

Indian Microfinance Institutions' Business Models: Evaluating Value Creation, Deliverance and Value Capture Dimensions

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Abstract

The research aims to evaluate the business models of microfinance institutions (MFIs). The major research question is as to what the performance of the MFI Business Model in India was during the COVID-19 situation. The secondary data from 2018 to 2021 is taken across the legal form of MFIs operating all over India. The variables studied include gross loan portfolio (GLP), operating expense ratio (OER), capital adequacy ratio (CAR), finance cost ratio (FCR), active borrower per credit officer (ABCO), return on assets (ROA), return on equity (ROE), YIELD, debt-to-equity ratio (DER) and active borrowers (AB). The statistical technique implemented in the research includes Kolmogorov-Smirnov, Shapiro-Wilk and Levene statistic for testing normality and homogeneity, one-way ANOVA and post-hoc multiple comparisons. The NBFC-MFI (Non-Banking Financial Company-Microfinance Institution) business model is found to be performing well as far as the value creation is concerned. On other dimensions of business model evaluation, that is, value deliverance and value capture, business models of all the categories of MFIs are similar. The result reveals status of business model on value creation, deliverance and capture dimensions during COVID-19.

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Keywords

Business models, legal forms, value creation, value deliverance, value capture, NBFC-MFI and COVID-19

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Abbreviations

AB: Active borrowers

ABCO: Active borrower per credit officer

ANOVA: Analysis of variance

BRICS: Brazil Russia India China South Africa

CAR: Capital adequacy ratio

COVID-19: Coronavirus disease-2019

DER: Debt-to-equity ratio

FCR: Finance cost ratio

GLP: Gross loan portfolio

JLG: Joint liability group

MFI: Microfinance institution

NABARD: National Bank for Agriculture and Rural Development

NBFC: Non-banking financial company

NBFC-MFI: Non-banking financial company-microfinance institution

NGO: Non-governmental organisation

OER: Operating expense ratio

ROA: Return on assets

ROE: Return on equity

RRBs: Regional rural banks

SEC.8CO.: Section 8 company

SHG: Self-help group

YIELD: Yield on portfolio

Introduction

The COVID-19 pandemic exposed the financial fragility of businesses globally, particularly smaller ones, due to sharp cash flow disruptions from lockdowns (Brown & Rocha, 2020). No sector or economy was spared, including microfinance, where microfinance institutions (MFIs) saw major operational setbacks. Loan collections plummeted in April–May 2020, with a modest recovery beginning in June. By Q3, the sector showed signs of rebound, yet many small and medium MFIs faced acute liquidity crises. Despite national efforts, full crisis control remained elusive. As FY 2020 ended, MFI clients' livelihoods began recovering. MFIs must support this recovery while addressing their liquidity stress. The pandemic has brought critical lessons, urging MFIs to be more client-centric. Strong client relationships are essential, as cooperation post-crisis depends on trust. Encouragingly, most MFIs have shown patience and empathy toward clients' challenges despite their own financial constraints. COVID-related losses

led to higher credit costs for most MFIs. Additionally, the cost of funds rose due to increasing interest rates in the country (Nandi et al., 2023).

The microfinance sector in India comprises various legal forms, including Non-Banking Financial Companies (NBFC-MFIs), Section 8 Companies, Societies & Trusts and Cooperatives. These institutions cater to low-income borrowers through diverse lending models such as self-help groups (SHGs) and joint liability groups (JLGs). The pandemic-induced economic downturn tested the sustainability of these business models, necessitating an evaluation of their value creation, deliverance and capture capabilities.

Research Objectives

The study aims to assess the performance of MFI business models in India across three dimensions:

1. Value creation: Evaluating MFIs' ability to generate value for their clients.
2. Value deliverance: Analysing the efficiency of credit disbursement and operational effectiveness.
3. Value capture: Assessing MFIs' profitability and financial sustainability.

Literature Review

Business Model Dimensions

Teece (2010) defines a business model as how an organisation delivers value and earns profit. Rappa (2010) sees it as a method for sustaining operations through revenue generation, explaining how a firm profits based on its position in the value chain. Osterwalder and Pigneur (2009) describe it as the rationale behind how a firm creates, delivers and captures value. Frank (2008) views production as transforming inputs into outputs or utility. Watson (2005) adds that a business model encompasses all organisational activities that incur costs and create customer value. Afuah (2003) identifies four profitability determinants: industry factors (competition, barriers, clients), resources (value creation), cost (low-cost model) and positioning (finding a unique market space). Together, these elements shape an effective and competitive business model. The analysis on service quality among MFIs indicates a significant disparity across the dimensions of tangibility, reliability, responsiveness, assurance and empathy (Badruddin, 2024). Therefore, it is essential to identify the most impactful business model of MFIs.

Understanding Business Models in Microfinancing

Definition of Microfinance

Nandi et al. (2018) define microfinance as the provision of small-scale thrift, credit and financial services to the poor in rural, semi-urban, or urban areas to

enhance income and living standards. Microfinance Gateway views it as financial services for low-income earners, aiming for permanent access to quality, affordable services to fund income-generating activities, stabilise consumption and mitigate risks. Initially linked to microcredit, it now includes savings, insurance, payments and remittances. Asian Development Bank (2000) defines it as a range of financial services—deposits, loans, transfers and insurance—for small enterprises and households. CGAP (2009) describes it as a credit method using collateral substitutes to deliver and recover short-term loans to micro-entrepreneurs. Nandi et al. (2018) identify MFIs as non-bank institutions offering microfinance. MicroRate (2014) proposes a tier system based on institutional maturity using three indicators: sustainability return on assets (ROA), size (total assets) and transparency (regulation/reporting level).

Microfinance Business Models

Srinivas (2015) identified 14 microfinance models across India, Thailand, the Philippines, Indonesia and Sri Lanka through literature review, fieldwork and interviews. These include associations, bank guarantees, community banking, cooperatives, credit unions, Grameen, group and individual lending, intermediaries, NGOs, peer pressure, ROSCAs, small business and village banking models. Most MFIs adopt elements from multiple models, many of which are formalised versions of informal financial systems. Badruddin and Anees (2018) conducted ratio analysis to assess the outreach and portfolios of small, medium and large NBFC-MFIs. MFIs are classified based on Gross Loan Portfolio (GLP) as per MFIN. Ratio analysis shows smaller MFIs face greater challenges, especially in debt funding, as reflected in their higher debt-to-equity ratios (DER). However, operating self-sufficiency benefits all MFI categories. Kumar (2015) studied SHG Federations in five states and found that federation SHGs performed better in financial management than non-federated ones. Both types were similar in general management practices like meeting frequency, participation and awareness. However, non-federated SHGs showed better governance and record-keeping. Batra and Sumanjeet (2012) noted that while government-led SHG microfinance initiatives are promising, they have gaps and must focus on expanding outreach to the lowest income groups.

Banks, RRBs, cooperatives and NGO-linked SHGs are key players in microfinance. Focus should be on three inclusive growth strategies: scaling quality financial services to reach large populations, targeting the lowest income segments, and reducing costs for clients and providers. Kanayi (2009) found that MFIs typically follow a three-tier structure—Field Officer, Branch and Head Office. He highlighted innovative models such as Mexico's corner shop banking for basic services and the rise of Islamic microfinance, blending microfinance with Islamic finance, especially in South Asia, the Middle East and Africa. He also noted that diverse entities—insurance firms, money exchanges, mobile operators, property developers and retail shops—alongside NGOs, banks and NBFCs, are increasingly delivering microfinance services. El Gamal et al. (2014) suggested an alternative microcredit model built on the Rotating Savings and Credit Association (ROSCA) model (which does not involve interest rate payments), but with payments of individual borrowers guaranteed by a bank for a fee. In a laboratory experiment in rural Egypt, they find

that this model attracts more clients than the traditional Grameen group lending model. Thus, it can be used to expand microfinance in Islamic countries also.

Issues and Challenges

EDA Rural Systems Pvt. Ltd. (2005), in a SIDBI-sponsored study of 20 MFIs across SHG, Grameen and Individual Banking/cooperative models, observed a perceived trade-off between outreach to the poor and operational self-sufficiency. Individual Banking MFIs showed high self-sufficiency but low outreach depth, while SHG and Grameen MFIs demonstrated broader outreach. Notably, two SHGs and two Grameen MFIs achieved both sustainability and significant outreach. Badruddin (2017) examined fintech advancements, highlighting the role of technology in microfinance delivery, key distribution tools for financial inclusion and related challenges. The transition from traditional institutions to mobile/e-banking enhances outreach. Uddin et al. (2022) noted that systemic business risk may limit MFIs' services to the poor, but effective asset-liability monitoring with donor funds can mitigate this. Collaboration between banks and MFIs supports SDG achievement and promotes financial inclusion.

Research Gap

The literature review indicates that while global studies explore various microfinance models, few focus on business models. In India, most analyses compare SHGs and JLGs, with some attention to the Grameen model. However, no study examines MFIs' business models across legal forms using the dimensions of value creation, delivery and capture.

Contribution and Motivation

This research contributes to the existing literature by analysing business models beyond traditional SHG and JLG frameworks. Unlike previous studies that focus solely on financial sustainability, this study incorporates business model dimensions that address financial viability and social impact. The findings are expected to inform policymakers, practitioners and MFIs on best practices for enhancing financial inclusion in the post-pandemic era.

Research Methodology

This section of the article focuses on the research design based on the identification of variables, development of hypotheses depending upon the variables identified, and the statistical tools utilised in the research.

Variables Identification and Hypotheses Development

The study adopts the definition by Osterwalder and Pigneur (2009): 'A business model describes the rationale of how an organisation creates, delivers and captures value'. The three aspects explored are: (a) How an organisation creates value:

Value creation focuses on offering a value proposition tailored to a customer segment's needs. For MFIs, this involves women's empowerment through financial inclusion by providing collateral-free microloans. Proxies for value creation include the number of active borrowers (ABs) and GLP. (b) How an organisation delivers value: MFIs distinguish themselves by offering doorstep financial services, primarily through credit officers who reach borrowers. Alongside credit delivery, they provide financial education and training for income-generating activities. Delivery channel effectiveness is assessed using proxies such as capital adequacy ratio (CAR) and DER (financing structure), active borrowers per credit officer (ABCO) (staff productivity), finance cost ratio (FCR) (expense ratio) and operating expense ratio (OER) (operational efficiency). (c) How an organisation captures value: MFIs generate recurring revenues through interest income and fees for delivering value or customer support. Value capture is measured using ROA and return on equity (ROE) (overall performance) and YIELD on the loan portfolio (revenue stream). Secondary data from Nandi et al. (2019, 2020) covers various MFIs in India, including NBFC-MFIs, Section 8 Companies, Societies & Trusts and Cooperatives.

The variables undertaken for study are GLP, OER, CAR, FCR, ABCO, ROA, ROE, YIELD, DER and AB.

Selection of Variables

The variables selected for this study align with critical performance indicators for MFIs as reported by Sa-Dhan (Nandi et al., 2022):

- GLP & AB (value creation): Indicate outreach and borrower engagement.
- OER, CAR, FCR, DER, ABCO (value deliverance): Measure operational efficiency, capital structure and lending capacity.
- ROA, ROE, YIELD (value capture): Assess profitability and financial sustainability.

Time Period Selection

The study period (2018–2021) covers pre-pandemic, peak-pandemic and recovery phases. While more recent data is available, this timeframe offers a comparative analysis of the business model performance before and during COVID-19.

Post-COVID Challenge

The pandemic exposed MFIs to new risks, including higher default rates, reduced liquidity and shifts in borrower behaviour. Post-pandemic recovery strategies, such as digital transformation and regulatory interventions by NABARD and RBI, have been crucial in stabilising the sector.

Research Questions

The major research question that needs to be dealt with is: What is the performance of the MFI Business Model in India during COVID-19? Therefore, the research questions framed under various variables to be answered constitute the following question: Is there a significant difference in GLP, OER, YIELD, FCR, ROA, ROE and AB across categories of MFIs?

Formulation of Hypotheses

The alternate hypotheses are formulated as follows:

- H_1 : There is a significant difference in GLP across categories of MFIs.
- H_2 : There is a significant difference in OER across categories of MFIs.
- H_3 : There is a significant difference in YIELD across categories of MFIs.
- H_4 : There is a significant difference in CAR across categories of MFIs.
- H_5 : There is a significant difference in DER across categories of MFIs.
- H_6 : There is a significant difference in FCR across categories of MFIs.
- H_7 : There is a significant difference in ABCO across categories of MFIs.
- H_8 : There is a significant difference in ROA across categories of MFIs.
- H_9 : There is a significant difference in ROE across categories of MFIs.
- H_{10} : There is a significant difference in AB across categories of MFIs.

Statistical Tools

The study employs a range of statistical methods tailored to meet its research objectives. To assess the normality of the data distribution, both the Kolmogorov-Smirnov and Shapiro-Wilk tests are applied. Levene's test is used to evaluate the homogeneity of variances among groups. For comparing different business models, a one-way ANOVA is conducted, followed by Tukey's Honestly Significant Difference (HSD) test to perform post-hoc analysis and identify specific group differences.

Data Analysis, Findings and Interpretation

Tests of Normality

To test the normality hypothesis, the Kolmogorov-Smirnov and Shapiro-Wilk tests are applied. The p value must be greater than .05 to meet the normality assumption. The GLP, AB and FCR were transformed using a log transformation in order to meet the normality assumption. The normality tests for each variable provide insight into whether the data follows a normal distribution in Table 1. For GLP, both the Kolmogorov-Smirnov and Shapiro-Wilk tests yield significance values above 0.05 (0.200 and 0.088, respectively), indicating that the data likely conform to a normal distribution. AB shows similar results, with both tests producing high significance values (0.200 for both), also suggesting normality. In contrast, FCR has a Shapiro-Wilk significance value of 0.047, which is below the 0.05 threshold, implying that its data may not be normally distributed. ABCO, with significance values of 0.200 (Kolmogorov-Smirnov) and 0.127 (Shapiro-Wilk), appears to follow a normal distribution. OER and YIELD both show strong indications of normality, as evidenced by their high significance levels in both tests. Similarly, CAR and DER meet the assumptions of normality, with Shapiro-Wilk values of 0.600 and 0.940, respectively. The case of ROA is borderline, with a Kolmogorov-Smirnov significance of 0.059 and a Shapiro-Wilk value

Table 1. Test of Normality.

	Kolmogorov-Smirnova			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
GLP	0.195	12	0.200*	0.880	12	0.088
AB	0.198	12	0.200*	0.908	12	0.200
FCR	0.239	12	0.057	0.859	12	0.047
ABCO	0.175	12	0.200*	0.892	12	0.127
OER	0.149	12	0.200*	0.938	12	0.468
YIELD	0.154	12	0.200*	0.956	12	0.719
CAR	0.182	12	0.200*	0.947	12	0.600
DER	0.139	12	0.200*	0.973	12	0.940
ROA	0.238	12	0.059	0.885	12	0.101
ROE	0.241	12	0.053	0.936	12	0.451

Note: *This is a lower bound of the true significance.

of 0.101—suggesting a potential deviation from normality, though not a strong one. Lastly, ROE shows a significance level just above the threshold in both tests (0.053 and 0.451), indicating mild deviation from normality, but not conclusively so. Overall, most variables appear to be normally distributed, with the possible exceptions of FCR and, to a lesser extent, ROA and ROE.

Test of Homogeneity of Variances

The Levene's test results in Table 2 evaluate the assumption of homogeneity of variances, which is important in ANOVA to ensure that the variances across groups are equal. A significance (sig.) value less than 0.05 indicates that the variances are not equal (i.e., the assumption of homogeneity is violated), while a value above 0.05 suggests the variances are homogeneous. The results depict that GLP has a Levene statistic of 6.305 with a significance value of 0.017, and AB shows a statistic of 10.888 with a sig. of 0.003. Both values are below the 0.05 threshold, indicating that the assumption of equal variances is violated for these two variables—the group variances differ significantly. For all other variables—FCR (0.184), OER (0.420), YIELD (0.187), CAR (0.708), DER (0.124), ABCO (0.183), ROA (0.864) and ROE (0.926)—the significance values are above 0.05. This means that the assumption of homogeneity of variances holds for these variables, and the differences in group variances are not statistically significant.

In summary, Levene's test results suggest that most variables meet the homogeneity assumption necessary for ANOVA, with the exception of GLP and AB, where group variances differ significantly and may require alternative statistical approaches or corrections (e.g., Welch's ANOVA) for accurate analysis.

One-way ANOVA

Table 3 shows that the assumption of normality and homogeneity is satisfied, so one-way ANOVA is used. From the table, it is seen that sig < 0.05. Hence, the null hypotheses are not accepted in case GLP, ABCO and AB. The null hypothesis is accepted in case of OER, CAR, FCR, ABCO, ROA, ROE, YIELD and DER as the

Table 2. Test of Homogeneity of Variances.

	Levene Statistic	df ²	df ²	Sig.
GLP	6.305	3	8	0.017
AB	10.888	3	8	0.003
FCR	2.061	3	8	0.184
OER	1.054	3	8	0.420
YIELD	2.040	3	8	0.187
CAR	0.475	3	8	0.708
DER	2.609	3	8	0.124
ABCO	2.065	3	8	0.183
ROA	0.243	3	8	0.864
ROE	0.152	3	8	0.926

Table 3. ANOVA.

		Sum of Squares	df	Mean Square	F	Sig.
GLP	Between groups	3.901	3	1.300	64.448	0.000
	Within groups	0.161	8	0.020		
	Total	4.062	11			
AB	Between groups	0.233	3	0.078	21.874	0.000
	Within groups	0.028	8	0.004		
	Total	0.261	11			
FCR	Between groups	0.034	3	0.011	0.932	0.469
	Within groups	0.099	8	0.012		
	Total	0.133	11			
OER	Between groups	6.998	3	2.333	0.619	0.622
	Within groups	30.127	8	3.766		
	Total	37.125	11			
YIELD	Between groups	4.000	3	1.333	0.162	0.919
	Within groups	66.000	8	8.250		
	Total	70.000	11			
CAR	Between groups	102.393	3	34.131	1.632	0.257
	Within groups	167.298	8	20.912		
	Total	269.691	11			
DER	Between groups	8.730	3	2.910	2.519	0.132
	Within groups	9.240	8	1.155		
	Total	17.970	11			
ABCO	Between groups	66160.667	3	22053.556	18.452	0.001
	Within groups	9561.333	8	1195.167		
	Total	75722.000	11			
ROA	Between groups	0.280	3	0.093	0.167	0.916
	Within groups	4.475	8	0.559		
	Total	4.755	11			
ROE	Between groups	23.576	3	7.859	0.551	0.662
	Within groups	114.118	8	14.265		
	Total	137.695	11			

sig > 0.05. The ANOVA results provide a detailed analysis of each variable to determine whether significant differences exist between the groups. For the GLP variable, the between-groups sum of squares (SS) is 3.901 with 3 degrees of freedom (*df*),

resulting in a mean square (MS) of 1.300 and an F -value of 64.448. The significance level (sig.) is 0.000, indicating a statistically significant difference among the groups. Similarly, AB shows a between-groups SS of 0.233, df of 3, MS of 0.078 and F -value of 21.874, with a sig. value of 0.000, also pointing to a significant difference. In contrast, FCR has a sig. value of 0.469, which is above the 0.05 threshold, suggesting no significant difference between the groups. The same applies to OER (sig. = 0.622), YIELD (0.919), CAR (0.257), DER (0.132), ROA (0.916) and ROE (0.662), all of which do not show statistically significant differences. However, ABCO stands out with a between-groups SS of 66,160.667, MS of 22,053.556, F -value of 18.452 and sig. value of 0.001, confirming a significant difference across groups. Overall, the ANOVA analysis reveals that the variables GLP, AB and ABCO exhibit significant variation among the groups, indicating different group behaviours, whereas the other variables suggest similarity across groups.

Post-hoc Multiple Comparison-Tukey HSD

The multiple comparison shows the analysis across different business models of MFIs on the dimensions of value creation, value deliverance and value capture in the purview of variables undertaken against each dimension.

Value Creation

The variable GLP and AB show multiple comparisons of value creation dimension of business model. The result of analysis of these variables follows below:

- GLP: GLP is the outstanding principal balance of a loan given to a client by an MFI. Table 4 shows that the mean difference is significant in the case of NBFC-MFI when compared with NBFC, SEC.8CO and OTHERS. Also, a significant difference is observed in case of NBFC and OTHERS and OTHERS are significantly different from NBFC-MFI, NBFC and SEC.8CO as sig < 0.05. There is no significant difference in mean when NBFC is compared with SECTION8CO on the GLP variable.
- AB: Table 4 shows the multiple comparisons of AB across all categories of MFIs. A significant mean difference is between NBFC-MFI and NBFC, SECTION8CO and OTHERS. The mean difference between NBFC and SEC.8 CO and OTHERS are not significant.

Value Deliverance

The variables FCR, OER, ABCO, CAR and DER show multiple comparisons of value deliverance dimension. The result of the analysis of these variables follows below:

- FCR: Finance cost here refers to the interest and other expenses incurred on average bank loan outstanding in the books of MFIs. This does not include the notional cost of utilising the equity fund. Table 5 shows no significant mean difference amongst all forms of MFIs as the $p > .05$, which means FCR is the same across all categories of MFIs.

Table 4. GLP and AB-multiple Comparisons-Tukey HSD.

Dependent Variable			Mean Difference (I-J)	Std. Error	Sig.
GLP	NBFC-MFI	NBFC	1.416*	0.115	0.000
		SEC.8CO	1.359*	0.115	0.000
		OTHERS	0.786*	0.115	0.001
	NBFC	NBFC-MFI	-1.416*	0.115	0.000
		SEC.8CO	-0.057	0.115	0.959
		OTHERS	-0.630*	0.115	0.003
	SEC.8CO	NBFC-MFI	-1.359*	0.115	0.000
		NBFC	0.057	0.115	0.959
		OTHERS	-0.573*	0.115	0.005
	OTHERS	NBFC-MFI	-0.786*	0.115	0.001
		NBFC	0.630*	0.115	0.003
		SEC.8CO	0.057	0.115	0.959
AB	NBFC-MFI	NBFC	0.344*	0.048	0.000
		SEC.8CO	0.336*	0.048	0.001
		OTHERS	0.205*	0.048	0.012
	NBFC	NBFC-MFI	-0.344*	0.048	0.000
		SEC.8CO	-0.008	0.048	0.998
		OTHERS	-0.139	0.048	0.081
	SEC.8CO	NBFC-MFI	-0.336*	0.048	0.001
		NBFC	0.008	0.048	0.998
		OTHERS	-0.130	0.048	0.104
	OTHERS	NBFC-MFI	-0.205*	0.048	0.012
		NBFC	0.139	0.048	0.081
		SEC.8CO	0.130	0.048	0.104

Note: *The mean difference is significant at the 0.05 level.

- OER: Staff, travel, administration costs, other overheads and depreciation charges of MFIs (non-financial costs) as a percentage of the average loan portfolio over a year. Table 5 shows no significant mean difference amongst all forms of MFIs as the $p > .05$, which means the Operation Expense Ratio is the same across all categories of MFIs.
- CAR: Capital adequacy is a method of measuring MFI solvency, which is an important indicator of the entity's risk-bearing ability. It is the proportion of an MFI's capital/own fund to its total assets. The multiple comparisons in Table 5 show that there is no significant mean difference in CAR across all categories of MFIs, with $\text{sig} > 0.05$ in all cases compared.
- DER: The debt-equity ratio is the ratio of total debt borrowed to total equity held at any given time. Table 5 shows multiple comparisons of DER across categories of MFIs. There is no significant mean difference in DER across all categories of MFIs, with $\text{sig} > 0.05$ in all cases compared.
- ABCO: ABCO is an abbreviation for Average Borrower per Credit Officer, which is a measure of the client-staff ratio. Case Load is another name for it. In Table 5, the mean difference between NBFC-MFI and NBFC is significant as $\text{sig} < 0.05$. In case of OTHERS, the mean difference is seen to be significant when compared with NBFC and SECTION8CO., as

sig < 0.05. No significant mean difference is seen between and NBFC-MFI, NBFC and SECTION8CO on the ABCO dimension.

Value Capture

The variables ROA, ROE and YIELD show multiple comparisons of value capture dimension of business model. The result of the analysis of these variables follows below:

Table 5. FCR, OER, CAR, DER & ABCO-multiple Comparisons-Tukey HSD.

Dependent Variable			Mean Difference (I-J)	Std. Error	Sig.
FCR	NBFC-MFI	NBFC	-0.113	0.090	0.619
		SEC.8CO	-0.134	0.090	0.489
		OTHERS	-0.045	0.090	0.959
	NBFC	NBFC-MFI	0.113	0.090	0.619
		SEC.8CO	-0.022	0.090	0.995
		OTHERS	0.068	0.090	0.873
	SEC.8CO	NBFC-MFI	0.134	0.090	0.489
		NBFC	0.022	0.090	0.995
		OTHERS	0.090	0.090	0.758
	OTHERS	NBFC-MFI	0.045	0.090	0.959
		NBFC	-0.068	0.090	0.873
		SEC.8CO	-0.090	0.090	0.758
OER	NBFC-MFI	NBFC	-0.700	1.584	0.969
		SEC.8CO	-1.573	1.584	0.758
		OTHERS	-1.963	1.584	0.622
	NBFC	NBFC-MFI	0.700	1.584	0.969
		SEC.8CO	-0.873	1.584	0.944
		OTHERS	-1.263	1.584	0.854
	SEC.8CO	NBFC-MFI	1.573	1.584	0.758
		NBFC	0.873	1.584	0.944
		OTHERS	-0.390	1.584	0.994
	OTHERS	NBFC-MFI	1.963	1.584	0.622
		NBFC	1.263	1.584	0.854
		SEC.8CO	0.390	1.584	0.994
CAR	NBFC-MFI	NBFC	-6.613	3.733	0.352
		SEC.8CO	-3.513	3.733	0.785
		OTHERS	0.663	3.733	0.998
	NBFC	NBFC-MFI	6.613	3.733	0.352
		SEC.8CO	3.100	3.733	0.839
		OTHERS	7.277	3.733	0.282
	SEC.8CO	NBFC-MFI	3.513	3.733	0.785
		NBFC	-3.100	3.733	0.839
		OTHERS	4.177	3.733	0.689
	OTHERS	NBFC-MFI	-0.663	3.733	0.998
		NBFC	-7.276	3.733	0.282
		SEC.8CO	-4.176	3.733	0.689

(Table 5 continued)

(Table 5 continued)

Dependent Variable			Mean Difference (I-J)	Std. Error	Sig.
DER	NBFC-MFI	NBFC	2.066	0.877	0.164
		SEC.8CO	0.666	0.877	0.870
		OTHERS	1.866	0.877	0.223
	NBFC	NBFC-MFI	-2.066	0.877	0.164
		SEC.8CO	-1.400	0.877	0.432
		OTHERS	-0.200	0.877	0.995
	SEC.8CO	NBFC-MFI	-0.666	0.877	0.870
		NBFC	1.400	0.877	0.432
		OTHERS	1.200	0.877	0.551
	OTHERS	NBFC-MFI	-1.866	0.877	0.223
		NBFC	0.200	0.877	0.995
		SEC.8CO	-1.200	0.877	0.551
ABCO	NBFC-MFI	NBFC	113.000*	28.227	0.017
		SEC.8CO	86.333	28.227	0.061
		OTHERS	-75.333	28.227	0.106
	NBFC	NBFC-MFI	-113.000*	28.227	0.017
		SEC.8CO	-26.667	28.227	0.783
		OTHERS	-188.333*	28.227	0.001
	SEC.8CO	NBFC-MFI	-86.333	28.227	0.061
		NBFC	26.667	28.227	0.783
		OTHERS	-161.667*	28.227	0.002
	OTHERS	NBFC-MFI	75.333	28.227	0.106
		NBFC	188.333*	28.227	0.001
		SEC.8CO	161.667*	28.227	0.002

Note: *The mean difference is significant at the 0.05 level.

- ROA: ROA is a widely accepted profitability metric that, in essence, is the percentage net income earned from the total average assets deployed by MFIs over a given period, say a year. Table 6 shows the multiple comparisons of ROA across all categories of MFIs. There is no significant mean difference seen in ROA across all categories of MFIs, as sig > 0.05.
- ROE: The net income earned from the average equity of MFIs held by MFIs during the given period is referred to as the ROE. Table 6 shows the multiple comparisons of ROE across all categories of MFIs. There is no significant mean difference seen in ROE across all categories of MFIs, as sig > 0.05.
- YIELD: YIELD represents total income from microfinance operations (interest, processing fee/service charge) earned from the average loan portfolio outstanding. Investment income is not included. It works well as a proxy or surrogate for the loan interest rate. In Table 6, there is no significant mean difference in YIELD across all categories of MFIs, with sig > 0.05 in all cases compared.

Table 6. ROA, ROE& YIELD-multiple Comparisons-Tukey HSD.

Dependent Variable			Mean Difference (I-J)	Std. Error	Sig.
ROA	NBFC-MFI	NBFC	0.040	0.611	1.000
		SEC.8CO	-0.303	0.611	0.958
		OTHERS	0.087	0.611	0.999
	NBFC	NBFC-MFI	-0.040	0.611	1.000
		SEC.8CO	-0.343	0.611	0.941
		OTHERS	0.047	0.611	1.000
	SEC.8CO	NBFC-MFI	0.303	0.611	0.958
		NBFC	0.343	0.611	0.941
		OTHERS	0.390	0.611	0.917
	OTHERS	NBFC-MFI	-0.087	0.611	0.999
		NBFC	-0.047	0.611	1.000
		SEC.8CO	-0.390	0.611	0.917
ROE	NBFC-MFI	NBFC	3.853	3.084	0.616
		SEC.8CO	2.317	3.084	0.874
		OTHERS	2.723	3.084	0.814
	NBFC	NBFC-MFI	-3.853	3.084	0.616
		SEC.8CO	-1.537	3.084	0.957
		OTHERS	-1.130	3.084	0.982
	SEC.8CO	NBFC-MFI	-2.317	3.084	0.874
		NBFC	1.537	3.084	0.957
		OTHERS	0.407	3.084	0.999
	OTHERS	NBFC-MFI	-2.723	3.084	0.814
		NBFC	1.130	3.084	0.982
		SEC.8CO	-0.407	3.084	0.999
YIELD	NBFC-MFI	NBFC	0.000	2.345	1.000
		SEC.8CO	1.333	2.345	0.939
		OTHERS	0.000	2.345	1.000
	NBFC	NBFC-MFI	0.000	2.345	1.000
		SEC.8CO	1.333	2.345	0.939
		OTHERS	0.000	2.345	1.000
	SEC.8CO	NBFC-MFI	-1.333	2.345	0.939
		NBFC	-1.333	2.345	0.939
		OTHERS	-1.333	2.345	0.939
	OTHERS	NBFC-MFI	0.000	2.345	1.000
		NBFC	0.000	2.345	1.000
		SEC.8CO	1.333	2.345	0.939

Note: *The mean difference is significant at the 0.05 level.

Summary of Findings

The results (Table 1: Normality & Table 2: Homogeneity of variances) confirm data suitability for ANOVA analysis. The analysis finds significant differences exist for GLP and AB (value creation), as shown in Table 3. Other variables show

uniform trends across MFI categories. The results of the analysis in Tables 4, 5 and 6 show multiple comparisons revealing that:

- Value creation: NBFC-MFIs outperform other categories in GLP and AB. NBFC-MFIs lead in value creation due to their expansive borrower base and higher loan portfolios. NBFC-MFIs perform best in value creation but need improvements in value deliverance and capture.
- Value deliverance: No significant differences in FCR, OER, CAR and DER across categories. Value deliverance remains consistent across MFI categories, suggesting similar operational efficiencies.
- Value capture: ROA, ROE and YIELD remain similar across MFI types. Value capture indicates financial parity among MFIs, implying stable revenue generation mechanisms.

Conclusion and Recommendations

- The business model analysis of MFIs in India during COVID-19 covered NBFC-MFIs, NBFCs, Section 8 Companies, and OTHERS. NBFC-MFIs performed best in value creation (ABs and GLP). For value delivery (CAR, DER, ABCO, FCR, excluding OER) and value capture (ROA and YIELD, excluding ROE), all MFI categories showed similar performance. NBFC-MFIs show strong value creation and have the potential to improve in delivery and capture by enhancing ROE, ROA, OER, FCR, DER, CAR and YIELD compared to other MFI forms.

Other MFIs—NBFCs, Section 8 Companies and OTHERS—are advised to improve GLP, ABCO, FCR, DER, CAR, ROE, ROA, OER, YIELD and AB to enhance their performance in value creation, delivery and capture.
- MFIs using SHG and JLG delivery models can enhance their performance with support from NABARD, self-regulatory organisations like Sa-Dhan and MFIN and the RBI's Regulatory Framework for Microfinance Loans introduced in March 2022.
- The COVID-19 pandemic affected all forms of MFIs. In response, NABARD launched initiatives to support the microfinance sector post-pandemic. Notably, 12.8 lakh SHGs across 281 districts in 26 states and 2 UTs were digitised under Project E-Shakti. In 2020, NABARD introduced a Business Model Scheme for RRBs/RCBs to promote and finance JLGs. During the pandemic, Hewa-Wellalage et al. (2022) found that female-led enterprises faced greater challenges, with women being up to two percentage points more likely to rely on debt financing than men, solely due to gender. Reserve Bank of India (2021) highlighted Project E-Shakti as a key digital inclusion initiative. By 2022, SHGs grew from 255 (₹29 lakh in bank credit, 1992) to 67.40 lakh (₹1.51 lakh crore), and JLGs from 285 (₹447 lakh, 2005) to 188 lakh (₹3.27 lakh crore). NABARD has led the SHG movement by offering policy support, training, capacity building and refinancing for SHG loans. Initiatives include simplified account opening procedures,

relaxed collateral norms, the 1993 Bulk Lending Scheme, support for SHG promotion, livelihood training, research and awareness programmes (Status of Microfinance, 2020–2021).

- Hence, it can be concluded that the role of Government and Non-Government organisations is significant for various forms of MFIs to cope with the post-COVID-19 scenario in value creation, value deliverance and value capture.

Policy Implications

- Enhancing capital adequacy: Strengthening financial reserves to mitigate economic shocks.
- Digital transformation: Technological integration, alternative financing and policy support are crucial for MFIs' sustainability. The study suggests promoting fintech adoption for efficient credit disbursement.
- Regulatory support: Post-pandemic, regulatory interventions have helped, but liquidity concerns persist. The study recommends leveraging RBI and NABARD frameworks to stabilise MFI growth.

Limitations of the Study

The current study is based on the COVID-19 period, which restricts its scope in analysing long-term changes in MFIs' business models and their post-pandemic recovery strategies.

Future Research Directions

Future research could focus on:

- Analysing post-2021 data to evaluate the prolonged effects of the pandemic, including economic recovery patterns, shifts in consumer behaviour and structural transformations across various sectors.
- Investigating innovative business models that utilise fintech advancements and digital lending, exploring their role in enhancing financial inclusion, market dynamics and regulatory implications.
- For future research, there is potential to explore more advanced methodologies such as machine learning and financial modelling, which offer deeper insights and predictive capabilities. However, traditional statistical techniques like one-way ANOVA and post-hoc tests continue to hold value, particularly in analysing structured financial data and identifying significant differences across business models. Integrating both conventional and modern approaches could enhance the robustness and depth of future analyses.

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