

DRIVERS OF SUSTAINABILITY OF INDIAN MICROFINANCE INSTITUTIONS

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Abstract *Microfinance is the most preferred way of satisfying the essentials of poor which are generally not taken care of by formal financial institutions. It is the way to facilitate them to uphold self-employment through various financial services like provision of funds, insurance, credit etc. Microfinance institutions cater to the need of major section of society by providing access to funds and other financial services, which basically lack access to these services. To accomplish this moral objective microfinance institutions (MFIs) need to be profitable and sustainable. Thus most important question arises is: what factors drive the sustainability of MFIs. The aim of microfinance is to alleviate poverty with the help of increasing access to finance.*

For well-being of the poor, good sustainable performance of MFIs must be achieved. Therefore, the present study attempts to explore different factors which might affect sustainability of Indian MFIs. Panel regression analysis is used to identify the determinants of sustainability of Indian MFIs. Due to non-availability of data for most of the MFIs, five years (2009-2013) data for 46 MFIs shall constitute our sample size. Results of the study exhibit that variables such as average loan balance, borrowers per staff member, return on asset, and yield on gross loan portfolio are major determinants of sustainability (financial and operational sustainability) of Indian MFIs.

Keywords *Microfinance, Microfinance Institutions, Financial Sustainability, Operational Sustainability*

INTRODUCTION

The word ‘microfinance’ refers to provision of thrift and other financial services to poor people who generally do not have access to banking and other related financial services. Thus, any small scale activity characterised by limited funds and low income beneficiaries may come under the category of microfinance (Mario La Torre, 2006). Microfinance includes wide array of financial services such as credit, savings, insurance, money transfer etc. Microfinance provides credit in small amounts along with other allied services to those who lack access to essential resources. Microfinance has become global phenomenon. Governments, central banks, donors, practitioners, and other development agencies promoting microfinance are increasingly involved in developing suitable policy initiatives for meeting local needs. Recently, microfinance has been considering the needs of small entrepreneurs or self-employed people which do not get bank loans. For micro-entrepreneurs, microfinance symbolizes an alternative to credit given by lenders. In India, many institutions operating in public and private sector render microfinance services. These institutions are bifurcated into two main categories: i) formal institutions and ii) semi-formal institutions. The first category i.e. formal institutions includes commercial banks, development financial institutions, regional rural banks and co-operative banks that render microfinance services in addition to their general banking activities and are known

as microfinance service providers whereas, semi-formal institutions providing microfinance services as key activity are denoted as microfinance institutions (MFIs).

Microfinance institutions have emerged as powerful instrument of economic development providing benefits to poor people. To offer micro-finance and other support services, sustainability of MFIs is a pre-requisite. Ledgerwood (1999) explained that MFIs being development organisations are assumed to fulfil the financial needs of economically weaker section of the society by providing employment or to facilitate them to start their own business although at small level. However it is argued that these positive impacts can be sustained only when MFIs are able to attain sound financial performance in long run. Due to the vital importance of MFIs as already discussed, sustainability of the MFIs is one of the critical issues that have gained attention of researchers throughout the world.

The financial sustainability of MFIs is an indispensable condition for institutional sustainability (Hollis & Sweetman, 1998) and the most essential prerequisite for any MFI (LOGOTRI, 2006). Schreiner (2000) said “unsustainable MFIs might help the poor now, but they will not help the poor in the future because the MFIs will be gone”. Moreover, it was also argued that it is betterment for an economy not to have MFIs than having unsustainable ones (Ganka, 2010). The unsustainable MFIs may hurt those people to whom

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they actually want to help (Krahnén & Schmidt, 1994). This indicates how crucial is studying the sustainability of MFIs and its determinants. As Ganka (2010) points out that microfinance paradigms tries to alleviate poverty level with the help of convalescing access to finance and other financial services. However, mostly microfinance institutions face the problem of achieving the level of financial sustainability (Dunford, 2003). From banker's viewpoint, any MFI is believed to be function at sustainability level when it can cover all the operating costs from its operating income (Kimando, 2012). The above definition takes "accounting approach" of sustainability into consideration by considering bankers' viewpoint. To define the expression "sustainability" Shah (1999) adopted an integrated approach and explained that concept of sustainability also incorporates other factors such as procuring funds at market rate and deployment of local resources.

Sustainability of Microfinance Institutions

Sustainability is foundation of a sound microfinance. In microfinance sustainability is understood primarily as the ability of MFIs to repay loans over time. The term sustainability is generally pertains to ability of MFI to cover its costs through interest and other generated income. Navajas *et al.* (2000) describe that "sustainability is generally defined as permanence", also the ability to repeat performance through time (Schreiner, 2000). CGAP (2004) labels sustainability as "it allows the continued operation of the microfinance provider and the ongoing provision of financial services to the poor". This will depend on the sustainability of MFIs themselves, sustainability of their market, sustainability of legal policy as an enabling environment, and sustainability of the impact they have on the poor. According to Khandker *et al.* (1995), the "concept of sustainability of microfinance can be divided in 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."

The success of an MFI is usually judged by their ability to be financially sustainable (Marakkath & Ramanan, 2012). However, only a small percent of the MFIs are sustainable to run their operations without subsidies (Hulme & Mosley, 1996). Further, due to high cost of delivering services to the poor, it is difficult for the MFIs to operate sustainably (CGAP, 1995; Hermes & Lensink, 2011). In contrast, Morduch (2000) and Little field and Rosenberg (2004) argued that MFIs can be financially sustainable by charging adequate interest

rate and by developing institutional capacity. Furthermore, it has been seen that MFIs have different dimensions of sustainability and one of the most crucial dimension of sustainability is the financial sustainability. Numerous researchers have defined the term 'financial sustainability' in their own way. In literature there is not any well-defined definition of the word financial sustainability. The various agencies such as ACCION, Women's World Banking, MIX and Planet rating etc. have tried to explain the expression 'financial sustainability' in different way. Financial self-sustainability is assumed to be obtained when the return on equity, net of any subsidy received, equals or exceeds the opportunity cost of funds.

Financial Sustainability

Financial sustainability is the building block of sustainability of any microfinance institution.

The concept of financial sustainability in context of microfinance implies that MFI is able to generate sufficient revenue so that it can cover all its cost without relying on subsidies and donor funds. The costs here comprise present costs incurred to maintain current operations and those incurred to support growth. Dunford (2003) defines financial sustainability as "the ability to keep on going towards microfinance objective without continuing donor support." The definition infers the likelihood of generating profit out of the microfinance activities. Due to its importance in microfinance performance, quite often, in microfinance literature the terms "financial sustainability" have been used to define institutional sustainability of microfinance institutions (Hollis & Sweetman, 1998). CGAP (2004) expresses sustainability as the "ability of a microfinance provider to cover all of its costs. Achieving financial sustainability means reducing transaction costs, offering better products and services that meet client needs, and finding new ways to reach the unbanked poor".

The financial sustainability of microfinance institutions consists of mainly in finding a balance between the profit gained from the projects and the cost of carrying them out. Financially as well as operationally sustainable MFIs are tend to become crucial division of our financial system as they are able to operate in the long run without depending on external grant. Donors have nowhere near enough funds to meet the global demand for microfinance. But when an MFI becomes sustainable, it is no longer limited to donor funding. It can also fetch commercial funds to finance immense extension of its outreach to poor people. The above definitions of financial sustainability confer that the MFI cannot be considered as financially sustainable if it is making loss. And also, profit generating MFI cannot be classified as financially sustainable whose profitability is ascertained in terms of its ability to cover operating cost by subsidised resources or funds.

MFIs attain financial self-sufficiency when they are able to cover all administrative costs, loan losses, and financing costs from operating income, after adjusting for inflation and subsidies and treating all funding as if it had a commercial cost. That is, to cover its costs if its activities were not subsidised and if it raised capital at commercial rates (Balkenhol, 2007). Chaves and Gonzalez-Vega (1996) have advocated that “the self-sustainability requires the MFIs to be able to cover at least opportunity cost of all factors of production and assets from self-generated income”. MFIs are assumed to be financially self-sufficient when their FSS ratio (financial income/ financial & operating cost + loan loss provision + imputed cost of capital) is above 100%. It is believed that successful MFIs are able to obtain financial self-sufficiency within five to ten years.

Operational Sustainability

Meyer (2002) defines operational sustainability as “ability of the MFI to cover its operational costs from its operating income regardless of whether it is subsidised or not. The operational self-sustainability (OSS) is a similar ratio to FSS but does not take capital costs into account. It indicates whether enough revenue has been generated to cover direct costs excluding adjusted cost of capital but including any financial costs incurred.” MFIs are said to be operationally sustainable when their OSS ratio (financial income/ financial & operating cost + loan loss provision) is above 100%.

The rest of the paper is structured as follows: second section deals with objectives of the study. Third section sheds light upon significance of the study. Fourth section discusses the relevant literature on the topic of sustainability of MFIs. Description of data and research methodology follows in fifth section. Sixth section presents the results of the study and a detailed discussion on it. Finally, summary and conclusions are presented in seventh section.

OBJECTIVES

The objectives of the study are as follows:

1. To assess sustainability (financial sustainability & operational sustainability) of Indian MFIs.
2. To determine factors influencing financial sustainability (FSS) of the Indian MFIs.
3. To determine factors influencing operational sustainability (OSS) of the Indian MFIs.

SIGNIFICANCE OF THE STUDY

MFIs play elemental role in the growth process of any developing nation. In India being developing country MFIs

also have very significant role to play as they help the country in dropping down the poverty level and promoting self-employment. Sustainability analysis is of foremost importance for all kinds of activity which relates to business or economy. However, for microfinance institutions, for two reasons it becomes very crucial element. First, MFIs works with skewed clientele who are separated from the formal financial system, as funding to them is considered to be risky and profitability from this segment is not so enough. Therefore, it is assumed that the institutions that works with such segmented clientele faces larger problems in realizing costs and drawing adequate profits in the medium to long term. Secondly, the cost of operations incurred for the screening of unimpeachable individuals and micro business and the regular monitoring of those borrowers are such that, when compared to the profit realised from an individual client, this can result in little advantageous in working for such small amounts. To this end the performance of the MFIs is key for the well-being of the society and the economy at large. Despite their foremost contribution to rural financial services, it has been reported that the MFIs only delivers to less number of population. In order to survive in the long run and to reach wider section of poor people, MFIs need to financially and operationally sustainable. Robinson (2001) in his study argued that government funds can fulfil only a small percentage of micro-finance demand and finally concluded that basically sustainable and efficient MFIs are able to maintain their business in the long run. Despite the major role played by MFIs, micro-finance sector particularly in India on the institutions part has rarely been investigated. Therefore this study emphasis on analysing the sustainability of the MFI and what are the various determinants of sustainability of these MFIs.

REVIEW OF LITERATURE

This section is divided into two subsections; first sub-section provides brief review of studies focusing on sustainability of MFIs and second sub-section throws light upon studies emphasizing on determining factors affecting sustainability of MFIs.

Sustainability of MFIs

Meyer (2002) explained that poor people are required to provide funds and other financial services on continuous basis. Short-term loan would worsen the welfare of the poor (Navajas *et al.*, 2000). According to Meyer (2002), there are two kinds of sustainability that we could observe in assessing MFIs performance: (i) operational self-sustainability and (ii) financial self-sustainability. Operational self-sustainability is said to exist when any institution is generating sufficient operating income so that operational costs like salaries,

supplies, loan losses, and other administrative costs can be covered. Financial self-sustainability is said to be achieved when MFIs are also able to cover the costs of funds and other forms of subsidies received when they are valued at market prices. Meyer (2002) indicated, "Measuring financial sustainability requires that MFIs maintain good financial accounts and follow recognised accounting practices that provide full transparency for income, expenses, loan recovery, and potential losses." Paxton (2002) and Nyamsogoro (2010) examined the trade-off between depth of outreach and sustainability of MFIs. The inverse relationship between depth of outreach and sustainability was found for other commonly used outreach proxies including average loan/GNP per economically active person, average annual loan/GNP, and average annual loan size was found by Paxton. On the contrary a positive relation between outreach and sustainability was found in another study conducted by Nyamsogoro. Rai, Kanwal, & Sharma (2010) formulated a model for measuring financial sustainability of MFIs by using five financial indicators such as portfolio at risk >30 days, write off ratio, operating cost ratio, average no. of active borrowers, operational self-sufficiency. This model can be used to enumerate the level of financial sustainability of MFI.

Factors influencing sustainability of MFIs

Crombrugghe *et al.* (2008) observed that the performance indicators of an MFI improve with age. He found that any increment in the number of borrowers can reduce the cost of the MFIs. Hence, to capture the effect of staff productivity on OSS of the MFIs, average number of borrowers per staff is included in the study. Kneiding and Mas (2009) found that the efficiency of the MFIs continuously improve over time. Apart from age, legal status of MFIs is also considered for study. Kimando, Njogu and Kihoro (2012) used descriptive study to identify the factors and focused his study in Murang'a municipality and also tried to identify whether financial regulations, geographical coverage and reach of the MFIs in Murang'a municipality influence their sustainability. They found that financial coverage, financial regulations, number of clients served, and geographical coverage are the major determinants of sustainability of MFIs. Bogan (2012), Iezza (2010), and Nyamsogoro (2010) observed that the size of the capital assets of an MFI and its capital structure are positively associated with the sustainability of the institution. Khandker (2011) found that loan repayment is also a major determinant of financial sustainability of MFIs. A number of studies in different countries are also conducted to explore factors affecting the financial sustainability of MFIs by using sample of large and well developed MFIs. Some of the determinants are found to be important in one economy or applicable to a set of MFIs, whereas some are found not to be significant. Studies conducted by Nyamsogoro

(2010), Ayayi and Sene (2010), Rai and Rai (2012), Kinde (2012), Kimando and Kihoro (2012) focused on determining factors affecting financial sustainability of MFIs in different countries. However methodologies applied by them were somewhat different. Ayayi & Sene (2010) applied regression method and found that high quality credit portfolio, high interest rates, client outreach and age of MFI are major determinants of MFIs' sustainability, whereas Nyamsogoro (2010) used the accounting profitability theory approach to study the determinants of financial sustainability and found that outreach related factors such as micro-finance's capital structure, interest rates charged, differences in lending type, cost per borrower, product type, MFI size, number of borrowers and efficiency related factors yield on gross loan portfolio, level of portfolio at risk, liquidity level, staff productivity, operating efficiency are some factors that affect the financial sustainability of rural microfinance institutions in Tanzania. Rai and Rai (2012) applied regression method to identify the factors affecting financial sustainability of MFIs in India and Bangladesh and found that capital/assets ratio, par>30 days, borrower per staff member, number of active borrowers, percent of women borrowers, age, debt/equity ratio, yield and return on equity are important factors affecting financial sustainability of MFIs. Authors also created an index to ascertain the financial sustainability of MFIs. Similarly Kinde (2012) identified factors affecting financial sustainability of MFIs in Ethiopia by applying panel data regression modelling by using least square method. Results of the study exhibited that major determinants of financial sustainability of MFIs are dependency ratio, breadth & depth of outreach, and cost per borrower. It was also found that staff productivity and capital structure do not have significant impact on financial sustainability of MFIs in Ethiopia.

RESEARCH METHODOLOGY

This section provides an overview of research methodology used to achieve the said objectives.

Data Source

The population for the study is all Micro Finance Institutions (MFIs) operative in India. The requisite data are sourced from MIX website. MIX (Microfinance Information Exchange) is a non-profit private organisation providing information related to microfinance institutions operating all over the world.

Sample Size

All MFIs operating in India can be categorised into 4 different categories such as NBFIs, NGOs, Credit Unions,

Cooperative Banks & others. All Indian MFIs reporting their data on MIX are considered for selecting the sample units. Out of 190 Indian MFIs which are reporting their financial data to MIX, only 88 MFIs reported in the year ended March 2013 and 52 MFIs had reported for consecutive 5 years i.e. 2009-2013.

Out of these MFIs 37 are NBFIs, 13 are NGOs, 1 is credit union and 1 is of co-operative type. For purpose of the study only NBFIs & NGOs types of MFIs are taken into consideration. But data reported by 4 NGO MFIs have some frequent missing values, so these are omitted from our sample size. So, on the basis of availability of data 46 MFIs belonging to only NBFI & NGO categories are being selected for the purpose of study. The study shall be based on last 5 years data (2009-2013). The list of selected sample MFIs is shown in Table 1.

Table 1: List of MFIs in the Sample

S. No.	Name of MFI	Legal Status
1	Adhikar	NBFI
2	AML	NBFI
3	Arohan	NBFI
4	ASA India	NBFI
5	Asirvad	NBFI
6	BASIX	NBFI
7	BFL	NBFI
8	Bandhan	NBFI
9	BSS	NBFI
10	CASHPOR MC	NBFI
11	ESAF	NBFI
12	GVMFL	NBFI
13	IDF Financial Services	NBFI
14	JFSPL	NBFI
15	RGVN(NE)	NBFI
16	Samasta	NBFI
17	SCNL	NBFI
18	SKS	NBFI
19	SMILE	NBFI
20	SML	NBFI
21	SNFL	NBFI
22	Sonata	NBFI
23	Spandana	NBFI
24	Suryoday	NBFI
25	SVCL	NBFI
26	Swadhaar	NBFI
27	Trident Microfinance	NBFI

S. No.	Name of MFI	Legal Status
28	UFSPL	NBFI
29	Ujjivan	NBFI
30	Utkarsh	NBFI
31	VFS	NBFI
32	MMFL	NBFI
33	BSFL	NBFI
34	FFSL	NBFI
35	HIH	NBFI
36	ASOMI	NBFI
37	EQUITAS	NBFI
38	BJS	NGO
39	GU	NGO
40	Mahasamam	NGO
41	NEED	NGO
42	Sahara Utsarga	NGO
43	Sanghamithra	NGO
44	Sarala	NGO
45	SKDRP	NGO
46	WSE	NGO

Research Methodology

This section is primarily divided into two subsections. First section deals with methodology to assess or to compute financial self-sufficiency (FSS) and operational self-sufficiency (OSS). Second section presents methodology to determine factors affecting financial and operational sustainability of MFIs.

Sustainability of MFIs

Sustainability has both an institutional and a financial dimension. In the present study sustainability of the MFIs is assessed with the help of two important sustainability indicators i.e. financial self-sufficiency (FSS) and operational self-sufficiency (OSS). Sustainability is said to be achieved when FSS ratio and OSS ratio is above 100%. Value of OSS ratio is provided in the financial statement of MFIs. Financial self-sufficiency (FSS) is computed as:

Adjusting Operating Revenue

FSS =

Adjusting Operating Revenue

Adjusted Financial expenses + Loan loss provision expense
+ Adjusted operating expense

where,

Adjusted Operating Revenue = Financial Revenue net of accrued interest + Other revenue from financial services

Adjusted Financial Expense = Interest & Fee expense on funding liabilities + Inflation adjustment expense + Other financial expense

Adjusted Operating Expense = Personnel expense + Administrative expense”

source: microbanking bulletin (2002)

Determinants of Sustainability

Since the present study has used 2 indicators (FSS & OSS) to appraise sustainability of the MFIs, these two variables are used as dependent variables of the study. Determinants of each dependent variable are identified separately.

Correlation Analysis and Variable Selection

After studying literature, 15 variables are identified initially, as potentially significant variables influencing sustainability (FSS & OSS) of the MFIs. Pairwise correlation analysis is conducted before conducting the regression analysis. The correlation analysis helps to actuate variables which are in high correlation and would be able to cause multicollinearity problem in our model. Multicollinearity condition is a situation where there is high, but not perfect correlation between two or more explanatory variables. According to Churchill and Iacobucci (2005) when there is multicollinearity, the amount of information about the effect of explanatory variables on dependent variable decreases. As a result, many of the explanatory variables could be judged as not related to the dependent variable when in fact they are. Other effects of multicollinearity condition in the data include: small change in data produces wide swing in parameter estimates; coefficients may have high standard errors and low significance level; coefficients could also

have wrong signs (Greene, 2003). Thus, as Churchill and Iacobucci (2005) have argued, multicollinearity condition reduces the efficiency of the estimates.

The correlation analysis (see Appendix 3) revealed that the number of personnel (NOP) is highly correlated with active number of borrowers (ACTBOR) and gross loan portfolio (GLP) at 0.949139 & 0.90511 respectively. Other strong correlations are found between active number of borrowers (ACTBOR) and gross loan portfolio (GLP) at 0.968; write-off ratio (WOR) & return on equity (ROE) at 0.80173; return on asset (ROA) and profit margin (PM) at 0.78643. Further, variable size (SZ) is found to be highly correlated with active number of borrowers (ACTBOR), gross loan portfolio (GLP) and number of personnel (NOP) at 0.951432, 0.979902 & 0.901747 respectively. No other variables are found to have high correlation coefficients to alarm for multicollinearity problem. So variables: number of personnel, active number of borrowers, write-off ratio, profit margin & size are removed for the purpose of analysis due to multicollinearity problem.

Independent Variables Considered in the Model

Results of correlation analysis reveal that out of selected 15 variables, 10 variables are free from multicollinearity problem. These variables are Average Loan Balance, Number of borrowers per staff member, Cost per borrower, Debt-equity ratio, Deposits, Gross loan portfolio, PAR>30, Return on Assets, Return on Equity, and Yield. After running regression analysis it is found that two variables Return on equity and Deposits are highly insignificant and are not affecting explanatory power of the model i.e. value of adjusted R square does not change even after dropping these two variables, so it is further decided to drop these two variables as well. Finally eight variables are selected for purpose of the study. Description of these variables is given in Table 2.

Table 2: Explanatory Variables

S. No.	Variable	Notation	Proxies/Explanation of Variable	Indicative of	Expected Impact	Literature Support
Dependent Variables						
1	Financial Self-Sufficiency	FSS	Adjusting Operating Revenue/ (Adjusted Financial expense + Loan loss provision expense + Adjusted operating expense)			
2	Operational Self-Sufficiency	OSS	Financial Revenue/ (Financial & Operating expense+ Loan loss provision expense)			
Independent Variables						
1	Average Loan Balance	ALB	Total value of loans/Number of credit clients	Depth of outreach	+	Woller & Schnier(2002), Ayayi & Sene (2010), Kinde (2012)

S. No.	Variable	Notation	Proxies/Explanation of Variable	Indicative of	Expected Impact	Literature Support
2	No. of Borrowers per staff member	BPS	Number of active borrowers / No. of staff in MFI	Productivity	+	Nyamsogoro (2010), Ayayi & Sene(2010) Bereket (2013)
3	Cost per Borrower	CPB	The ratio of operating expense to number of active borrowers	Efficiency	–	Nyamsogoro (2010), Kinde (2012) , Bereket (2013), Das(2014)
4	Debt Equity Ratio	DE	Total liabilities/equity	Leverage	–	Wald (1999), Ayayi & Sene (2010), Kinde (2012), Bahnot & Bapat (2015)
5	Gross-Loan Portfolio	GLP	Total amount of money lent by MFI	Size of MFI	+	Bogan (2012), Bahnot & Bapat (2015)
6	Portfolio at Risk greater than 30 days	PAR>30	Percentage of value of GLP that is at risk of default (Default is recorded when the payment of principal is more than 30 days overdue)	Portfolio quality	–	Nyamsogoro (2010), Ayayi & Sene (2010), Bahnot & Bapat (2015)
7	Return on Asset	ROA	Net operating income after-tax / Average Assets	Operating Profitability	+	Tucker & Miles(2004), Bahnot & Bapat (2015)
8	Yield on Gross Loan Portfolio	YLD	Interest and Fees on Loan Portfolio/ Gross Loan portfolio	Revenue	+	Rai & Rai (2012)

Panel Data Regression Model

Panel data regression analysis is being applied to identify drivers of sustainability/financial and operational sustainability.

Regression Model

Regression model aims to establish the relationship between regressors (independent variables) and regressands (dependent variable) by using following equation:

$$Y_{it} = \alpha_i + \beta'X_{it} + \varepsilon_{it}$$

where Y_{it} is the value of the dependent variable for cross section unit i , at time t , where $i = 1 \dots N$; α_i is a heterogeneity or individual effect. It contains a constant term and set of individual or group specific variables which may be observed. X_{it} is the regressor with a coefficient β , and ε_{it} indicates the error term.

The regressand is an indicator of sustainability and regressors are possible determinants of sustainability. However in present study two dependent variables (regressand) such as financial self-sufficiency (FSS) and operational self-sufficiency (OSS) are taken and factors influencing both need to be identified separately. Therefore, the operational models for the empirical investigation used in this study are given in the following sub-sections.

Regression model for Financial Self-sufficiency

$$FSS_{it} = \beta_0 + \beta_1(ALB_{it}) + \beta_2(BPS_{it}) + \beta_3(CPB_{it}) + \beta_4(DE_{it}) + \beta_5(GLP_{it}) + \beta_6(PAR>30_{it}) + \beta_7(ROA_{it}) + \beta_7(YLD_{it}) + \varepsilon_{it}$$

where:

FSS_{it} = Ratio of adjusted operating revenue to adjusted financial & operating expense and loan loss provision for firm i in period t

β_0 = Constant

β_1 = Regression coefficient of Average loan balance (ALB)

ALB_{it} = Independent variable Average loan balance (ALB) for MFI 'i'

β_2 = Regression coefficient of Borrower per staff member (BPS)

BPS_{it} = Independent variable Borrower per staff member (BPS) for MFI 'i'

β_3 = Regression coefficient of Cost per Borrower (CPB)

CPB_{it} = Independent variable Cost per Borrower for MFI 'i'

β_4 = Regression coefficient of Debt Equity ratio (DE)

DE_{it} = Independent variable Debt Equity ratio (DE) MFI 'i'

β_5 = Regression coefficient of Gross loan portfolio (GLP)

GLP_{it} = Independent variable Gross loan portfolio (GLP) for MFI 'i'

β_6 = Regression coefficient of Portfolio at Risk greater than 30 days (PAR>30)

$PAR>30_{it}$ = Independent variable Portfolio at Risk greater than 30 days (PAR>30) for MFI 'i'

β_7 = Regression coefficient of Return on Asset (ROA)

ROA_{it} = Independent variable Return on Asset (ROA) for MFI 'i'

β_8 = Regression coefficient of Yield on gross loan portfolio (YLD)

YLD_{it} = Independent variable Yield on gross loan portfolio (YLD) for MFI 'i'

ϵ_{it} = Error term

Regression Model for Operational Self-sufficiency

$$OSS_{it} = \beta_0 + \beta_1(ALB_{it}) + \beta_2(BPS_{it}) + \beta_3(CPB_{it}) + \beta_4(DE_{it}) + \beta_5(GLP_{it}) + \beta_6(PAR>30_{it}) + \beta_7(ROA_{it}) + \beta_8(YLD_{it}) + \epsilon_{it}$$

where:

OSS_{it} = Ratio of adjusted operating revenue to adjusted financial & operating

Expense for firm i in period t

β_0 = Constant

β_1 = Regression coefficient of Average loan balance (ALB)

ALB_{it} = Independent variable Average loan balance (ALB) for MFI 'i'

β_2 = Regression coefficient of MFI's Borrower per staff member (BPS)

BPS_{it} = Independent variable Borrower per staff member (BPS) for MFI 'i'

β_3 = Regression coefficient of MFI's Cost per Borrower (CPB)

CPB_{it} = Independent variable Cost per Borrower for MFI 'i'

β_4 = Regression coefficient of Debt Equity ratio (DE)

DE_{it} = Independent variable Debt Equity ratio (DE) MFI 'i'

β_5 = Regression coefficient of Gross loan portfolio (GLP)

GLP_{it} = Independent variable Gross loan portfolio (GLP) for MFI 'i'

β_6 = Regression coefficient of Portfolio at Risk greater than 30 days (PAR>30)

$PAR>30_{it}$ = Independent variable Portfolio at Risk greater than 30 days (PAR>30) for MFI 'i'

β_7 = Regression coefficient of Return on Asset (ROA)

ROA_{it} = Independent variable Return on Asset (ROA) for MFI 'i'

β_8 = Regression coefficient of Yield on gross loan portfolio (YLD)

YLD_{it} = Independent variable Yield on gross loan portfolio (YLD) for MFI 'i'

ϵ_{it} = Error term

Fixed Effects vs Random Effects

Panel data regression is adopted to identify the possible determinants of sustainability because the sample contained data across firms and overtime. Since panel data comprises observations on the same cross-sectional units over different time periods, there might be cross-sectional effects on each firm or on a set of group of firms. Two panel econometric models, the fixed effect model and random effect model, are designed to be applied when dealing with such a situation. A fixed effect (FE) model specification is incorporated in the studies where the individual and/or time specific effects are correlated with the explanatory variable. Moreover, each cross-sectional entity is recognised with some specific attributes of its own. However fixed effect cannot be used as a better estimator in case the individual specific effects are not correlated with the explanatory variable. Another, significant limitation of fixed effect model is that it cannot be used to generate reliable results in case the individual or entities do not vary or vary insignificantly across time. The random effects model estimates the coefficients under the assumption that the individual or group effects are uncorrelated with other explanatory variables and can be formulated. The study uses Hausman test designed to identify whether fixed effect or random effect model should be applied. Hausman test is basically designed to test whether individual effects are correlated with independent variables.

Hypotheses of the Study

Average loan balance (ALB) is indicator of depth of outreach of MFI.

Ha1: Average loan balance positively affects financial sustainability/operational sustainability of Indian MFIs.

The number of borrowers per staff (BPS) is a measure of staff productivity.

Ha2: Number of borrowers per staff member positively affects financial sustainability/operational sustainability of Indian MFIs.

Cost per borrower (CPB) enumerates effectiveness of MFI in reducing cost provided number of borrowers they are serving.

Ha3: Cost per borrower negatively affects financial sustainability/operational sustainability of Indian MFIs.

Debt Equity ratio (DE) indicates the relationship of debt to equity financing.

Ha4: Debt Equity ratio negatively affects financial sustainability/operational sustainability of Indian MFIs.

Gross loan portfolio (GLP) assesses the growth of the MFIs.

Ha5: Gross loan portfolio positively affects financial sustainability/operational sustainability of Indian MFIs

Portfolio at Risk greater than 30 days (PAR>30) depicts quality of loan portfolio.

Ha6: PAR>30 negatively affects financial sustainability/operational sustainability of Indian MFIs.

Return on Asset (ROA) assess the financial performance of MFI.

Ha7: Return on Asset positively affects financial sustainability/operational sustainability of Indian MFIs

Yield on Gross Loan Portfolio (YLD) represents the impact of revenue on sustainability of MFIs.

Ha8: Yield on gross loan portfolio positively affects financial sustainability/operational sustainability of Indian MFIs.

RESULTS AND ANALYSIS

Financial Self-sufficiency and Operational Self-sufficiency by Microfinance Institution

Table 3: FSS and OSS Scores of MFI

S. No.	Name of MFI	FSS Score	OSS Score
1	Adhikar	1.020893	1.07426
2	AML	0.992112	0.89328
3	Arohan	0.905744	0.98066
4	ASA India	1.090166	1.3656
5	Asirvad	0.988615	1.2792
6	BASIX	0.804296	0.77886
7	BFL	0.975816	1.03452
8	Bandhan	1.555548	1.6055
9	BSS	1.107782	1.14938

S. No.	Name of MFI	FSS Score	OSS Score
10	CASHPOR MC	1.106163	1.13008
11	ESAF	1.067769	1.07452
12	GVMFL	1.115417	1.13952
13	IDF Financial Services	1.008589	1.09452
14	JFSPL	0.870135	0.93172
15	RGVN(NE)	1.214015	1.25134
16	Samasta	0.907451	0.98144
17	SCNL	0.998668	1.07472
18	SKS	0.922818	0.92326
19	SMILE	1.073837	1.20124
20	SML	1.013309	0.94992
21	SNFL	0.872819	1.00362
22	Sonata	1.135889	1.26974
23	Spandana	1.16834	1.04116
24	Suryoday	0.713935	0.83268
25	SVCL	0.540302	0.5672
26	Swadhaar	0.667352	0.73504
27	Trident Microfinance	0.883465	0.76092
28	UFSP	0.918804	1.10844
29	Ujjivan	1.006657	1.11042
30	Utkarsh	0.900064	1.04314
31	VFS	1.086916	1.17684
32	MMFL	1.191238	1.35722
33	BSFL	0.804296	0.77886
34	FFSL	1.145117	1.18642
35	HIH	0.364304	0.37686
36	ASOMI	0.798858	1.12876
37	EQUITAS	1.091764	1.23944
38	BJS	1.138733	1.12934
39	GU	0.969178	0.93458
40	Mahasamam	1.062168	1.05854
41	NEED	1.113925	1.14862
42	Sahara Utsarga	1.25831	1.31034
43	Sanghamithra	1.086117	1.1965
44	Sarala	1.490147	1.51874
45	SKDRP	1.114939	1.11616
46	WSE	1.114939	1.15478
Average		1.008211	1.06952
No. of Sustainable MFIs		26	32

Source: Author's computation, (Above FSS & OSS scores are average of FSS & OSS scores from year 2009-2013, for details refer Appendix 1 & 2)

Interpretation

In present study, sustainability of Indian MFIs is assessed in terms of operational self-sufficiency and financial self-sufficiency. Even though Indian microfinance sector have seen many ups and down in past years, the MFIs have exhibited remarkable progress in both dimensions of sustainability i.e. financial and operational sustainability over the study period. Table 3 exhibits that out of the sample of 46 MFIs, 26 are financially sustainable whereas in terms of operational sustainability number is quite high, 32 MFIs in India are found to be operationally sustainable. It should be noted that MFI having FSS or OSS score equal to or greater than 1 (implies ratio is above or equal to 100%) are termed as sustainable MFI. The financial self-sufficiency of Indian MFIs ranges from the highest 156% (Bandhan) to the lowest 36% (HIH), whereas operational self-sufficiency of Indian MFIs ranges from the highest 160% (Bandhan) to the lowest 38% (HIH). Bandhan is ranked '1' in terms of both the financial sustainability as well as the operational sustainability having ratio more than 100% and HIH is ranked lowest on sustainability as its financial and operational self-sufficiency is less than 40%. It can also be observed that overall Indian MFIs are found to be financial and operational sustainable for the sample period as both average FSS and OSS scores are greater than '1' i.e. financial self-sufficiency and operational self-sufficiency ratio is above 100%.

Determinants of Financial Sustainability and Operational Sustainability

Empirical results on determinants of financial and operational sustainability of Indian MFIs are presented in this section. At the outset both fixed effects and random effects models are estimated. However, the performed Hausman test (Table 4 & 5) provides us evidence in favour of a fixed effect model. The empirical results using the fixed effect model are presented in Table 7.

Table 4: Hausman Test for Financial Self Sufficiency (FSS) as dependent variable

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	45.852438	8	0.000

Source: Author's computation

Table 5: Hausman Test for Operational Self Sufficiency (OSS) as dependent variable

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	38.079141	8	0.000

Source: Author's computation

Table 6: Estimation Results Using Fixed Effect Model

FSS as Dependent Variable					OSS as Dependent Variable				
Variable	Coefficient	Std. Error	t-Statistic	Prob.	Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.566828	0.06709	8.44907	0	C	0.698154	0.070743	9.868892	0
ALB	0.00185	0.00042	4.42897	0.0000***	ALB	0.001488	0.00044	3.378902	0.0009***
BPS	0.000273	8.93E-05	3.05861	0.0026***	BPS	0.000247	9.42E-05	2.618572	0.0096***
CPB	-0.001111	0.00081	-1.37228	0.1717	CPB	0.000532	0.000854	0.622952	0.5341
DE	-0.001526	0.00107	-1.43133	0.1541	DE	0.000238	0.001124	0.212084	0.8323
GLP	-3.10E-10	1.71E-10	-1.81367	0.0714*	GLP	-2.04E-10	1.80E-10	-1.1309	0.2596
PAR>30	-0.053835	0.04336	-1.24148	0.2161	PAR>30	-0.078602	0.045726	-1.71896	0.0874*
ROA	0.902569	0.1428	6.32061	0.0000***	ROA	1.648664	0.150578	10.94888	0.0000***
YLD	1.456346	0.19948	7.30081	0.0000***	YLD	1.071835	0.210346	5.095578	0.0000***
R- squared	0.789211				R-squared	0.824053			
Adjusted R squared	0.725735				Adjusted R-squared	0.771069			
F-statistic	12.43317				F-statistic	15.55287			
Prob(F-statistic)	0.0000				Prob(F-statistic)	0.0000			
Durbin-Watson stat	2.224739				Durbin-Watson stat	2.069253			

Source: Author's computation

***, ** and * denote significance level at the 1, 5 and 10% respectively

Interpretation

The results for Hausman test (Table 4 & 5) support in favour of rejecting the null hypothesis as $p < 0.05$, suggesting fixed effect model is better estimator as compare to random effect model for present study. Above table exhibits that the p-value of F-Statistic is less than 0.05 in both the cases which clearly indicates that our model is accurate and can be used to predict FSS and OSS value of Indian MFIs based on the independent variables included in our study. Value of R^2 represents the percentage of variation in the dependent variable explained by the independent variables in the model. Result shows the value of R squared is 78.92% when FSS is taken as dependent variable, representing that almost 79% variation in FSS is explained by given set of independent variables whereas when OSS is taken as dependent variable value of R^2 is 82.40% which indicates that 82.40% variation in OSS is explained by given set of independent variables. Value of DW statistic for FSS and OSS is 2.22 & 2.06 respectively which shows no autocorrelation among residuals or errors in regression are independent. The results revealed that majority of the explanatory variables confirm to our prior expectation.

Variables Having Significant Impact on the Financial Sustainability of the MFIs

Findings of the results exhibit that variables such as Average loan balance, Number of borrowers per staff member, Return on Assets, and Yield on gross loan portfolio are positively related with financial sustainability and highly significant at 1% significance level. On the other hand the variable gross loan portfolio is also found to be positively related with financial sustainability but significant at 10% level of significance whereas other variables like Debt equity ratio, Cost per borrower and $PAR > 30$ are found to have insignificant impact on financial sustainability of Indian MFIs.

Variables Having Significant Impact on the Operational Sustainability of the MFIs

Econometric results provide that the variables like Average loan balance, Number of borrowers per staff member, Return on Assets, Yield on gross loan portfolio has positive and statistically significant (at 1% significance level) impact on operational sustainability of the MFIs. Whereas the variable $PAR > 30$ is also found to be positively associated with operational sustainability but significant at 10% level of significance. On the other hand Debt equity ratio, Cost per borrower, and Gross loan portfolio are found to have insignificant impact on operational sustainability of the MFIs.

SUMMARY AND CONCLUSION

Microfinance is considered as an innovative financial weapon facilitating people to have access to funds and other financial services to those lacking access to banks and other financial institutions. Present study attempted to assess sustainability level of Indian MFIs both in terms of financial sustainability and operational sustainability. The study also tried to identify the main drivers of financial sustainability as well as operational sustainability of Indian MFIs. The study constituted a sample of 46 Indian MFIs over a 5-year period (2009-2013) and collected data from MIX website. Subsequently, data were processed and analysed further to test the model and to identify the determinants of financial and operational sustainability of MFIs. To identify the significant determinants, panel data regression model is used with the help of E-Views software (version 8). From the literature initially 15 variables were identified and due to multicollinearity problem and insignificant nature of the variables 7 variables were removed and finally eight variables were selected for the purpose of study.

Initially financial and operational sustainability performance of Indian MFIs was assessed for the period of 2009-2013. During the sample period Indian MFIs were found quite sustainable in both dimensions, 26 MFIs were found financially sustainable whereas 32 were operationally sustainable. So it can be said that more than 50% of MFIs are sustainable in India. Based on the empirical results obtained from econometric analysis, it is to be concluded that variables such as Average loan balance (ALB), Borrowers per staff member (BPS), Return on Asset (ROA), and Yield on gross loan portfolio (YLD) have statistically significant positive impact on both the financial and operational sustainability of Indian MFIs. Variables such as Cost per borrower (CPB) & Debt -Equity ratio (DE) seem to have insignificant impact on financial and operational sustainability of Indian MFIs. More specifically debt -equity ratio and cost per borrower have negative impact on financial sustainability whereas these variables are found to be positively associated with operational sustainability. Major notable difference in results is that variable gross loan portfolio (GLP) seems to have a significant impact on dependent variable FSS, however no significant association was found between this variable and operational self-sufficiency of the MFIs. Lastly, variable $PAR > 30$ which did not seem to affect the financial sustainability, appeared to affect the operational sustainability of the MFIs.

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APPENDICES

Appendix 1: Financial Sustainability by Institution, 2009-2013 (%)

S.No.	Name of MFI	Legal Status	2009	2010	2011	2012	2013	Average
1	Adhikar	NBFI	1.147073	1.07889	0.911014	1.033306	0.934181	1.02089
2	AML	NBFI	1.257214	1.338075	1.046879	0.52746	0.790934	0.992112
3	Arohan	NBFI	1.114606	1.113211	0.921863	0.54713	0.831911	0.905744
4	ASA India	NBFI	1.08742	1.372646	1.120727	1.043621	0.826416	1.09017
5	Asirvad	NBFI	0.862612	1.049917	1.051992	1.107447	0.871109	0.988615
6	BASIX	NBFI	1.108981	1.179091	0.999613	0.257323	0.476472	0.804296
7	BFL	NBFI	1.09946	1.030274	1.041503	1.021539	0.686302	0.975816
8	Bandhan	NBFI	1.638247	1.482628	1.537153	1.726143	1.393572	1.55555
9	BSS	NBFI	1.470324	0.974057	1.058214	1.016564	1.01975	1.10778
10	CASHPOR MC	NBFI	0.99845	1.194495	1.0862	1.122409	1.129263	1.10616
11	ESAF	NBFI	1.054706	1.020871	1.006375	1.16525	1.091643	1.06777
12	GVMFL	NBFI	1.21577	1.249251	1.134296	0.965046	1.012722	1.11542
13	IDF Financial Services	NBFI	1.039037	1.006338	0.932966	1.075773	0.988831	1.00859
14	JFSPL	NBFI	0.728567	0.709194	0.838235	1.038662	1.036015	0.870135
15	RGVN(NE)	NBFI	1.379095	1.274549	1.067766	1.125207	1.22346	1.21402
16	Samasta	NBFI	0.915759	0.732557	0.946199	0.974586	0.968157	0.907451
17	SCNL	NBFI	1.022271	1.07758	0.93719	0.994123	0.962177	0.998668
18	SKS	NBFI	1.187176	1.269774	1.062565	0.347678	0.746894	0.922818
19	SMILE	NBFI	1.10735	0.979516	1.167736	1.13582	0.978765	1.07384
20	SML	NBFI	1.436365	1.422982	0.76906	0.54062	0.89752	1.01331
21	SNFL	NBFI	0.909722	0.931296	0.807453	0.842576	0.873046	0.872819
22	Sonata	NBFI	1.401905	0.902811	1.177912	1.223095	0.973721	1.13589
23	Spandana	NBFI	1.614492	1.680532	0.844445	0.668941	1.033289	1.16834
24	Suryoday	NBFI	0.078281	0.723183	0.910091	0.908623	0.949498	0.713935
25	SVCL	NBFI	0	0.063464	0.662851	1.003094	0.972101	0.540302
26	Swadhaar	NBFI	0.28082	0.438902	0.694405	0.990768	0.931866	0.667352
27	Trident Microfinance	NBFI	1.007156	1.331533	1.282714	0.455727	0.340194	0.883465
28	UFSP	NBFI	0.502367	1.135275	1.070068	0.978997	0.907311	0.918804
29	Ujjivan	NBFI	0.798338	1.041585	1.088555	0.995143	1.109666	1.00666

S.No.	Name of MFI	Legal Status	2009	2010	2011	2012	2013	Average
30	Utkarsh	NBFI	1.174431	0.235142	0.944586	1.112324	1.033836	0.900064
31	VFS	NBFI	1.037925	1.034869	1.275893	1.126136	0.959757	1.08692
32	MMFL	NBFI	1.181916	1.318867	1.184381	1.128083	1.142945	1.19124
33	BSFL	NBFI	1.108981	1.179091	0.999613	0.257323	0.476472	0.804296
34	FFSL	NBFI	1.68359	1.324051	1.064363	0.801423	0.852158	1.14512
35	HIH	NBFI	0.891715	0.228081	0.261387	0.243694	0.196643	0.364304
36	ASOMI	NBFI	0.209169	0.758211	0.977375	1.107847	0.941686	0.798858
37	EQUITAS	NBFI	0.980838	1.181812	0.989615	1.197497	1.10906	1.09176
38	BJS	NGO	1.127607	1.104123	1.119102	1.234348	1.108486	1.13873
39	GU	NGO	1.13636	1.033674	1.075161	0.73611	0.864583	0.969178
40	Mahasemam	NGO	1.059943	1.020258	1.039394	1.111978	1.079267	1.06217
41	NEED	NGO	1.147625	1.115047	1.098842	1.154024	1.05409	1.11393
42	Sahara Utsarga	NGO	1.631106	1.224762	1.257328	1.198584	0.979769	1.25831
43	Sanghamithra	NGO	1.207428	0.94604	0.993605	1.050681	1.232832	1.08612
44	Sarala	NGO	1.384354	1.801258	1.473104	1.546052	1.245969	1.49015
45	SKDRP	NGO	1.034593	1.112357	1.110882	1.144042	1.172822	1.11494
46	WSE	NGO	1.068962	1.158186	1.218824	1.126883	1.00184	1.11494
	Average		1.055002	1.056094	1.02738	0.958906	0.943674	1.008211

Appendix 2: Operational Sustainability by Institution, 2009-2013 (%)

S. No.	Name of MFI	Legal Status	2009	2010	2011	2012	2013	Average
1	Adhikar	NBFI	1.1291	1.1541	1.0104	1.0577	1.02	1.07426
2	AML	NBFI	1.3104	1.4666	1.0799	0.4207	0.1888	0.89328
3	Arohan	NBFI	1.2037	1.1485	1.0179	0.5411	0.9921	0.98066
4	ASA India	NBFI	1.9358	1.7658	1.1656	1.0448	0.916	1.3656
5	Asirvad	NBFI	1.3274	1.5698	1.2289	1.088	1.1819	1.2792
6	BASIX	NBFI	1.1412	1.2632	1.0431	0.1462	0.3006	0.77886
7	BFL	NBFI	1.1724	1.1128	1.1306	1.0506	0.7062	1.03452
8	Bandhan	NBFI	1.7423	1.583	1.5652	1.6268	1.5102	1.6055
9	BSS	NBFI	1.4954	1.0561	1.1103	1.013	1.0721	1.14938
10	CASHPOR MC	NBFI	1.0154	1.2064	1.1126	1.1194	1.1966	1.13008
11	ESAF	NBFI	1.0507	1.0301	1.0376	1.1226	1.1316	1.07452
12	GVMFL	NBFI	1.2561	1.2536	1.1485	1.0016	1.0378	1.13952
13	IDF Financial Services	NBFI	1.0216	1.2525	1.0424	1.0664	1.0897	1.09452
14	JFSPL	NBFI	0.6908	0.8646	0.9563	1.0175	1.1294	0.93172
15	RGVN(NE)	NBFI	1.3024	1.2109	1.1843	1.2632	1.2959	1.25134
16	Samasta	NBFI	1.0283	0.8797	1.0135	0.9776	1.0081	0.98144
17	SCNL	NBFI	1.0718	1.1414	1.0613	1.039	1.0601	1.07472
18	SKS	NBFI	1.2853	1.3888	1.158	0.2536	0.5306	0.92326
19	SMILE	NBFI	1.1488	1.1937	1.3834	1.1943	1.086	1.20124
20	SML	NBFI	1.5172	1.5494	1.0327	0.4339	0.2164	0.94992

S. No.	Name of MFI	Legal Status	2009	2010	2011	2012	2013	Average
21	SNFL	NBFI	0.9966	1.0472	1.054	0.761	1.1593	1.00362
22	Sonata	NBFI	1.4442	1.0834	1.3816	1.282	1.1575	1.26974
23	Spandana	NBFI	1.6629	1.8004	1.0005	0.5636	0.1784	1.04116
24	Suryoday	NBFI	0.1103	0.8105	1.087	1.0368	1.1188	0.83268
25	SVCL	NBFI	0	0.0734	0.6916	1.0273	1.0437	0.5672
26	Swadhaar	NBFI	0.3118	0.4924	0.7937	1.0179	1.0594	0.73504
27	Trident Microfinance	NBFI	1.1417	1.3473	0.8408	0.4333	0.0415	0.76092
28	UFSPL	NBFI	1.0859	1.2429	1.1016	1.0322	1.0796	1.10844
29	Ujjivan	NBFI	0.9767	1.165	1.1301	1.0142	1.2661	1.11042
30	Utkarsh	NBFI	1.4118	0.3279	1.0602	1.2005	1.2153	1.04314
31	VFS	NBFI	1.1608	1.1026	1.402	1.1606	1.0582	1.17684
32	MMFL	NBFI	1.3257	1.622	1.3857	1.121	1.3317	1.35722
33	BSFL	NBFI	1.1412	1.2632	1.0431	0.1462	0.3006	0.77886
34	FFSL	NBFI	1.7506	1.5243	1.1944	0.6763	0.7865	1.18642
35	HIH	NBFI	0.8669	0.2502	0.295	0.2536	0.2186	0.37686
36	ASOMI	NBFI	1.3681	0.9421	1.1458	1.1455	1.0423	1.12876
37	EQUITAS	NBFI	1.0893	1.4496	1.265	1.1723	1.221	1.23944
38	BJS	NGO	1.1067	1.0562	1.1213	1.241	1.1215	1.12934
39	GU	NGO	1.0716	1.0112	1.0422	0.7122	0.8357	0.93458
40	Mahasamam	NGO	1.0554	1.0202	1.0412	1.084	1.0919	1.05854
41	NEED	NGO	1.1275	1.1274	1.1164	1.1748	1.197	1.14862
42	Sahara Utsarga	NGO	1.6482	1.357	1.2671	1.1582	1.1212	1.31034
43	Sanghamithra	NGO	1.1163	1.1913	1.2304	1.2169	1.2276	1.1965
44	Sarala	NGO	1.2701	1.8262	1.5357	1.5175	1.4442	1.51874
45	SKDRP	NGO	1.0134	1.127	1.1159	1.1197	1.2048	1.11616
46	WSE	NGO	1.0422	1.2477	1.3222	1.1198	1.042	1.15478
	Average		1.155261	1.165209	1.111891	0.953617	0.96162	1.06952

Appendix 3: Correlation Matrix for testing multicollinearity among the explanatory variables

	ACTBOR	ALB	BPS	CPB	DE	DPST	GLP	NOP	PAR>30	PM	ROA	ROE	SZ	WOR	YLD
ACTBOR	1	0.259836	0.041352	-0.097008	-0.077645	0.227851	0.968	0.949139	0.087321	-0.001794	-0.066813	-0.000456	0.951432	0.175363	-0.110248
ALB	0.259836	1	-0.02329	0.208458	-0.019759	0.086176	0.368352	0.230815	0.043683	0.035162	-0.014046	-0.079491	0.370713	-0.064079	-0.069631
BPS	0.041352	-0.02329	1	-0.260595	0.016144	-0.031465	0.043929	-0.051508	0.092121	-0.058552	0.028525	-0.075652	0.030505	-0.061278	-0.22099
CPB	-0.097008	0.208458	-0.260595	1	-0.063271	-0.009085	-0.092142	-0.038732	-0.057406	-0.359482	-0.473263	0.027877	-0.082268	0.00512	0.075591
DE	-0.077645	-0.019759	0.016144	-0.063271	1	0.031554	-0.078498	-0.040684	-0.118205	0.183905	0.244726	-0.033537	-0.018001	-0.119265	0.036877
DPST	0.227851	0.086176	-0.031465	-0.009085	0.031554	1	0.230686	0.241707	-0.030897	0.061835	0.089303	-0.017679	0.278134	-0.041207	0.033304
GLP	0.968	0.368352	0.043929	-0.092142	-0.078498	0.230686	1	0.905109	0.095485	0.016182	-0.020044	-0.018745	0.979902	0.089646	-0.097566
NOP	0.949139	0.230815	-0.051508	-0.038732	-0.040684	0.241707	0.905109	1	0.072198	-0.015142	-0.101309	0.114973	0.901747	0.28504	-0.083703
PAR>30	0.087321	0.043683	0.092121	-0.057406	-0.118205	-0.030897	0.095485	0.072198	1	-0.257535	-0.310782	0.163761	0.066794	0.199835	-0.231116
PM	-0.001794	0.035162	-0.058552	-0.359482	0.183905	0.061835	0.016182	-0.015142	-0.257535	1	0.786431	-0.241405	0.051739	-0.251382	0.376383
ROA	-0.066813	-0.014046	0.028525	-0.473263	0.244726	0.089303	-0.020044	-0.101309	-0.310782	0.786431	1	-0.431858	0.037579	-0.510173	0.41449
ROE	-0.000456	-0.079491	-0.075652	0.027877	-0.033537	-0.017679	-0.018745	0.114973	0.163761	-0.241405	-0.431858	1	-0.011516	0.801727	-0.168927
SZ	0.951432	0.370713	0.030505	-0.082268	-0.018001	0.278134	0.979902	0.901747	0.066794	0.051739	0.037579	-0.011516	1	0.082167	-0.065919
WOR	0.175363	-0.064079	-0.061278	0.00512	-0.119265	-0.041207	0.089646	0.28504	0.199835	-0.251382	-0.510173	0.801727	0.082167	1	-0.184019
YLD	-0.110248	-0.069631	-0.22099	0.075591	0.036877	0.033304	-0.097566	-0.083703	-0.231116	0.376383	0.41449	-0.168927	-0.065919	-0.184019	1