Sustainability Index of Microfinance Institutions and Contributory Factors

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This research is about the Sustainability Index calculations of Pakistan's microfinance institutions and identifying those factors, which significantly affect the Sustainability Index. The analysis is employed on the sample of Pakistan's microfinance institutions for 2020 using the TOPSIS method for sustainability index and regression analysis for contributory factors. The sustainability score for MFIs ranges from a maximum score of 0.836 to a minimum of 0.005. Gross Loan Portfolio, Number of Borrowers per Staff Member, and Return on Assets are significant contributors to sustainability scores of Pakistani MFIs. By focusing on these contributory factors, policymakers and regulators may devise policies to support the long-term sustainability of MFIs. These contributory factors are not only useful to determine the sustainability of MFIs but can also assist the future researchers in unfolding further factors of sustainability.

Keywords: Sustainability, TOPSIS, Microfinance institutions, Sustainability Index

INTRODUCTION

Development in society is visionary but seems impractical. The development in an economy is directed towards the high-class people and everyone, the lower and middle-class (Peet & Hartwick, 2015; Das & Laha, 2021). Therefore, for economic prosperity, finance must be made available to all groups of people in society. On average, 74% of the world population is deprived of the formal banking sector. Since the 1970s, microfinance institutions (MFIs) have become significant determinants of equitable opportunity for economic participants and continuous development. The purpose of an MFI is to let people with lower income have easy access to financial services to become self-sufficient.

Harper, Fisher, and Sriram (2002) also found MFIs as the fundamentals of outreach, strike, and preserving ability. Two different approaches to MFIs have been widely discussed in the literature, i.e., the Institutionists approach and the Welfarists approach. Under the Institutions approach, the MFIs extend the basic resources for the needs of the poor and, at the same time, work on their self-sufficiency. On the other hand, Welfarists go a little further than Institutionists and work for their consumers' comfort by lowering the lower-income people's interest rates.

A prior study presented by Reed (2011) found that by the end of 2010, about 200 million people from around the globe had accessed MFIs. Pakistan is probably one of the most progressive microfinance sectors in the World. The central bank has developed the most enabling regulations possible, Pakistan continues to top the Economist Intelligence Unit list of the most enabling regulatory environment, innovations in branchless banking and new modes of financial services delivery are being incubated here, and the microfinance network in Pakistan continues to be regarded as world-class.

As per Puhazhendhi (2013) research, MFIs have secured a vast client base with over 20 million existing clients and a portfolio

surpassing Rs. 200 billion. In the past few decades, microfinance innovation has allowed poor people, usually excluded from the traditional banking system's actual means, to obtain credit to develop microenterprises and build savings. Microfinance has reduced poverty by improving both people's standard of living and economic self-sufficiency and offering a pathway to education, health care, and equality between men and women (Tamanni & Haji Besar, 2019).

Although, on one side, MFIs are working for the betterment of the needy and poor and there is tremendous growth, while on the other hand, the imperfect MFIs can equally endanger the economy and can do much harm to the lower-class, ending up in putting more burden on their shoulders (Chikwira, Vengesai, & Mandude, 2022). The sustainability of the MFIs need attention as they could be helping the poor now, but they may not exist in the future (Schreiner, 2000). Vinelli (2002) supports the ongoing debate and offers five .key areas in the MFI sector to be looked upon:

- 1. That survival of the MFIs is important so they could cater to the needs of smaller businesses.
- 2. That the market that has no access to MFIs should be attracted and served effectively.
- 3. That a check and balance be maintained on the competition from long-established lenders.
- 4. That different sources of funds are explored.
- 5. That the cost of lending to the poorer be actively managed.

For all the reasons stated above, the sustainability of these institutes is essential. Microfinance business is, by nature, a precarious business as the cost of providing the finance and the associated risks are higher as the poor community is not much exposed to financial risks and returns. So the returns may be lower or negative (Sarma, 2011). Even in modern times, small businesses that access microfinance mostly depends upon institutes' funds and may not be financially viable. Morduch (2000) accepts the presence of breach of interest and microfinance institutes to be

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biased towards their self-sufficiency, which conforms with the Institutionists approach and the Welfarists approach.

The study's main objectives include the calculations of the sustainability index of the microfinance institutions and identifying those contributory factors that significantly affect the sustainability index of Pakistani MFIs. This study also suggests measures to help MFIs to improve their score of sustainability. The present study is intended to let readers examine the sustainability of MFIs by stepping beyond the financial indicators. The current research gestates the sustainability of MFIs from clientele and selfsufficiency point of view that as MFIs step ahead to help as many more impoverished people as possible, the only way possible is a financially sustainable manner. The present study gestates the sustainability of MFIs as a complicated composition of clientele and the financial performance. To be able to measure the clientele, we need the breadth and depth. Clientele's capacity is measured by the number of active borrowers, while the center of the clientele is measured by the average credit offered to the borrower. The depth and breadth help us compose the MFI index or sustainability scores using the 'Technique of Order Preference by Similarity to Ideal Solution' (TOPSIS). Once the MFI index is composed, this study can rank each MFI from a sustainability perspective and then further explore the factors that could explain the MFI index variation.

LITERATURE REVIEW

Sustainability can be defined as the continuous ability to provide the resource to the lower community through recurring operations (Navajas, Schreiner, Meyer, Gonzalez-Vega, and Rodriguez-Meza (2000). Acharya and Acharya (2006) define sustainability as financial institutions' ability to offer different resources to the middle and poor-class society from the borrowers' aspect. Another definition that has come to light defines sustainability as the continuous long-term operations having no end to providing facilities for better living and higher opportunities for small and medium businesses.

The motive of MFIs can be achieved only and only if they are doing financially well. This means that their profitability is equally important (Ahlin & Jiang, 2008). When an institution can sustain, it is at a point where all its costs have been recovered, earns profits, and is in a position to offer financial services to entrepreneurs. Simultaneously, the institution can decrease its reliance on governments and any donating parties (Bhanot & Bapat, 2015). Similarly, Morduch (2000) also suggests that the MFIs can only sustain where they have achieved where their operational costs have been recovered and are financially stable. Hence, their source of funds becomes well balanced. For all the reasons stated above, the sustainability of MFIs has become important.

Keeping in mind the primary objective of an MFI, this study speaks about the sustainability from two different aspects; one being the client reach while the other can recover its operating costs. However, this study excludes the impact, MFIs may have one source of incomes of the lower community as it is not within the scope. Several studies that have come to light have used the same objective to study the sustainability of MFIs. One commonly used indicator is the number of active borrowers for the MFI index, and an MFI would be found to be sustainable if its client reach is more than 10,000 active borrowers (Gow, 2001). For another region of countries, Qayyum and Ahmad (2006) used the same index for their study.

Other widely used measures are deemed to be more reliable. There are two different ratios: the OSS and the FSS. OSS ratio being the mnemonic of Operational Self-Sufficiency, speaks about the MFI's ability to recover operational costs. This ratio has been used in various studies, for example, Okumu (2007) and that of Ruben and Schers (2007) and is preferred over FSS, which means Financial Self-Sufficiency. On the other hand, Rai and Rai (2012) study was more inclined towards financial indicators and was less focused on operational indicators. Millson (2013) also relied on the same measures for his study.

For each MFI, sustainable growth is important to cater to the low and middle-class community well. The results that have come to light are inconclusive. For the Indian region, Sarma (2011) used several indicators, operational self-sufficiency, and financial selfsufficiency being two of them. Their analysis concluded that although MFI's have secured many borrowers, they are still not financially doing well, known by several indicators used in their study. On the contrary, Martinez-Gonzalez (2008) found that MFI's have not performed well on the clientele; however, they were performing financially well. The study of Kinde (2012) concluded that for Ethiopia, the depth, breadth, cost per borrowing significantly impact the sustainability of MFIs. Several case studies also discussed the ongoing debate; however, none has reached a definite conclusion regarding the sustainability of MFIs. Further to the above, several other variables are equally important to explore how they impact the sustainability of MFIs. This is because prior literature has found that although operating profits are necessary, they are insufficient to justify clientele' sustainability (Copestake, 2004; Schreiner, 2000; Chikalipah, 2019; Chikwira, Vengesai, & Mandude, 2022). In light of this, Nyamsogoro (2010) examined the sustainability using portfolio at risk (PAR) in addition to some other variables and found that PAR significantly determines the MFIs' ability to recover their principal loans as well as the associated interest payments.

In addition to the portfolio at risk (PAR), staff productivity, which is measured by the total number of borrowers divided by total staff members, has also been the focus of several researchers (Gregoire & Tuya, 2006; Nyamsogoro, 2010). Moving towards the financial performance, Return on Assets, and Gross Portfolio Loan are also found to be important indicators as confirmed in the study of (Rai & Rai, 2012). Both of these variables can be used to measure the financial performance of MFIs as they are found to be positively correlated to one another (Nørgaard Jørgensen, 2012; Siwale & Okoye, 2017). A study by Hartarska and Nadolnyak (2007) used the Debt-to-Equity ratio and found it significantly associated with sustainability.

The most major variable that impacts the MFI's self-sufficiency is the number of deposits collected by MFIs (Maisch, Soria, & Westley, 2006). Tehulu (2013)) also found that in East African Development banks, deposits play a significant role in determining their sustainability.

RESEARCH METHODOLOGY

The impact of different contributory factors is studied to influence the sustainability of specialized Microfinance institutions in Pakistan. This analysis is employed on the sample of Pakistan microfinance institutions for the year 2020. This sample is selected based on the availability of data related to microfinance banks and institutions in Pakistan. The data is extracted from the annual financial statements of 30 microfinance banks and institutions in Pakistan.

In this study, we have focused on a multi-dimensional sustainability index based on three significant indicators, such as Operational Self-sufficiency ratio (OSS), Average Loan Balance per Borrower (ALPB), and Number of Active Borrowers (NAB). OSS is the MFI's ability to have the required revenue to cover their relevant costs. ALPB and NAB are depth and breadth of outreach, respectively. Individual indicators have been aggregated to formulate sustainability scores based on Multi-Criteria Decision Making (MCDM) technique. When we have multiple criteria for the decision-making process, the multi-criteria decision-making technique is more effective.

In this analysis, there are three individual factors for the multiple criteria of the decision-making process. TOPSIS, commonly used as a multi-criteria decision making technique, is developed by Hwang and Yoon (2012) to aggregate individual indicators as a sustainability score. In the TOPSIS technique, M alternatives are ranked on N attributes. In our study, we have a total of 30 MFIs as M=30 with three main indicators, N=3, to composite sustainability scores for MFIs in Pakistan. A normalized decision-making matrix was constructed to normalize the data as:

$$r_{ij} = \frac{x_{ij}}{\sqrt{\sum_{i=1}^{M} (x_{ij})^2}}$$

Each element in the M*N matrix is represented as x_{ij} , $i \in M, j \in N$. After that matrix, an equally weighted normalized matrix has been developed. TOPSIS ranking is based on an ideal positive and negative solution. Each criterion has been minimized or maximized based on their respective high or low values. After that minimum and maximum criteria selection, ideal positive and idea, negative solutions can be defined as:

$$A^{*} = \begin{cases} \binom{min}{j} v_{ij \ \forall i \ when \ criteria \ j \ is \ to \ be \ maximized} \\ \binom{min}{j} v_{ij \ \forall i \ when \ criteria \ j \ is \ to \ be \ minimized} \end{cases} = \{v_{1.}^{*}v_{2.}^{*}v_{3}^{*}\}$$
And:
$$A^{-} = \begin{cases} \binom{min}{j} v_{ij \ \forall i \ when \ criteria \ j \ is \ to \ be \ maximized} \\ \binom{max}{j} v_{ij \ \forall i \ when \ criteria \ j \ is \ to \ be \ minimized} \end{cases} = \{v_{1-}^{*}v_{2-}^{*}v_{3-}^{*}\}$$

For a positive ideal solution, individual criteria OSS and NAB are highest while ALPB as lowest. Then, the calculation for ideal positive and ideal negative situations are:

$$S_{i^*} = \sqrt{\sum_{j=1}^3 (v_{ij} - v_{j^*})^2}, \text{ for } i = 1, 2, 3, \dots, 30$$

And:
$$S_{i^-} = \sqrt{\sum_{j=1}^3 (v_{ij} - v_{j^-})^2}, \text{ for } i = 1, 2, 3, \dots, 30$$

And:

$$c_{i^*} = \frac{S_{i-}}{S_{i^*} + S_{j-}}, \quad for \ i = 1, 2, 3, \dots, 30$$

After the calculation of ideal solutions, MFIs' alternatives are ranked accordingly. The best alternative is more closeness to the highest perfect solution and distant from the ideal negative solution. $C_{i^*}(C_{1^*}toC_{30^*})$ is represented as the sustainability scores of MFIs. When MFIs are ranked according to the sustainability scores, then we will get the desired ranking of MFIs with the highest positive solution at the top and lowest ideal solution at the lowest position. Thus, we found the relative ranking of MFIs based on the ideal positive and ideal negative solution through the TOPSIS technique.

This study's secondary objective is to investigate those factors that have a significant impact on sustainability scores of MFIs in Pakistan. The regression analysis has been performed to test which factors play a more important role in the sustainability of MFIs in Pakistan. Independent variables are selected with the help of previous literature related to our study.

EMPIRICAL RESULTS AND DISCUSSIONS

We found sustainability scores for MFIs in Pakistan through TOPSIS, using an equally weighted method. Sustainability scores obtained from that equally weighted index have been used for further analysis in this study. Sustainable Pakistani MFIs with their respective sustainability scores are mentioned in Table 1, according to their rankings based on the TOPSIS method. **Table 1:** Sustainability Scores

Ranking	Name	Sustainability		
		Scores		
1	NRSP	0.8368		
2	Khushhali Bank	0.7571		
3	Kashf Foundation	0.6841		
4	Rozgar	0.5375		
5	FMFB – Pakistan	0.4720		
6	TMFB	0.3997		
7	BRAC – PAK	0.3848		
8	NRSP Bank	0.3825		
9	Farz Foundation	0.3708		
10	ASA Pakistan	0.3679		
11	PRSP	0.3575		
12	SRSP	0.3416		
13	Taraqee	0.3340		
14	Akhuwat	0.3328		
15	Kashf Bank	0.3302		
16	Asasah	0.3293		
17	CWCD	0.3227		
18	Apna Microfinance Bank (Formerly NMFB)	0.3167		
19	POMFB	0.3144		
20	CSC	0.3102		
21	SAFWCO	0.2978		
22	Orangi	0.2960		
23	JWS	0.2935		
24	RCDS	0.2933		
25	TRDP	0.2905		
26	Sungi	0.2856		
27	DAMEN	0.2847		
28	Orix Leasing	0.2730		
29	Bank of Khyber	0.2167		
30	NLCL	0.0054		

Econometric results

Table 2 explains the summary statistics of all the variables used in the analysis to determine the impact of different contributory factors on the sustainability of MFIs in Pakistan. It shows the

observations mean, standard deviation, maximum and minimum values of the study variables.

Table 2: Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Max	Min
Dependent Variable					
Sustainability scores	30	.37	0.16	0.84	0.01
Independent Variables					
Gross loan portfolio (GLP)	30	14.66	2.88	2.85	18.0
Borrower per staff member (BPS)	30	233.9 2	398.87	2292	78
Portfolio at risk (PAR)W30 days (in %)	30	11.81	19.04	64.5 1	0
Return on assets (ROA) (in %)	30	-5.67	11.99	11.1 4	-39.8
Debt to equity ratio (D_E)	30	5.59	14.72	72.5 6	12.51
Deposits (DP)	30	5.707	7.24	17.9 4	0

Correlation analysis

Table 3 shows the results of correlation analysis. Some variables are positively, and others are negatively correlated with each other. **Table 3:** Correlation Analysis

Variables	DP	BPS	D_E	GLP	PAR	ROA	
DP	1.0000						
BPS	-0.0978	1.0000					
D_E	-0.0906	-0.0837	1.0000				
GLP	0.3464	0.0034	-0.0224	1.0000			
PAR	0.1268	-0.0561	0.1926	-0.2618	1.0000		
ROA	-0.1179	0.0653	-0.0406	0.1890	-0.3806	1.0000	

Regression analysis

Sustainability scores are regressed with other contributory factors as independent variables in this analysis. All the regression assumptions, like linearity, normality, heteroskedasticity, and auto-correlation for the dependent and independent variables, have been tested before the regression analysis. Results of heteroskedasticity have been attached in Annexure-A.

 Table 4: Regression Results

Variable	Coefficient	t-Statistics	p-value		
PAR	0.120469	1.638964	0.1148		
DP	-0.003	-0.016325	0.9871		
ROA	0.199758	-1.828189*	0.0805		
D_E	-0.00044	-0.523861	0.6054		
BPS	0.0002	-5.587914**	0.0000		
GLP	0.00827	9.972283**	0.0000		
R square		0.8702			
Adj.R-square		0.8364			
F-statistics	25.7194**				
DW-Test	2.1616				

*10%, **1% level of significance

Table 4 summarizes the results of the regression analysis for MFIs. Keeping in view the value of the significant F-test, it seems that the model applied is suitable for this sustainability analysis. R-square's value is 0.8702, which implies that this model's independent variables have explained 87.02% variation in sustainability scores.

The coefficient value is statistically significant for the gross loan portfolio, which implies that GLP acts as an indicator of the selfefficiency of MFIs in Pakistan. GLP helps MFIs achieve their economies of scale, resulting in more sustainability of MFIs in Pakistan. These findings are consistent with the results of different literature studies, such as analysis done by (Addo & Twum, 2013; Cull & Morduch, 2007). Borrowers per staff are also significant and positively linked with sustainability scores, which indicates that higher borrowers per staff, more staff productivity, and high level of sustainability of MFIs are consistent with the findings (Nyamsogoro, 2010).

The declined level of borrowers per staff will be a sign of inefficiency. It will negatively impact the sustainability of MFIs, especially those MFIs which are struggling at the start-up stage (Nyamsogoro, 2010). Finally, the coefficient for ROA is statistically positive. It suggests that as the MFI focuses on its ability to generate profits on its assets, it helps the MFI improve its sustainability level. Berger, Otero, and Schor (2006) suggest that by maintaining portfolio quality and efficiency, MFIs will achieve higher ROA, and it will indirectly aid in achieving higher sustainability. The study did not find any significant results for other remaining variables: debt to equity, PAR, and deposits.

DISCUSSIONS AND IMPLICATIONS

There are many practical implications of this analysis. This study has examined the sustainability index, outreach perspectives, and self-sufficiency of MFIs in Pakistan. Investors, donors, creditors, and other experts can use the developed sustainability scores or index to plan their strategies with the double bottom-line perspective. As per regression analysis, this study found three main significant variables that are, Gross loan portfolio, staff productivity, and ROA. A higher gross loan portfolio will help MFIs achieve their economies of scale, leading to better outreach and sustainability. The positive impact of active borrowers per staff indicates a need to remain, staff, be motivated. Highly motivated staff will contribute to their associated organization and result in a more beneficial outreach perspective.

Another important factor is that MFIs serve more poor employees; more money is lent to more poor clients than lending a more significant chunk to better-off clients. Moreover, this study found a positive relationship between sustainability scores with ROA as expected. This implies that the higher ROA, the better the sustainability is. In other words, MFIs should focus on the higher gross loan portfolio, higher staff productivity, and higher ROA to have more sustainability scores in Pakistan.

Conclusion

This study explored various contributory factors for the long-term sustainability of MFIs in Pakistan for 2015 by developing sustainability scores. All the sustainability scores and regression analysis findings concluded that three contributory factors have significant positive impacts: gross loan portfolio, staff productivity, and ROA. This study has not found any significant relation between sustainability scores with other independent variables, debt to equity, deposits, and PAR.

This study's findings can be used by policymakers to formulate their strategies to increase the sustainability level of microfinance institutions in Pakistan in the long run. In addition, being one of the important players in the country's economic growth, the sustainability of MFIs can have a better effect. This study also has some limitations due to data limitations and variables. The inclusion of more independent variables is recommended for future studies. This study can further proceed with the economic impact on the sustainability of MFIs. Moreover, this study can be expanded by taking across the countries sample as well.

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Annexure-A Heteroskedasticity

Regression Assumptions

Heteroskedasticity Test: Breusch-Pagan-Godfrey						
F-statistic	2.781142	Prob.	0.53*			
Breusch-Godfrey Serial Correlation LM Test						
F-statistic	0.217528	Prob.	0.8063*			
*significant						