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Article

Impact of Efficiency on Voluntary Disclosure of Non-Banking Financial Company—Microfinance Institutions in India

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Abstract: This paper investigates how the financial and social efficiency of firms influence the extent of the voluntary disclosure of Non-Banking Financial Companies—Micro Financial Institutions (NBFC-MFI). The study constructed an unweighted index of voluntary disclosure to estimate the level of voluntary disclosure of all of the included firms from the years 2015–2019. The financial and social efficiency, which is analogous to the technical efficiency of production theory and analyses both sustainability and outreach, respectively, was estimated using data envelopment analysis (DEA). The panel data analysis was completed, and a positive association of financial efficiency was estimated. The social efficiency was found to have no relationship to the voluntary disclosure level. This paper contributed to the literature by providing new determinants of voluntary disclosure. The study examines the econometric model and suggests that financially sustainable firms that utilize these resources well are more open to outsiders, while socially efficient firms are reluctant to voluntary disclosure, which also includes social activities, and consider this as a wasteful activity. The findings of this study are relevant to industry practitioners and regulators, who need to think upon the sustainability of this crucial sector by meeting the dual objectives of financial and social performance. This study is helpful to all stakeholders as well as for the government, who can use the results to design additional rules for the NBFC–MFI. This study will also help firms to design disclosure strategies to ascertain goodwill and less cost of capital, with easy access to funds.

Keywords: voluntary disclosure; efficiency; panel data analysis; data envelopment analysis; NBFC-MFI



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1. Introduction

In the last decade, the Indian microfinance sector experienced extraordinary progress and took its fair position in the financial inclusion setup of the country. Commercial banks do their part in meeting the credit needs of financially deprived people who cannot produce collateral. However, the banks alone are unable to bridge this gap, which exists due to a mismatch in the supply and demand of the required funds. This vacuum is filled by microfinancial institutions, through various grass root level programmes. The microfinance industry across the globe, and specifically in India, is crucial to financial inclusion and helps in economic development (Young 2010). The microfinance sector in India has seen phenomenal growth, with an increase in credit disbursement and an increasing number of beneficiaries (Sa-Dhan 2019).

The Indian microfinance sector is divided into two complex structures: regulated and unregulated. The regulated institutions are either deposit or non-deposit-taking microfinance entities, but the most dominant form, suggested by the Reserve Bank of India (RBI), is non-deposit-taking NBFC–MFI. It is observed that the NBFC–MFI industry is changing its form, as some of the giant NBFC–MFI are converting into small finance banks. At the same time, some of these firms, such as Credit Access Grameen Bank, are becoming larger. The RBI (2011) has created NBFC–MFI, a new form of micro-financial institutions, and has set up various guidelines after the Andhra Pradesh crisis in 2010 and based on

suggestions given in the Malegam Committee Report. The RBI (2015a) has defined the code of conduct of NBFC–MFI and suggested efficiency improvement, which includes improving their processes and operations to reduce the cost of these firms. This suggests that regulators are acting in line with the changing microlending environment in India and introducing new entities. However, the bigger question for these entities is if they can survive in this volatile market of microlending. NBFC–MFI (Quayes 2012) have to meet the bottom line of the dual objectives of sustainability and outreach for their survival. Prior studies (Gutiérrez-Nieto et al. 2009; Widiarto and Emrouznejad 2015) have examined the first MFI objective of sustainability through financial efficiency, and the second MFI objective was estimated through social efficiency.

With the changing regulatory environment, the industry has raised concerns from the investors and donors and has emphasized the utilization of resources by these MFI. The motivation of this study is to relieve MFI from external subsidies. This results in better resource utilization and the disclosure of the same information to external parties and stakeholders to ensure and substantiate the regulatory compliance and performance of the MFI (Quayes and Hasan 2014). The disclosures must comply with the RBI, and the MFI should maintain a transparent and good corporate governance system; hence, meaningful disclosures by the MFI verify the firm's credibility (Das 2011).

1.1. Regulations for NBFC–MFI in India

Non-banking financial companies are made and comply to rules under the RBI (2015a). The directions are systematically designed for the non-deposit-taking companies. The prudential norms/directions are applicable to the non-banking financial companies defined under clause (45) of Section 2 of the companies Act 18 of 2013 (RBI 2015b). The RBI suggests additional regulations depending on the type of NBFC. NBFC–MFI are the non-deposit-taking companies registered under the Section 25 of the companies Act, 1956. Special directions are given in chapter IX of the direction received from RBI (2016) for NBFC–MFI. The guidelines specify the disclosure and transparency norms of these entities. NBFC–MFI should also follow the directions issued by the Financial Inclusion and Development Department (FIDD). NBFC–MFI need to become members and comply with the code of conduct for the self-regulatory organisations (SRO), which are recognized by the RBI. NBFC–MFI need to follow the Fair Practice Code (FPC), which is mentioned in directions of chapter IV of the RBI (2011).

1.2. Motivation

Corporate disclosure norms provide a safeguard to the reputation and proper functioning of a rapidly expanding industry, providing benefits to poor borrowers. These disclosures provide transparency in the system for donors, policymakers, which puts the stakeholders at ease, and help in tapping the required resources for the sustenance of the MFI. Unlike banks that are supported by deposits, credit disbursement, and the government, MFI are dependent on market credit operations and self-sustainability. Thus, NBFC–MFI need to emphasize both financial sustainability and social outreach, as the investors have a vested interest in this.

Corporate disclosure is mainly categorized as obligatory disclosure and voluntary disclosure. Annual reports are a source of all of the information that comes under regulation and compliance. Voluntary corporate disclosure is a set of information revealed over and above the regulatory requirements. This voluntary disclosure can include a firm's financial disclosures, non-financial disclosures, strategic disclosures, etc. (Beyer et al. 2010; Hossain 2008); hence it is required for researchers to understand the characteristics of the firms that go the extra mile and disclose this information. Michels (2012) suggests that the lending activities in the group lending scenario are positively impacted by voluntary disclosure.

Prior studies explain various factors of the firms that impact the level of voluntary disclosure. Quayes and Hasan (2014) establish the association between the financial performance and the financial disclosures of global MFI. Charumathi and Ramesh (2020)

establish that higher value firms positively impact the voluntary disclosure of the firms in India. [Chen et al. \(2014\)](#) argue that certain non-high tech firms in less developed regions working with associations or networks such as banks, the government, or other companies, are reluctant to disclose voluntarily due to a lack of motivation. Hence for these firms, value is negatively related to voluntary disclosure. This negative association is due to the close watch of competitors. It is noted that the low disclosure standards of the microfinance industry affect overall social welfare. Thus, the current study is motivated by the importance of the existing literature on voluntary disclosure and demands an urgent need to study the similar affect in the context of the Indian NBFC–MFI industry. This study aims to answer the following research questions: First, how efficiently are the MFI utilizing the resources available to them? Second, what are the different levels of financial and social efficiency mapping the dual objectives of the firms? Third, what is the level of voluntary disclosure maintained by the MFI? Fourth, what kind of firms disclose more after finding out the impact of the level of financial and social efficiency on the level of voluntary disclosure?

As such, the current study feels an urge to find the association of efficiency and level of voluntary disclosure for NBFC-MFI in India, where efficiency is taken as a performance indicator for MFI ([Hartarska and Mersland 2012](#)) and can be taken as one of the variables in the accounted literature for determinants of voluntary disclosure.

The research questions lead to the following objectives:

1. To find out the level of the efficiency levels of the NBFC-MFI;
2. To find out the level of voluntary disclosure in the NBFC-MFI;
3. To find out the association between the efficiency and level of voluntary disclosure.

The second section of this paper includes a literature review and hypothesis development. Section three explains the research methodology, and section four presents the data analysis and the results. The managerial implications are mentioned in section four, and the conclusion, limitations, and future scope of this paper is presented in the last section.

2. Literature Review and Hypothesis Development

2.1. Theoretical Development: Voluntary Disclosures

This section explains the theories behind voluntary disclosure, which help in discovering the features of the firms that effect the level of voluntary disclosures. This section also explains the prior empirical research in the voluntary disclosure field.

By nature, voluntary disclosure is a communication tool to promote a company's ideas to potential stakeholders for the long-term sustainability and growth of the company ([Abeysekera and Guthrie 2005](#)). By definition, voluntary corporate disclosure is the additional evidence released by the company that is beyond the scope of the mandatory disclosures required under the law ([Boesso and Kumar 2007](#); [Hossain and Hammami 2009](#); [Chau and Gray 2002](#); [Barako et al. 2006](#)). Theoretically, voluntary disclosure is grouped into economic theories (such as signaling theory, capital need theory, and agency theory) or socio-political theory (such as legitimacy theory, institutional theory, political theory, and stakeholder theory). *Agency theory* is one of the widely researched theories that supported the concept of voluntary disclosure ([Jensen and Meckling 1976](#)). It provides the importance of information disclosure and discusses the information asymmetry that leads to adverse selection and moral hazards. Researchers describe that asymmetric information among borrowers and lenders might create severe issues of adverse selection in the industry, such as microfinance institutions, which are group lending based ([Berger and Udell 1995](#); [Petersen and Rajan 1994](#)). Therefore, good quality information disclosure ([Healy and Palepu 2001](#)) helps in reducing information asymmetry. The *Theory of signalling* suggests ([Verrecchia 1983](#)) that voluntary corporate disclosure acts as 'signals' sent by the managers to the potential lenders; hence information disclosure is one of the key strategic decisions taken by the firm ([Beyer et al. 2010](#)).

[Md Zaini \(2017\)](#) shows that voluntary disclosure is done to gain the stakeholder's feelings confidence, status, and legitimacy for the organisation ([Faisal et al. 2012](#)). [Nurhayati](#)

et al. (2015) highlight that developing countries show a low level of voluntary disclosure, as the firms are concerned about the unfavorable impact on the firm's reputation (Zaini et al. 2018; Mondal and Ghosh 2014).

The amount of voluntary disclosure is empirically tested with corporate governance measures and has shown a positive association (Barako et al. 2006). Higher institutional ownership increases voluntary disclosure. The determinants of voluntary disclosure by Kenyan companies derive that the act of disclosing more voluntarily is positively associated with the shares held by foreigners and institutional shareholders, the level of leverage, the size of the firm, the external audit by audit firms, the profitability, and the liquidity (Barako et al. 2006; Abeywardana and Panditharathna 2016). Eng and Mak (2003) showed that firms larger in size disclose more, and firms with low debt also disclose more. Quayes and Hasan (2014) tested the endogenous relationship between financial disclosures and financial performance of microfinance institutions in 75 countries and inferred that better disclosures have a positive impact on operational performance and that better financial performance improves the disclosure quality.

Some studies (Quayes and Hasan 2014; Gutiérrez-Nieto et al. 2009) showed the internet disclosures of microfinance institutions and found out that NGOs reveal more social information, and for-profit organizations are better at financial information disclosures. They also noted that disclosures in the media are correlated with the amount of technological development of the country and the amount of legal transparency of the region in which the MFI operates.

Voluntary Disclosure Index

To estimate the level and quality of disclosure, indices were created. Some disclosure indices are self-constructed or can be directly taken from previous studies (Abeywardana and Panditharathna 2016; Al-Akra and Hutchinson 2013; Al-Akra et al. 2010; Tsang 1998). Healy and Palepu (2001) stated that there is greater confidence in a self-constructed index compared to the readily available indices.

Content analysis is used to calculate the scores and level of disclosures (Basalamah and Jermias 2005; Hackston and Milne 1996). Content analysis is a technique used to codify the texts present in the annual reports into different themes or categories (Weber 1990).

The amount of voluntary disclosure observes the firm's quality and credibility disclosed through different categories and can be measured through an index. These categories can be (1) internal and external information of the firm; (2) financial and non-financial information; (3) social, strategic, operational, futuristic information, etc. (Abeywardana and Panditharathna 2016; Singhvi and Desai 1971; Charumathi and Ramesh 2015).

Relevancy comes from the scores given by experts on these items. It has been identified that the quantity and quality of voluntary disclosures relate to the type and complexity of the firm. Researchers believe and explain that annual reports remain the object of the study (Beattie et al. 2004).

There are two ways of measuring the index: one is weighted, and another is unweighted. The weighted index is used for a specific purpose, and the weights are given based on the requirements of the researcher. The unweighted index is neutral and gives all of the items equal importance.

2.2. Efficiency

Traditional performance indicators are not enough for estimating the performance of MFI. One of the widely used techniques was ratio analysis, which suffers from the major problem of benchmarking and the handling of multiple inputs and outputs (Thanassoulis 2001; Otto 2011). Efficiency is defined as the measure to check the ability of the firm to reach the output(s) through the minimum amount of input resources. Efficiency is simply the operational efficiency of the firm in the industry, which explains the process of the utilization of resources and the optimal allocation of those resources (Achabal et al. 1984). Caballer-Tarazona et al. (2010) and Golany and Storbeck (1999) studied efficiency as the

parameter to explain the performance of the decision-making units (DMU). Kumar and Gulati (2010) measured the efficiency to calculate the overall performance of Indian banks. The performance was assessed and measured through efficiency (Mouzas 2006; Sharma et al. 2020). Studies confirm that firms that are non-high technology-based and that work in networks (guanxi) that are based on governments and close allies and interpersonal ties are resistant towards disclosing information, and therefore, show a negative association of the firm value with voluntary disclosure (Chen et al. 2014). This is because of the following reasons: (i) the marginal benefits of the increased disclosure are less than the marginal costs of the firm (Dye 1986; Verrecchia 1983; Chen et al. 2014) and, (ii) the firms may not have significant information that need a disclosure (Dye 1985). The microfinance institutions with dual objectives measure financial performance (Louis et al. 2013) with the combination of inputs and outputs required for the efficiency estimation. The expenses on the personnel, total assets, non-interest expenses, total liabilities, operating costs, and number of employees are some of the indicators taken for the inputs (Louis et al. 2013; Lebovics et al. 2016). Gross loans, gross interests, net income, dividend income, and financial revenue are some of the indicators taken as the outputs for estimating financial performance. Social efficiency (Gutiérrez-Nieto et al. 2009; Lebovics et al. 2016), which is measured through an input–output combination of average annual income and average loan balance per borrower, respectively, which is analogous to the technical efficiency (Servin et al. 2012) under production theory.

Social efficiency is explained by the social indicators of firms (Ravallion 2003). Microfinance studies explain that firms sometimes compromise on the social mission of serving the beneficiaries, and only financial efficiency is focused on. Financial efficiency measures the intensity with which the firms generate revenues utilizing their assets. Some researches (Otero and Rhyne 1994; Von Pischke 1996; Morduch 2000; Woller 2002; Mersland and Strøm 2010; Hermes et al. 2011, 2018) endorse the trade-off between social and financial efficiency. Researchers have shown that the firms with high financial efficiency might have low outreach but have larger loans. This simply means that the outreach of the organizations is negatively related to financial efficiency (Hermes et al. 2011), although some researchers argue this and suggest that the firms showing good social impact also show financial efficiency (Gutiérrez-Nieto et al. 2009).

2.2.1. Efficiency Measurement through Data Envelopment Analysis

Efficiency is measured through a non-parametric technique called data envelopment analysis (DEA) (Charnes et al. 1978). The firm of which the efficiency is measured is known as the decision-making unit (DMU). These DMUs can be non-profit or for-profit organizations, and DEA is used to measure the overall efficiency of them. Charnes et al. (1978) considered the constant return to scale model, which takes the small sample size (CCR model) and assumes that efficiency can be measured with two models, input minimization and output maximization, that will have the same efficiencies. An alternative assumption of Banker et al. (1984) is the use of the variable returns to scale (VRS) model, which is suitable for larger sample sizes. This model is also known as the BCC model. Ferdousi (2013) measured the overall efficiency under the assumption of the CCR, and pure technical and scale efficiencies were measured through VRS. Variables such as operating expenses and the number of staff (inputs) and gross loan portfolio and the number of active borrowers (outputs) were taken for the study. There are other approaches to measure efficiency as well. Data from 435 MFI were collected (Mix Market TM) over the period of 1997–2007. The study used Stochastic Frontier Analysis (BC Model), Battese and Coelli (1995), to measure the efficiency of the MFI since it controls random effects and measurement errors. In the analysis, cost efficiency was taken as the parameter for efficiency in terms of how close the actual costs of the lending activities of an MFI relative to the costs of a best-practice MFI were, making the case that it produced identical output under the same conditions. It was also discovered that the MFI that had lower average loan balances

were less efficient [Hermes et al. \(2011\)](#). Additionally, MFIs with more female clients were also less efficient.

2.2.2. Impact of Efficiency on Voluntary Disclosure

[Baiman and Verrecchia \(1996\)](#) demonstrated how the level of disclosure is affected by the production efficiency of firms. The production efficiency of firms is inversely related to the level of disclosure. When the level of disclosure increases, it leads to an increase in liquidity, and it lowers the cost of capital. This leads to a decline in the gains to insiders and further increases in the moral hazard of the manager, which decreases efficiency. In contrast to this, [Gutiérrez-Nieto et al. \(2009\)](#) found no association between disclosure with social efficiency. [Goldstein and Yang \(2019\)](#) studied the disclosure and market efficiency and concluded that market efficiency and disclosure share a negative association. This is due to uninformed retail investors. According to the Friedman style, investors consider voluntary social responsibility activities as wasteful. [Jaggi and Freedman \(1982\)](#) study the negative correlation between pollution disclosures (quantitative and qualitative) and economic performance. The economic performance is derived from indicators like ROA, ROE, and EBIT. This is supported by [Ingram and Frazier \(1983\)](#), who also established a weak negative correlation between the content disclosed in the annual reports and the economic performance. [Ullman \(1985\)](#) established a negative association between social disclosure (which is quasi-mandated) and economic performance.

2.3. Research Gap and Hypothesis Design

The authors find that there is a dearth of voluntary disclosure studies in India. Prior studies have given a lot of determinants of voluntary disclosure, but very few studies are done on micro-financial institutions. There is no such study present on the NBFC–MFI which studies the pattern of the voluntary disclosure of a for-profit organisation with a social objective. The literature review has helped in finding the following research gaps for the study. First, the literature does not have any voluntary disclosure studies in the MFI sector. Second, the financial performance is checked, but the social performance is not, even though for-profit organisations like NBFC–MFI have a dual objective. Third, efficiency is a superior measure to check performance, and the relationship between efficiency and voluntary disclosure is not present in the literature. Fourth, the literature review done across the dimensions of voluntary disclosures, index construction, efficiency, and their relationship creates the notion that a self-constructed voluntary disclosure is not available for NBFC–MFI, which are for-profit companies and have dual objectives to meet. Hence the current study tries to test the relationship between voluntary disclosure and the financial efficiency and social efficiency of NBFC–MFI in India.

Hypothesis 1 (H1): *Financial efficiency is significantly associated with the voluntary disclosure of the firm.*

Hypothesis 2 (H2): *Social efficiency is significantly associated with the voluntary disclosure of the firm.*

This will help the sector understand how for-profit MFI are making a tradeoff between social and financial efficiency, and how it impacts the voluntary disclosure, or if it works the other way. Thus, a high or low score of voluntary disclosure (VD) can meet the conflicting twin goals of the MFI, i.e., servicing the underprivileged and meeting the expectations of investors. Thus, this study will focus on the impact of efficiency on voluntary disclosure on the efficiency of the NBFC-MFI in India.

3. Research Design and Methodology

3.1. Research Design

The study adopts a mixed method wherein both quantitative and qualitative study is undertaken. The study is divided into two parts. The qualitative part includes the in-depth interviews of experts to construct the content analysis for measuring the level of voluntary disclosure. The quantitative part includes an estimation of efficiency by using DEA and the relationship of the efficiency with the level of voluntary disclosure through panel data analysis.

3.1.1. Construction and Measurement of Levels Voluntary Disclosure

Part one of the study is to estimate the magnitude of voluntary disclosure of NBFC-MFI. An index for voluntary disclosure was constructed. The definition used for the construction of voluntary corporate disclosure was the discretionary release of a different set of information. This can be financial and non-financial, futuristic, etc. This information is over and above the mandatory disclosures.

The study used an unweighted index. This study method is known as the dichotomous method. The disclosure of an item in the annual report is given '0', and non-disclosure of an item is given '1'. If a study does not have a specific user group, then unweighted indexes are made, and each user group can assign weights and make sense out of it for their specific user group (Cooke 1989; Abeysekera and Guthrie 2005; Jones and Shoemaker 1994; Owusu-Ansah 1998; Raffournier 1995; Hossain et al. 1994).

The study focused on the micro-financial intuitions that are regulated by the RBI and NABARD. The regulated MFI are divided into entities like commercial banks, small finance banks, and cooperatives that are deposit-taking. Others are non-deposit taking, which are non-bank financial companies (NBFC) (RBI 2015a, 2016). One of the major challenges of the non-deposit-taking entities is to raise funds for the firm and finding donors and investors. Thus, these non-deposit-taking entities face challenges meeting the dual financial and social objectives. As such, the current study aims to find out the efficiency levels of these firms. The study also aims to find out the level of transparency that the firms maintain for the stakeholders and find out how the efficiency levels of the firm impact the level of voluntary disclosure. The study considers 25 registered NBFC-MFI with the Reserve Bank of India from 2015 to 2019, with a total of 125 observations, which constitutes an adequate sample size for the study (Nunnally 1967). This suggests that per indicator, there are 10 observations required. It is noted that these are unlisted entities, and due to data insufficiency, data from only 46 firms were available on CMIE Prowess. The study dropped firms if the firms did not fit the following criteria:

- (i) Firms need availability of the annual reports from 2015–2019.
- (ii) Firms need to be registered with the RBI from 2015–2019.

The disclosure studies used the annual reports and various studies confirm this (Kassarjian 1977; Srinivasan 2006). The annual reports underwent content analysis. The themes and categories were identified. The categories have a group of statements.

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

Equation (1) explains the formula to calculate the voluntary disclosure (VD) score.

An extensive literature review was done to develop the voluntary disclosure index by the firm. The following steps were taken to construct the voluntary disclosure: First, the disclosure norms of the NBFC-MFI are according to the Fair Practice Code of Conduct as per the RBI. The microfinance direction of 2011 is considered for transparency and directions. Second, the study took in-depth interviews of the experts, financial professional, and accountants across the industry, and third, the disclosure index was made by referring to the literature (Hossain et al. 1994; Buckland et al. 2000; Barako 2007; Firer and Meth 1986). The 97-item index was sent to experts, and their feedback was taken to create a list of 74 items. The final list of items was created and divided into nine categories

that were derived from (Abeywardana and Panditharathna 2016). The methodology was adopted from Barako (2007). The index has nine categories (Table 1) which consist of: background about the NBFC–MFI, corporate strategy, financial performance, forward-looking information, social performance, human intellectual and capital, corporate social responsibility, competitive environment, and outlook, and risk management. The different categories adopted for the study cover all the detailed narratives, financial, non-financial, strategic, forward-looking, and the competitive perspectives of the organisation. Studies support that these are major areas that constitute the voluntary disclosure index (Elfeky (2017); Barako (2007); Htay et al. (2012); Sinha and Gadarowski (2010); Quayes and Hasan (2014)).

Table 1. The categories for voluntary disclosure index.

Major Categories	Resources
A Background about the NBFC–MFI corporate information (08):	Elfeky (2017); Barako (2007)
B Corporate Strategy (04):	Elfeky (2017).
C Financial Performance (10)	Elfeky (2017); Barako (2007); Quayes and Hasan (2014).
D Forward-looking information (9)	Elfeky (2017); Sinha and Gadarowski (2010)
E Social Performance (7)	Htay et al. (2012); Sinha and Gadarowski (2010)
F Human Intellectual and Capital (9)	Elfeky (2017); Barako (2007)
G Corporate Social Responsibility (8)	Barako (2007); Sinha and Gadarowski (2010)
H Competitive Environment and Outlook (6)	Elfeky (2017); Quayes and Hasan (2014).
I Risk Management (13)	Quayes and Hasan (2014).

Note the authors’ contribution. Categories for the VD index.

3.1.2. Efficiency Estimation

In the second part of the study, the efficiency of the firms was measured through a non-parametric approach, DEA. For ascertaining the efficiencies, input and output combinations were derived from the literature given in Table 2. The efficiency is taken as financial efficiency and social efficiency. The input parameters to measure both the efficiencies were the number of employees, operating expenses, and total assets. The output parameters for financial efficiency and social efficiency were the gross loan portfolio, income from financial service and average loans and advances, and active borrowers, respectively. The DEA estimated the efficiency of decision-making units (DMUs) for a particular year. The study measured the efficiency of the NBFC–MFI. First, the efficiency was measured by taking the constant return to scale technical efficiency (CRSTE), which applies to the small samples (CCR model). The CRSTE is considered to be the global measurement for firm performance (Huguenin 2012). Second, the orientation model for the current study is an output orientation model because the firms selected for the study were granted a level of input, and their objective was to maximize output (Huguenin 2012). The technical efficiency for the CCR and BCC output-oriented model is given in Equations (2) and (3).

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

Equation (2) explains the output-oriented CCR Model (Charnes et al. 1978). The variable φ indicates the increase in the output to achieve efficiency.

$$\begin{aligned}
 & z_0 = \varphi + \epsilon (eTs + + eTs-) \\
 & \Phi Y_0 - Y\lambda + s+ = 0 \\
 & \max \quad X\lambda + s- = X_0 \\
 & \varphi, \lambda, s+, s- \quad T\lambda = 1 \\
 & \text{Subjet to} \quad \lambda, s+, s- \geq 0
 \end{aligned} \tag{3}$$

Equation (3) explains the output-oriented BCC Model (Banker et al. 1984).

The study measured the efficiency as financial efficiency and social efficiency by taking different input–output combinations aiming to meet the dual objectives of the sustainability and the outreach of the firm. The input and output combinations for estimating the financial efficiency for the current study are mentioned in Table 2a and the input–output combinations for measuring the social efficiency are mentioned in Table 2b.

Table 2. (a) Input and output combinations for financial efficiency estimation; (b) Input and output combinations for social efficiency estimation.

(a)			
Variable Symbol	Variable Name	Definition	Reference
Input_TA	Total Asset	Total of all the asset account	(Gutiérrez-Nieto et al. 2009)
Input_OE	Operating Expenses	These are the operating expenses related to the operations f the MFI, like rent, transportation,	Widiarto and Emrouznejad (2015)
Input_NOE	Number of Employees	This includes those who are working for the MFI, who are regular or contract workers.	(Gutiérrez-Nieto et al. 2009)
Output_Financial Revenue	Financial Revenue	The outstanding principal balance of the outstanding loans.	(Gutiérrez-Nieto et al. 2009) Widiarto and Emrouznejad (2015)
(b)			
Variable Symbol	Variable Name	Definition	Reference
Input_TA	Total Asset	Total of all the asset account	(Gutiérrez-Nieto et al. 2009)
Input_OE	Operating Expenses	These are the operating expenses related to the operations f the MFI, like rent, transportation,	Widiarto and Emrouznejad (2015)
Input_NOE	Number of Employees	This includes those who are working for the MFI, who are regular or contract workers	(Gutiérrez-Nieto et al. 2009)
Output_AB	Active Borrower	Number of active beneficieries	Mersland and Strøm (2010)

Note authors’ contribution: variables for estimation of the efficiency.

3.1.3. Firm-Specific Variables for the Study

The studies in the area of voluntary disclosure take into account the firm-specific variables such as size (El-Diftar et al. 2017; Hossain and Reaz 2007; Ingram and Frazier 1983). It is observed that a firm’s size is positively related to voluntary disclosure (Quayes and Hasan 2014). The study has taken the number of employees as aproxy of the size. The firms with a higher number of employees disclosed more. Profitability shows a positive relationship with voluntary disclosure (Camfferman and Cooke 2002; Soliman 2013). The younger firms, unlike the older firms, do not show a strong corporate governance structure, so age also impacts voluntary disclosures (Sharma et al. 2019; El-Diftar et al. 2017; Hossain and Reaz 2007). Studies done on microfinance institutions show that the Gross Loan Portfolio positively impacts the disclosures of the firms, Quayes and Hasan (2014). The

literature does not show a clear association of the leverage with the disclosures. Some studies show a positive association between the leverage and the voluntary disclosure (Foster 1986). The study measured leverage as the ratio of debt and equity.

3.1.4. Impact of Efficiency on Voluntary Disclosure

In the final stage, the impact of financial and social efficiency on the level of voluntary disclosure was tested. The software used for the study was STATA.

The voluntary disclosure index was constructed through interviews and the existing literature. The content analysis was completed to measure the scores of each firm from 2015–2019. The level of disclosure was taken as LOGVD, which was measured as the log value of the voluntary disclosure score measures for each year from the annual reports. Efficiency scores (financial and social) were taken from the DEA software. The model also considers some firm-specific variables (refer to Section 3.1.3). Equation (4) attempts to examine the model that finds the impact of financial efficiency and social efficiency on voluntary disclosure.

4. Data Analysis and Results

4.1. Voluntary Disclosure Index and Its Reliability

The index was created with nine categories, and the scores were calculated (Equation (1)) by completing a content analysis of the annual reports of each firm over five years.

The reliability of the index of voluntary disclosure was measured. The Cronbach alpha of the voluntary index was 0.717, which was more than the cut-off value of 0.7 and was considered good, considering the internal consistency of the items in the index used (Cronbach 1951).

4.2. Measurement of Efficiencies of the NBFC-MFI

4.2.1. Input and Output Variables for DEA

The descriptive statistics in Table 3 explain the maximum, minimum, and standard deviation of the input and output for the financial and social efficiency, respectively.

Table 3. Descriptive statistics of inputs and outputs for the years 2015–2019 for financial efficiency and social efficiency estimation.

	Both FE & SE Model			FE Model	SE Model
	TA(I)	OE(I)	NOE(I)	GLP(O)	AB(O)
MAX	1.12247×10^{11}	7,831,669,413	16,021	30,366,400,000	7,401,000
MIN	52,878,201	6,097,109	20	3,803,391	46
MEAN	12,511,771,130	814,673,003.2	1981	2,382,702,459	706,451
SD	19,572,137,459	1,386,105,619	2760	4,286,968,015	1,239,852

Note: Authors’ calculations using SPSS. The brackets specify the O = Output and I = Input Variable for both financial efficiency (FE) and the social efficiency model (SE). TA, OE, and GLP are in the Rs crore denomination, and the NOE and AB are in numbers.

4.2.2. The Validity of the Efficiency Evaluation Model

This section explains the validity in terms of model specification. First, we introduced the isotonicity test to check how the change in the inputs affected the change in the outputs. This was done by measuring the inter-correlation among the input and output variables. Table 4a,b explain the correlation among the input and output variables. The results show that the variables are significantly correlated, which validates their association to measure efficiency.

Table 4. (a) Correlation matrix (financial efficiency)—test of isotonicity; (b) Correlation matrix (social efficiency)—test of isotonicity.

(a)				
	FR_O	TA_I	OE_I	NOE_I
FR_O	1			
TA_I	0.951 **	1		
OE_I	0.897 **	0.858 **	1	
NOE_I	0.937 **	0.926 **	0.855 **	1
(b)				
	AB_O	TA_I	OE_I	NOE_I
AB_O	1			
TA_I	0.909 **	1		
OE_I	0.862 **	0.858 **	1	
NOE_I	0.948 **	0.926 **	0.855 **	1

Note: Authors’ calculations ** The matrix correlation is significant at the 0.01 level (2-tailed).

4.2.3. Efficiency Estimation of NBFC–MFI in India

The efficiency estimates were measured through DEAP 2.1. DEA estimated the technical efficiency under the output-oriented model and CCR. The efficiency scores were measured by taking two models, financial efficiency and social efficiency, of NBFC-MFI.

Table 5 explains the number of a firm’s average technical efficiency under the FE and E model and the mean voluntary disclosure score. The mean disclosure scores were measured every year, and the results show that the mean voluntary disclosure score improved over time from the years 2015 to 2019. The variation is also increased over the years.

Table 5. Technical efficiency of NBFC–MFI and mean VD score from 2015–2019.

Year	No of NBFC-MFI	DMU with Max Value of 1 (FE Model)	Mean CRSTE-FE Model	DMU with Max Value of 1 (SE Model)	Mean CRSTE-SE Model	Mean VD Score	STD of VD Score
2015	25	1	0.48	3	0.78	26.96	9.10
2016	25	3	0.63	4	0.81	33.28	12.47
2017	25	5	0.78	5	0.80	36.08	12.27
2018	25	5	0.88	3	0.59	36.16	12.06
2019	25	4	0.89	3	0.61	42.52	13.81

Note Authors’ calculations: DEAP 2.1.STD is the standard deviation of the voluntary disclosure scores.

The financial and social efficiency is measured at CRSTE. Columns three and five show the number of DMU benchmarked with a technical efficiency score of 1 at CRSTE. It can be seen through Table 5 that the number of firms reaching the maximum score, (1), is under the FE model more than the SE model. The average CRSTE score is in the range from 0.485 in 2015 to 0.803 in 2019 for the FE model, which infers that a 51.5% increase in the output in 2015 and 10.1% of the increase in the output in 2019 is required at the given level of input usage to attain efficiency. However, for the SE model, the CRSTE shows that the average CRSTE is around 0.785 in the year 2015 and 0.634 in the year 2019, which shows that an increase of approximately 21.5% in the output in the year 2015 and a 38.6% increase in the social output in the year 2019 is required by the firms to reach efficiency while maintaining the input.

Table 6 explains the returns to scale and technical efficiency under the financial efficiency and social efficiency model. Under the FE model, the average efficiency score under CRSTE means that NBFC–MFI can maximize 10.1% of the output (FR) by maintaining the same level of input (TA, OE, and NOE). Under the VRSTE model, the NBFC–MFI can maximize 7.9% of the output while maintaining the input. Under the SE model, the average

CRSTE implies that the NBFCI-MFI output of (AB) can be maximized by 38.6% while maintaining the same level of input (TA, OE, and NOE).

The outcomes of Table 6 show that DMUs NBFC–MFI 5, 10, 11, 18, and 23 are showing returns to scale, which indicates if the firm needs to increase or decrease the scale of the firm for minimizing the firms average costs. 13 NBFC-MFIs show decreasing returns to scale in technical efficiency under the FE model, whereas under the SE model, none of the NBFC–MFI show an increasing return to scale.

Table 6. Efficiency summary for the year 2019.

FIRM	CRSTE	VRSTE	SCALE	RTS	CRSTE	VRSTE	SCALE	RTS
	Financial Efficiency				Social Efficiency			
NBFC-MFI1	1	1	1	0	1	1	1	0
NBFC-MFI2	0.86	1	0.861	−1	0.60	1	0.60	−1
NBFC-MFI3	1	1	1	0	0.08	0.24	0.33	−1
NBFC-MFI4	0.97	1	0.970	−1	0.63	0.83	0.76	−1
NBFC-MFI5	0.92	0.92	0.9975	1	0.44	0.52	0.84	−1
NBFC-MFI6	1	1	1	0	0.80	1	0.80	−1
NBFC-MFI7	0.89	0.94	0.945	−1	0.63	0.78	0.80	−1
NBFC-MFI8	0.76	0.77	0.987	−1	0.62	0.75	0.82	−1
NBFC-MFI9	1	1	1	0	0.62	0.65	0.94	−1
NBFC-MFI10	0.93	0.94	0.996	1	0.67	0.79	0.85	−1
NBFC-MFI11	0.84	0.84	0.998	1	0.68	0.80	0.85	−1
NBFC-MFI12	0.93	0.95	0.980	−1	0.92	1	0.92	−1
NBFC-MFI13	1	1	1	0	0.90	0.99	0.90	−1
NBFC-MFI14	0.93	0.94	0.987	−1	0.50	0.62	0.80	−1
NBFC-MFI15	0.86	0.89	0.971	−1	0.66	0.87	0.76	−1
NBFC-MFI16	0.80	0.85	0.935	−1	0.52	0.70	0.74	−1
NBFC-MFI17	1	1	1	0	0.74	1	0.74	−1
NBFC-MFI18	0.91	0.92	0.994	1	0.52	0.59	0.88	−1
NBFC-MFI19	0.74	0.75	0.988	−1	0.62	0.67	0.93	−1
NBFC-MFI20	0.93	0.99	0.946	−1	0.49	0.68	0.71	−1
NBFC-MFI21	0.91	1	0.910	−1	0.55	0.67	0.81	−1
NBFC-MFI22	0.78	0.82	0.944	−1	0.47	0.50	0.92	−1
NBFC-MFI23	0.91	0.91	0.998	1	0.67	0.73	0.92	−1
NBFC-MFI24	0.73	0.74	0.987	−1	0.33	0.34	0.97	−1
NBFC-MFI25	0.80	0.80	1	0	0.59	0.63	0.94	−1
Mean	0.89	0.92	0.976		0.61	0.73	0.82	

Note Authors’ calculations: DEAP 2.1 CRSTE = technical efficiency from CRS DEA; VRSTE = technical efficiency from VRS DEA; SCALE = scale efficiency = crste/vrste; RTS = returns to scale; 1 = Increasing returns to scale, −1 = decreasing return to scale, 0 = means constant return to scale.

Table 7 explains the peer summary. The firm that appears the most frequently is the most efficient firm among its peers. Under the FE model, Madhura Microfinance (NBFC–MFI 10) is the most efficient NBFC-MFI. Whereas in the SE model, Bharat Microfinance (NBFC–MFI 6) is the most efficient NBFC–MFI and is also the second most efficient firm under the FE model.

Table 7. Peer Summary.

Firm	Peers (FE)-NBFC-MFI	Peers(SE)-NBFC-MFI
NBFC-MFI1	1.	1
NBFC-MFI2	12, 1.	1, 12
NBFC-MFI3	3.	5, 12
NBFC-MFI4	21, 10, 12, 15.	15, 6, 1
NBFC-MFI5	10, 12, 21, 15.	15, 6, 1
NBFC-MFI6	6.	6.
NBFC-MFI7	6, 10, 12, 22.	1, 6
NBFC-MFI8	6, 22, 10, 15.	15, 6, 1
NBFC-MFI9	1, 10, 15, 22, 12.	15, 1, 6.
NBFC-MFI10	10.	6, 1.
NBFC-MFI11	19, 10, 1, 6.	6, 1.
NBFC-MFI12	19.	12.
NBFC-MFI13	19, 15, 12, 15, 10.	15, 1, 6.
NBFC-MFI14	15, 19, 21, 10, 12.	15, 6, 1.
NBFC-MFI15	15.	15.
NBFC-MFI16	10, 17, 15, 19.	1, 6.
NBFC-MFI17	17.	15, 6, 1.
NBFC-MFI18	6, 10, 15, 22.	12, 15, 6.
NBFC-MFI19	19.	1, 6.
NBFC-MFI20	6, 10, 1.	6, 1.
NBFC-MFI21	21.	15, 6, 1.
NBFC-MFI22	22.	6, 12, 15.
NBFC-MFI23	15, 22, 10, 12.	6, 1, 15, 12.
NBFC-MFI24	19, 1, 25, 10, 12.	1, 15, 6,
NBFC-MFI25	25.	1, 6.

Note authors' calculation from DEAP 2.1. The table shows the peer summary. Annexure 1 for names of NBFC-MFI.

4.3. Consolidate Panel Regression Results

In the subsection, the panel regression results are presented. The relationship empirically tests the relationship between voluntary disclosure and efficiency. Some of the variables are dropped due to the presence of a higher value of VIF (variance inflation factor). Table 8 explains the descriptive statistics, and Table 9 explains the panel data estimation.

To establish the relationship, the efficiency scores (measured through DEA) are regressed against the log of VD scores using panel data (Equation (4)). The firm variables are taken as control variables (refer to Section 3.1.3).

Table 8. Descriptive statistics.

Variable	Observations	Mean	Standard Deviation	Minimum	Maximum
Log-VD	125	3.59	0.46	1.67	4.41
Financial Efficiency	125	0.71	0.21	0.16	1
Social Efficiency	125	0.72	0.19	0.004	1
Profitability	125	0.018	0.03	-0.15	0.11
Log-GLP	125	22.18	2.10	13.64	35.95
Number of personal	125	1981.78	2759.85	20	16,021
Leverage	125	4.63	4.26	-36.57	9.13

Note: the table explains the descriptive statistics of the variables used for the panel estimate.

Table 9 shows the panel estimates for Model 1. LOGVD_{it} is the dependent variable, FECRS_{it} and SECRS_{it} are independent variables, and the error term is ε_{it} for i = 1, 2, 3, etc. Cross-sectional units (M) are observed for dated periods, t = 1, 2, 3, etc. T and δ_{it} capture the firm effect, and ζ_{it} captures time effect (Equation (4)). Model 2 and Model 3 test the model at different levels of voluntary disclosure score. LOG_HVD explains the firms with the high level of voluntary disclosure scores, and LOG_LVD explains the firm's low level of disclosure scores.

$$\text{Model 1 LOGVD}_{it} = \alpha + \beta_1 \text{FE_CRS}_{it} + \beta_2 \text{SE_CRS}_{it} + \gamma_{it} \text{ Firm specific} + \delta_{it} + \zeta_{it} + \varepsilon_{it} \tag{4}$$

$$\text{Model 2 LOGHVD}_{it} = \alpha + \beta_1 \text{FE_CRS}_{it} + \beta_2 \text{SE_CRS}_{it} + \gamma_{it} \text{ Firm specific} + \delta_{it} + \zeta_{it} \tag{5}$$

$$\text{Model 3 LOGLVD}_{it} = \alpha + \beta_1 \text{FE_CRS}_{it} + \beta_2 \text{SE_CRS}_{it} + \gamma_{it} \text{ Firm specific} + \delta_{it} + \zeta_{it} \tag{6}$$

The selection of the applicable model is explained by the likelihood test, which helped in choosing between pooled OLS and fixed effect. After a fixed test was chosen among the two, Hausman was completed, which suggested the presence of a fixed effect regression model. The model fit of the fixed effect was tested. The Breusch Pagan LM test results signified the presence of a fixed effect. The serial correlation was tested through the Wooldridge test, and the results show that no serial correlation was present. The fixed-effect model showed an absence of heteroscedasticity (Wooldridge 2010).

Table 9. Panel estimate.

Independent Variable Log-VD	Coefficient	Standard Error	t Ratio
Constant	3.00	0.29	10.16 (0.000)
Financial Efficiency	0.40	0.12	3.30 (0.001)
Social Efficiency	−0.16	0.14	−1.15 (0.253)
Log-GLP	0.020	0.01	1.54 (0.128)
Leverage	−0.002	0.005	−0.48(0.635)
Profitability	2.05	0.79	2.58 (0.011)
Number of employees	0.00004	0.00001	2.85 (0.005)
Test for differing groups	11.08 **	BP Test	112.18 **
Hausman Test	62.36 **	R ²	0.41
Wooldridge Test for autocorrelation	0.184	Number of observation	125
Number of years	5		

Note: The table shows the estimates and the fixed effect model. Statistical significance ** are significant at the 5% level. Social efficiency (constant return to scale). FECRS, financial efficiency, (constant return to scale). LOGVD = Log of Voluntary disclosure score. The model explains the model fit indicators. Wooldridge test (Wooldridge 2010; Drukker 2003) of autocorrelation was performed.

4.4. Robustness of the Findings

The robustness is checked through sensitivity analysis. In this analysis, various other forms of proxies are created from the disclosure index to check the robustness Albassam (2014). The robustness of the model is tested by creating sub-indices (Hassan and Marston 2019), the higher-level index and low-level index.

Models 1, 2, and 3 (Table 10) report the findings of the different sub-indices. It can be observed that the two sub-indices were created with a higher and lower level of voluntary disclosure. The financial efficiency was found to have a relationship that is significant and positive with Log-VD in all three models. The social efficiency is found to have no significant relationship with Log-VD. The Log-GLP level of the gross loan portfolio was found to have a significant relationship in Model 3, whereas models 1 and 2 do not show any significant relationship between Log-GLP and Log-VD. The number of employees (a proxy for size) was found to have a positive and significant relationship with Log-VD in Models 1, 2, and 3. Profitability also has a positive and significant relationship with Log-VD in all three models, although leverage was found to have a negative and non-significant effect on the Log-VD in Model 1. In models 2 and 3, leverage was positive but non-significant relation with the Log-VD. The models were found to be similar in obtaining the results. This supports the robustness of the findings.

Table 10. Robustness check with a lower and higher level of disclosures.

Independent Variable Log-VD	Whole Index (Fixed Effect) Model 1	Low-Level Index Model 2	High-Level Index Model 3
Constant	10.16 **	15.64 **	12.64 **
Financial Efficiency (FECRS)	3.30 **	2.22 **	1.59 **
Social Efficiency (SECRS)	−1.15	−0.45	−0.93
Log-GLP	1.54	0.71	1.52 **
Leverage	−0.48	0.92	0.85
Profitability	2.58 ***	1.02	1.62
Number of employee	2.85 **	3.27 **	2.96 **
F test	11.08 **	7.40 **	6.65 **
Number of years	5	5	5
R ²	0.41	0.60	0.49
Wald Chi2	30.18 **	12.74 **	46.86 **

Note: ** and *** indicates the *p*-value significant at 5% levels and 1% level respectively. The robustness is checked with high level and low level of disclosure models.

Panel A (Table 11) reports the fixed effect estimates, where the independent variables, called efficiency estimates, are taken at constant levels of returns, and Panel B estimates (Table 11) the fixed effect but at the variables returns to scale. Both models report a positive and significant impact on the financial efficiency (CRS and VRS) on Log-VD. The panels also found a positive and significant impact on the profitability and the number of employees (a proxy for size) on Log-VD. The panels show the similarity in the results. Thus, the analysis supports the robustness of the study.

Table 11. Robustness check by comparing the impact of efficiency estimate at a constant return to scale and the variables return to scale on the level of voluntary disclosures.

Independent Variable Log-VD	Efficiency at Constant Returns to Scale Panel A	Efficiency at Variable Returns to Scale Panel B
Constant	10.16 ***	8.55 ***
Financial Efficiency	3.30 ***	3.65 ***
Social Efficiency	−1.15	−0.36
Log-GLP	1.54	2.07
Leverage	−0.48	0.06
Profitability	2.58	2.67 ***
Number of employees	2.85	3.81 ***
F test		11.41 **
Hausman Test	62.36 **	15.13 **
Wooldridge test for autocorrelation	0.184	0.384
Breusch-Pagan Test	112.18 **	108.94 **
R ²	0.41	0.42
Number of observations	125	125

Note: Panel A has taken financial and social efficiency estimates at a constant return to scale (CRS). Panel B has taken financial and social efficiency estimates at the variables to the scale (VRS). *P*-value is significant at the ***, ** at 1% and 5% levels.

4.5. Endogeneity

The problem of endogeneity is usual in disclosure studies. This study has checked for this problem. This problem occurs when the explanatory variables have a high correlation with the error term. This study estimates the 2 SLS and uses the instrumental variable method to check the problem of endogeneity (Brooks 2019). The financial efficiency variable has the Durbin–Wu–Hausman (F statistics = 0.394344) value a insignificant, which shows that the variable is exogenous. The social efficiency variable has Durbin–Wu–Hausman (F statistics = 0.073502) values as insignificant, which shows that the variables are exogenous, and endogeneity is absent. Furthermore, the relevance of the instrument is checked and

shows that R^2 statistics are 0.30 and the F statistics are significant at 12.86, which is more than the threshold of 10 and the critical value of 5% for Wald test; hence suggesting that the instruments used in the models were not weak.

5. Implications

The current study has significant managerial implications. First, it will be relevant for managers to understand the efficiency level of the firm and the firm's benchmarking with their peers. The financial efficiency level is the indicator of the sustainability of the NBFC–MFI, and the social efficiency is an indicator of the outreach levels. Certain firms are efficiently maintaining a higher level of sustainability, and certain firms are increasing outreach.

Second, the study helps to understand the corporate activity of the firms by using various input and output combinations using data envelopment analysis.

Third, the study simplifies the concept of voluntary disclosure by linking it with the performance indicator of efficiency (Han et al. 2016; Goldstein and Yang 2019) and introduces policy implications, where the Indian government with the regulators should take a keen interest and determine specific types of indexing for these firms, which can check disclosure norms. This study suggests that those firms that efficiently use financial resources yield higher-level voluntary disclosure. However, this study fails to establish any relationship between the socially efficient firms and the level of voluntary disclosures. The results are in line with the studies done in Asian countries, which suggest that the companies get less incentive for releasing more information.

In India, the RBI has suggested that these entities can list themselves to any self-regulatory organization-SRO (RBI 2015a) and share details with these institutes. However, the sharing of the data is a voluntary activity, which attracts a lot of governance issues. Therefore, the current study justifies that even if the organizations are efficient, these firms should disclose more information to remove the asymmetry in the financial market and thus attract more investors and donors and lessen the cost of capital. The firms should not consider this voluntary disclosure as a wasteful activity (Ullman 1985; Jaggi and Freedman 1982; Ingram and Frazier 1983). This will endorse a favorable environment for social mobility, which is one of the ultimate objectives of these entities called NBFC-MFI.

6. Conclusions, Limitations, and Future Scope

The paper empirically tests the impact of financial efficiency and social efficiency on the voluntary disclosure of the non-banking financial companies–micro-financial institutions over the period 2015 to 2019.

The study concludes that the level of efficiency at CRSTE is measured through data envelopment analysis and shows that the average efficiency of NBFC–MFI in India under the FE model is better than the SE model. This brings a hindrance to the dual objectives of NBFC-MFI.

The study also shows that the average voluntary disclosures by NBFC-MFI are not high but are improving gradually. In the sample of NBFC–MFI, the majority are private limited firms. The financial efficiency is positively associated with the level of voluntary disclosure.

This suggests that the firms that are efficiently utilizing their resources are also open to outsiders and insiders and disclose more voluntarily. This also suggests that these firms are financially sustainable, which tends to maintain transparency. The study does not find any significant impacts on the firms that are socially efficient, which is supported by prior studies (Gutiérrez-Nieto et al. 2009). However, the negative sign of social efficiency (outreach) is because the firms that show good performance believe that voluntary disclosure might not impact their investors and donors, as they believe that disclosing voluntarily is a wasteful activity. The result is supported by (Luo and Chen 1997; Peng and Luo 2000). The studies done on the Chinese guanxi network, which suggests that the firms working in a closed environment and take resources on mutual trust and interpersonal ties disclose less

voluntarily to decrease the cost of capital and avoid competition. Indian NBFC–MFI also work in a similar environment. They also believe that putting money into social activities only increases the cost. The current study is done on both public and private limited firms, which enforce the presence of more uninformed investors. As the majority of the firms are private, they are closely linked, and therefore, resist disclosing voluntary information.

The fixed-effect model suggests that the impact of efficiency and the specific variables of the firms is fixed over the years.

The study confirms that as the number of employees (a proxy of size) and profitability leads to an increase in the level of voluntary disclosure.

The current study can be extended to a large set of companies of similar nature and with other forms of microfinance institutions. With the recent advancement and regulations for microlenders, the study can be further tested in a global setup. The productivity of the firms can also be tested, and the reasons for the efficiency change can be gauged. The current study constructs an unweighted index. Other researchers can construct a weighted index and the model can be empirically tested for different geography and different dataset.

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Abbreviations

S. NO	List of NBFC-MFI
NBFC-MFI1	Adhikar Microfinance Pvt. Ltd.
NBFC-MFI2	Annapurna Finance Pvt. Ltd.
NBFC-MFI3	Agora Microfinance India Ltd.
NBFC-MFI4	Asirvad Micro Finance Ltd.
NBFC-MFI5	Belstar Microfinance Pvt. Ltd.
NBFC-MFI6	Bharat Financial Inclusion Ltd. [Merged]
NBFC-MFI7	Chaitanya India Fin Credit Pvt. Ltd.
NBFC-MFI8	Fusion Micro Finance Pvt. Ltd.
NBFC-MFI9	M Power Micro Finance Pvt. Ltd.
NBFC-MFI10	Madura Micro Finance Ltd.
NBFC-MFI11	Margdarshak Financial Services Ltd.
NBFC-MFI12	Muthoot Microfin Ltd.
NBFC-MFI13	Pahal Financial Services Pvt. Ltd.
NBFC-MFI14	Saija Finance Pvt. Ltd.
NBFC-MFI15	Satin Creditcare Network Ltd.
NBFC-MFI16	Sonata Finance Pvt. Ltd.
NBFC-MFI17	Spandana Sphoorty Financial Ltd.
NBFC-MFI18	Samasta Microfinance Ltd.
NBFC-MFI19	Svasti Microfinance Pvt. Ltd.
NBFC-MFI20	Svatantra Microfin Pvt. Ltd.
NBFC-MFI21	Village Microfinance Pvt Ltd.
NBFC-MFI22	Creditaccess Grameen Ltd.
NBFC-MFI23	Jagaran Microfin Pvt. Ltd.
NBFC-MFI24	Navachetana Microfin Services Pvt. Ltd.
NBFC-MFI25	Shikhar Microfinance Pvt. Ltd.

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