

Chapter VII

Sustainability of the MFIs in Assam

Chapter VII

Sustainability of the MFIs in Assam

7.1 Introduction

Sustainability is one of the major issues for the Micro Finance Institutions (MFIs) (Hermes, Lensink and Meesters 939). It refers to the long-term continuation of the microfinance activities by the institution and also the ability to repeat performance through time (Schreiner 425). The success of an MFI is usually judged by their ability to be financially sustainable (Marakkath, Polanco and Ramanan 449). With high cost of delivering services to the poor, it is difficult for the MFIs to remain sustainable (Hermes and Lensink F6). In contrast, Morduch (618) argued that MFIs can be financially sustainable by charging adequate interest rate and by developing institutional capacity. Some researchers believe that by adopting for-profit model MFIs can manage their costs more efficiently (Pollinger, Outhwaite and Guzman 36-37). However, the proposition of achieving sustainability became a questionable issue due to the various practices adopted by the MFIs. For instance, higher interest rates, larger loan sizes, multiple lending, over borrowing and coercive recovery practices were some of the means used by the MFIs for achieving sustainability. These practices effected the Indian microfinance industry with negative growth in client outreach and loan portfolio in 2011-12. This context, brings in the relevance of the sustainability of the MFIs in Assam, which is dealt in the current chapter. This chapter attempts to find out the factors which effect the financial sustainability of the MFIs in Assam.

Multiple linear regression technique is used to model the relationship between the variables and sustainability of MFIs. Thereafter using a multi criteria ranking technique called TOPSIS (*technique for order preference by similarity to an ideal solution*), the eight selected MFIs in Assam are ranked for five financial years (2009-10 to 2013-14) based on the variables that significantly impact their sustainability.

7.2 Measure of financial sustainability

Operational self sufficiency (OSS) is the most commonly used measure of MFI's financial sustainability. Microfinance Information Exchange refers financial sustainability as having OSS level more than 100 percent (Rai and Rai 13). Meyer suggested that by maintaining good financial accounts and follow recognized accounting practices that provide full transparency for income, expenses, loan recovery, and potential losses an MFI can be financially sustainable (4). Rai, Khanwal and Sharma (12-17) and Bhanot and Bagat (387-403) used operational self-sufficiency ratio as one of the parameter to develop a model for financial sustainability of All Indian MFIs. Further, various agencies such as ACCION, CAMEL, MIX, Small Enterprise Education and Promotion (SEEP) and GIRAFE model (1999) from Planet Rating included operating self-sufficiency as an indicator of financial sustainability. Similarly, the performance framework for Women's World Banking (WWB) has measured self-sufficiency through operating self-sufficiency. As apparent in literature, operational self sufficiency (OSS) as important indicator for financial sustainability of the MFIs. Hence, for the present analysis OSS acts as the dependent variable.

7.2.1 Factors effecting sustainability of the MFIs

The legal status, age of the MFI, lending model, number of borrowers per staff, average loan balance per borrower, debt to equity ratio, and capital adequacy ratio are the variables that explain the variation in sustainability of the MFIs in Assam (From the literature review in Chapter II). The macroeconomic variables such as inflation and lending rates are usually used to study how the economic conditions across different countries affect the sustainability of the MFIs in those countries (Dutta and Das 732). Therefore, it is difficult to study their effect on the OSS via multiple regressions based on data from a given financial year. Some other variables such as the product type are also excluded from the proposed regression model.

The indicators selected for the present study are given in Table 7.1. The variables legal status, lending methodology and age of the institution (1, 2 and 3

in Table 7.1) reflect the institutional characteristics of the MFIs. The variables average loan balance per borrower reflects outreach (depth) of an MFI. Lower average loan balance per borrower reflects greater depth of an MFI, the reason being that financially strong section of a society are less inclined to availing small or micro loans (Rosenberg 4). The variables number of borrowers per staff measure the productivity of the MFIs. The criterion, cost per borrower, is used to measure the efficiency. The lower this ratio, the more efficient is an MFI. The variables capital adequacy ratio and debt to equity ratio (7 and 8) show the financing structure of the MFIs. Higher capital adequacy ratio and lower debt equity ratio imply better financing structure of an MFI. The variable, yield reflects the ability of the MFIs to generate revenue with which the institution will cover its expenses. The last variable, Portfolio at risk greater than 30 days expense measures the portfolio quality of the MFIs. It decreases the revenue, and hinders MFIs ability to reach poor clients (Ayayi and Sene 306-307). A multiple linear regression technique will be used to depict the relationship between the variables and sustainability of MFIs.

Table 7.1: List of independent variables

Sl. no.	Factors	Independent variables	Description	Expected relation with OSS	Literature
1.	Institutional Factor	Legal status	Regulatory status of the MFI. Weightage is given to the MFI according to their legal status, NBFCs= 1 and NGO-MFIs =0.	+	Crombrugge <i>et al.</i> (2008), Ayayi and Sene (2010)
2.		Lending methodology	Credit delivery model of the MFI. We use 1 for denoting JLG and 0 for SHG model.	+/-	
3.		Age of the institutions	Number of years since inception of the MFI.	+/-	
4.	Outreach	Average loan balance per borrower	It is used to measure the depth of outreach. Depth of outreach and financial sustainability are perceived as contradictory objectives in literature.	+/-	Ganka (2010), Hartarska and Nadolnyak (2010) Olivares-Polanco, (2005)
5.	Productivity	Number of borrowers per staff	Ratio of number of active borrowers to number of staff in MFIs	+/-	Woller and Schriener (2001), Crombrugge <i>et al.</i> (2008), Ayayi and Sene (2010), Ganka (2010), Hartarska and Nadolnyak (2010)
6.		Cost per borrower	Determining the average cost of maintaining an active borrower or client	-	

7.	Financing structure	Capital adequacy ratio	It is the proportion of the capital/own fund held by an MFI against its total asset	+	Bogan (2012) Crombrugghe <i>et al.</i> (2008), Islam <i>et al.</i> (2013), Ganka (2010), Hartarska and Nadolnyak (2010)
8.		Debt to equity ratio	Ratio of total liabilities to equity.	-	
9.	Revenue	Yield	Ratio of interest and fees on loan portfolio to average gross loan portfolio	+	Ganka (2010), Hartarska and Nadolnyak (2010)
10.	Risk	Portfolio at risk greater than 30 days	Indicates the portion of portfolio that is overdue and at risk of not being paid. High delinquency makes financial sustainability impossible.	-	Ayayi and Sene, 2010, Crombrugghe <i>et al.</i> (2008),

Note: in legal status 1 is for NBFCs and 0 for NGO-MFIs

—+| shows positive relationship of the variable with OSS, whereas —_| shows negative relationship between the independent variable and OSS.

A regression model for operational self sustainability is proposed below.

$$\text{Operational Self sustainability} = \beta_0 + \beta_1 \text{ Legal status} + \beta_2 \text{ lending methodology} + \beta_3 \text{ number of borrowers per staff} + \beta_4 \text{ Average loan balance per borrower} + \beta_5 \text{ Capital adequacy ratio} + \beta_6 \text{ debt to equity ratio} + \beta_7 \text{ cost per borrower} + \beta_8 \text{ yield} + \beta_9 \text{ Portfolio at risk greater than 30 days} + \text{error component} \dots\dots\dots(\text{II})$$

Where, β_0 is the intercept, β_1 to β_8 are the beta coefficients of the independent variables. The data collected from the selected MFIs in Assam on nine variables for five financial years from 2009-10 to 2013-14. While fitting the above regression models to the data we check for multicollinearity, which is a statistical phenomenon where two or more independent variables in a multiple regression model are highly correlated.

7.3 Findings and interpretations

7.3.1 Regression analysis

The descriptive statistics of the variables used in this model are summarized in Table 7.2. OSS ratio of the sample MFIs have shown a positive growth for the period 2009-10 to 2013-14. The mean ratio of the operational self sufficiency (OSS) for the MFIs is 109.6 indicating sustainable MFIs (Table 7.2). In total there are 39 observations (MZGPS not reported data for 2013-14) of OSS, out of which 26 (79.5 percent) indicated sustainability and the remaining 13 observations (20 percent) indicated that the MFIs were not financially sustainable. This shows that the sample comprises of MFIs with varying OSS status (Annexure XIV).

Table 7.2: Descriptive Statistics for dependent variable

Variable	Mean	Minimum	Maximum	Std. Deviation
Operational self sufficiency	109.69	77.20	142.91	15.74

The descriptive statistics of the independent variables are mentioned in Table 7.3.

Table 7.3: Descriptive Statistics for independent variables

	Minimum	Maximum	Mean	Std. Deviation
Average loan balance per borrower	2500.00	9601.59	5793.32	1948.60
Number of borrowers per staff	60.00	600.00	280.55	121.98
Cost per borrower	170.00	1423.00	548.13	255.31
Capital to asset ratio	2.40	61.70	24.37	17.15
Debt to equity ratio	0.30	40.70	7.81	9.49
Portfolio at risk greater than 30 days	0.00	1.78	0.48	0.54
Yield	12.48	43.98	23.85	6.85

Data source: Author's calculation

Multiple regression analysis results:

The values of the F statistics, *p-value* of the F tests, values of R and R square (coefficient of determination) for the regression model (II) fitted to the data for the period 2009-10 to 2013-14 are reported in Table 7.4. It is observed that the *p-value* of F statistics is less than 0.01. So the null hypothesis is rejected at 1 percent level of significance. It means that the variation in OSS value explained by the model is not due to chance. The Fishers F-test confirms the overall model fit. The F-value of 11.3 is significant at 1 percent level, signifies that the model has good overall significance. The value of R is 89 percent, indicating that the linear regression model can be used to predict the values of dependent variable of the MFIs based on the independent variables included in the study. R square represents the proportion of variation in the dependent variable (the OSS) which is explained by the independent variables in the model.

Table 7.4: Test statistic and p-value

Mode I	R	R Square	Adjusted R Square	Std. Error of the Estimate	F	Sig.
II	896(a).	.802	.732	8.15361	11.368	.000(a)

In Table 7.5 the values of regression coefficients in model (II) and the p-values of the t-tests to detect significance of the regression coefficients are reported. The tolerance and variance inflation factor (VIF) values, which measure multicollinearity, are also reported. It is observed that, four variables seem to have significant impact on the OSS. There is no multicollinearity among the independent variables included in the study, as the tolerance values are above 0.01 and the VIF is below 10 (Bhanot and Bapat, 395). The regression results (in Table 7.5) depict eight independent variable to be significant in the study. As per the probability values depicted in Tables 7.5, the *legal status of the MFIs*, *lending methodology*, *age of the MFI*, *number of borrowers per staff cost per borrower*, *capital to asset ratio*, *debt to equity ratio* and *yield* are significant variables effecting the financial sustainability of the MFIs. The variables indicate the following factors, respectively- institutional factor, Productivity/efficiency, financing structure and revenue.

Table 7.5: Regression coefficient and multicollinearity test statistic

Model II		Standardized Coefficients	T	Sig.	Collinearity Statistics	
Dependent variables	Independent variables	Beta			Tolerance	VIF
Operational self sufficiency	(Constant)		7.34	.000		
	Legal status	0.998	5.91	.000*	.248	4.036
	Age of the MFI	0.638	3.90	.001*	.265	3.780
	Lending model	0.525	3.81	.001*	.373	2.678
	Average loan balance per borrower	-0.144	-0.97	.337	.325	3.073
	Number of borrowers per staff	-0.437	-2.81	.009*	.293	3.416
	Cost per borrower	-0.255	-1.84	.076*	.368	2.717
	Capital to asset ratio	-.429	-1.93	.063*	.144	6.955
	Debt to equity ratio	-0.250	-1.84	.076*	.382	2.619
	Yield	0.477	3.09	.004*	.298	3.353
	PAR greater than 30 days	0.010	.08	.934	.477	2.098

Note: in legal status '1' is for NBFCs and '0' for NGO-MFIs and in lending model '0' stands for SHG and '1' stands for JLG. * Significant at 10 percent
Source: Author's calculation

The legal status, age of the institution and lending methodology of the MFI represents the institutional characteristics of the MFIs. The NBFCs are more sustainable than the NGO-MFIs. In case of lending model, MFIs following JLG model are more sustainable. The variable age of the MFI is directly related to the sustainability of the MFIs. Similar results were reported by Crombrughe et al., (279), who observed that the performance of MFIs was positively effected by age. The productivity variables are significant with negative coefficient. The variable cost per borrower is significant with negative beta coefficient (-0.454). Hence, with the decrease in cost per borrower the OSS of the MFIs is increasing. The variable debt to equity ratio and capital to asset ratio depicting financing structure

of the MFIs, has statistically significant impact on financial sustainability of the MFIs in Assam. Yield on loan portfolio has positive and significant relationship with financial sustainability of the MFIs. With the increase in revenue the sustainability of the MFIs is increasing. The variable yield is positively associated with the OSS. The coefficient for portfolio at risk is statistically insignificant. The average loan balance per borrower which measures the depth of outreach is found insignificant in our study. Cull, Asli and Jonathan (F108) reported that depth of outreach and sustainability cannot be attained simultaneously. The result indicates that the MFIs in Assam are not moving away from their social motive, by increasing their loan sizes.

Thus the results of regression analysis infer that the MFIs in Assam must concentrate on these variables for enhancing the sustainability of their organization. Detailed discussion on these variables will be carried out later in this chapter, in section 7.5.

7.3.2 TOPSIS (technique for order preference by similarity to an ideal solution)

From the data, it is observed that none of the MFIs is uniformly superior to its peers with respect to all the criteria. For instance, RGVN (NE) MFL has lower cost per borrower, whereas the UF SPL exhibits higher yield. Similarly, the debt to equity ratio varies a lot among the MFIs. An institution may raise capital for increasing its outreach. Consequently, a large MFI may have higher debt, than a smaller MFI. One may question —which of these two criteria is more suitable for ranking MFIs? These criteria do not seem to be directly comparable, as they measure different aspects of the MFIs. Therefore, there seems to be no unique criterion for comparing or ranking MFIs. TOPSIS (technique for order preference by similarity to an ideal solution) is a multiple criteria method to identify solutions from a finite set of alternatives (Dutta and Dutta, (103-111) and Bhanot and Bapat (387-403)).

7.3.2.1 Selection of variables for TOPSIS

The variables identified as significant determinant of financial sustainability in regression analysis are used to conduct performance analysis to identify the operationally efficient MFIs in Assam, which in long run remain sustainable. The eight significant variables are given in Table 7.6.

Table 7.6: List of variables

Sl. no.	List of variables
1	Legal status
2	Age of the MFI
3	Lending model
4	Number of borrowers per staff
5	Cost per borrower
6	Capital to asset ratio
7	Debt to equity ratio
8	Yield

These variables capture four dimensions of an MFI's sustainability- institutional, productivity/efficiency, financing structure and revenue/profitability. Integrating all these four dimensions, a sustainable MFI will be identified.

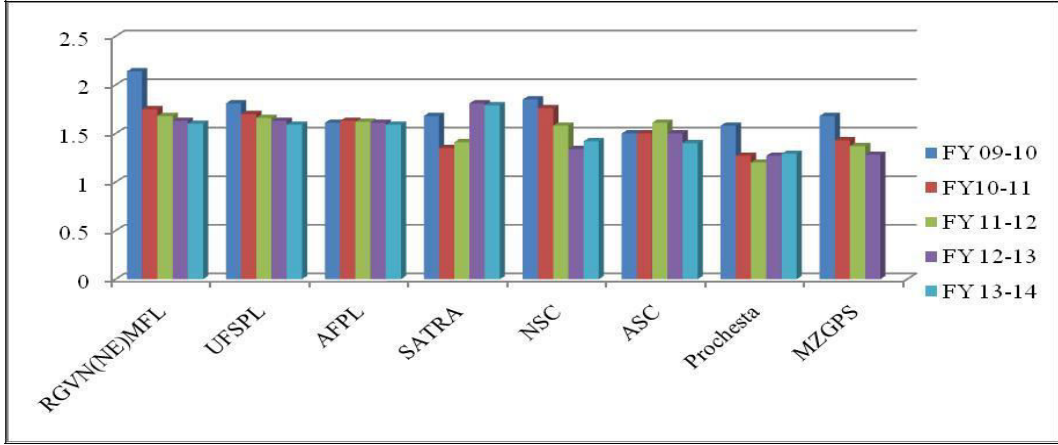
7.3.2.2 Methodology for TOPSIS

The basic principle of TOPSIS is that the best alternative (or the MFI) should have the shortest distance from the positive ideal solution and the farthest distance from the negative ideal solution (Dutta and Dutta 104). In context of ranking MFIs, an ideal solution represents an MFI that outperforms all its peers with respect to all the criteria. In contrast, a negative ideal solution represents the worst performing MFI, with respect to all the criteria. None of the eight MFIs, considered in this study, is an ideal or negative ideal solution. TOPSIS method is used to assign scores to the MFIs. For the present analysis, equal weight age will be assigned to all the variables. A high score will reflect that the corresponding

MFI is far from the negative ideal and close to the ideal solution. Finally the MFIs are ranked from 1 to 8 for five financial years using these scores (the highest score is assigned rank 1). The technical details of computation of the TOPSIS score are described in Annexure XV.

For this study, the eight individual indicators serve as multiple decision criteria. The OSS, DER, CAR, Yeild ratios are in percentage terms, number of borrowers per staff, and cost per borrower were absolute figures, and so in the 1st step of the TOPSIS method, the data is normalized i.e. made unit free. Consequently, the TOPSIS ranking are not affected by the unit or scale in which the different criteria are measured. In the next step, each criterion is either to be minimized or maximized depending on whether the values of the criteria should be high or low. For instance, higher the OSS ratio, the more sustainable are an MFI whereas lower cost per borrower indicates higher efficiency of an MFI. Hence, the MFI which is nearest to the positive ideal and farthest from the negative ideal is the best alternative. After analyzing, we obtained scores of eight MFIs for the period of five financial years (2009-10 to 2013-14). When these scores are sorted they provide the ranking of the MFIs – the MFI closest to the positive ideal takes the top position and the farthest one takes the lowest position (Figure 7.1). The relative score of AFPL remains almost same in all five financial years, whereas fluctuations are observed in case of other MFIs.

Figure 7.1: TOPSIS score of the MFIs for five financial years



Source: Author’s calculation

Next, in order to identify the MFI scored top position, average of five years data for each MFI is calculated (Table 7.7). Based on the TOPSIS relative score RGVN (NE) MFL maintained a top position ranked first, which also reflects in the CRISIL Report (2012, 2013 and 2014). UFSPL and AFPL ranked 2nd and 3rd respectively (Table 7.7).

Table 7.7: Average score of the MFIs

MFI Rank	MFI score *	MFI name
1	1.761	RGVN (NE)MFL
2	1.677	UFSPL
3	1.611	AFPL
4	1.609	SATRA
5	1.590	NSC
6	1.501	ASC
7	1.441	MZGPS
8	1.322	Prochesta

Note: Computed using equally weighted indicators; * average score of five financial years are given; The sustainability scores of MFIs (computed using TOPSIS) are ranked in descending order.
Source: Author's calculation

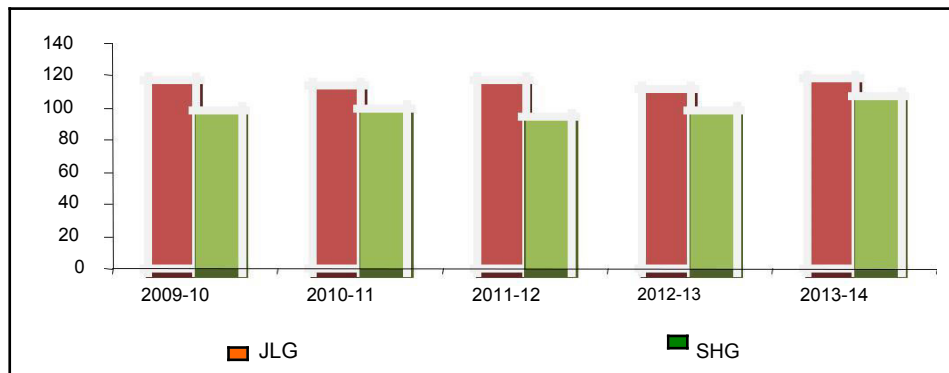
RGVN (NE) MFL scored top most position among the MFIs in Assam. The MFI has performed better in compare to other MFIs in terms of outreach, financing structure, and the organization is having more than 100 branch offices spread across five states of North East India. Recently, RGVN (NE) MFL was selected as small finance bank (SFB) ⁱ by RBI in 2015, and declared to start banking operations in the next 18 months ⁱⁱ. It is expected that the SFB license will increase the funding options for the MFI, and allow extending diversified services to the poor clients (Singh, Anand and Pareek 10). In addition, RGVN (North East) Microfinance has won the Microfinance Organization of the Year 2015 award under Small & Medium organization category. Among the NGO-MFIs, the NCS and SATRA are equally competing with the NBFCs, holding 4th and 5th position (Table 7.5). As mentioned earlier, these two MFIs are in transformation phase. Hence, they require to complying with the new RBI regulation.

7.4 Factors effecting OSS of the MFIs

The present section aims to discuss the variables which have significant impact on the financial sustainability of the MFIs in Assam (Table 7.5).

7.4.1 Lending Model: From the analysis (in Table 7.5) it is observed that, the MFIs following JLG model are attaining more financial sustainability in compare to the MFIs following SHG model. The MFIs following JLG model reported higher sustainability from 2009-10 to 2013-14, in compare to the MFIs following SHG lending model (Figure 7.2).

Figure 7.2: Trend in OSS (based on lending model)



Source: field survey

The lending methodology of the MFI has positive impact on its operating expense (Table 5.5). The SHG model significantly reduces the operating expense of the MFI branch offices. Crombrugge et al. (293) and SIDBI (29) reported similar results that the cost of MFIs in serving SHG borrowers is relatively less. It is found that the operating expense of the MFIs with JLG model is 16 percent higher than the MFIs following SHG model (Chapter V, endnote ix). But the yield and OSS of the MFIs following JLG model is higher than the MFIs following SHG model (Table 7.8). Consequently, the sustainability of the MFIs following JLG model is higher than the MFIs following SHG model (Figure 7.3).

Table 7.8: Comparison of JLG and SHG model

Variables	JLG		SHG	
	Mean	Median	Mean	Median
Cost per borrower	567.0	609.0	514.5	438.4
Number of borrowers per staff	327.5	293.2	196.7	228.1
Average loan balance per borrower	6097.1	6320.8	5250.8	5210.5
Yield	25.6	24.9	20.8	22.6
OSS	115.5	118.4	99.3	99.2

Source: Author's calculation

In the SHG model, the field officers require more skill and experience in maintaining and monitoring the savings and internal loan details of the group members. In addition, there are some other concerns such as large group size in SHGs decreases the group cohesion creates problems among the members and is more time consuming. Consequently, majority of the MFIs are shifting towards the JLG model, in spite of the fact that the SHG model is more cost effective. Out of the eight MFIs, five MFIs adopted JLG model, indicating the models growth potential. Sarma and Mehta (6) reported two significant advantages of JLG over SHG: *JLG is more compatible with the supply-driven modelⁱⁱⁱ of microfinance because of its shorter gestation period^{iv} for turning creditworthy.* And second, *JLGs are free from the clutches of various subsidy schemes floated by the government.* According to Sarma and Mehta (2), and Marakkath (107) JLG model has become a symbol of commercialization, due to its lower group formation cost and time.

An independent sample t-test was conducted to see if there is a significant difference in the sample MFIs using SHG model and JLG model (Table 7.8). The results revealed that the MFIs with JLG model have a significantly higher yield and number of borrowers per staff than MFIs with SHG model. MFIs with JLG model reported significantly higher levels of yield than the MFIs with SHG (0.03). The results were significant at 95 percent confidence interval (Table 7.8). Further, independent sample t-test were conducted to see if there is a difference in the cost

per borrowers and portfolio at risk greater than 30 days of the MFIs, using SHG model and JLG model. The results show no such significant difference. The analysis reveals a positive relationship between the JLG model and OSS is may be due to higher yield and productivity (number of borrower per staff indicates productivity of the MFIs). The cost of borrowers between the MFIs following JLG and SHG model is not found significant. Considering the benefits of JLG model over the SHG model, it can be suggested that MFIs can adopt the JLG model for attaining sustainability.

Table 7.9: Independent Samples Test

Variables	Levene's Test for Equality of Variances		t-test for Equality of Means	
	F	Sig.*	t	Sig. (2-tailed)
Cost per borrower	1.922	0.174	0.611	0.545
PAR greater than 30 days	0.928	0.342	0.524	0.603
Yield	0.264	0.610	2.220	0.033
Number of borrowers per staff	0.367	0.549	3.713	0.001

Note: *the significance value of the statistic is greater than 0.10, the study assumes that the groups have equal variances and ignore the second test i.e equal variances not assumed.

7.4.2 Effect of Legal status: From the regression results (Table 7.5), it is observed that NBFCs are financially more sustainable in compare to the NGO-MFIs. The operational and financial indicators of NGO-MFIs and NBFCs are reported in Table 7.12 for the two financial years. It is found that the NBFCs have done well, which explained their overall sustainability. Financial indicators such as ROA, ROE, and yield reflect low profitability of the NGO-MFIs. High ROA of the NBFCs indicates efficient utilization of assets to earn surplus or returns. The surplus/returns can be ploughed back to improve the capabilities of the MFIs (398). In contrast, high PAR of the NGO-MFIs reflects more default losses, the loss of interest income, and curtailment of outreach, which in total lowers the sustainability of the MFIs (Bhanot and Bapat 398). Hence, form the results it seems to be clear, that the NGO-MFI sector is steadily turning unviable. Nair and Tanka, reported that the NGO-MFI sector in India, have already lost their battle (29). The central bank and other regulatory bodies have turned their attention to

regulated NBFC sector, The NBFCs are regulated, maintain a minimum capital adequacy and yield a return on the capital so as to be able to attract additional capital.

Among the NGO-MFIs the position of NCS is superior in compare to other NGO-MFIs. The NCS which was started as a NGO in year 2004, acquired an NBFC in 2011. Simultaneously, the organization transferred the portfolio of 10 branch offices of NCS to Nightingale Finvest Private Limited. Thus, it can be concluded that with transformation the position of NCS has improved.

Table 7.10: Operational and Financial Indicators of the NGO-MFIs and NBFCs

Indicators	NGO-MFIs		NBFCs	
	2012-13	2013-14	2012-13	2013-14
Number of active borrowers	44,610	40,013	252,323	267,272
Gross loan portfolio (in INR millions)	297.3	329.9	1780.2	1964.3
Average loan outstanding per borrower	6,666	8,246	7,055	7,349
Return on assets	0.04	0.65	3.11	3.34
Return on equity	0.12	2.97	12.04	16.2
Yield	20.06	23.98	26.41	26.97
Financial expense to assets	6.72	8.66	8.31	9.33
Operating expense/loan portfolio	7.34	7.03	13	14

An independent sample t-test was conducted to study the effect of legal status on four important dimensions of MFIs, viz productivity/efficiency of MFIs, outreach, financing structure and profitability. It is observed that there is significant difference in productivity/efficiency and profitability of NGO-MFIs and NBFCs (Table 7.11).

Table 7.11: Independent Samples Test

Dimension	Variables	Levene's Test for Equality of Variances		t-test for Equality of Means	
		F	Sig.*	t	Sig. (2-tailed)
Outreach	Number of borrowers per staff	29.05	0.00	0.205	0.839
Financing structure	Debt to equity ratio	.000	.983	1.264	0.214
Efficiency	Cost per borrower	.884	.353	-4.025	0.000
Productivity	Yield	.165	.687	-3.193	0.003

Note: *the significance value of the statistic is greater than 0.10, the study assumes that the groups have equal variances and ignore the second test i.e equal variances not assumed for the variables debt to equity ratio, cost per borrower and yield. Whereas, for the variable number of borrowers per staff the value for equal variances not assumed is considered.

Hence, to maintain sustainability of MFIs need to take care of two dimensions, viz. efficiency and profitability. In addition, the organizational structure, decentralized decision making and clear set of regulation augment sustainability of the NBFCs.

7.4.3 Effect of debt to equity ratio and capital adequacy ratio: The variable debt to equity ratio has statistically significant impact on financial sustainability of the MFIs in Assam. This implies that various combination of capital improve the financial sustainability of the MFIs. Dutta and Das (733) also found that debt of a company has considerable implications on its sustainability. The negative coefficient indicates that more the MFI is debt financed compared to other sources of finance, the more they be deficient in their sustainability (Kinde 7). Thus, equity financing improves financial sustainability. However, Ledgerwood reported that if an MFI has a large amount of equity and very little debt, it is likely limiting its income-generating potential by not making use of external sources of debt (224). Thus, it is important for the MFIs to maintain a striking balance between debt and equity. The NGO-MFIs are more leveraged than that of the NBFCs (Table 4.7). The average leverage ratio in the FY 2013-14 for NBFCs is 2.4 percent whereas for NGO-MFIs it is 13.7 percent. This shows that leverage

ratio is lower for the MFIs with higher scale (Sa-dhan 43). Also the NBFCs have large equity bases which allow the MFIs to be less dependent on commercial debt. It is observed that NGO-MFIs are too much debt financed, which effects their stability and profitability.

Table 7.12: Financing structure of the NGO-MFIs and NBFCs

Financial Year	NGO-MFIs		NBFCs	
	Capital to asset ratio	Debt to equity ratio	Capital to asset ratio	Debt to equity ratio
FY 2009-10	24.16	8.36	34.77	14.17
FY 2010-11	24.32	6.18	25.57	3.77
FY 2011-12	25.24	5.64	27.27	3.33
FY 2012-13	17.76	13.64	27.87	3.03
FY 2013-14	13.35	13.67	31.13	2.73

Source: Calculated from Annual reports of the MFIs

Similarly, the ratio of capital to asset has significant impact on all financial sustainability of the MFIs. This variable measures the institution's solvency and its ability to meet the long term financial obligations. The value of the beta coefficient is less than one, and is negatively related to the sustainability of the MFIs. The CAR for NBFCs in Assam is higher than the NGO-MFIs (Table 4.8). A lower CAR of NGO-MFIs indicates a higher degree of leverage, as equity contributes a lower proportion of net owned funds, which is deployed in assets. After the AP crisis the ratio has higher impact on the financial sustainability of the MFIs (Dutta and Das 736). To maintain the solvency of the MFIs the RBI has fixed the Capital adequacy ratio of 15 percent for the MFIs. However, from the Table 7.5, it is observed that the beta corresponding to CAR is negative. This indicates that maintaining higher CAR than the required amount will curtail profitability of the MFIs. whereas on the another side it shows that the NBFCs have less chances of solvency. The median CAR of the NGO-MFIs is lower than 15 percent.

7.4.4 Effect of Cost per borrower: The ratio cost per borrower measures the efficiency of the MFIs, by determining the average cost of maintaining an active borrower (CGAP 19). From the analysis (Table 7.5), it is observed that with the increase in cost per borrower reduces the financial sustainability of MFIs or vice versa. In other words, MFIs can attain greater sustainability by decreasing their cost per borrower. This variable has a negative coefficient which was statistically significant at 10 percent significant level. This result is in line with findings of Ganka (123). The cost per borrower measures the MFI effectiveness in cost reduction given the number of borrowers they are serving. The regression analysis in Chapter V, reported a significant positive correlation (0.64) between the number of active borrowers and the operating expense of the MFIs under study. Therefore, cost per borrower for the MFIs under study may not decrease simply by increasing the number of active borrowers, without managing operating expense efficiently. This implies the role of cost reduction in improving financial sustainability. However, with the increase in the NAB, the number of employees of the MFIs in Assam exhibits an increasing trend. Hence, the increase in number of employees contributes to the increase in operating expense of the MFIs. Consequently, with the increase in number of borrowers the operating expenses is increasing. The operating expense can be reduced either by keeping the number of staff constant and increase in the number of active borrowers. It is important for the MFIs to maintain a striking balance between the number active of borrowers and the number of staff.

7.4.5 Effect of Yield

From the analysis in Table 7.5, the yield indicates positive and significant impact on the sustainability of the MFIs. In our discussions, yield is higher for the MFIs registered as NBFCs and following JLG model. Yield indicates the profitability dimension of an MFI (Marakkath 85). It is used as a proxy for the interest rate charged by an MFI (Sa-dhan xiii). Lower yield denotes that an MFI charges lower interest rate from the borrowers. In last five years under study, the yield of

the MFIs in Assam reflects a declining trend (Figure 4.18). Decrease in yield in due to various price regulations stated by the RBI from 2011 onwards.

In 2011, RBI came with 26 percent cap on the interest rate charged and an allowance of one percent for loan processing fee (M-Cril 19). In 2012, the pricing cap was removed but a margin cap^v of 12 percent was introduced. Until end of March 2014, the margin cap was applied irrespective of the size of the MFIs, which was later divided into two margin cap with respect to the size of the MFIs. According to the revised Regulatory Framework for NBFCs: Implication for NBFC-MFIs issued by RBI on 10th of November 2015, the margin cap may not exceed 10 percent for large MFIs (loan portfolio exceeding Rs 100 crore) and 12 percent for the others.

Therefore, the interest rates charged by a MFI to its borrowers will be lower of the following: a 10-percent margin for MFIs with loan portfolios exceeding 1 billion INR (USD 16.1 million) or a 12-percent margin for all other registered MFIs.

According to the M-CRIL (9) study, the yield is the summation of MFI borrowing cost, margin cap and 1 percent processing fee. The average borrowing cost^{vi} for the MFIs in Assam ranges from 10 to 13 percent in the FY 2013-14, with an average of 12.23 percent. Hence, with the margin cap of 12 percent, the yield^{vii} for the MFIs in Assam stands at 25.23 percent, whereas the mean yield of the MFIs in the FY 2013-14 is 24.75. Hence, in the FY 2013-14, four out of eight MFIs are complying with 12 percent level of margin cap.

7.5 Applicability of the results

From Table 7.5, it is found that seven factors, viz. LS, LM, Yield, NBPS, CPB, CAR and DER have significant impact on the OSS of the MFIs under study. Another multiple linear regression model is fitted with only these factors as independent variable. The values of the regression coefficients and the p-values of the F-tests for significance of the regression coefficients are reported in the following Table 7.13 and 7.14.

Table 7.13: Model Summary

R	R Square	Adjusted R Square	Std. Error of the Estimate	F-Test	Sig.
.828(a)	.685	.614	9.78038	9.68	0.00

Table 7.14: Regression Analysis

Dependent Variable	Independent variables	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
Operational self sufficiency	(Constant)	92.51	9.47		9.769	.000
	Legal status	16.14	4.09	.505	3.941	.000
	Lending model	14.19	5.26	.438	2.696	.011
	Number of borrowers per staff	-.026	.016	-.203	1.680	.103
	Cost per borrower	-.018	.010	-.291	1.843	.075
	Capital to asset ratio	-.146	.170	-.159	-.861	.396
	Debt to equity ratio	-.249	.259	-.150	-.962	.344
	Yield	1.030	.366	.448	2.811	.008

Based on the values of the regression coefficients in Table 7.14, we propose the following model to estimate OSS of the MFIs in Assam based on the above mentioned seven significant factors.

$$OSS = (16.14*LS + 14.19*LM + 1.03*Yield - 0.02*NBPS - 0.017*CPB - 0.146*CAR - 0.24*DER) + 92.5 \quad (III)$$

Using the above equation, we compute the values of OSS for various combinations^{viii} of values of these factors included in the equation (III). These computations can help the MFIs to determine the values of these factors that ensure optimum sustainability.

7.6 Conclusion

Based on the empirical evidence from the regression analysis, it is observed that institutional factors, financing structure, revenue generated and efficiency of the MFIs were found to be important factors in determining financial sustainability of microfinance institutions in Assam. The above mentioned factors determine sustainability; hence require considerable attention from the MFI. The institutional factor includes legal status and lending model of the MFIs. Though the JLG lending model has its own benefits, the SHG model is still popular among the MFIs having development agenda. However, based on the empirical analysis, JLG lending model help the MFIs to achieve sustainability. The selection of lending model depends on the organizational culture, leadership, mission and vision of the institution. Similarly, from analysis it is observed that MFIs registered as NBFC are more sustainable than the NGO-MFI. The NBFCs are regulated by Reserve Bank of India and follow a clear legal mandate, whereas the NGO-MFIs registered as societies do not have any legal mandate to undertake microfinance. Another disadvantage is that societies cannot accumulate profits to become financially independent. Here transformation of the NGO-MFIs to NBFCs is the only solution. However, transformation of legal entity depends on regulatory environment, benefits associated with transformation and on the financial performance of the MFIs.

The variables debt to equity ratio and capital adequacy ratio reflects financing structure of the MFIs, which depends on the market environment and the government policies. To some extent, it is difficult for the MFIs to control this factor to minimize costs. On the other hand, the profitability and efficiency of the MFIs depends on the operational processes of the MFIs. The MFI can achieve sustainability, either by increasing their yield, or by decreasing their expenses (Ledgerwood 217). Hence, with efficient utilization of resources the MFI can minimise the expenses and enhance their revenue. The MFIs in Assam had to resort to different cost cutting measures.

Notes:

ⁱ Small Finance Banks (SFBs) by definition will cater to the diverse needs for financial services amongst the low-income people.

ⁱⁱ <http://www.rgvnnemfl.com/>

ⁱⁱⁱ Supply driven model suggests that the JLGs are considered to be a mere mechanism for loan disbursement which can be replicated quickly and effectively (Sarma and Mehta 8).

^{iv} Gestation period includes the group formation period to loan disbursement.

^v Margin is the difference between MFIs Financial revenue (excluding processing fee) percentage on average loan portfolio and the financial cost percentage on average outstanding borrowing from different sources.

^{vi} The total charge for taking on a debt obligation that can involve interest payments and other financing fees (Sa-Dhan xii).

^{vii} The permissible yield is calculated by considering the formula:
Yield=borrowing cost+ margin cap+1 percent processing fee, where borrowing cost is the average borrowing cost of the NBFCs and NGO-MFIS in the FY 2013-14, The margin is assumed at 12 percent (M-CRIL 2014 9).

^{viii} Some hypothetical combinations

Sl.no.	Hypothetical combination	OSS
1.	NBFC+JLG + 23.8 % yield+24 % CAR+7.8 % DER+280NBPS+548 CPB	126
2.	NGO-MFI+SHG+23.8 % yield+24 % CAR+7.8 % DER+280NBPS+548 CPB	95
3.	NBFC+SHG + 23.8 % yield+24 % CAR+7.8 % DER+280NBPS+548 CPB	112
4.	NGO-MFI+JLG + 23.8 % yield+24 % CAR+7.8 % DER+280NBPS+548 CPB	110

References:

Ayayi Ayi Gavriel and Sene Maty. —What drives microfinance institution's financial sustainability?|| *The Journal of Developing Areas*, 44.1(2010): 303-324, Print.

Barrès Isabelle. "Breaking it Down... Efficiency.|| *MICROBANKING BULLETIN*, Microfinance Information eXchange, Inc, 14(2007): 29-30.

Boas Klaus. —Indicators of financial sustainability.|| (2012) <http://www.thesustainablengo.org/improving-financial-viability/financial-sustainability-indicators>, Accessed on 18th December 2015.

Bhanot Disha and Bapat Varadraj. "Sustainability index of micro finance institutions (MFIs) and contributory factors", *International Journal of Social Economics*, 42(4), 2015: pp. 387 – 403

-
- Dutta, Pinky and Das, Debabrata. "Indian MFI at crossroads: sustainability perspective", *Corporate Governance: The international journal of business in society*, 14.5 (2014):728 – 748, Print.
- Gonzalez, Adrian. —Efficiency Drivers of Microfinance Institutions (MFIs): The Case of Operating Expenses.‖ *MicroBanking Bulletin Highlights*, 15 (2008): 1-6. Print
- Hermes, Niels and Lensink, Robert. —The Empirics of Microfinance: What Do We Know?‖, *The Economic Journal*, 117.517(2007):F1-F10, Print
- Hermes, Niels, Lensink, Robert and Meesters, Aljar. —Outreach and Efficiency of Microfinance Institutions.‖ *World Development*, 39 (6) (2011): 938–948, Print.
- Karduck, S. and Siebel Hans D. —Transaction costs of self-help groups in NABARD_s SHG banking program: a study in Karnataka statel. NABARD, (2004):17-21, Print.
- Khandker, S.R. and Khalily, B. (1996), —The Bangladesh rural advancement committee's credit programs‖, World Bank Discussion Paper No. 324.
- Ledgerwood, Joanna. —Sustainable Banking with the poor-Microfinance Handbook: An Institutional and Financial perspective‖. The World Bank, (1999).
- Marakkath Nadiya, M., Polanco, F. and Ramanan, T. (2012), —Dangers in Mismanaging the Factors Affecting the Operational Self-Sustainability (OSS) of Indian Microfinance Institutions (MFIs)—An Exploration into Indian Microfinance Crisis‖, *Asian Economic and Financial Review*, Vol.2, No. 3, pp. 448-462.
- M-CRIL. —M-CRIL Microfinance Review 2014: Risk, regulation & reward.‖ *Micro-Credit Ratings International Limited*, (2014):1-55, Print.
- Meyer, Richard L. —Track Record of Financial Institutions in Assisting the Poor in Asia.‖ *Asian Development Bank Institute Research Paper*, 49 (2002):1-42, Online.
- Morduch, Jonathan. —TheMicrofinance Schism‖, *World Development*, 28.4 (2000): 617- 629, print.

-
- Pollinger, J. Jordan, Outhwaite, John and Cordero-Guzman, Hector. —The question of sustainability for Microfinance institutions, *Journal of Small Business Management*, 45. (1007): 23-41, Print.
- Rai, Anand K. and Rai, Sandhya. —Factors Affecting Financial Sustainability of Microfinance Institutions. *Journal of Economics and Sustainable Development*, 3.6, (2012): 1-10, Online.
- Rosenberg, Richard. —Measuring Results of Microfinance Institutions Minimum Indicators That Donors and Investors Should Track: A Technical Guide. *Consultative Group to Assist the Poor*, The World Bank, (2009):1-25, Print.
- Sa-Dhan. —Tracking Financial Performance Standards of Microfinance Institution, An Operational Manual Technical Tool Series-1. Sa-dhan Microfinance Resources Center.
- Schreiner, Mark. —Ways Donors Can Help the Evolution of Sustainable Microfinance Organizations. *Savings and Development*, 24. 4 (2000): 423–437, Print.
- Singh, Anup; Anand, Abhishek and Pareek, Abhay. —Small Finance Banks – Is there an Opportunity for MFIs/NBFCs? *Microsave*, (2015):1-75, Print.