YES
3. Arrears rate				YES	YES	
4. Loan Loss Rate	YES		YES	YES		
5. Loan loss provision rate	YES	YES		YES	YES	YES
PRODUCTIVITY						
1. No. of loan per credit officer		YES		YES		YES
2. Amount of loan per credit officer				YES		YES
3. Ratio of credit officer to total staff	YES	YES	YES			

EFFICIENCY						
1. Cost per borrower		YES		YES		YES
2. Cost per unit of money lent	YES	YES		YES		YES
3.Operational efficiency	YES	YES	YES	YES	YES	
4. Administrative efficiency		YES	YES			
SUSTAINABILITY						
1. Operational sustainability		YES	YES	YES		YES
2. Financial sustainability		YES	YES	YES		YES
PROFITABILTY						
1. Return on assets	YES	YES	YES	YES	YES	YES
2. Return on equity	YES	YES	YES		YES	
3. Yield on Portfolio		YES			YES	YES

Table-5.10:   Financial Sustainability Index for Indian Microfinance Institutions

SN	MFIs	CA	CA Score	OELP	OELP Score	PAR	PAR Score	OSS	OSS Score	GLP Million $	Weight	Weighted Score
1	SKS	23.7	23.7	10.1	89.9	0.22	99.78	150	75	960	0.28	76.03
2	SPANDANA	16.7	16.7	5.4	94.6	0.13	99.87	180	90	787	0.23	78.96
3	SHARE	11.3	11.3	8.2	91.8	0.16	99.84	154	77	376	0.11	74.36
4	BANDHAN	10.45	10.45	5.43	94.57	0.13	99.87	158	79	332	0.10	75.33
5	AML	11.1	11.1	6.34	93.66	0.77	99.23	146	73	315	0.09	73.77
6	BASIX	14.1	14.1	15.9	84.1	2.5	97.5	114	57	172	0.05	68.00
7	SKDRDP	4.8	4.8	4.8	95.2	0.31	99.69	112	56	136	0.04	69.42
8	EQITAS	36.5	36.5	8.1	91.9	0.11	99.89	145	72.5	134	0.04	78.75
9	GV	12	12	11.8	88.2	0	100	125	62.5	134	0.04	70.58
10	UJJIVAN	25.9	25.9	19	81	0.46	99.54	116	58	82	0.02	70.53
	Total									3428	1.00	
											S. Index (2010):	**75.34**

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