

Financial Efficiency of Non – Banking Financial Companies-Microfinance Institutions: A Data Envelopment Analysis.

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Abstract:

The current paper measures the performance of the NBFC-MFI. The study measures the efficiency through the Data Envelopment Analysis (DEA). DEA is used to estimate the performance of the 39 (NBFC-MFI) non-banking finance companies- microfinance institutions in India. The cross efficiency is also measured by using Malmquist Productivity Index (MPI) over the period of 2015-2019. The current study takes the balanced panel for the study by using DEAP 2.1 to study the productivity and efficiency of the NBFC-MFI in India. The study concludes on the present inefficient status of the NBFC-MFI and also which type of efficiency contributes that.

Keywords: Microfinance, DEA, NBFC-MFI, Malmquist Productivity Index.

1. INTRODUCTION

The last 10 years of the Indian Microfinance Sector experienced extraordinary progress and taking its fair position in the financial inclusion setup of the country. The modern microfinance movement dates back to the 1970s when the experimental programmes in India, Bangladesh, Brazil, and a few other countries began to extend tiny loans to groups of poor women to invest in microenterprises. It has been argued for long that commercial banks have not met the credit needs of financially challenged people who are not able to offer collaterals but who have feasible and promising investment ideas that can turn into profitable initiatives. The role of MFIs in India in bridging the gap between the demand and supply of financial services among credit thirsty people

is realised over the past two decades, while organisations such as Shri Mahila Sewa Sahakari Bank Ltd. (SEWA), Ahmedabad and Working

Women's Forum, Chennai have taken a pioneering effort to meet the vacuum in financial services, the more vigorous attempt has started during the 1990s, with the initiation of the microfinance programme by several Non-Governmental Organisations (NGOs). Two broad approaches characterise the microfinance sector in India – groups formed by NGOs and linked to banks (Self Help Group Bank Linkage Program - SBLP) and NGOs/non-banking financial companies (NBFCs) form groups and perform financial intermediation role as a lender to groups after sourcing loans from banks, other financial institutions (MFI Bank Linkage Model). The institutions serving the underprivileged have increased in number from a handful to a few hundred. According to the report by **Sa Dhan (2016)**, the Indian beneficiaries of the service have crossed 39 Million. The regulatory bodies with the government of India have framed policy under the regulatory framework for all MFI's to function in the nation's interest. The sector needs a continuous

focus on one of the critical dimension i.e. for-profit microfinance institutions, which have a dual objective, one to maximize profitability and other to appraise the social impact and thus attain the overall sustainability. Microfinance has emerged as a powerful way for poverty mitigation in the developing and under-developing economies and its gaining importance in the eyes of the government, donors, academicians, and policymakers. It deals with the concept of providing microcredit to the poor, which anyways conventionally was not being served by commercial banks, and /or the financial institutions which provide a wide range of financial services from saving, insurance to credit. Microfinance is necessary to overcome economic evils like exploitation; it creates confidence for the economic self-reliance of the rural poor. Nowadays commercialized microfinance institutions are building in with more demand-driven financial products required to have a sustainable MFI. Supply-side and demand-side i.e. service provider and the users or beneficiaries both should be evaluated in terms of efficiency and sustainability to sustain its operations in the future. Microfinance in India remains in prolonged failure from the time when 2010 Andhra Pradesh Crisis was reported. The dual objective of MFI i.e. poverty reduction and fulfillment of investors' interest. There are different legal forms of MFI- according to SaDhan (2016), they are Societies/NGO, Trust, Sec-25 companies, NBFC-MFI, and Cooperatives. NBFC-MFI route started with a not –for – profit orientation but gradually due to high demand for the resources and the sectoral growth, a shift is observed to the for-profit organizations. Although the studies show that for-profit MFIs are high on financial information disclosure (profitability, return on asset, return on equity) and low on social disclosures (outreach, loan to women borrowers) but still they are MFIs and donor who would like to see the social efficiency. Thus it is important to know the sustainability of these for-profit MFIs and what is the level of transparency they show to the various stakeholders.

2.Rationale behind the study

Global GDP growth is estimated at 3.1%. However, the low-income population often gets neglected in this growth story. Banks are doing a lot under programs like Financial Inclusion to link this population to the financial services but in spite of it still there exists a gap. Microfinance institutions (MFI's) have taken care in addressing the gap. If we see the sectorial performance Indian Microfinance industry is pegged at Rs 63,853 crores making it about a US\$ 10 billion industry. (SaDhan, 2017). (Table1.1) Roy & Goswami (2013) during the banking crisis, the institutions which serve poor perform better than banks, studies from East Asia & Latin America provide the evidence for the same. MFI industry is slowly penetrating the Indian economy which is helping the bottom of the pyramid to upraise. Around 85 % of the total loan is given for income generation. The current status of the Indian MFI sector according to a SaDhan (2017) (refer table 1)

Table 1 Microfinance network and status in India - 2017

States	29
Union Territory	4
Districts	563
Reported MFI	168
Branch Network	10233 (8852 NBFC-MFI)
Clients(Million)	39 million
Outstanding loan (Excluding Small Finance Bank)	46,842
(Rs, crore)	
Average Loan per borrower (Rs)	12,751

Note: The data is extracted from Sa Dhan report 2017

According to Sa-Dhan's report 2016 the top ten MFI in India on the gross loan value are NBFC-MFI.

They contribute 79 % of the total gross loan value. Due to high penetration of NBFC-MFI in this sector it is important and relevant to study the performance of these entities. A committee made by Reserve Bank of India (RBI) and chaired by Shri Y.H. Malegam was constituted in order to study the problems of the MFI sector. NBFC- MFI (2011) capturing the maximum share of MFI sector thus separately defined and regulated by the committee recommendations. According to this NBFC-MFI (**RBI Directions 2011**)“An NBFC-MFI is defined as a non-deposit taking NBFC (other than a company licensed under Section 25 of the Indian Companies Act, 1956) that fulfils the following conditions: Min. Net Owned Funds of Rs.5 crores. (The north east based NBFC-MFI require NOF of Rs 2 crore) Not less than 85% of its net assets are in the nature of “qualifying assets.”These regulation has also lead an emphasis on the corporate governance parameters of these financial entities. Studies confirm that firms can only be sustainable if at all they have good governance. Good governance practices protect stakeholder’s interests and also increases their confidence in the company. NBFC is an essential part of the corporate sector and thus the once comes under regulation needs to adhere to the corporate governance compliances released by the regulators from time to time. According to the latest RBI directions- NBFC-MFI should review their operations and control mechanism. RBI has also given directions on the corporate governance of the NBFCs-MFI. The guideline is projected with respect to the Board of Directors of the class of NBFC’s for disclosure and transparency. Following committees to be formed for audit, nomination and risk management. It has been proven from The Bharat Microfinance Report 2015 that however contribution of the NBFC-MFI to the excess generated by the sector is high as 96 % but its ROA is 1.73% and ROE is 7.36% which is more or less low in comparison to the other’s legal form of MFI’s. This requires a lot of investigation about NBFC-MFI in India by looking at the size of it and the present-day regulatory norms. They also have economic

incentives to demonstrate details of financial standing and social performance to their donors, depositors, and other stakeholders that funds have been utilised efficiently consistent with their mission to build public trust and maintain growth for sustained operations. The issue of utilising the resources, especially concerning finances and performance, is thus at the heart of contemporary debates over creating a more open and accountable non-profit sector. The study will contribute to the body of literature for example the kind and level of efficiency measures required by the NBFC-MFI. The study will let the policymakers know how the financial efficiency impact the performance of the such entities.

3.Literature Review

The literature of the current study discusses the performance of the firms in terms of efficiency and different models of measuring the same.

3.1. Performance measure as Efficiency

Toindepi (2016) Researchers say that there are two ways to see sustainability, one client sustainability that showcase the customer/ poor and the other talks about the institutions. “Operational performance or sustainability broadly defined is the ability to cover costs and to continue operations without resorting to gifts, subsidies and debt relief or without keeping depositor’s savings illiquid.” **De Crombrughe et al (2008)**. Operating efficiencies are defined as “non-interest expense (input) to operating income (output) where non-interest expense are before-tax total expenses less interest expenses and charges for bad and doubtful debts, and operating income are net interest income plus non-interest income” **Srinivasan (1992), Johnson (1993)**.

Pal (2010)Efficiency considers the minimization of the cost of the MFI’s, which take into consideration cost incurred per borrower and cost per saver for computing efficiency. The study also concluded that MFI’s. Efficient MFI should have objectives which affirm that MFIs should generate enough revenue to

meet their operating and financing costs i.e. the institutionalist paradigm (**Woller et al 1999**) and second is the welfarist paradigm which includes a focus on poverty upliftment to achieve financial sustainability

3.2. Efficiency Models

Kar (2011) Some MFIS are better than the others or more sustainable is based on indicators like profitability, repayment of loan, cost indicators, interest rates etc. **Ferdousi (2013)** in his paper mentioned that economies of scale could be a determining factor of MFIs efficiency also the management skills are required in MFIs to properly utilize the input. Some studies show that variables like expense ratio, loans, staff number examine the MFI efficiencies. In addition, Sources of funds, lending methodology, loan size and salary structure are also found to drive efficiency. Labour (average salary, number of employee), physical capital (operating expenses, personal expenses) and financial capital (weighted average cost of capital) are taken as the input for cost function to measure efficiency **Hartarska & Mersland (2012)**. The efficiencies are measured by studying the NBFCI's of Malaysia using DEA i.e. data envelopment analysis and found out that size and part of the market negatively impact efficiency and he proved that more efficient NBFC's are highly profitable **Sufian (2006)**. **Charnes et al (1978)** Developed the method of DEA Data Envelopment Analysis for the nonprofit organization. The DEA assumes constant returns to scale Charnes et al (1978) which takes the small sample size and it assumes that as efficiency can be measured with two models one input minimization or output maximization will have the same efficiencies. And an alternative assumption of **Banker et al (1984)** variable returns to scale (which is suitable for the larger sample sizes). **Ferdousi (2013)** has measures the overall efficiency under the

assumption of the constant returns to scale and pure technical and scale efficiencies are measure under the assumption of variable returns to scale. Variables like operating expenses and the number of staff (inputs) and gross loan portfolio and the number of active borrowers (output) were taken for the study. Paper also finds out that the inefficiencies are due to technical inefficiencies and rather scale efficiency. There are other approaches as well to measure the efficiency. Data from 435 MFIs had been collected (Mix Market TM) over the period 1997-2007. The study uses Stochastic Frontier Analysis (BC Model) **Battese & Coelli (1995)** to measure the efficiency of the MFI, since it controls the random effects and measurement errors. In the analysis cost efficiency has been 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, taking the case that it produces identical output under the same conditions. It is also found out that the MFI'S that have lower average loan balances are less efficient **Hermes et al (2008)**. Also MFI with more women clients are also less efficient.

3.3. Financial Efficiency

The overall health of any firm can be accessed through its financial performance. Financial performance is the function of cost and revenue. It has been tested by the studies that majority of the MFI's are unprofitable and not good performers. Only self-sufficient MFI's are showing profitability figures. To assess profitability, the return on assets, and net profit margin and return on equity parameter have been taken **Tucker & Miles (2004)**. **Pal (2010)** for the study has taken ROA, ROE OSS yield on gross portfolio a financial expense per asset to calculate financial efficiency

Table 2 Financial efficiency parameters

(Gutiérrez-Nieto et al., 2009),	Input Variables	Output Variable
Financial Efficiency	Assets (A)	Gross Loan Portfolio (P)
	Operating Cost (C)	Revenue(R)
	Number of Employees (E)	
	Input Variables	Output Variable

Widiarto & Emrouznejad 2015).

Efficiency is the measure of performance

Financial Efficiency	Asset (A)	Financial Revenues (FR)
	Operating Expense (OE)	
	Portfolio at risk 30 days (PAR)	
	Employees (E)	

Note: The table is authors compilation

1. The objective of the study are
 - a) To identify the variables for financial efficiency
 - b) To identify the level of financial efficiency.
 - c) To compare the pattern of financial efficiency in the form of total factor productivity over the years and find out the productivity of the NBFC-MFI.

4. Research Methodology

The paper discusses the two methodologies of efficiency measure. The methods are DEA and Malmquist Productive Index (MPI). The study measures the technical efficiency of the Non-Banking Financial companies –Microfinance companies, which are listed by the RBI. All the NBFC MFI taken are unlisted. After the data cleaning efficiency and productivity of six companies are analysed over the five years. For efficiency calculation, input-output parameters are taken from the Prowess 1.9. The parameters are selected from the literature as given in Table 1. The study considers financial efficiency. The input

variable taken for financial efficiency are total assets and operating expenses of financial companies. The output variables to measure financial efficiency are income from financial services. The data is taken from the database of CMIE. The study applies the Data Envelopment Analysis model of BCC- DEA to benchmark the NBFC –MFI in India. The study also applies Malmquist Productive Index (MPI) to cross-validate the benchmark. The scores are calculated for the year 2015-2019. The paper reports 2019 scores.

4.1. Data Envelopment Analysis

Farrell (1957) proposes DEA. This is a non-parametric method for calculating the efficiency of the DMU which is the Decision-making unit. **Charnes et al (1978)** explain the method of DEA for nonprofit organisation. The DEA takes into consideration the (CRS) constant return to scale constant returns to scale (**Charnes et al 1978**) which takes the small sample size and it assumes that as efficiency can be measured with two models one input minimization or output maximization will have

same efficiencies. And an alternative assumption where (Banker et al 1984) (VRS) variable returns to scale is taken (which is suitable for the larger sample sizes). **Ferdousi (2013)** measures the total efficiency under CRS. Scale and pure technical efficiency are measures under the assumption of VRS. MPI is another approach used to measure efficiency over the year and calculate Malmquist Index, scale efficiency technical efficiency change, and pure technical change. After the DEA, the same output and input variables are used for the second stage to check the relative productivity of the NBFC-MFI in India.

The following calculations are:

$$\text{Efficiency Ratio} = \frac{\text{weighted sum of output}}{\text{weighted sum of input}} \quad (1)$$

DEA model is used with Constant Returns to Scale with CCR Model in which Input is minimized, the following Linear Programming is used to have DEA Efficient through Fth Decision Making Unit (DMU):

Minimize:

$$\theta_p, \lambda_f = \theta_f \quad (2)$$

$$M\lambda_f \geq m_f \quad (3)$$

$$\lambda_f \geq 0 \quad (4)$$

Where,

θ_f is the input-oriented technical efficiency measurement for firm f.

L is the $I \times F$ matrix of observed input quantities.

M is the $J \times F$ matrix of observed output quantities.

Vector l_f is the observed input quantities of firm F.

Vector m_f is the observed output quantities of firm F

The CCR DEA Model measures the technical efficiency of each firm F by finding the factor θ_p , by which f_{th} Firm can reduce its vector Input.

The Malmquist Productivity (mp) Index (Input oriented) of the total factor productivity change (TFPCH) between base period (s) to reference period (t) which is estimated by

$$mp_0^t(Y_s, X_s, Y_t, X_t) = \frac{d_0^t(Y_t, X_t)}{d_0^t(Y_s, X_s)} \quad (5)$$

But if, the Base period is 't' and the reference period is 's' then,

$$mp_0^s(Y_s, X_s, Y_t, X_t) = \frac{d_0^s(Y_t, X_t)}{d_0^s(Y_s, X_s)} \quad (6)$$

The Malmquist Productivity Index is the product of two-equation which can be written as:

$$mp_0(Y_s, X_s, Y_t, X_t) = \sqrt{\left[\frac{d_0^s(Y_t, X_t)}{d_0^s(Y_s, X_s)} \right] \times \left[\frac{d_0^t(Y_t, X_t)}{d_0^t(Y_s, X_s)} \right]} \quad (7)$$

If $mp > 1$ that denotes growth in Total Factor Productivity positively whereas if $mp < 1$, denotes a decrease in TFP growth. Hence the equation can be rewritten as:

$$mp_0(Y_s, X_s, Y_t, X_t) = \frac{d_0^t(Y_t, X_t)}{d_0^s(Y_s, X_s)} \sqrt{\left[\frac{d_0^s(Y_t, X_t)}{d_0^s(Y_s, X_s)} \right] \times \left[\frac{d_0^t(Y_t, X_t)}{d_0^t(Y_s, X_s)} \right]} \quad (7)$$

In equation 4 the proportion outside the square root denotes the technical efficiency part and the square root portion determines the technology change during base to reference period.

Total Factor Productivity change is the product of technical efficiency change and technology change. If the revelation is of CRS (Constant Returns to scale) then two forms are there: efficiency and technical change. But if revelation is of VRS (Variable Returns to Scale) then Pure and scale technical efficiency change are used for showing productivity growth.

Pure technical efficiency change (PTECH):

$$\text{PTECH} = \frac{d_{0VRS}^t(Y_t, X_t)}{d_{0VRS}^s(Y_s, X_s)} \quad (8)$$

Scale Efficiency Change (SECH):

SECH=

$$\sqrt{\left[\frac{d_{0VRS}^s(Y_t, X_t)/d_{0CRS}^s(Y_t, X_t)}{d_{0VRS}^s(Y_s, X_s)/d_{0CRS}^s(Y_t, X_t)} \right] \times \left[\frac{d_{0VRS}^t(Y_t, X_t)/d_{0CRS}^t(Y_t, X_t)}{d_{0VRS}^t(Y_s, X_s)/d_{0CRS}^t(Y_t, X_t)} \right]} \quad (9)$$

Hence, $TFPCH = PTECH \times SECH \times TCH$

4.2. Data Input-output variable

The descriptive statistics in Table 3 explain the maximum, minimum and standard deviation of the input and output. Table 4 explains the correlation between the input and output variables. The results show that the variables are significantly correlated which validates their association to measure the efficiency.

Table 3 Descriptive statistics of inputs and outputs for the year 2015-2019 for Financial Efficiency

	I	TA	OE
Max	20961.6	115367.5	14417
Mean	1505.773	9049.288	1118.549
SD	2845.549	16446.4	1971.295

Source: Authors Calculation of descriptive statistics

Table 4 Correlation matrix Financial Efficiency

	I	TA	OE
I	1		
OI	0.989*	1	
TA	0.987*	0.982*	1

Source: Authors Calculation correlation is * significant at 5 %.

6. Results and Analysis

The results of the study are as follows

6.1. Efficiency estimation of NBFC-MFI

DEAP Version 2.1 has been used to find the efficiency level for the period of 2015-19. The output-oriented DEA scores of 39 NBFC-MFI are presented the table 5.

Table 5 The efficiency Scores of NBFC-MFI

Firm No	Scale Efficiency	RTS
1	0.872	-1
2	0.807	-1
3	0.725	-1
4	0.949	1
5	0.853	-1
6	0.861	-1
7	0.612	-1
8	1.000	0

9	1.000	0
10	0.858	-1
11	0.910	1
12	0.835	-1
13	0.548	-1
14	0.922	1
15	0.721	-1
16	0.906	1
17	0.765	-1
18	1.000	0
19	0.898	-1
20	0.812	-1
21	0.879	-1
22	0.872	-1
23	0.880	-1
24	0.709	-1
25	0.742	-1
26	0.921	1
27	0.916	1
28	0.825	-1
29	0.791	-1
30	0.901	1
31	0.747	-1
32	1.000	0
33	0.899	-1
34	0.636	-1
35	0.788	-1
36	0.740	-1
37	0.887	-1
38	0.890	-1
39	0.683	-1
Average Efficiency Score		0.835

Note: Table explains the scale efficiencies of NBFC-MFI

Table 5 explains the scale efficiency, negative values explain the decreasing returns to scale which means the NBFC-MFI is not taking the proper advantage of the operating expenses and they can generate more revenue. The zero value represents no improvement. But the positive values show an optimal scale of operations. However, most NBFC-MFI in the calculated table needs an improvement in controlling

the operating expenses and they have to manage their loan as the value of the portfolio at risk is quite high that directly affects the revenue earning capacity of these firms. The study further analyses the peer count which are performing best among the peers.

Table 6 Peer Count Analysis

Firm No	Peer Summary
1	MFI9
2	MFI9
3	MFI9
4	MFI9
5	MFI9
6	MFI9
7	MFI9
8	MFI8
9	MFI9
10	MFI18
11	MFI9
12	MFI9
13	MFI9
14	MFI9
15	MFI9
16	MFI18
17	MFI9
18	MFI18
19	MFI9
20	MFI9
21	MFI9
22	MFI9
23	MFI9
24	MFI9
25	MFI9
26	MFI9
27	MFI9
28	MFI9
29	MFI9
30	MFI18
31	MFI9
32	MFI9
33	MFI9
34	MFI9
35	MFI9

36	MFI9
37	MFI9
38	MFI9
39	MFI9

Note: Table showing companies which are inefficient.

Peer count summary analysis in table 6 shows that NBFC- MFI (Annexure A) occurring in Peer count found to be inefficient and cannot be set as a benchmark due to their high operating expenses and loan restructuring issues. And those who are not found in the peer count analysis have a unique mix of the input-output ratio which cannot be set as a benchmark for the other MFI's.

6.2 Productivity Change in NBFC-MFI through MPI

Table 7 shows the annual MPI and its decomposition into technical efficiency and technological efficiency that will result in TFP Change.

Table 7 Annual MPIs for NBFC-MFI from 2015-19

Year	Technical efficiency Change	Technological Change	Pure Efficiency change	Scale Efficiency Change	Total Factor Productivity Change
2015-2016	0.867	1.039	0.957	0.906	0.901
2016-2017	0.992	1.044	0.953	1.041	1.036
2017-2018	0.976	1.019	1.068	0.914	0.994
2018-2019	0.938	1.043	0.884	1.061	0.978

9					
Me	0.942	1.036	0.963	0.978	0.976
an					

Note: The table is the output of the Malmquist Productivity Index over the years for financial efficiency.

Table 7 explains that the values which are greater than 1 show improvement during the period which happened in year 2016-17 and in rest of the year value are less than 1 means regress over the period. Values equal to 1 show no change in the Total Factor Productivity over the period. As such, there is a technological improvement, but technical efficiency change is dependent upon the pure and scale technical efficiency that is regressing during the period. The table revealed that the financial efficiency of these NBFC- MFIneeds improvement.

Table8 MPI Summery of NBFC-MFI

Fir ms	Techn ical efficie ncy Chang e	Technolo gical Change	Pure Efficie ncy chang e	Scale Efficie ncy Chang e	Total Factor Product ivity Change
1	0.949	1.036	0.956	0.993	0.984
2	0.848	1.073	0.880	0.963	0.910
3	0.937	1.027	1.000	0.937	0.962
4	0.910	1.026	0.951	0.957	0.934
5	0.921	1.033	0.965	0.954	0.951
6	0.953	1.059	1.000	0.953	1.010*
7	1.130	1.111	1.000	1.130	1.256*
8	1.000	1.040	1.000	1.000	1.040*
9	1.000	1.018	1.000	1.000	1.018*
10	0.908	1.024	0.939	0.967	0.930
11	0.936	1.023	1.000	0.936	0.957
12	0.947	1.044	0.947	1.000	0.989
13	1.046	1.117	1.125	0.930	1.168*
14	0.879	1.025	0.879	1.000	0.902
15	0.982	1.046	1.023	0.959	1.027*

16	0.867	0.998	0.850	1.020	0.865
17	0.994	1.029	1.021	0.973	1.023*
18	0.899	1.024	0.905	0.993	0.921
19	0.965	1.039	1.022	0.944	1.002*
20	0.951	1.037	0.951	0.999	0.986
21	0.949	1.066	0.957	0.992	1.012*
22	0.825	1.023	0.829	0.995	0.844
23	1.000	1.037	1.002	0.998	1.036*
24	0.929	1.021	0.928	1.001	0.949
25	0.952	1.027	0.965	0.986	0.978
26	0.976	1.008	1.021	0.957	0.984
27	0.876	1.024	0.915	0.957	0.897
28	0.950	1.055	0.945	1.005	1.002*
29	0.957	1.041	1.014	0.945	0.997
30	0.857	1.017	0.920	0.932	0.871
31	0.951	1.012	1.011	0.941	0.963
32	0.897	1.010	0.995	0.901	0.906
33	0.918	1.053	0.918	1.000	0.967
34	0.896	1.031	0.892	1.004	0.924
35	0.975	1.048	0.975	1.000	1.022*
36	1.053	1.007	1.077	0.978	1.061*
37	0.906	1.032	0.924	0.981	0.935
38	0.933	1.049	0.939	0.993	0.979
39	0.977	1.035	0.984	0.992	1.011*
Me	0.942	1.036	0.963	0.978	0.976
an					

Note: The table explains the total factor productivity.

Table 8 shows the results of the NBFC-MFI's which confirms productivity improvement over the period. The highest productivity improvement during the period is the Seventh MFI (MFI7) due to technical and simultaneously technological progress. There are fourteen firms in (table 8 *marked firms) which record progress (MFI6, MFI7, MFI8, MFI9, MFI13, MFI15, MFI17, MFI19, MFI21, MFI23, MFI28, MFI35, MFI36, MFI39) and other are having productivity regress due to technical efficiency which need to be improved. The technical efficiency

regress is due to high loan restructuring and most of the loans are remain unpaid. So to achieve financial efficiency MFI's need to find some ways so that their loan rebalancing problems can be solved out.

7. Discussion and Conclusion:

The study had taken the 39 MFI's for study during 2015-19 on the financial aspect which showed that 14 MFI's were efficient which are doing good enough on both technical and technological aspect but other MFI need improvement at technical aspect. Through literature support, the variables are identified to measure the financial efficiency of the NBFC- MFI. In a study, empirical estimation is performed to know technical efficiency. The average technical efficiency score of the firms is 0.835 (table 5) which shows that average firms reported a regressed relative technical efficiency.

DEA estimation is performed and for productivity change, MPI is used. The average total productivity score over the year is 0.976 (Table 7) which again shows an inefficient status. The study concludes that the NBFC-MFI in India is not efficient in the financial standard. The financial viability can be improved by increasing the technical productivity of the companies (Sinha & Pandey 2019). This means that companies need to optimally utilize the input variables or resources of the company to release the output. The study suggests that firms should improve their operations. This inefficiency might be the factor that resists the entry of donors and investors in the industry. The study identifies a set of variables but a different set of input and output combinations can be taken for the study. The panel taken for the study is balanced and with the use of DEAP 2.1, the efficiency scores are calculated for the NBFC-MFI which is comparable over the years.

8. Limitation and future scope

There are a couple of limitations of the paper is data crunch due to the presence of unlisted firms. More parameters can be taken for making different efficiency models. The social efficiency can also be

measured of such firms. As social performance is one more objective of the NBFC-MF

Annexure A

List of NBFC-MFI

	Name of the NBFC-MFI
MFI1	Adhikar Microfinance Pvt. Ltd.
MFI2	Agora Microfinance India Ltd.
MFI3	Annapurna Finance Pvt. Ltd.
MFI4	Asirvad Micro Finance Ltd.
MFI5	Belstar Microfinance Pvt. Ltd.
MFI6	Bharat Financial Inclusion Ltd. [Merged]
MFI7	Blue Horizon Investments Ltd.
MFI8	Capital Trust Ltd.
MFI9	Ceejay Finance Ltd.
MFI10	Chaitanya India Fin Credit Pvt. Ltd.
MFI11	Creditaccess Grameen Ltd.
MFI12	Digamber Capfin Ltd.
MFI13	Esaf Financial Holdings Pvt. Ltd.
MFI14	Fino Finance Pvt. Ltd.
MFI15	Fusion Micro Finance Pvt. Ltd.
MFI16	Hindusthan Microfinance Pvt. Ltd.
MFI17	Jagaran Microfin Pvt. Ltd.
MFI18	M Power Micro Finance Pvt. Ltd.

	Madura	Micro
MFI19	Finance Ltd.	
	Margdarshak	
	Financial	Services
MFI20	Ltd.	
	Midland	Microfin
MFI21	Ltd.	
	Muthoot	Microfin
MFI22	Ltd.	
MFI23	Namra Finance Ltd.	
	Navachetana	
	Microfin	Services
MFI24	Pvt. Ltd.	
	Pahal	Financial
MFI25	Services Pvt. Ltd.	
	Repco	Micro
MFI26	Finance Ltd.	
	Saija Finance	Pvt.
MFI27	Ltd.	
	Samasta	
MFI28	Microfinance Ltd.	
	Satin	Creditcare
MFI29	Network Ltd.	
MFI30	Share Microfin Ltd.	
	Sonata Finance	Pvt.
MFI31	Ltd.	
	Spandana	Sphoorty
MFI32	Financial Ltd.	
	Svasti	Microfinance
MFI33	Pvt. Ltd.	
	Svatantra	Microfin
MFI34	Pvt. Ltd.	
	Unacco	Financial
MFI35	Services Pvt. Ltd.	
	Varam Capital	Pvt.
MFI36	Ltd.	
	Vedika	Credit
MFI37	Capital Ltd.	
	Village	Financial
MFI38	Services Pvt. Ltd.	
	Virutcham	
MFI39	Microfinance Ltd.	

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Note: These are registered NBFC –MFI with Reserve Bank of India

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