

# Leverage and Firm Efficiency: A Study of Indian Microfinance Institutions

**Swati Chauhan**

Research Scholar  
Indian Institute of Forest Management, Bhopal  
Nehru Nagar, Bhopal  
Email : swati.chauhan09@gmail.com

## ABSTRACT

Microfinance is the provision of providing savings, credit, insurance and remittance facility to poor and deprived people. Microfinance Institutions (MFIs) are playing a significant role in the development of developing countries like India by providing financial services to the financially excluded population. MFIs differ from traditional financial institutions by providing a mortgage-free loan. MFIs have the double bottom line objective of outreach and financial sustainability. The objective of this study is to examine the impact of leverage on the efficiency of Microfinance Institutions (MFIs). For the study fixed and random effect model have been performed on a panel dataset of 25 Indian NGO-MFIs for the period 2010-2015. Regression result of the study shows that Indian MFIs are highly leveraged. Leverage enhanced the efficiency of NGO-MFIs by reducing cost per borrower and operating expenses resulting in improvement of portfolio quality.

**Keywords:** leverage, efficiency, microfinance institutions, panel regression, outreach, financial sustainability.

### Introduction

Various theories in financial management have proved the relationship between capital structure and firm performance. Theories like trade off theory, pecking order theory, agency cost theory have shown the positive view while Seminal paper of Modigliani and Miller, 1958 had different view about this relationship. Modigliani and Miller said the capital structure is irrelevant to the value of the firm. Theory of Modigliani and Miller is based on certain assumption; perfect capital market, no taxes, absence of transaction cost and similar expectations of investors. Hamada (1996), and Stiglitz (1974) had supported the work of Modigliani and Miller. But in the real world where no perfect capital market exists, how these restrictive assumptions will work. As a result, studies were done by Myers (1977); Harris and Raviv (1990); Grossman and Hart (1982) had exposed the assertion made by Modigliani and Miller.

Studies based on capital structure and firm performance are very less and the studies which are available, examined the relationship between capital structure and firm performance, none of the studies has focused towards efficiency of the firm. In Indian context no study is available which explored the relationship between leverage and firm efficiency. It gives the motivation to author to explore the relationship between leverage and firm efficiency. Efficiency is a performance measure that shows how well the institutions are streamlining its operations. Efficiency shows the relationship between input and output in terms of cost. Every organisation tries to reduce its expenses and enhance the profit. Microfinance institutions differ from traditional financial institutions by providing mortgage free loan.

The concept of microfinance is not new in India; it is evolved in the nineteenth century. Microfinance is the provision of providing various financial services like savings, credit, insurance, remittance, etc to those who are unable to access these services from formal financial institutions. India is a developing country, where poverty is a major problem, and 30% of the population is living below poverty line and their daily income is \$1.90 (World Bank, 2013). Unavailability of essential financial services and access to credit is a major problem for the poor to come out of poverty. The big challenge in front of formal financial institutions is to cater to the poor as they do not have any collateral security and are unable to repay their loan at regular interval

as they do not have a continuous source of income. There is a huge gap between demand and supply for serving them. To fill this gap, microfinance institutions (MFIs) have built the capacities of the poor who are largely ignored by commercial banks and other lending institutions.

This research study tries to contribute to the scarce literature of microfinance by providing insight into the capital structure of Indian Microfinance institution and how leverage affects the efficiency of the firm. The effect of leverage on the efficiency of NGO-MFIs is an important area that has not yet been explored in Indian microfinance literature. The findings of the study will serve as a foundation for further studies in this sector. The paper is structured as follows. Section two describes both theoretical and empirical literature. Section three will provide a research model, data and justifies the selection of variables in the study. Section four discusses the empirical result, and section five concludes and provides the recommendations resulting from the study.

### **Literature Review**

The relationship between capital structure and firm value has drawn the attention of both academicians and practitioners. Indeed, the famous seminal paper by Modigliani and Miller (1958) set the stage for numerous assumptions that have been developed to provide the theoretical underpinnings of this crucial concept. They proposed that capital structure was irrelevant to firm value. However, in 1963, they revised their proposition by incorporating tax benefits as determinant of capital structure. One of the important financial decisions facing a firm is the choice between debt and equity (Glen and Pinto, 1994).

Much of the debate on various theories of capital structure has centered on the determination of an optimal composition of debt and equity for firms. Many studies have been conducted in developed and developing countries to define the effect of capital structure on the performance of firms. They investigate the link between the choice of leverage ratios, profitability, firm size, and other factors (such as non-debt tax shields, firm growth and collateral values of assets). The results of most studies provide useful evidence supporting the consistent negative correlation between profitability and the leverage ratio of firms in developed and developing countries (Titman and Wessels, 1988; Rajan and Zingles, 1995; Antoniou, Guney and Paudyal, 2008). They suggest that firms tend to hold fewer debts, especially fewer short-term debts but they tend to use more long-term debts and equity in countries with better legal protection for shareholders and investors. In general, these empirical studies do not shed any light on the adjustment process in which firms must trade-off between benefits and costs to achieve an optimal ratio (i.e. the dynamic nature of the financial structure of firms).

Based on the suggestion of the pecking order theory, Taggart, (1985) examines how US firms build their financial structures and concludes that leverage is negatively related to profitability (Baskin, 1989; Adedji, 1998; Tong and Green 2005). The comparative costs of available financing sources tend to make firms use internally generated funds as a first choice before raising funds. The amount of debt needed will be determined as the residual between the desired investment and the supply of retained earnings (Baskin, 1989; Allen, 1993). The main reason is the presence of asymmetric information (Adedji, 1998)

According to the view of Myers and Majluf (1984) firms tend to issue equity when its cost is relatively low (Frank & Goyal, 2003; Flannery & Rangan, 2006; and Huang & Ritter, 2007). The results show that higher cash flow firms tend to use low levels of debt, while higher investment level will increase the need for debt (Benito, 2003). On the other hand, profitable large firms prefer debt to equity and increase debt according to their financing requirements (Mayer and Sussman, 2003).

Lafourcade, Isern, Mwangi, and Brown (2005) examined the outreach and financial performance of MFIs in Africa and found that African MFIs fund only 25% of the total assets with equity. MFIs finance their activities

with funds from sources including debt and equity. Abor (2005) examined the relationship between capital structure and profitability of SMEs and construction industry using regression analysis and found that short-term debt ratio is positively correlated with the return on equity.

Berger and Di Patti (2006) investigated the bi-directional relationship between capital structure and firm performance on commercial banks in the USA by using the parametric measure of profit efficiency as an indicator of agency cost. Similarly Margaritis and Psillaki (2007) examined the relationship between firm efficiency and leverage and analysed the effect of leverage on firm performance and the reverse causality relationship using non-parametric DEA method.

Kyereboah-Coleman (2007) examines the impact of financial structure on the performance of MFIs. Study shows that highly leveraged MFIs perform better by reaching out to more clients and enjoy scale economies; therefore, they are better able to deal with moral hazard and adverse selection enhancing their ability to deal with risk.

Bogan (2012) examines the link between the financial structure and sustainability of MFIs by testing the life cycle theory. The results showed that the life cycle stage variables are significantly related to both operational self-sufficiency and financial sustainability. The age of the MFI is found to be related to operational self-sufficiency. Grants are found to be negatively related to sustainability but positively related to cost per borrower. This result is also consistent with the findings of Matu (2008). The feasibility of investment funds is considered to be a key driver for channeling alternative sources of funding to MFIs. The growing competition to access funding sources leads to a financial gap in the supply of microfinance services. Therefore, increasing funds for MFIs during the financial crisis should be on a short term basis (Littlefield and Kneiding, 2009).

El-Sayed (2009) investigated the impact of capital structure choice on the performance of Egyptian listed firms from 1997-2005 using regression analysis and found that capital structure choice has weak or no impact on firm's performance. Kar (2011) explored the impact of capital and financing structure on the performance of MFIs and confirmed the application of agency theory that profits in MFIs increased on account of increased leverage.

Abrar and Javaid, (2016) examined the impact of capital structure on the profitability of MFIs by using random effect model. The results indicated that deposits enhance the overall profitability of MFIs while increased amounts of operating cost and relative risks reduce the profitability.

The above given analysis clearly shows that capital structure and firm performance of MFIs is an important research agenda. Various studies have focused on this sector as it is playing an important role to overcome poverty. The sector apart from being a critical component of the financial system is also regarded as poverty reduction strategy for developing countries like India. There is no empirical study available in Indian context to measure the impact of leverage on the efficiency of MFIs in India.

### **Objective of the Study:**

Major objective of the study is to examine the impact of leverage on the operating efficiency of Microfinance institutions.

### **Research Methodology:**

To examine the effect of capital structure on the efficiency of MFIs panel data from 25 NGO- MFIs has been taken. These 25 institutions are purposely selected due to data availability and accessibility. The data are annual in nature and covering six-year period from 2009-10 to 2014-15. The annual data has been taken from the MIX (Microfinance Information Exchange) market. It is US-based NGO which provide data of MFIs all

over the world. Selection of MFIs has been done based on the consistent availability of data on the below-given variables. The study period is limited due to consistent availability of the data.

### Variable Selection:

This study focuses on examining the impact of leverage on the efficiency of NGO-MFIs. Capital structure is a mix of debt and equity. In this analysis it is used as an independent variable and measured by debt to equity ratio. For measuring efficiency cost per borrowers (CPB) and operating expenses ratio (OPEX) are used and used as dependent variable.

To ensure the accuracy of the results of regression model study, size, age and risk level are taken as control variables. These control variables have been used to reflect the fact that efficiency not only depends on capital structure but also on their size, age and level of risk. Size is measured by total asset base, age is measured by year of establishment, and risk level is measured by PAR ( portfolio at risk). These control variables are therefore not explicitly considered in this analysis.

### Research Model

In carrying out the analysis, study employs the basic panel data regression equation:

$$Performance_{it} = \alpha + \beta DebtR_{it} + \phi Control_{it} + u_{it} \quad (1)$$

Where  $i$  denotes the individual MFIs and  $t$  denoting time. In this case,  $i$  represent the cross-section dimension and  $t$  represents the time-series component.  $\alpha$  is a scalar,  $\beta$  is a  $K \times 1$  vector and  $X_{it}$  is the  $i^{th}$  observation on the  $K$  explanatory variables. In estimating a panel data model, most applications make use of a one-way error component model for the disturbances, with,

$$u_{it} = \mu_i + v_i \quad (2)$$

Where  $u_i$  represents the unobservable individual-specific effect and  $v_i$  denotes the remainder of the disturbance.

Following the econometric model by Miyajima et al. (2003) study estimate the following specific multiple regression model. Equations three and four are derived from equation one to present independent variables individually.

$$Performance_{it} = \alpha + \beta DER_{it} + \phi Control_{it} + u_{it} \quad (3)$$

where  $DER_{it}$  represents the debt to equity ratio of firm  $i$  in time  $t$ .

**Regression Equations:**

Based on variables of efficiency, two regression equations have been run for analysing the impact of capital structure on the efficiency of the firm.

$$CPB_{it} = \alpha_0 + \alpha_1 DebtR_{it} + \alpha_2 Size_{it} + \alpha_3 Risk_{it} + \alpha_4 Age_{it} + u_{it} \quad (4)$$

$$OPEX_{it} = \alpha_0 + \alpha_1 DebtR_{it} + \alpha_2 Size_{it} + \alpha_3 Risk_{it} + \alpha_4 Age_{it} + u_{it} \quad (5)$$

DebtR<sub>it</sub> represents debt ratio of firms i at time t. Equation 4 and 5 will analyse the effect of debt to equity ratio over cost per borrower and operating expense ratio.

**4.4 Estimation Techniques:**

Various approaches had been used for estimating any basic panel model. However, the best techniques for estimating the basic model is dependent on structure of the error term (refer equation number 2) and also association between error term and observed explanatory variables. Basic OLS model is appropriate where no form specific and time effects in the data and treats observation is being serially uncorrelated for a given firm with homoskedastic errors across individuals and time periods (Johnston and Di Nardo, 1997).

However unobservable effect can be compromised by using one of two techniques, but the basic question arise here “is it fixed or random effect”? Hausman (1978) carried out a specification test to choose between random and fixed effect. Null hypothesis for Hausman test is that the preferred model is random effect and alternative hypothesis is preferred model is fixed effect.

**Results and discussion:**

**Table 1 Descriptive Statistics**

Variables	Mean	Max	Min	Std. Dev.	Obs.
DER	11.114	364.670	-183.210	36.204	150
OP.EXP.	0.138	1.054	0.020	0.153	150
CPB	809.973	5988.653	15.116	773.164	150
AGE	10.540	28	2	6.377	150
SIZE	1140000000	28100000000	1923977	3810000000	150
PAR	0.008	0.065	0.000	0.011	150

Source: E-views Output

The results of descriptive statistics for various variables are presented in Table 1. The value of DER was 11.11 times on average which means firms are using eleven times more debt than equity. DER gives a measure of how much of the company's worth is funded through debt and how much through equity. A ratio of greater than 1 means that the MFI has less equity than total liabilities; a ratio of greater than 0 but less than 1 means that the MFI has more equity than total liabilities. These rules apply only as long as MFI has positive equity, a negative DER would indicate that many MFIs have negative equity when total liabilities exceed total assets. This suggests that MFIs depend heavily on borrowings and subsidised funds for lending. It leads to MFIs having negative equity since they do not earn enough revenue to cover total costs.

This result shows that there are some MFIs who do not earn enough profit to cover their total costs. Other performance variables such as outreach, risk and operating efficiency are relatively encouraging suggesting that the institutions are evenly matched. With noticeable different sizes as measured by their assets base, these intuitions have been operating for the past 28 years with an average age of operation of about ten years.

**Correlation Matrix:**

**Table 2 Results of Correlation Matrix**

	DE	OPEX	CPB	AGE	SIZE	PAR
DE	1.000					
OPEX	-0.084	1.000				
CPB	-0.044	0.812	1.000			
AGE	0.032	-0.078	-0.001	1.000		
SIZE	0.062	-0.090	-0.069	0.351	1.000	
PAR	-0.122	0.214	0.088	-0.090	-0.041	1.000

Source: E-views Output

The results of correlation amongst the variables are presented in Table 3.19. NOAB shows positive relationship with leverage (DAR) while ALBPB shows negative relationship. It shows negative relationship with operating expense ratio and cost per borrowers, it is obvious as firms increase debt cost per borrower and operating expenses get reduced. Age and size have positive relationship with leverage while portfolio at risk has negative relationship.

### Impact of Leverage on Efficiency

For measuring the impact of leverage on efficiency, two proxy variables has been considered, one is operating expense ratio and another is cost per borrower. The major objective of microfinance institutions is to provide the basic financial services to a larger number of people. As these institutions are not very financially efficient because of lack of availability of funding sources. Being an NGO-MFIs having limited funding facility in terms of donation, grants and subsidy. So, these institutions try to reduce their cost and increase its operating efficiency. Table 3 and 4 is showing the analysis of leverage effect on operating expenses and cost per borrower.

**Table 3 Results of Impact of Leverage on OPER**

Regressors	Model 1	
Debt Equity Ratio (DER)	Coefficient	-0.127
	t-statistics	-2.890
	(p-value)	0.004
Log of firm age (LNAGE)	Coefficient	-0.161
	t-statistics	-1.681
	(p-value)	0.094
Log of Portfolio at Risk (LNPAR)	Coefficient	-0.002
	t-statistics	-0.086
	(p-value)	0.931
Log of Firm Size (LNSIZE)	Coefficient	-0.012
	t-statistics	-0.319
	(p-value)	0.749
Constant	Coefficient	-1.423
	t-statistics	-2.018
	(p-value)	0.045
R-Square	7.06%	
Number of Observations	147	
Hausman Test	0.949	

Source: E-views Output

Table 3 shows the impact of leverage on operating expense ratio. Analysis shows that leverage has negative and significant relationship with operating expense ratio. If firms increase the debt amount in their capital structure then operational efficiency of the firm increase. Hausman test is giving evidence towards random

effect and shows that there is no correlation between error term and regressors. Leverage is explaining only 7.06% variation in the operating expense ratio of MFIs. Lower R square value shows that leverage is having little impact on the operating expense ratio. R square is the measure of explanatory power of the model. For details we can explore the work of Neter, Kunter, Nachtsheim and Washerman (1996) for low R square. Leverage also has negative and insignificant relationship with control variables like Age, size and risk.

**Table 4 Results of Impact of Leverage on CPB**

Regressors	Model 1	
Debt Equity Ratio (DER)	Coefficient	-0.221
	t-statistics	-4.692
	(p-value)	0.000
Log of firm age (LNAGE)	Coefficient	0.065
	t-statistics	0.639
	(p-value)	0.523
Log of Portfolio at Risk (LNPAR)	Coefficient	-0.059
	t-statistics	-2.010
	(p-value)	0.046
Log of Firm Size (LNSIZE)	Coefficient	0.065
	t-statistics	1.511
	(p-value)	0.133
Constant	Coefficient	5.097
	t-statistics	6.467
	(p-value)	0.000
R-Square	20.97%	
Number of Observations	147	
Hausman Test	0.712	

Source: E-views Output

Table 4 shows the impact of leverage on cost per borrower. Leverage has negative and significant relationship with cost per borrower. Similarly, as the firm start using debt in their capital structure, cost per borrower decreases and firms can increase outreach of the firms by serving larger number of clients. Here leverage is explaining 20.97% variation in the cost per borrower fo MFIs. Hausman test shows the acceptance of random effect model over fixed effect. DER has the negative and insignificant relationship with age and size. PAR as proxy indicator to measure risk has negative but insignificant relationship with CPB.

**Conclusion:**

Microfinance institutions are playing very important role in the social and economic development of country. These institutions are filling the gap that is created by formal financial institutions by not serving the poor and deprived person due to lack of mortgage. In India MFIs exist in various forms like NGO-MFIs, NBFC-MFIs,



trust, societies and co-operative forms. The objective of this study was to analyse the impact of leverage on the efficiency of microfinance institutions. For measuring efficiency operating expenses and cost per borrower were taken as the variables. Study used fixed and random effect panel regression technique to examine the effect. Analysis shows that leverage has negative and significant relationship with

efficiency. As firm utilising more debt, operating efficiency of the firm increases by reducing the operating expenses and cost per borrower. As a result outreach and financial sustainability of the firm increases. NGO-MFIs having very limited sources of funds in the form of donations, grants, and subsidy, and efficiency is very important for these institutions. Because if the institutions are not efficient they will not get further grant and how will they achieve financial sustainability. This research study here shows that leverage is having relationship with efficiency of microfinance institutions. Low R square value shows that the leverage has little impact on the efficiency of MFIs, as in Indian context not such studies are available so unable to compare our findings of this study. For further extending our research work we can explore the impact of leverage on profitability and sustainability of MFIs. Profitability and sustainability is also the major concern for the MFIs.

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