



## Voluntary Disclosures of Indian Microfinance Institutions

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### Abstract

The microfinance sector is growing at an astonishing rate in India. Reserve Bank of India, from time to time, comes up with a lot of directions to maintain transparency and governance in the microfinance sector. The current study focuses on the voluntary disclosure (VD) of the Non-Banking Financial Companies- Microfinance Institutions in India. The study constructs an unweighted index to measure the VD scores of the firms. The study also estimates the technical efficiency of the firms in meeting dual objectives of social and financial efficiency of the microfinance institutions. The empirical testing derived the association of the VD score and the efficiency from the data sourced from 2015 to 2019. The findings suggest a negative association between VD and efficiency. The study's major contribution is the type of VD disclosed by the firms. Finding also suggests that firms consider discretionary disclosure a wasteful activity. The dual performance is low but shows a gradual increase. The study is relevant for the policymakers and managers to check the disclosure strategy and the patterns of these firms, which mainly depend on the donors for raising funds for their sustainability.

**JEL:** G21; G34; G38

**Keywords:** Voluntary Disclosure, Non- Banking Financial Companies- Micro financial Institutions, Data Envelopment Analysis, Panel regression, Efficiency estimation.

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## 1. INTRODUCTION

The microfinance industry is essential for inclusive finance and economic sustainability (Oero and Rhyne, 1994). The microfinance industry is witnessing impressive growth due to expansion in the credit disbursement and number of borrowers (Sa-Dhan, 2019a; Khan A.A. 2008; Morduch, 2000). But this expansion is heavily based on the investment and subsidies given by the donors. The donors of the microfinance institutions (MFI) want to know about the utilization and appropriate allocation of the funds which will meet the objectives of the MFI (Khan, 2008).

### NBFC-MFI regulations in India

Microfinance in India is a complex system with many different business models and types. These are credit unions, banks, and NGOs. After the 2011 microfinance crisis in an Indian state Andhra Pradesh, the Reserve Bank of India (RBI) created a new category after announcing several regulatory directives to make the Non-Banking Financial Companies – Microfinance Institutions (NBFC- MFI) in its monetary policy of 2011-2012 (RBI, 2011). The updated and revised guidelines are given in (RBI 2015). A non - deposit-taking "NBFC (other than a company formed and registered under section 25 of the companies act, 1956/ section 8 in companies act 2013)" is referred to as the NBFC-MFI. The disclosure and transparency guidelines of the NBFC-MFI are given in the special guidelines under the chapter IX of RBI (2016).

The NBFC-MFI code of conduct suggested efficiency and operations improvements to reduce the firm's cost (Ferdousi, 2013). The suggestion indicates how authorities are reacting to the changing micro-lending environment and the introduction of new organisations in India. The main concern is whether these businesses can survive the fragile micro-lending industry. Since it is a non-deposit-taking entity, NBFC-MFIs have faced liquidity challenges, forcing some to change to deposit-taking entities. Existing and future NBFC-MFIs must adhere to governance and disclosure controls to demonstrate to equity providers, donors, and funding agencies that they are achieving the MFI's dual goal of profit maximisation and overall welfare of impoverished beneficiaries (Quayes and Hasan 2014). As a result, the disclosure protects a rapidly expanding industry's reputation and proper operation that benefits low-income borrowers. These disclosures offer visibility and accountability for donors and policymakers, putting interested parties at ease and allowing the MFI to access the necessary resources. Corporate disclosure is divided into two categories: mandatory and voluntary disclosure. The data and information made public over the regulatory requirements are voluntary corporate disclosure. The financial, non-financial, and strategic disclosure makes the voluntary disclosure (Hossain, 2008; Beyer et al., 2010). Michels (2012) explains that voluntary disclosures positively impact the lenders' activity in the microfinance setting where group lending happens. As a result, the first source of concern is the microfinance industry's low disclosure standards, which have an impact on overall social welfare. Second point of concern is that the NBFC- MFI have dual objectives of social (Gutiérrez-Nieto et al. 2009) and financial performance (Widiarto and Emrouznejad, 2015). The study considers firms' efficiency, which indicates the firms' financial and social performance and sustainability (Hartarska and Mersland 2012; Sharma et al. 2020; Sharma and Rastogi 2021). The stakeholders want to see if the firms are meeting the objectives (Von, 1996). And the third central point of concern is to explore the association of voluntary disclosure and efficiency.

Therefore, the current study raises the first objective to evaluate the voluntary disclosures of the NBFC-MFI after constructing a voluntary disclosure index for the same. Secondly, the authors also feel an urge to determine the social and financial efficiency of the NBFC- MFI's in India. Thirdly, to explore the efficiencies associated with the voluntary disclosures.

The paper is structured into sections highlighting different research components. The paper's second section follows the current section and includes a conceptual framework and hypothesis development. The third section describes the research design and methodology, and the fourth section provides the results and findings. Section five discusses the implications, while section six discusses the observed conclusion and future scope of the study.

## **2. CONCEPTUAL FRAMEWORK AND HYPOTHESIS DEVELOPMENT**

### **2.1 Theory and determinants of Voluntary disclosures**

Voluntary disclosure (VD) is a decision of the company's management to provide information beyond the legal requirements and is not mandated by the regulatory authorities (Hossain and Hammami, 2009; Scaltrito, 2016). The information can be financial, non-financial, social, environmental, and revealed in the company's periodical reports and is relevant for the company's stakeholders. VD (Abeysekera and Guthrie, 2005) is a strategy used to endorse a company's philosophies to prospective shareholders to ensure sustainable growth and survival. A recent study (Zamil et al., 2021) has linked 36 different theories to the concept of voluntary disclosures, which explains the reporting practices of the companies. Prior literature suggests the socio-political perspective is related to legitimacy, institutional, stakeholder, and political theory, and the economic view is linked to the agency, signaling, and capital theory.

Jensen and Meckling (1976) gave 'Agency theory' is well studied and extensively used and is considered the most relevant (Khatib and Nour, 2021; Hazaea et al., 2020). It is believed that unequal knowledge between debtors and creditors could lead to considerable adverse selection problems in industries, especially those that rely on group lending like microfinance (Petersen and Rajan 1994; Berger and Udell 1995).

Legitimacy theory suggests that the firms' social contract with the surrounding community requires higher voluntary disclosure norms to adhere to the law and community principles if the mandatory disclosures are not sufficient (Suarez-Rico et al., 2018; Solikhah, 2016; Wang et al., 2013). According to Md Zaini (2017) and Faisal et al., (2012), voluntary disclosures are made to build stakeholder confidence, prestige, and validity for the organisation. The high brand-conscious levels in developing countries' firms lead to low VD levels. (Nurhayati et al., 2015; Mondal and Ghosh, 2014; Zaini, 2018).

#### **Determinants of voluntary disclosure**

Various factors determine voluntary disclosures. The significant factors in the previous writings are factors like size, liquidity, profitability, and leverage (Abeywardhan and Panditharathana 2016), followed by the firm's ownership structure and corporate governance (Cahu and Gray, 2002; Zamil et al., 2021). Other factors are policy or strategy of disclosure norm, factors related to the country, quality of the audit, and decisions of topmost management. Voluntary disclosures studies are majorly done on the listed firms (Tran and Beddewela, 2020; Situ et al., 2020), like the banking sector, the airline, manufacturing, and textile or SMEs. Researchers suggest that voluntary disclosure studies should be done for financial institutions and standalone sectors (Alotaibi and Hussainey, 2016; Fahad and Nidheesh, 2020; Nyahas et al., 2017). The amount of voluntary disclosure realizes the firm's trustworthiness, which is disclosed in multiple types and can be evaluated using an index. Internal and external firm data; financial and non-financial relevant data; and Strategic, social, operational, and futuristic information are examples of these types (Abeywardhan and Panditharathana 2016; Singhavi and Desai, 1971; Charumathu and Ramesh, 2015).

Barako et al. (2006) and Alyousef and Alsughayer (2021) suggest that the level of voluntary disclosure has been scientifically examined with corporate governance indicators and found a positive relationship. Increased institutional ownership leads to more voluntary disclosures. Barako et al. (2006) and Abeywardhan and Panditharathana (2016) suggest the act of revealing more willingly is positively related to the shares held by foreigners and institutional shareholders, level of leverage, firm size, an external audit by audit firms, profitability, and liquidity, according to the determinants of voluntary disclosures. Eng and Mak (2003) suggest low debt and larger firms reveal more. Quayes and Hasan (2014) suggest firms' financial performance improves the quality of financial disclosure, which increases operational performance due to the endogenous relationship between performance and disclosure. Research indicates that microfinance NGOs and for-profit firms disclose more social and financial release information on the internet, respectively (Gutiérrez-Nieto et al., 2008). Internet disclosure gets impacted by country-level technology adoption.

The level and quality of voluntary disclosures are estimated through the indices. The disclosure indices can be self-created for the study or readily available (Al-Akra and Hutchinson, 2013; Al-Akra et al., 2010; Tsang, 1998). The self-constructed indices have high reliability and confidence for the study over readily available indices due to differences in the context (Healy and Palepu, 2001). The expert ratings on the categories determine relevancy. It is discovered that the VD quality and quantity are related to the firm's type and complexity. The primary sources of information disclosures remain to be annual reports (Beattie et al. 2004).

The two methods for calculating the index are weighted and unweighted. (Botosan, 1997; Firer and Meth, 1986; Singhvi and Desai, 1971). The unweighted index is neutral and assigns equal weight to all items, whereas the weighted index gives weights based on the objective of the current study.

## 2.2 Technical efficiency of microfinance institutions

Efficiency refers to the process of utilizing available resources and allocating resources optimally (Achabal et al. 1984) within a decision-making unit (DMU) (Golany and Storbeck 1999; Caballer-Tarazone et al. 2010). The efficiency is applied to evaluate the performance of the Indian banks (Kumar and Gulati 2010; Sabui and Sharma 2020). The microfinance institution's performance can be assessed through dual measures called financial efficiency and social efficiency (Hermes et al., 2011; Louis et al., 2013; Hermes et al., 2018; Ravallion, 2003). The efficiency estimated is the technical efficiency of the DMU under the production theory. The firm's financial efficiency measures how well the MFI's generate revenues as the output, and the social efficiency measures show how well the organisation is increasing the number of active borrowers.

The disclosure level is impacted by the firm's production efficiency (Baiman and Verrecchia 1996). Studies also suggest that disclosure and social-technical efficiency have no association (Gutiérrez-Nieto et al., 2009). This seems to be due to Friedman's style, which indicates that investors consider voluntary social responsibility activities to be wasteful. Some suggest association be negative due to uninformed investors (Chen et al., 2014; Han et al., 2014; Goldstein and Yang 2018). Researchers found that economic performance is found to have a negative association with the disclosures in the annual report (Ingram and Frazier, 1983; Jaggi and Friedman 1982). According to Ullman (1985), there is a negative association between economic performance and social disclosure.

Charnes et al. (1978) suggested the Data Envelopment Analysis (DEA) and defined that as a non-parametric technique used to measure the firm's efficiency. The firms are known as decision-making units (DMU). An efficiency model which assumes constant returns to scale

(CCR) can be applied to small sample sizes. The input and output-oriented models under the CCR model have the same efficiencies. For larger samples, Banker et al. (1984) suggested another model called variable returns to scale (VRS), or BCC model. The literature indicates that MFI efficiency estimation has used multiple DEA models like BCC models, technical efficiency, cost efficiency (Battese & Coelli 1995). Technical efficiency will measure the efficiency of the DMU, covering its costing models and its best practices. The variables used to estimate the efficiency of a DMU need to be identified and categorized as inputs and outputs.

### 2.3 Research Gap

The existing literature revolves around the voluntary disclosure dimensions and the determinants (Verrecchia, 1983; Boessao and Kumar, 2007), the disclosure index, and efficiency estimation. First, the gaps identified are an absence of VD studies in the micro-financial sector and no research on the Indian NBFC-MFI sector. Second, the current study considered the MIX market index for the disclosure studies in the microfinance sector, which can suffer from selection bias self-constructed indices not available for MFIs. There are significantly fewer studies exploring the association between performance and voluntary disclosure. In addition, various accounting measures were used to measure the performance, which was criticized, and therefore, efficiency as an indicator can be researched meeting the dual objectives of the microfinance institutions. As a result, the current study attempts to test the association between efficiency and voluntary disclosures.

*H<sub>1</sub>: Voluntary disclosure of the firm is significantly associated with Financial efficiency*

*H<sub>2</sub>: Voluntary disclosure of the firm is significantly associated with Social efficiency*

The hypothesis will help the researcher to understand how the efficiency levels (financial and social) are related to the levels of the voluntary disclosures of the NBFC-MFI.

## 3. RESEARCH DESIGN AND METHODOLOGY

### 3.1 Data and Selection of variable

The current study considers the NBFC-MFI, registered with the RBI. The firms are selected based on sufficient data and the availability of the annual reports. The empirical analysis considers data and annual reports of 25 NBFC-MFI from 2011 to 2019.

### 3.2 Research Design

The research design of the study comprises of the mixed method. Both quantitative and qualitative studies are carried out to meet the study's objective.

#### 3.2.1 Voluntary Disclosure Index Construction

The instrument used to estimate the level of voluntary disclosure is referred to as the VD index. The items in the constructed index are checked against the annual reports of the NBFC- MFI. The index construction involves the following steps (Cook 1989; Firer and Meth, 1986; Buckland et al., 2000). Firstly, the literature review identifies the components of voluntary disclosures. The second step includes the expert's interview, which helped extract specific elements of the index construction. The third step checks the Indian regulatory disclosure requirements (Companies act 2013; clause 45, RBI Act 1934 ) of NBFC-MFI. Items that are beyond the needs of the RBI 2011, Schedule III of the companies act 2013, and the SEBI (Listing obligations and Disclosures norms) 2019 are taken for construction.

Index Items fall in the category of financial information, including financial narratives, financial ratios, non-financial information such as business strategy, employee information, forward-looking information, beneficiary profiling, outreach (Quayes, 2012), human capital, and corporate social responsibility (CSR). The CSR items in section 135 of Schedule VII of CA 2013 are not included as they are mandatory.

An exhaustive list of 97 items is produced. The items are categorised into different categories. The list is shared with the experts, and the final list with 75 items falling into nine categories is formed. The nine categories are BG, CG, FP, FLI, SP, HIC, CSR, CEO, and RM (Table 1). Each category has a group of items.

The disclosure studies use the annual reports to estimate the disclosure level (Kassarjian, 1977; Kavitha and Nandagopal, 2019). The items in the categories are identified in the annual reports. Binary coding is used to score the firm; in case the item is available, the firm is marked '1' or otherwise '0' (Basalamah and Jermias, 2005; Jones and Shoemaker, 1994; Hackston and Milne 1996). Different coders are used to test the reliability. Equation 1 formulate to calculate the voluntary disclosure (VD) score.

$$VD\ Score = \frac{\sum Score\ of\ all\ categories}{Number\ of\ items} \quad \text{Equation (1)}$$

Table 1 Voluntary disclosure index categories.

Categories	Resources
A Background about the NBFC –MFI corporate information- BG (08):	Elfeky, M. I. (2017). Barako (2007)
B Corporate Strategy- CG (04):	Elfeky, (2017).
C Financial Performance- FP (11)	Elfeky, (2017); Barako (2007); Quayes and Hasan (2014).
D Forward-looking information -FLI(9)	Elfeky, (2017 ); Gadarrowaski and Sinha, (2007)
E Social Performance- SP(7)	Htay et al. (2012);Gadarrowaski and Sinha, (2007)
F Human Intellectual and Capital –HIC (9)	Elfeky, (2017) ; Barako, 2007)
G Corporate Social Responsibility – CSR (8)	Barako 2007, Gadarrowaski and Sinha, (2007)
H Competitive Environment and Outlook-CEO (6)	Elfeky, M. I. (2017). Quayes and Hasan (2014).
I Risk Management -RM(13)	Quayes and Hasan (2014).

Note The Author's contribution. Categories for the VD index. Abeywardana & Panditharathna (2016)

The study follows the unweighted (Choi, 1973; Stanga, 1976) disclosure index as they are non-biased and later can be shaped according to the need of the study (Cooke, 1989; Raffournier, 1995; Owusu-Ansah, 1998). Although it comes with a drawback, it gives all the items the same weight.

### 3.2.2 Efficiency Estimation

Firms' efficiency is estimated through DEA, a non – parametric technique, which requires the identification of input and output variables (Table 2). Total assets, number of employees, and operating expenses are taken as input variables for both models. The output variables for the financial efficiency are the gross loan portfolio and the income for the financial services, and for the social efficiency is the active borrowers.

The model selected for estimating efficiency is the Constant Returns to scale technical efficiency (CRSTE) due to the small sample and the output-orientated model (Huguenin, 2015). The output-oriented model focuses on maximizing the output for a level of input.

CCR output-oriented model

$$\begin{aligned}
 & z_0 = \varphi + \epsilon (eTs + + eTs-) \\
 & \max_{\varphi, \lambda, s+, s-} \Phi Y_0 - Y\lambda + s+ = 0 \\
 & \text{Subject to} \quad X\lambda + s- = X_0 \\
 & \quad \quad \quad \lambda, s+, s- \geq 0
 \end{aligned}
 \tag{Equation (2).}$$

The study adopts the output-oriented CCR Model (Eq 2). The efficiency is achieved if growth in the output variable is required and is denoted by  $\varphi$ . The input and output combination is mentioned in table 2.

Table 2 Input and Output Combination

Models	Input	Output
Financial Efficiency(FE) (Widiarto and Emrouznejad, 2015; Gutiérrez-Nieto et al., 2009)	1. Total Asset(TA) 2. Operating Expense(OE) 3. Number of employees(NOE)	1. Gross Loan Portfolio (GLP) 2. Operating Income (OI)
Social Efficiency (SE.) Mersland and Storm (2010)	1. Total Asset(T.A.) 2. Operating Expenses(OE.) 3. Number of employees(NOE)	1. Active Borrowers(AB)

Note: Variables for efficiency estimation

### 3.2.3 Econometric Model: Efficiency and Voluntary Disclosure

The current section explains the model used to test the firm's efficiency association and voluntary disclosure—the model checks financial and social efficiency association with voluntary disclosures through the panel data analysis. Equation 3 shows the econometric model tested on STATA. The outcome variable of the study is measured as the  $LOGVD_{it}$ . This indicates the log value of voluntary disclosure scores estimated in equation 1. The study's independent variables are  $FECRS_{it}$ , and  $SECRS_{it}$  estimated through equation 2. The equation explains the static panel data analysis. The  $\alpha$  denotes a constant term,  $i = 25$  firms,  $t =$  years,  $uit$  is the error term  $uit = \mu_i + vit$  ( $\mu_i$  = represents the unobservable individual effect and  $vit$  = means the remainder disturbance).

$$\text{Model - } LOGVD_{it} = \alpha + \beta_1 FE\_CRS\_it + \beta_2 SE\_CRS\_it + uit \tag{Equation (3) ...}$$

The scores are estimated by checking the index against the firms' annual reports for each year. The DEA software is used to calculate FECRS and SECRS (financial and social) efficiency scores. The firm-specific variables are taken and mentioned in section 3.4.4.

### 3.4.4 Firm-Specific Variables selected

Firm size is considered an important variable that affects the disclosures ( Ingram and Frazier 1983; Hossian and Reaz 2007). The size is measured as the Log value of the total asset. It is observed that the size is expected to have a positive association with VD. Research suggests profitability is another critical variable. It is measured as the return on asset (EBITA/Total asset), its expected association with VD is positive (Camfferman and Cooke 2002; Soliman 2013). The firm's age is a critical variable estimated as the number of years from inception, and the expected sign shows that older firms offer more robust governance (Hossian and Reaz, 2007). The gross loan portfolio impacts the microfinance institutions' disclosures and is measured as the outstanding loan portfolio of the NBFC-MFI (Quayes and Hasan, 2014).

## 4. RESULTS AND FINDINGS

### 4.1 The reliability and levels of the Voluntary Disclosure Index

The voluntary disclosure index consists of nine categories with substatements. The annual reports underwent content analysis (Weber, 1990), and the VD scores of each firm were calculated.

The reliability of the VD index is checked through Cronbach alpha. The good reliability value, which shows the internal consistency, should be greater than 0.7. The study has 0.717 has the Cronbach alpha value (Cronbach, 1951). The findings suggest that firms disclose more financial information, background information, risk management, human intellectual capital, and forward-looking information but are relatively low social performance disclosure, corporate strategy, competitive environment, and outlook information. Although social information disclosure has increased in past years, they are still low. The voluntary CSR scores are less as the firms only focus on the legal requirements.

### 4.2 Estimation of NBFC-MFI Efficiencies

#### 4.2.1 DEA-Model

The DEA model is applied to estimate the efficiency levels, and output and input (table 2) are identified for the NBFC- MFI for social efficiency (SE) and financial efficiency (FE) models. Table 3 shows the descriptive statistics for the selected variables.

Table 3 Descriptive statistics of the variables for Efficiency Estimation

	S.E. Model	F.E. Model		Both F.E. & S.E. Model		
	A.B.(O)	G.L.P.(O)	O.I. (O)	T.A.(I)	O.E.(I)	N.O.E.(I)
MAX	7401000	173940	20961.6	115367.5	14417	16021
MIN	46	0.84725	3.8	53	5.7	20
MEAN	706451	11795.51654	2068.03528	12241.6248	1504.6656	1893
SD	1239852	23379.04	3400.69	19587.48	2336.21	2760

Note: SPSS results. F.E.= Financial Efficiency and is S.E= Social Efficiency Models, O= Output, and I= Input Variable.

#### 4.2.2 The Model's Validity in Evaluating Efficiency

The validity of the variable selection for the FE and SE models, following steps, is followed: the isotonicity test is conducted, examining how changes in inputs affect outputs. The test will check the correlation among the output and the input variable (Table 4 (a) and (b)). The results indicate the association is significant and validate the efficiency models.

Table 4(a) Test of Isotonicity- Financial Efficiency

	<i>GLP</i>	<i>OI</i>	<i>TA</i>	<i>OE</i>	<i>NOE</i>
GLP	1				
OI	0.888	1			
TA	0.881	0.994***	1		
OE	0.911*	0.989**	0.986**	1	
NOE	0.908*	0.933*	0.925*	0.941*	1

Note: Authors Calculation the matrix relationship is significant at the levels of \*\*\*1%, \*\*5%, and \*10%, respectively.

Output variable- GLP, OI

Input variables- TA, OE, NOE.

Table 4 (b) Test of Isotonicity - Social Efficiency

	<i>AB</i>	<i>TA</i>	<i>OE</i>	<i>NOE</i>
AB	1			
TA	0.898	1		
OE	0.925*	0.986**	1	
NOE	0.957**	0.925*	0.941*	1

Note: Authors Calculation he matrix relationship is significant at the levels of \*\*\*1%, \*\*5%, and \*10%, respectively.

Output variable- AB,

Input variables- TA, OE, NOE

### 4.2.3 Estimation of Efficiency

DEAP 2.1 is used to measure technical efficiency for the firm's financial and social efficiency models. The CCR model and the output-oriented model estimates are reported in Table 5. 2015 to 2016 explain the average VD scores and average technical efficiency of both models. An improvement is observed in the VD scores average VD scores, and an increase in the standard deviation is also observed.

Table 5 Technical efficiency and VD score

Year	Firm with score 1 Model-FE	Mean CRSTE- FE Model	Firm with score 1 ( Model- SE)	Mean CRSTE -SE Model	Mean VD. Score	STD of VD. Score
1	9	.894	3	.548	26.9	9.1
2	6	.894	1	.069	33.2	12.4
3	5	.861	2	.371	36.0	12.2
4	7	.893	1	.508	36.1	12.0
5	6	.899	1	.614	42.5	13.8

Note Authors Calculation DEAP 2.1. Year ranges from 1 (2015) to (2019). The total number of firms are 25. STD is the standard deviation of the voluntary disclosure scores

The benchmarked firms have a CRSTE score of one. The number of firms with means CRSTE with the perfect one in the FE model is higher than the number of firms in the SE model. The mean value of CRSTE (FE) ranges from 0.8 to 0.9, which explains that an output rise is required, ranging from 10- 20 %, for a given input level to achieve efficiency. The means CRSTE (SE) ranges from 0.5 to 0.61, which explains that an output rise is required, ranging from 40- 50 % for a given input level to achieve efficiency.

The firm-wise efficiency scores are mentioned in table 6. The two measurement models, CRSTE, VRSTE, scale efficiency, and returns to scale (RTS) are estimated. The mean CRSTE (FE) explains that the firm can maximize output by 10.1 percent by maintaining input levels. For VRSTE (FE) model, the firm can maximize output by 7.9 percent by retaining the input levels. The mean CRSTE in the (SE) model needs to maximize the output by 38.6 percent while retaining the same input level.

The FE model shows that (table 6) NBFC-MFI numbers five, ten, eleven, eighteen, and twenty-three have increasing RTS to minimize the firm's average cost. The NBFC-MFI thirteen shows are decreasing RTS. The SE model finds all the firms showing diminishing RTS except firm one with the constant RTS.

Table 6 Summary of Efficiency

NBFC-MFI	SE				FE			
	CRSTE	VRSTE	SCALE	RTS	CRSTE	VRSTE	SCALE	RTS

1	1	1	1	0	1	1	1	0
2	0.602	1	0.602	-1	0.861	1	0.861	-1
3	0.082	0.244	0.3360	0	1	1	1	-1
4	0.636	0.832	0.764	-1	0.970	1	0.970	-1
5	0.44	0.521	0.844	1	0.926	0.928	0.997	-1
6	0.809	1	0.809	0	1	1	1	-1
7	0.636	0.787	0.808	-1	0.895	0.947	0.945	-1
8	0.621	0.754	0.823	-1	0.760	0.770	0.987	-1
9	0.621	0.659	0.942	0	1	1	1	-1
10	0.676	0.795	0.850	1	0.937	0.94	0.996	-1
11	0.686	0.802	0.855	1	0.842	0.843	0.998	-1
12	0.927	1	0.927	-1	0.938	0.957	0.980	-1
13	0.907	0.998	0.908	0	1	1	1	-1
14	0.506	0.625	0.8096	-1	0.935	0.947	0.987	-1
15	0.667	0.873	0.764	-1	0.866	0.891	0.971	-1
16	0.523	0.706	0.740	-1	0.804	0.859	0.935	-1
17	0.748	1	0.748	0	1	1	1	-1
18	0.523	0.594	0.880	1	0.916	0.921	0.994	-1
19	0.628	0.673	0.933	-1	0.748	0.757	0.988	-1
20	0.49	0.683	0.717	-1	0.938	0.991	0.946	-1
21	0.554	0.676	0.819	-1	0.910	1	0.910	-1
22	0.47	0.506	0.928	-1	0.780	0.826	0.944	-1
23	0.679	0.731	0.928	1	0.914	0.915	0.998	-1
24	0.331	0.34	0.973	-1	0.733	0.742	0.987	-1
25	0.598	0.632	0.946	0	0.808	0.808	1	-1
Mean	0.6144	0.73724	0.826		0.899	0.921	0.976	

Note DEAP 2.1 is the author's calculation. VRSTE = VRS DEA technical efficiency. CRSTE = CRS DEA technical efficiency

SCALE is an abbreviation for scale efficiency = crste/vrste

"returns to scale." The RTS explains as (1) stands for increasing returns to scale, '0' stands for constant return to scale, and (-1) stands for decreasing returns to scale,

The peer summary explains the efficient firms among their peers (Table 7). The financial efficiency models present MFI 10 as the most efficient, and the second most efficient is the MFI 6. The social efficiency model shows MFI 6 as the most efficient.

Table 7 Peer Summary

Firm	Peers (FE)	Peers(SE)
MF1	MF1	MF1
MF2	MF12 MF1	MF1 MG12
MF3	MF3	M15 MG12
MF4	MF21 MF10 MF12 MF15	MF15 MG6 MF1
MF5	MF10 MF12 MF21 MF15	MF15 MG6 MF1
MF6	MF6	MF6
MF7	MF6 MF10 MF12 MF22	MF1 MF6
MF8	MF6 MF22 MF10 MF15	MF15 MF6 MF1
MF9	MF1 MF10 MF15 MF22 MF12	MF15 MF1 MF6
MF10	MF10	MF6 MF1

MG11	MF19 MF10 MF1 MF6	MF6 MF1
MF12	MF19	MF12
MF13	MF19 MF15 MF12 MF15 MF10	MF15 MF1 MF6
MF14	MF15 MF19 MF21 MF10 MF12	MF15 MF6 MF1
MF15	MF15	MF15
MF16	MF10 MF17 MF15 MF19	MF1 MF6
MF17	MF17	MF15 MF6 MF1
MF18	MF6 MF10 MF15 MF22	MF12 MF15 MF6
MF19	MF19	MF1 MF6
MF20	MF6 MF10 MF1	MF6 MF1
MF21	MF21	MF15 MF6 MF1
MF22	MF22	MF6 MF12 MF15
MF23	MF15 MF22 MF10 MF12	MF6 MF1 MF15 MF12
MF24	MF19 MF1 MF25 MF10 MF12	MF1 MF15 MF6
MF25	MF25	MF1 MF6

Note The authors' calculations are based on DEAP 2.1. Annexure 1 has the names NBFC-MFI names.

### 4.3 Panel regression results

The empirical results present an association between efficiency and VD. The descriptive statistics are in table 8. Panel regression results are shown in Table 9. The findings of the DEA are efficiency scores which are the independent variables and regressed for the outcome variable LOGVD (equation 3). The other variables used are size, profitability, age, and gross loan portfolio of the firm.

Table 8 Panel Regression: Descriptive statistics

Variable	Obs	Min	Max	Mean	Std. Dev
LOGVD	125	1.673976	4.414816	3.759172	.461505
FECRS	125	.539	1	.887808	.1032881
SECRS	125	.005	1	.42192	.2765104
Size	125	3.970292	9684.4	85.67452	865.4614
PROFITABILITY	125	-.1598415	.1156683	.0180497	.0328043
Age	125	.039	187.8736	7.140548	17.98508
GROSSLOANPORTFOLIO	125	.84725	173940	11695.86	23408.82

Note Descriptive statistics for the variables used in the panel estimate are mentioned in the table.

The likelihood test and Breusch Pagan LM assists in the applicability of fixed and random effect. Hausman test indicates the presence of a random effect regression model. The Wooldridge test is used to determine the absence of serial correlation. Due to the presence of heteroscedasticity, the study reports robust Random Effect results (Wooldridge, 2010; Drukker, 2003).

The signs in table 14 indicate the significant negative association of the FECRS and SECRS with the level of voluntary disclosures. The model also suggests that SIZE, PROFITABILITY, and GROSS LOAN PORTFOLIO are positively associated with the LOGVD. The age comes out to be significant and negatively associated with LOGVD.

Table 9 Panel Estimate

	Random Effect (Robust) Estimates
LOGVD	
SECRS	-2.23 (0.026)* [.12]
FECRS	-2.08 (0.038)* [.21]
SIZE	3.84 (0.000)**
PROFITABILITY	2.39 (0.017)*
AGE	-1.59 (0.112)
GROSSLOAN PORTFOLIO	2.86 (0.004)*
R Square	.3132

Wald Test (Model F test)	49.01**
Wooldridge Test	0.578(0.456)
Sigma_e	.21941505
rho	.76396139
F(Test)	13.58** Prob > F = 0.0000
Breusch Pagan LM	124.00(0.0000)**
Effect Hausman	0.46 (0.9776)
$\alpha$	20.05(0.000)**
N	125

Note The table displays the estimated table values, and the effects show that the panel has a random effect. The results show random effect (robust) estimates. Statistical significance is indicated in parentheses \*5% and \*\*1%. SECRS =Social efficiency (constant return to scale). The std error is indicated by values in the []. Financial Efficiency of FECRS (constant return to scale). The size of an asset is represented by its log. LOGVD is an abbreviation for Log of VD score. The autocorrelation Wooldridge test is used.

## 5. IMPLICATIONS

The significant implications of the study are categorised as theoretical and practical implications. The theoretical implication is that the index and sub-index can be referred to for the researchers who want to work in the VD literature specific to the microfinance industry.

The practical implications are for the various stakeholders. The managers of the firms need to focus on the efforts and the strategy to meet the financial sustainability and outreach simultaneously. Managers will need to comprehend the firm's efficiency level and benchmark with its peers. Second, the study checks the social and financial performance of the firms through the data envelopment analysis. Through input and output variables identification, efficiency levels are estimated. Third, the study contributes by testing the association between the efficiency levels and their impact on the level of voluntary disclosures. This will bring regulatory and policy implications for the government, checking the firm's voluntary disclosures (Khan, 2011). The donors and government keep a check on less efficient firms.

The central bank of India suggests that each NBFC-MFI should be registered with any Self-regulatory organization (SGO) and do required disclosures (RBI, 2015). The current study's findings explain the importance of information even by efficient firms to remove the asymmetry among the firm's various stakeholders. The disclosure being a voluntary activity will help raise the firms' governance standards. Fourth, The managers and regulators should also check the VD policy of the firms with less profitable firms or low gross loan portfolios. The regulators should also check the small-sized firm's voluntary disclosure policy.

VD is not a wasteful activity. It is a governance indicator that helps the organisation maintain transparency and reduce the cost of capital. This will help create a sustainable environment for social upliftment, one of these NBFC-MFI entities' ultimate goals.

## 6. OBSERVED CONCLUSION AND FUTURE SCOPE

The study deals with the performance of the microfinance institutions and found that technical efficiency removes the performance measurement issues and for analysing the performance of the DMU's. The study estimates the dual efficiency levels of the NBFC-MFI of India, which are financial and social efficiency. The study concludes that technical financial efficiency estimated at the constant returns to scale is better than the technical social efficiency levels assessed at the constant return to scale. It is observed that the Indian NBFC- MFI are found to improve the financial performance, which explains the sustainability of the organisations but still, a lot of scopes exist for the firms to improve their social performance indicating the outreach from the year 2015 to 2019.

The voluntary disclosures level of the NBFC- MFI for different sub-indices are estimated. It concludes that firms disclose more voluntarily on the financial performance and the forward-looking information but show low voluntary disclosures on the corporate social responsibility,

social communication, competitive environment, and corporate strategy. But the average voluntary disclosures are improved from 2015 to 2019.

The research also suggests that mean VD scores of the NBFC-MFI are not, but still, a gradual improvement is observed from 2015 to 2019. The level of voluntary disclosure is negatively associated with financial efficiency in the sample of NBFC-MFIs, the majority of which are private limited companies. It also concludes that the level of voluntary disclosures is inversely connected to social efficiency. The negative relationship exists because high-performing companies assume that voluntary disclosures will have no impact on their investors and contributors and that reporting voluntarily is a waste of time. They also believe that investing in community events adds to the cost. The present research studies firms, which are public and private companies, which means there are more misinformed investors.

The random effect model suggests the uniqueness of all of the firms studied over the years. The size and profitability of a company grow, so does the level of voluntary disclosure. In the random effect model, age is significant and negative. However, the study discovered that age has no significant relationship with voluntary disclosures in the robust model. The voluntary disclosures are positively related to the gross loan portfolio, which is an excellent social performance indicator.

The study can be extended with many similar companies and other microfinance institutions. The productivity of the firms can be tested as the determinant of VD. The index construction can adopt a weighted index methodology, and the association with efficiency can be tested empirically. A future study could also examine the endogeneity of efficiency and voluntary disclosure.

**Annexure 1**

S. NO –NBFC- MFI	Name
1	Adhikar Microfinance Private Limited
2	Agora Microfinance India Limited.
3	Annapurna Finance Privat Limited.
4	Asirvad Micro Finance Limited.
5	Belstar Microfinance Private Limited.
6	Bharat Financial Inclusion Limited [Merged]
7	Chaitanya India Fin Credit Private Limited.
8	Creditaccess Grameen Limited
9	Fusion Micro Finance Private Limited
10	Jagaran Microfin Private Limited
11	M Power Micro Finance Private Limited.
12	Madura Micro Finance Limited
13	Margdarshak Financial Services Limited
14	Muthoot Microfin Limited
15	Navachetana Microfin Services Private Limited.
16	Pahal Financial Services Private Limited.
17	Saija Finance Private Limited
18	Samasta Microfinance Limited
19	Satin Creditcare Network Limited
20	Shikhar Microfinance Private Limited
21	Sonata Finance Private Limited.
22	Spandana Sphoorty Financial Limited
23	Svasti Microfinance Private Limited.
24	Svatantra Microfin Private Limited.
25	Village Financial Services Limited

Note: These are the selected NBFC-MFI for the study

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