

Tracking Efficiency and Productivity Shifts in Microfinance Institutions Operating in Odisha: Evidence from Data Envelopment Analysis and Malmquist Productivity Index

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Abstract: Microfinance institutions (MFIs) seek to balance the two-fold objectives of pursuing a social mission and achieving financial sustainability; however, they cannot fulfil the social mission without operating at a high level of efficiency. This study examines the efficiency and productivity shifts of MFIs functioning in Odisha, India. Therefore, the study employs panel data covering a five-year period, i.e., from 2019 to 2023, for 18 NBFC-MFIs. The paper to measure the efficiency score, the DEA model with variable returns to scale (VRS) was applied. In addition, the Malmquist total factor productivity index (TFP) is employed to examine productivity changes over time. The results indicate that only four DMUs are completely effective with a score of 1, while the majority exhibited inefficiency related to scale. The average total factor productivity (TFP) score of 0.995 indicates a slight decline in overall productivity, while 50 percent of the sampled MFIs experienced productivity growth. These findings provide practical insights for policymakers and managers to improve resource utilisation, identify efficiency gaps, and formulate strategies to promote sustainable growth in the microfinance sector.

1. Introduction

The progress of microfinance institutions is closely associated with Nobel laureate Mohammed Yunus and the Grameen Bank, and his initiation of the movement in Bangladesh during the 1970s (Daniel Awuah Agyapong, 2015). Microfinance evolved as a powerful tool in the 1970's to expand credit access for the poor in developing nations, who were often excluded by traditional banking (Ram Rajbanshi, 2015). The impoverished in emerging nations have gradually acquired access to monetary services provided by well-known microfinance institutions (MFIs) since the late 1970s (Hermes & Hudon, 2018). In India, two distinct approaches evolved for microfinance. The first is the bank-led approach, mainly through the SHG-based bank linkage scheme. The second is the microfinance institution model. The root of India's microfinance structure can be traced back to 1992, when NABARD started the SHG Bank linkage programme as a pilot study. When microfinance activities became noticeable in the 1990's, the RBI recognised the need for regulating this sector in the early 2000s. A thorough regulatory framework for NBFC-MFIs was introduced by the RBI in Dec, 2011, which prescribed the eligibility criteria for microfinance loans (Rao, 2021). The Microfinance institutions are different from traditional banking as they try to fulfil the dual purpose of reducing poverty and attaining financial sustainability, thus positioning it between social welfare programs and conventional commercial banking (Balkenhol, 2007). Initially, microfinance was a non-profit and socially driven mission, but over time it has shifted into a profit-oriented industry (Augustine, 2012). MFIs, however, cannot fulfil their social mission unless they operate with economic efficiency (Chauhan, 2020). In the past decade, the microfinance industry has witnessed a significant transformation in India. The growing trend of commercialisation among microfinance institutions is evident through key developments of this sector, for instance, when Bandhan Financial Services Private Ltd., which initially operated as an NBFC-MFI, transformed into a full-fledged universal bank in 2014. Similarly, Bharat Financial Inclusion Ltd., one of the largest NBFC-

MFIs, merged with IndusInd Bank in July 2019 (RBI Consultative Document 2021). With many profit-oriented microfinance institutions entering the market, competition has increased significantly. In a highly competitive environment, merely covering costs is insufficient. MFIs are also required to strengthen their financial base and pursue a profit-oriented approach in both their administration and operations (Hamada, 2010). A competitive market helps to reduce costs, thereby increasing efficiency by improving the service quality (Assefa, Hermes, & Meesters, 2013). The performance of microfinance is measured either by efficiency or outreach. Profitability in isolation is not a reliable yardstick for performance measurement of MFIs (Balkenhol, 2007). Thus, efficiency is considered a more robust indicator for gauging financial performance (Mia, Pellegrina, Damme, & Wijesiri, 2019; Hudon & Traca, 2011). The microfinance sector consists of diverse players operating under different types and legal forms. A new category of NBFC-MFI was formed on the recommendations of the Malegam committee in 2011 and is regulated by the RBI. This category of MFIs dominates the market share with Rs.173504 Cr. Portfolio, also, the total loan portfolio of the microfinance sector was Rs. 4.43 lakh crore as on 31st March, 2024 (The Bharat Microfinance report 2024). According to the Standing of Microfinance in India during 2022-23, "Microfinance in India has become nearly a Rs. 5 trillion business, thus showing a tremendous growth". Although various studies on DEA-based efficiency analysis have been undertaken on the banking sector, very few studies have been conducted on the NBFC-MFIs sector. This form of microfinance institutions holds thirty-nine percent of the market share and was leading (Sa-Dhan Report 2024). Despite their growing importance, the efficiency and productivity performance of NBFC-MFIs remain underexplored. Therefore, the present study examines the performance of NBFC-MFIs by applying DEA to find out the best-performing DMUs. Further, the TFP was applied to examine the productivity changes over the study period. We have considered only those 18 NBFC-MFIs that have business operations in Odisha. According to the Sa Dhan Report 2024, 49 MFIs operate in Odisha, of which 34 are NBFC-MFIs. According to the MFIN report 2021, around 28 NBFC-MFIs are currently operating in the state of Odisha and have reached out to 30.3 lakh client borrowers through 1261 branches, with a gross loan portfolio of Rs 6004 Cr as of 2019 and loan disbursed of Rs 1598 Cr, making Odisha one of the top 5 states in terms of loan amount outstanding. This study adds to the existing literature by assessing the efficiency score, total factor productivity growth of selected NBFC-MFIs.

2. Literature Review

DEA-based efficiency studies in MFIs

A Substantial body of literature has applied (DEA) to evaluate the performance of microfinance institutions across different countries. Early Studies mainly focused on measuring the technical and operational efficiency using DEA. Namely, Nieto (2005) examined the efficiencies of Latin American MFIs and observed that efficiency is largely hinged on the specification adopted, Shyu & Chiang (2012), evaluated operating efficiencies of banks and revealed that scale inadequacy is the primary factor behind inefficiency; however, efficiency drops after making adjustments through SFA regression, proving an overestimate of efficiency. It also highlights the significant influence of environmental variables on efficiency. Several studies extended DEA analysis by combining second-stage regression techniques, such as Tobit and truncated regression, to identify the determinants. In a similar line of research, Haq et al. (2010) calculated the effectiveness of MFIs and then regressed on variables by applying the Tobit model. Their results depict that bank-led MFIs demonstrate the highest efficiency under the intermediation approach. Likewise, Ferdousi (2013) confirms that total assets, profitability and operational scope are crucial determinants for sustainable development and efficacy of MFIs in Bangladesh, India and China. In a similar tone, Mahindra Wijesiri (2015) obtained efficiency estimates using a bootstrap procedure followed by a bootstrap truncated regression to determine the key elements. The result found that the age of MFIs has a higher financial efficiency; however, MFIs were found to be inefficient in the social dimension. The type of organisation and ROA are crucial determinants of social efficiency. Another stream of literature focused on productivity and efficiency decomposition through the Malmquist Index. Azad et al (2016) evaluated the performance of fifteen MFIs between 2008 and 2012, and the results demonstrated that most MFIs achieved efficiency mainly through pure efficiency change; also, there is a need to chase the TCH to attain the core objective of outreach and

sustainability. Researchers have also explored the relationship between efficiency, outreach and institutional characteristics. Mia et al (2018) sought to explore the relation between outreach and efficiency, and the findings depict that financial inclusion, which is the extent of outreach, is positively associated with the competence of MFIs; however, they found a negative association between financial deepening, that is, the depth of outreach and efficiency. Balammal et al. (2019) conducted cluster analysis to evaluate outreach performance. The findings suggest that MFIs attain higher social efficiency by focusing on poor clients. Similarly, Asif et al. (2019) highlighted significant efficiency differences across legal forms, with NBFC and section 8 companies demonstrating higher financial efficiency than NGOs. In Contrast, the equity-to-asset ratio exerts a negative effect on social performance, suggesting that more capitalised MFIs may compromise social mission. Moreover, younger MFIs exhibit higher social efficiency compared to their counterparts. Various Studies identified multiple factors as key determinants of efficiency. Gulati & Kumar (2017) observed that size, liquidity condition, direct lending activities, intermediation cost, profitability and income diversification significantly influence overall operational efficiencies. Similarly, Kumar & Sensarma (2017) reported leverage, profitability and size as key drivers to improve efficiency. Ram Pratap Sinha (2019) explores the connection between efficiency and environmental variables and found that highly capitalised MFIs tend to exhibit higher inefficiency due to underexploitation of available resources. Likewise, Dutta 2020 identified size, income diversity, and ROA as significant factors influencing efficiency. The other paper is that of Farooq (2018), which measures and compares the profit performance of Pakistan-based MFIs by using DEA. The findings reveal that some MFIs have relative efficiency scores less than 70 percent thus providing scope for future researchers to address the social performance of MFIs along with profit performance to know the overall performance of microfinance providers. Several previous studies have attempted to analyse performance using DEA analysis. However, very limited research has specifically focused on NBFC-MFIs in the Indian context. Therefore, this study attempts to fill this gap and add to the existing body of literature in this domain.

3. Research Methodology

3.1. Variables used in the Study

For evaluating the performance of MFIs through an efficiency score, DEA analysis is applied, which requires both input and output variables, and these must be aligned with the approach being used. According to production theory, performance is defined as achieving the highest level of output with minimum inputs through an optimal mix of resources (Farrell, 1957). Input efficiency indicates how much a DMU's input levels can be reduced through improved performance without decreasing output, while still maintaining the same input mix (Thanassoulis, 2001). Approaches to production and intermediation are the two well-known approaches (Sealey & Lindley, 1977). Under the production approach, a financial institution acts as a production unit which produces services by incorporating various factors of production like labour, technology, material and related costs. Whereas, financial institutions behave as mediators that employ labour, deposit and investment to extend credit under an intermediation approach. The production model views the deposit as output; the intermediation approach regards the deposit as input (Wijesiri, Vigano, & Meoli, 2015). In our study, we don't need to ponder how deposits are being treated since microfinance institutions do not accept deposits and hence remove them as a variable from the dataset. The present study considers three input and three output variables. The no. of employees, operating expenses and total assets are our input variables. The output variables employed are 'gross loan portfolio' (GLP), no. of borrowers, and financial revenue. Variables were selected based on prior research studies done by Aruna Balammal et al. (2019), Ferdousi (2013), Santa Kar et al. (2017), Asif Khan et al. (2021), Nitin Kumar et al. (2017) and Sinha et al. (2019) and as management has greater control over input variables than output variables, which are influenced by external factors, an input -based DEA model assuming VRS, was applied to measure efficiency.

Table 1: Specification of Input and Output Variables

Specification	Variable	Definition
Input	Total Asset	Sum of all net assets
	Employee	Total no of employees employed
	Operating Expenses	Total operating expenses
Output	GLP	Total outstanding principal amount due on client loans
	Borrower	Total active borrowers
	Financial Revenue	Total revenue generated includes GLP, Investment, Operating income

Source: Self-compiled.

3.2. Data and sample selection

The study focuses on MFIs registered as NBFC-MFIs that are operating within the state of Odisha. The microfinance sector of Odisha state, India, is particularly selected as a sample. The data were collected from the annual reports of respective MFIs and also from the mix market database. The study periods cover from 2018-19 to 2022-23 of 18 MFIs that were registered under NBFC-MFIs operating in Odisha. The selection of NBFC-MFIs is done on the basis of the directory of microfinance 2020, as there were a total of 34 MFIs operating in Odisha; however, only 18 NBFC-MFIs were chosen on the basis of consistent accessibility of data. The number of samples was fixed on data obtainability, and MFIs with missing data on the required variables were excluded from the study. Therefore, this study evaluates the performance of 18 NBFC-MFIs based on the availability of the data. Thus, the study works with panel data covering 5 years (2019-2023) and is analysed using the DEAP software. According to Avkiran (2001), the sample size should not exceed the total inputs multiplied by outputs. Alternatively, it is suggested that the sample size be at least three times the total of inputs and outputs (Nunamaker, 1985). In the present study, there are three outputs and three inputs, which gives a product of 9. Also, the selected sample is 18, which satisfies the sampling guidelines.

Table 2: Population and sample of MFIs

Total number of MFIs across various legal forms	234
Number of NBFC- MFIs operating across India	94
Number of NBFC MFIs operating in Odisha	33
Selected sample MFIs	18

Source: MF Directory Report 2020

3.3. Technique used in the study

DEA is a non-parametric technique, used primarily to evaluate and compare the performance of peer organisations that transform common inputs into outputs (Farooq, 2018). It is a technique to measure efficiency (Thanassoulis, 2001). Farrel 1957 introduced the concept of DEA and categorised them into technical and allocative efficiency. Farrel applied DEA in the situation of a single input and output (Chauhan, 2020). Subsequently, the CCR model (1978) evaluates the comparative effectiveness of some DMUs. The CCR model is applied in the situation of multiple inputs and outputs predicted on the idea of constant returns to scale (CRS). The BCC (1984) model is the extended version of DEA, which includes VRS (Bowlín, 1998). The performance of MFIs using an efficiency score that is derived from an input-oriented DEA model under VRS is computed in this study. DEA provides three forms of efficiency. They are overall efficiency (OTE), pure efficiency (PTE) and scale efficiency (SE). The CCR model provides the OTE score, whereas the BCC model gives the PTE score. Scale efficiency is premeditated by dividing OTE by PTE, with a value less than one indicating that a DMU is not operating at an optimum scale (Dutta, Jain, & Gupta, 2020). Thus, overall technical efficiency is made up of two elements, namely (PTE) and (SE). DEA does not assume any statistical distribution of data or any predetermined functional relationship between inputs and outputs. A major limitation of DEA is that it does not account for statistical noise or measurement error, as any deviation from the benchmark DMUs is treated as inefficiency. (Berger & Humphrey, 1997).

3.4. Model Specification

The formulation of an input-based DEA model with VRS is presented below:

Minimise θ

Subject to:

$$\sum_{j=1}^n \lambda_j x_{ij} \leq \theta x_{i0}; \forall i \text{ (input constraints)}$$

$$\sum_{j=1}^n \lambda_j y_{rj} \geq y_{r0}; \forall r \text{ (output constraints)}$$

$$\sum_{j=1}^n \lambda_j = 1 \text{ (VRS Constraints)}$$

$$\lambda_j \geq 0; \forall j$$

Where,

θ = Efficiency score,

λ_j = Intensity variable,

x_{ij} = Input i for DMU j ,

y_{rj} = Output r for DMU j

Later on, TFP analysis under constant return to scale was employed to examine the total change in productivity over time. It is an extension of DEA, and its non-parametric features help to make a difference in performance during two time periods (Cooper, Seiford, and Tone, 2007). Productivity and efficiency are closely linked, as higher productivity will ultimately result in advanced efficiency, considering all other factors remain constant (Sanchez-Robles, 1997). Technological Change (TC) and technical Efficiency Change (TEC) are the two parts of total factor productivity (TFP) (Fare, Grosskopf, Norris, & Zhang, 1994). Efficiency change reflects variations in efficiency levels over time, whereas technical change captures shifts in the technological frontier across periods.

The present study uses the MFI defined by (Fare, Grosskopf, Norris, & Zhang, 1994) given as:

$$MPI_0^{t+1}(x^{t+1}, x^{t-1}, x^t, y^t) = \left(\frac{D_0^t(x^{t+1}, y^{t+1} | CRS)}{D_0^t(x^t, y^t | CRS)} \times \frac{D_0^{t+1}(x^{t+1}, y^{t+1} | CRS)}{D_0^{t+1}(x^t, y^t | CRS)} \right)$$

Where, $MPI_0^{t+1} > 1$ indicates upward trend of productivity

$MPI_0^{t+1} = 1$ indicates no change in productivity.

$MPI_0^{t+1} < 1$ indicates downward trend of productivity

4. Results and findings

Table 3: Overall technical, Pure technical and Scale efficiencies of MFIs

Name of the DMUs	Overall	Pure	Scale
Fusion Microfinance Private Ltd.	0.622	0.796	0.782
Satin Credit Care Network Ltd.	0.650	1.000	0.650
Samasta Microfinance Ltd.	1.000	1.000	1.000
Muthoot Microfinance Ltd.	0.405	0.405	1.000
Svatantra Microfinance Private Ltd.	0.837	0.892	0.939
Annapurna Finance Private Ltd.	0.642	0.848	0.757
Asirvad Microfinance Private Ltd	0.505	0.676	0.748
Belstar Investment Finance Private Ltd	0.598	0.677	0.882
Credit Access Grameen Ltd.	0.465	1.000	0.465
Spandana Sphooty Financial Ltd.	0.609	1.000	0.609
Vaya Finseve Private Ltd.	1.000	1.000	1.000
Arohan Financial Services Private Ltd.	0.507	0.854	0.594
Jagaran Microfin Private Ltd.	0.718	0.718	1.000
Janakalyan Consultancy & service Private ltd	1.000	1.000	1.000
Village Financial Services Private Ltd.	0.615	0.630	0.976
Satya Microcapital Ltd.	0.657	0.876	0.750
Vedika Credit Capital Ltd.	1.000	1.000	1.000
Nabfins Ltd.	0.214	1.000	0.214

Source: Self-compiled

Table 4: Descriptive Statistics of Efficiency Score.

Efficiency Score	Overall	Pure	Scale
$E < 0.9$	14	10	10
$0.9 \leq E \leq 1$	0	0	2
$E=1$	4	8	6
<i>Descriptive Statistics</i>			
Number of DMUs	18	18	18
Mean	0.669	0.854	0.798
Median	0.632	0.884	0.832
Standard deviations	0.224	0.173	0.225
Minimum	0.214	0.405	0.214
Maximum	1	1	1

Source: Self-compiled

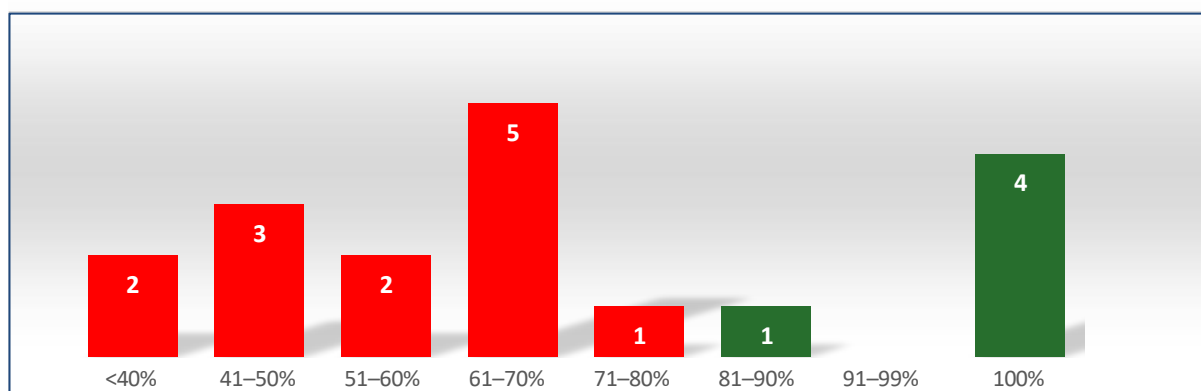


Figure 1: Distribution of efficiency scores

The efficiency score obtained from the DEA for 18 DMUs in Table 3 was run under three models. OTE, PE and SE. Out of the total 18 DMUs, 4 are fully efficient, each achieving a score of 1 under the OTE score. These DMUs are Samasta Microfinance Limited, Vaya Finserve Private Ltd, Janakalyan Consultancy & Service Private Ltd & Vedika Credit Capital Ltd. The mean efficiency score of these DMUs is 0.669, which discloses that the MFIs in Odisha have around 33.1% overall inefficiency, as mentioned in table3. On average, DMUs can reduce inputs by 33.1% while maintaining the same output. More DMUs are efficient under the PTE model, with a total of 8 DMUs fully efficient, with a mean efficiency score of 0.854, which shows that around 14.6% inefficiency and most inefficiency arises from scale as compared to technical operations. The mean score of scale efficiency is 0.798, indicating that many DMUs are not operating at their optimal scale of production due to inefficient scale operation. Only 4 DMUs are efficient under all three measures, whereas 14 DMUs have overall efficiency < 0.9, indicating significant room for improvement. Thus, it is recommended to improve technical processes by focusing on optimisation, and the government can also use fully efficient DMUs as performance models.

Table 5: Malmquist total factor productivity analysis

Name of the Institutions	TEC	TC	PTE	SE	TFP
Fusion Microfinance Private Ltd.	0.924	1.02	0.975	0.947	0.943
Satin Credit Care Network Ltd.	0.909	0.797	0.935	0.972	0.724
Samasta Microfinance Ltd.	0.841	0.975	0.988	0.851	0.82
Muthoot Microfinance Ltd.	1.036	1.034	1.17	0.886	1.071
Svatantra Microfinance Private Ltd.	0.852	1.014	0.94	0.906	0.864
Annapurna Finance Private Ltd.	1.041	0.963	1.042	0.999	1.003
Asirvad Microfinance Private Ltd.	1.054	1.005	1.103	0.956	1.06
Belstar Investment Finance Private Ltd.	0.999	0.966	1.074	0.93	0.966
Credit Access Grameen Ltd.	0.954	0.984	1	0.954	0.939
Spandana Sphoorty Financial Ltd.	1.003	0.97	0.996	1.008	0.973
Vaya Finserve Private Ltd.	0.868	1.096	0.955	0.909	0.951
Arohan Financial Services Private Ltd.	1.006	1.001	1.011	0.995	1.007
Jagaran Microfin Private Ltd.	0.999	1.044	1.047	0.955	1.043
Janakalyan Consultancy & Service Pvt.Ltd	1	1.21	1	1	1.21
Village Financial Services Private Ltd.	1.014	1.035	1.122	0.903	1.049
Satya Microcapital Ltd.	1.111	1.12	1.034	1.075	1.244
Vedika Credit Capital Limited	0.853	1.079	1	0.853	0.921
Nabfins Ltd.	1.106	1.016	1	1.106	1.123
Average	0.976	1.018	1.021	0.955	0.995
Maximum	1.111	1.21	1.17	1.106	1.244
Minimum	0.841	0.797	0.935	0.851	0.724
Standard Deviation	0.082	0.081	0.061	0.066	0.123

Source: Self-compiled

Table 6: Catch-up Shift, Frontier Shift and Malmquist Index of MFIs

Overall MFIs	2019-20	2020-21	2021-22	2022-23	Average
Catch-up	1.036	0.945	0.858	1.064	0.973
Frontier	1.199	0.915	1.063	0.91	1.015
Malmquist	1.243	0.865	0.912	0.968	0.987

Source: Self-compiled

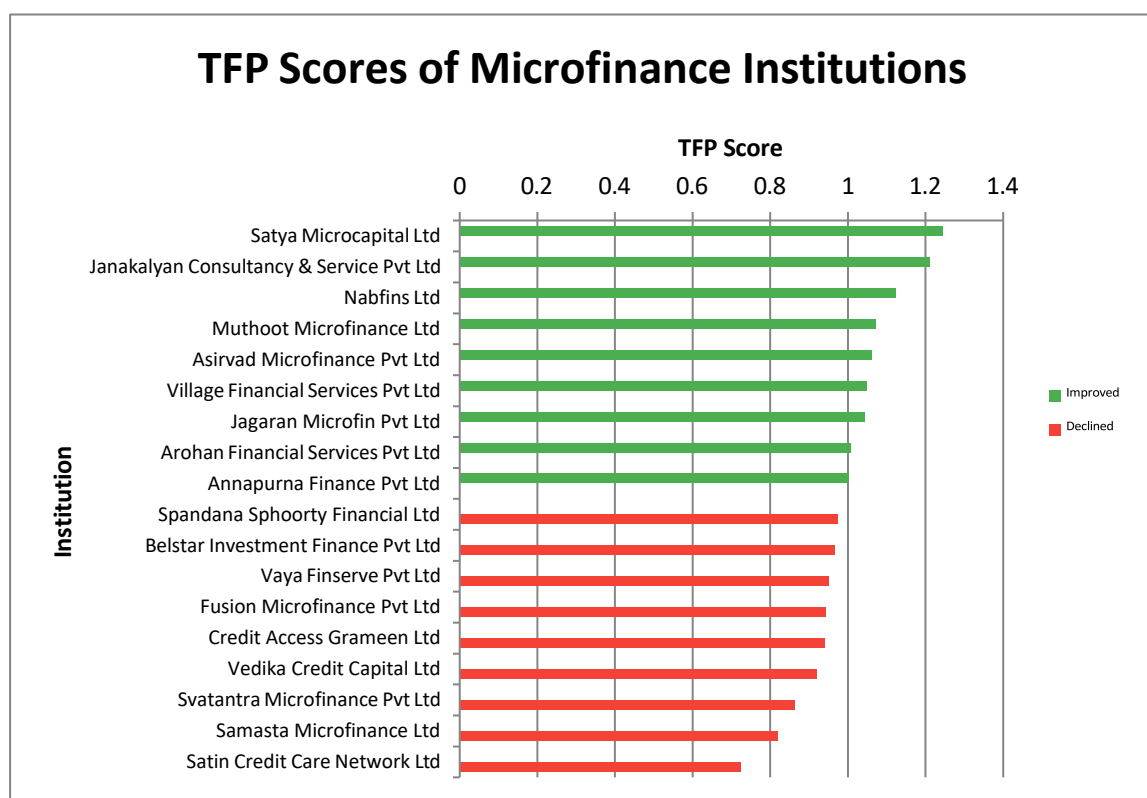


Figure 2: Total Factor Productivity Score

This study applies the Malmquist total factor productivity (TFP) index. If TFP exceeds one, it represents the progress trend of productivity, and less than one indicates a declining trend in productivity. Table 5 reports the (TFP) performance of individual MFIs over the period of 5 years from 2019 to 2023. It is found that Satya Micro Capital Limited has achieved the highest productivity gain with a TFP score of 1.244, reflecting 24.4 percent improvement, along with TEC & TC of 1.111 and 1.120, respectively, which reveals that this DMUs has managed to improve its operations with the adoption of the latest technology, followed by Janakalyan Consultancy & Service Private Ltd with TFP 1.210. The other DMUs with TFP exceeding one are Muthoot Microfinance Limited, Annapurna Finance Private Ltd., Asirvad Microfinance Private Ltd., Arohan Financial Services Private Ltd., Jagaran Microfin Private Ltd., Village Financial Service Private Limited and Nabfins Limited. It is also found that six DMUs, namely, Fusion Microfinance Private Ltd., Credit Access Grameen Ltd., Belster Investment Finance Private Ltd., Spandana Sphoorty Financial Ltd., Vaya Finserve Private Ltd. and Vedika Credit Capital Ltd., hovered around TFP of one, indicating stable productivity, with neither progress nor decline. Three DMUs having TFP less than one are mainly due to their setback in technology. Based on these performance results, it can be interpreted that MFIs need to increase their total factor productivity by attempting to reduce their wastage, optimum utilisation of resources by minimising the input and maximising the output, adopting new innovations, including digital systems and management training in order to sustain growth. Table 6 reports the overall Malmquist index, catch-up index and frontier index of selected MFIs over the last 5 years. This table summarises the overall performance of the selected MFIs during the study period, which revealed that productivity improved significantly in 2019-20; however, it declined in the subsequent years. The average Malmquist index of 0.987 reflects a 1.3 percent decline in total factor productivity during the study period. While the average frontier score (technical change) of 1.015 indicates a slight improvement in technological progress, the average catch-up score (efficiency score) of 0.973 reflected a 2.7 percent decline in their efficiency levels.

5. Conclusion

The study was based on 18 NBFC-MFIs operating in the state of Odisha. It measured the efficacy of each DMU using DEA and later examined productivity through the Malmquist productivity Index. The results indicate that only 4 of the 18 DMUs were efficient under (OTE). Under the (PTE) model, it revealed that more DMUs were found efficient, suggesting that most MFIs are not utilising their full operational capacity. However, only 4 DMUs were found to be efficient under all three models. The mean scale efficiency score of 0.798 suggests that the major contributor to inefficiency is scale rather than technical operations. This indicates that many MFIs are not performing at their optimum scale of production. Shyu & Chiang (2012) also reported similar findings that scale inadequacy is the major contributor to operational inefficiency. Gulati & Kumar (2017) and Kumar & Sensarma (2017) also confirm that institutional scale and optimal resource utilisation are essential for improving operational efficiencies. The results derived from the TFP indicate that 9 out of 18 MFIs have total factor productivity more than 1. Satya Microcapital Ltd. has the highest total factor productivity (TFP) score of 1.244, supported by high TEC, TC, PTE and SE scores. This finding suggests that MFIs need to improve their total factor productivity by reducing their wastage and improving input-output utilisation. Similar findings were reported by Azad et al. (2016), who also observed that technological progress alone cannot improve productivity unless resources are efficiently utilised. The presence of scale inefficiency and declining productivity suggests that the dual objective of financial sustainability and social outreach cannot be achieved without proper resource management and technological advancement. Improving these dimensions can significantly strengthen financial inclusion in Odisha and India. Thus, it is highly recommended that DMUs should optimise their scale of operations and make greater efforts to introduce more technological systems into their operation to strengthen efficiency. From a policy perspective, fully efficient DMUs may be used as a benchmark for other MFIs. Finally, future research may further expand this analysis by including a larger number of DMUs and undertaking a comparative analysis of financial and social performance to provide a clearer and more comprehensive understanding.

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