



Understanding The Factors Affecting The Sustainability Model Prevalent In The Microfinance Sector Using Pls-Sem

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ABSTRACT

Purpose: The aim of this study is to examine as well as analyze the most influential determinants of sustainability using the Microfinance Information Exchange (MIX) secondary database for the year 2022 on 528 Microfinance Institutions (MFIs) operating worldwide.

Design/methodology/approach: The methodology used in the present paper involves the application of Partial Least Squares Structural Equation Modelling (PLS-SEM) on Smart PLS4 software for the secondary database comprising microfinance institutions operating worldwide.

Findings: The results have indicated the most important indicators affecting the sustainability over the profitability variables of the microfinance institutions operating worldwide in alignment with one of the leading Microfinance companies in India; Satin Creditcare Network Ltd.

Research, Practical & Social implications: The study will be quite advantageous and gainful for the currently operating microfinance institutions to enhance their productivity and alleviate poverty as well as provide means of livelihood for the vulnerable section of the society.

Originality/value: The value of the study is in developing a sustainability model for the microfinance industry employing the latest technique of Partial least squares structural equation modelling using Smart PLS 4 software.

Keywords- Ease of doing business, Microfinance, Outreach, Profitability, Sustainability.

1. INTRODUCTION

Microfinance is regarded as a strategy for economic development with the ability to significantly reduce poverty among the most vulnerable members of society. Microcredit and numerous other non-financial services are offered by microfinance organizations to a group of lower-class people without the use of any type of security, with the condition that they are all jointly responsible for paying back the institution's loan. Financial advances help people with various requirements, including lifecycle, emergency, and opportunity needs, and when institutions profit from them, it benefits both sides (Sethi et al., n.d.). The first microfinance institution, Shri Mahila SEWA Sahkari Bank, was founded in 1974, followed by regional rural banks in 1975, the Integrated Rural Development Programme (IRDP) in 1978, and the NABARD-launched Self Help Group Bank linkage model in 1989. These historical events, which began with the establishment of corporative societies in 1904, laid the ideal groundwork for the microfinance institutions' operations. The provision of financial services to the underprivileged in a sustainable manner is a feature shared by all of the approaches. The poverty lending strategy promotes giving subsidized credit to the most vulnerable at the expense of the institution's financial viability for the poor's ultimate welfare, in contrast to the financial systems approach, which places an emphasis on commercial profitability (Zerai & Rani, 2012). Microfinance is grounded on the realm that the impoverished have the necessary talents but are unable to use them because they have no access to any money (Abdulai & Tewari, 2017). Evidence from sub-Saharan Africa on the trade-off between microfinance institutions' sustainability and their reach it is now necessary for the poor to increase their levels of production, asset building, income generation, and security (Thapa, 2006). It encourages regular saving habits, mainstreams the poor masses into the formal banking system, and offers advice on how to make the

most use of the resources at their disposal (Tripathi & Tripathi, 2014). Being such a crucial instrument, it is also crucial to preserve its sustainability so that it serves the needy in an effective and efficient manner.

Broadly speaking, sustainability refers to the capacity to effectively fulfil the demands of the current generation while simultaneously safeguarding and not undermining the needs of future generations (Muhmad et al., 2021). In the microfinance context, institutions strive for self-sufficiency, aiming to enhance their operational and financial revenues, mitigate and minimize operational costs, and expand their outreach to impoverished individuals. This is done with the objective of reducing reliance on donor funds and ensuring long-term sustainability in their operations (Xue et al., 2016)(Xu, Fu, & Liu, 2019). According to a well-known saying, imparting the talent of fishing to someone is more advantageous than merely providing them with a fish. Financial sustainability in the context of the microfinance industry is inclusion of loan products, education programs and delivery systems that effectively serve the needs of impoverished clients, while also generating sufficient revenue to cover the costs associated with providing these services (Adongo Christoph Stork, 2005). (Mohamad Fazli Sabri & Nurul Farhana Zakaria, 2015) emphasizes the significance of financial sustainability, highlighting that only microfinance organizations that possess sustainable practices can effectively assist impoverished individuals in overcoming poverty. The author asserts that microfinance institutions that are not sustainable pose a burden to society and should cease their activities. Sustainable microfinance institutions have the capacity to offer high-quality financial and non-financial services to marginalized populations without relying substantially on subsidies. As it is, most of the aid policies have catastrophically failed over the world (Ayayi & Sene, n.d.). In order to effectively address the financial requirements of marginalized individuals over an extended period, it is advised that institutions prioritize the maintenance of elevated repayment rates (MIX Report Mix, 2018). Additionally, it is recommended that these institutions diligently manage their administrative expenses, ensuring that they do not exceed 15-20 percent of the overall portfolio. According to (Abdulai & Tewari, 2017), the implementation of cost-effective strategies, such as strengthening staff appraisals, improving productivity levels, enhancing loan collection mechanisms, and utilizing the latest information communication technology, can contribute to increased outreach and decreased costs for institutions. The significance of microfinance institutions as catalysts for social transformation should be acknowledged, with financial sustainability being evaluated through non-financial indicators such as poverty reduction and the accessibility of non-financial services to marginalized populations.

Moreover, the sustainability indices exhibit significant variability across diverse socio-cultural contexts. The significance of a collection of metrics in one economy may not necessarily hold true for other economies (Mahapatra & Dutta, 2016) (Oware, 2022). Moreover, the economies themselves exhibit significant differences. Latin America and the Caribbean (LAC) exhibited the highest ownership of Financial Service Providers (FSPs) in terms of worldwide outreach, whilst South Asia had the highest absolute numbers of active borrowers. India emerged as the leading nation in terms of active borrower base, even when compared to other South Asian countries. East Asia and the Pacific (EAP) has successfully achieved a greater level of outreach by prioritizing a higher percentage of rural borrowers compared to urban borrowers, with 79 percent of borrowers being from rural areas and 21 percent from urban areas. In terms of portfolio quality, the economies of South Asia (PAR30 = 3.3 percent), East Asia and the Pacific (PAR30 = 3.5 percent), and the Middle East and North Africa (PAR30 = 4.4 percent) demonstrated the highest efficiency. Conversely, Eastern Europe and Central Asia (PAR30 = 15.1 percent) and Africa (PAR30 = 13.6 percent) exhibited the lowest performance. According to Mix (2018). Therefore, there is a perceived necessity to comprehend the primary factors that exert influence on the sustainability of microfinance institutions on a global scale (Deb, n.d.). Relying excessively on subsidies can pose significant risks for institutions, as the availability of donor funds may become uncertain, perhaps leading to the cessation of their operations (Nyamsogoro, 2010). The present study aims to comprehensively examine and evaluate the sustainability indicators that are currently employed on a global scale. Subsequently, a sustainability model will be constructed utilizing Partial Least Squares Structural Equation Modelling. This model will be designed to seamlessly integrate into the routine operations of Microfinance institutions.

The Microfinance Industry is currently undergoing a shift from the Institutional approach to the Welfarist approach, which presents a new set of issues for the industry. The achievement of sustainability for these institutions is not driven by profit motives, but rather by other social characteristics that require additional empirical investigation. In their study, (Rai & Rai, 2012) sought to do a comparative analysis and assessment of the variables influencing the financial viability of Microfinance institutions in India and Bangladesh. To achieve this, they utilized secondary data from MIX sources. A sector-specific financial sustainability index has been established. The variables of active borrower count, percentage of women borrowers, institution age, debt to equity ratio, capital to asset ratio, portfolio at risk greater than 30 days, borrower per staff member, return on equity, and yield collectively account for approximately 50 percent of the variation observed in the dependent variable Operational Self Sufficiency (OSS). A sustainability index has been established to assess and analyze the performance of microfinance institutions operating in diverse global countries. This index comprises four indicators: portfolio at risk, capital to asset ratio, operating expense per loan portfolio, and operational self-sufficiency. According to (Rajdev & Bhatt, 2013), the Welfarist perspective goes beyond focusing solely on profits and instead seeks to promote financial inclusion by offering a wide range of financial services to a large population of economically disadvantaged individuals in a sustainable manner. The researchers discovered that the gross loan portfolio, debt to equity ratio, total equity, total expenditure ratio,

and the number of active borrowers were identified as the most influential factors impacting the financial performance of Microfinance institutions throughout the specified study period of 2005 and 2006. However, in the most recent analysis conducted in 2010 and 2011, only the gross loan portfolio, total expense ratio, and the number of active borrowers were found to be statistically significant. The transition suggesting that the pursuit of profit as a motivating factor holds less significance in the context of establishing sustainability in Microfinance institutions. In their study, (Bhanot & Bapat, 2015) have endeavored to construct a comprehensive sustainability index specific to the Indian context, by examining the various elements that contribute to sustainability. The study employed the TOPSIS technique to develop a Sustainability score, which considered several contributory elements, including Gross Loan Portfolio (GLP), Borrower Per Staff Member (BPSM), Portfolio at risk greater than 30 days (PAR30), Return on Asset (ROA), Debt to Equity ratio (DER), deposits, and age of the institution. The study revealed that the Gross Loan Portfolio (GLP), staff productivity, and Return on Asset (ROA) were identified as the most influential factors contributing to the sustainability of the institutions. Conversely, it has been determined that the viability of Indian Microfinance institutions is adversely impacted by the quality of their portfolios. Based on the findings of the research, diligent observation of the key metrics within the sustainability framework has the potential to establish a self-perpetuating cycle of financial resources for the currently operational microfinance institutions. By adopting this approach, the industry will enhance its ability to effectively address the financial requirements of the economically disadvantaged population.

Furthermore, the integration of empirical research has demonstrated the prevalent trade-off between the sustainability of Microfinance Institutions (MFIs) and the Outreach indicator, which pertains to the ability to reach a larger population of impoverished individuals residing in rural areas. In a similar vein, the trade-off was examined by (Kwami Awaworyi & Marr, 2014) in a study encompassing 215 Microfinance institutions in six South Asian nations and 332 Microfinance institutions in 33 regions of Latin America and the Caribbean. The empirical findings suggest that there is a trade-off between the extent of outreach and the financial sustainability across different geographies. While previous research has indicated that LAC has placed considerable emphasis on achieving financial sustainability. South Asian nations continue to prioritize poverty reduction efforts by focusing on expanding their access to marginalized populations. A recommended approach for achieving more complementarity of objectives in both regions is to adopt a more balanced strategy that incorporates both outreach and sustainability. In contrast, a study undertaken by (M.S, 2014) examined the branches of microfinance institutions operating in Bangladesh in order to analyze the trade-off that exists between sustainability and the extent of outreach. The regression model incorporated six explanatory variables, including staff productivity, loan size, the number of borrowers, wage rate in the branch region, number of branches, deposit advance ratio, and subsidy dependence index. The working paper did not uncover any empirical evidence supporting the existence of a trade-off. Instead, it suggested that institutions should consider increasing the size of loans provided to low-income households in order to enhance sustainability. This recommendation aims to shift the overall thinking of these institutions towards achieving sustainability. According to (Ngo, 2015), there exists a favorable correlation between sustainability and outreach. By expanding the pool of borrowers and increasing the effective interest rate, financial institutions can capitalize on economies of scale and achieve long-term viability by generating sufficient revenue to cover their operational expenses. Research has demonstrated that there exists a non-linear association between outreach and sustainability, whereby the performance of institutions exhibits a drop beyond a certain threshold of increased outreach towards impoverished clientele. (H et al., 2021) investigated the various aspects that influence the financial sustainability of Microfinance organizations located in Malawi. The enhancement of financial sustainability in a microfinance institution is contingent upon several critical factors, namely the commercialization of its operations, implementation of standardized reporting practices, establishment of effective loan portfolio management systems, maintenance of an independent board, and adoption of a stakeholder-based approach to corporate governance. (Githaiga, 2022) investigated the influence of revenue diversification on the financial sustainability of a sample of 443 microfinance institutions operating in 108 countries. The study included a time span of six years, from 2013 to 2018. The research employed the two-step Generalized Method of Moments (GMM) estimate model. In contrast to prior research that emphasizes the importance of government grants and subsidies within the industry, this study supports the notion that there is a significant correlation between revenue diversification of firms' income streams and enhanced performance and financial sustainability of the respective institution. Therefore, the implementation of diversification strategies will result in the establishment of financially self-sustaining enterprises. Consequently, these enterprises will be able to extend the advantages to the most marginalized populations by providing larger loan amounts and reaching a greater number of individuals. The study undertaken by (Illangakoon et al., 2022) investigated the correlation between risk management practices and the sustainability of microfinance institutions across several areas in Sri Lanka. A regression analysis was performed on the main data obtained from a sample of 376 women borrowers in the microfinance business. The significance of risk management in promoting sustainability within institutions is often overlooked and requires renewed attention in order to effectively address the challenges and activities of the underlying organizations. To guarantee the progression of their operations and effectively serve a larger number of financially disadvantaged female borrowers with higher loan balances, it is imperative for institutions to

establish a risk manual or a comprehensive risk management framework. Subsequently, they should provide corresponding reports in accordance with these frameworks. (Duramany-Lakkoh & Duramany-Lakkoh, 2021) placed significant emphasis on various key indicators, namely profitability, portfolio quality, asset and liquidity management, as well as efficiency and productivity parameters. These indicators were utilized to get insights into the sustainability of Microfinance institutions in Sierra Leone during the years 2011 and 2012, prior to the occurrence of the Ebola outbreak. During the time under investigation, the Financial Service associations and Banks had a decline in portfolio quality, profitability, and Operational Self Sufficiency. This decline poses a threat to the long-term sustainability of these institutions, making it unavoidable that bad loans will need to be written off in the near future.

2. METHODS

2.1 Data and Sampling

The dataset utilized in this study was acquired from the secondary data source known as the Microfinance Information Exchange (MIX). The primary objective of the organization is to mitigate the presence of information asymmetries that are commonly observed within the microfinance sector. This is achieved through the provision of a substantial amount of data pertaining to diverse financial and social performance indicators. In the current study, a total of 528 Microfinance institutions were selected for analysis following careful examination and exclusion of institutions with incomplete data and outliers. The institutions were mostly established and functioning in the geographical areas encompassing parts of America and the Caribbean, Europe, few regions in Central Asia, Sub-Saharan and North Africa. The data for the year 2022 pertaining to sustainability indicators was obtained through a comprehensive literature research conducted for the purpose of this study.

2.2 Variable and their measurement

The study's sustainability model utilizes Operational Self Sufficiency and Financial Self Sufficiency as the variables of interest. The secondary data source presents the values of both indicators as percentages, which are subsequently transformed into a ratio scale. In this scale, a value below one indicates that institutions have not yet achieved sustainability break-even. It is strongly advised and encouraged that microfinance institutions strive to achieve sustainability within a maximum period of five years from their initial creation, without exceeding this timeframe. The only institutions that deviate from this instance are those operating in rural areas characterized by low population density, as stated by CGAP.

The predictor variables incorporated in the sustainability model encompass various factors. These factors include the size of the institution, which is quantified by the total value of assets and gross loan portfolio. Additionally, portfolio quality is considered, which is assessed by examining the portfolio at risk for periods exceeding 30 days and 90 days. Efficiency is also taken into account, with measurements such as cost per borrower and cost per loan being utilized. Furthermore, outreach is evaluated by considering the number of active borrowers, categorized by gender (male and female) as well as location (rural and urban). Profitability is another crucial aspect, with metrics such as return on asset and return on equity being employed. Lastly, the macroeconomic indicator of ease of doing business, as measured by the ease of doing business index, is included as a predictor variable. The majority of indicators were initially presented in absolute values, however the variables stated as percentages (PAR30, PAR90, ROA, and ROE) were transformed into decimal form in order to align them with the model. Table 1 presents a comprehensive compilation of the sustainability indicators employed in the proposed model, along with their corresponding definitions. On the other hand, Table 2 illustrates the sustainability indicators, the latent constructs that may be measured, and the references from the exhaustive literature review that was conducted.

Table 1: Sustainability Indicators and their Definitions

S.NO.	SUSTAINABILITY INDICATORS	LATENT CONSTRUCTS	DEFINITIONS
1	Sustainability	Operational Self Sufficiency (OSS)	The most widely used metric for determining whether a microfinance institution is sustainable is operational self-sufficiency. It mandates that all administrative expenses and loan losses be paid for by earned operating incomes at the organization. According to (Jovita Okumu, 2007), it is calculated by dividing operational incomes by operating expenses. Within three to seven years of beginning operations, microfinance institutions are advised to achieve operational sustainability (Thapa, 2006).
		Financial Self Sufficiency (FSS)	The institution achieves financial self-sufficiency when, after accounting for inflation and subsidies, its operating incomes cover all of its costs, including administrative expenses, loan losses, and financing costs (after operational self-sufficiency, or OSS). Within five to 10 years of their operations, all microfinance institutions are

			expected to meet these standards (Thapa, 2006).
2	Size	Total Assets	Assets serve as the principal metric for assessing the magnitude of an institution. The concept being referred to is the aggregate worth of assets possessed by an entity, encompassing various forms of assets as presented in the financial institution's balance sheet, after deducting counter asset accounts such as loan loss reserves and accumulated depreciation (Samuel, 2012).
		Gross Loan Portfolio (GLP)	The Gross Loan Portfolio is a crucial indicator for evaluating the magnitude of a Microfinance institution. The term "it" refers to the aggregate outstanding principal balance of all loans, including both current and delinquent loans, as well as debts that have been restructured. According to (Singh, 2010), it is important to note that the data presented excludes debts that have been written off.
3	Outreach	Active Borrowers	The number of active borrowers who have an outstanding loan balance with the organization or are held liable for any part of the Gross Loan Portfolio, is a key indicator of a microfinance company's outreach. Individuals rather than groups are used to calculate the number (Samuel, 2012). The PLS sustainability model further divides the total number of active borrowers for the current study into rural, urban, male, and female groups.
4	Portfolio Quality	Portfolio at Risk greater than 30 days (PAR30)	Portfolio at Risk (PAR) metric assesses the portfolio's overall quality by quantifying the extent to which loans are being repaid. The term "PAR30" (or "PAR90") is used to denote the segment of a portfolio that has had a delay in repayment exceeding 30 days (or 90 days) after the original due date. The calculation involves adding the portfolio overdue for more than 30 days (or 90 days), and the renegotiated portfolio, and then dividing this sum by the modified Gross Loan Portfolio. According to (Mahapatra & Dutta, 2016) and (Veenapani, 2017), ratios over five to ten percent are indicative of challenges faced by institutions, suggesting a decrease in operational sustainability.
		Portfolio at Risk greater than 90 days (PAR90)	
5	Efficiency	Cost per Borrower	An efficiency statistic called cost per borrower shows the expenses incurred by a microfinance institution to serve one borrower. As it does not penalize institutions for making lesser loans, it is the perfect ratio for assessing the effectiveness of various institutions. It is ascertained by dividing the total of staff and administrative costs by the ratio of the gross national income per capita and the average number of active clients (Rosenberg, 2009).
		Cost per Loan	The cost per loan is a key indicator of efficiency in microfinance institutions. It quantifies the overall expenses spent by the institution at a specific moment and is calculated by dividing these expenses by the average number of loans extended to borrowers (43. Sethi, K., Nasreen, R., 2019; Sethi et al., 2019).
6	Profitability	Return on Assets (ROA)	This ratio evaluates the profitability of a Microfinance organization by examining the net revenue generated in relation to the overall value of its assets. The formula for calculating ROA is derived by subtracting taxes from net operating income and dividing the result by the average value of assets (Rajdev & Bhatt, 2013).
		Return on Equity (ROE)	The second measure used to assess profitability in the context of microfinance institutions is the return on equity, which quantifies the rate of return generated from the equity investments made. The formula for calculating this metric involves subtracting taxes from net operating income, and then dividing the result by the average equity (Rajdev & Bhatt, 2013).

7	Ease of Doing Business	Ease of Doing Business Index (EDBI)	The Ease of Doing commercial Index evaluates the various procedures involved in conducting commercial operations across 190 economies. It specifically examines the regulatory frameworks that facilitate efficiency and foster a climate conducive to conducting business activities. New Zealand ranks first on the list with a Doing Business score of 86.8, indicating a high level of performance. In contrast, Somalia is at the bottom with a significantly lower Doing Business score of only 20. According to the World Bank Group Report of 2020, notable advancements in economic performance have been observed in several countries, namely Jordan, Togo, Saudi Arabia, Bahrain, Tajikistan, Kuwait, Pakistan, China, India, and Nigeria.
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Table 2: Sustainability Indicators and their references

S.NO.	SUSTAINABILITY INDICATORS	LATENT CONSTRUCTS	REFERENCES
1	Sustainability	Operational Sufficiency(OSS)	Self (Abdulai & Tewari, 2017; Aveh et al., 2013; Azhar et al., 2014; Bhanot & Bapat, 2015; Churchill & Marr, 2017; Deb, 2017; Duramany-Lakkoh & Duramany-Lakkoh, 2021; Fabian & Xianzhi, 2013; M.S, 2014; Mahapatra & Dutta, 2016; Samuel, 2012; Singh, 2010; Veenapani, 2017; Xu, Fu, & Liu, 2019).
		Financial Self Sufficiency (FSS)	(Xu, Fu, Liu, et al., 2019), (Deb, 2017), (Bhanot & Bapat, 2015), (Azhar et al., 2014), (M.S, 2014), (Tehulu, 2013), (Samuel, 2012), (Ayayi & Sene,2010), (Singh, 2010), (Pati, 2009).
2	Size	Total Assets	(Gupta & Gupta, 2014), Duramany-Lakkoh & Duramany-Lakkoh, 2021), (Meutia et al., 2020), (Makan & Kabra, 2021), (Mahapatra & Dutta, 2016), (GUPTA, 2012), (Kwami Awaworyi & Marr, 2014), (Rajdev & Bhatt, 2013; Tehulu, 2013).
		Gross Loan Portfolio (GLP)	(Abdulai & Tewari, 2017; Aveh et al., 2013; Bhanot & Bapat, 2015; Deb, 2017; Duramany-Lakkoh & Duramany-Lakkoh, 2021; Kwami Awaworyi & Marr, 2014; Mahapatra & Dutta, 2016; Prakash, 2016; Rajdev & Bhatt, 2013; Tehulu, 2013; Veenapani, 2017; Xu, Fu, Liu, et al., 2019).
3	Outreach	Active Borrowers	(Abdulai & Tewari, 2017; Ayayi & Sene, n.d.; Azhar et al., 2014; Bhanot & Bapat, 2015; Churchill & Marr, 2017; Deb, 2017; Fabian & Xianzhi, 2013; M.S, 2014; Pati, 2009; Rajdev & Bhatt, 2013; Samuel, 2012; Tehulu, 2013; Xu, Fu, Liu, et al., 2019).
4	Portfolio Quality	Portfolio at Risk greater than 30 days (PAR ₃₀)	(Abdulai & Tewari, 2017; Aveh et al., 2013; Ayayi & Sene, n.d.; Bhanot & Bapat, 2015; Deb, 2017; Duramany-Lakkoh & Duramany-Lakkoh, 2021; H et al., 2021; Mahapatra & Dutta, 2016; Prakash, 2016; Tehulu, 2013; Veenapani, 2017; Xu, Fu, Liu, et al., 2019).
		Portfolio at Risk greater than 390 days (PAR ₉₀)	
5	Efficiency	Cost per Borrower	(Abdulai & Tewari, 2017; Aveh et al., 2013; Ayayi & Sene, n.d.; Churchill & Marr, 2017; Mahapatra & Dutta, 2016; Pati, 2009; Xu, Fu, Liu, et al., 2019).
		Cost per Loan	
6	Profitability	Return on Assets (ROA)	(Duramany-Lakkoh & Duramany-Lakkoh, 2021; Meutia et al., 2020; Veenapani, 2017; Xu, Fu, Liu, et al., 2019). (Azhar et al., 2014; Bhanot & Bapat, 2015; Churchill & Marr, 2017; Deb, n.d.; Fabian & Xianzhi, 2013; GUPTA, 2012; M.S, 2014; Meutia et al., 2020; Prakash, 2016; Samuel, 2012; Singh, 2010).
		Return on Equity (ROE)	
7	Ease of Doing Business	Ease of Doing Business Index(EDBI)	(World Bank Group Report, 2020; Xu, Fu, Liu, et al., 2019).

2.3 Objectives of the study and Hypotheses

The present study establishes its aims based on the comprehensive analysis of existing literature. These objectives are outlined as follows:

2.3.1 To explore and analyze the determinants of sustainability of Microfinance institutions operating worldwide. To develop a sustainability model for more efficient operations in the microfinance sector.

The hypotheses framed to test the relationships between the variables of the study are elaborated below:

H₀₁: Size of the institution (measured by the total value of Assets and Gross Loan Portfolio) does not have a significant impact on the sustainability of Microfinance institutions operating worldwide.

H₀₂: Portfolio quality of the institution (measured by Portfolio at risk greater than 30 days and Portfolio at risk greater than 90 days) does not have a significant impact on the sustainability of Microfinance institutions operating worldwide.

H03: *Efficiency of the institution (measured by Cost per borrower and Cost per loan) does not have a significant impact on the sustainability of Microfinance institutions operating worldwide.*

H04: *Outreach of the institution (measured by the number of active borrowers subdivided into male, female, rural and urban) does not have a significant impact on the sustainability of Microfinance institutions operating worldwide.*

H05: *Profitability of the institution (measured by Return on Asset and Return on Equity) does not have a significant impact on the sustainability of Microfinance institutions operating worldwide.*

H06: *Ease of doing business (measured by Ease of doing business index) does not have a significant impact on the sustainability of Microfinance institutions operating worldwide.*

2.3 Model Technique and method employed

The sustainability model developed in the study was validated using partial least squares structural equation modelling (PLS-SEM), PLS4 software, which also allowed for the identification of novel patterns and confirmation of the a priori defined sustainability indicators. The study is exploratory in that it looks at new independent factors that have been discovered to have a magnificent impact on the dependent variables of the model in addition to testing the theories that have already been put out (Murugan et al., 2019). A second-generation method for empirically testing the numerous variables contained in a complicated model in the context of social science research is PLS route modelling. The soft modelling technique is non-parametric since it does not rely on the normality of the data distribution. It can very effectively handle complicated models with no identification issues, small sample numbers, single item constructs, and reflective and formative measurement models (Hair et al., 2019; Lowry & Gaskin, 2014).

Partial least squares structural equation modelling (PLS-SEM) is commonly employed in research because it can assess multiple dependent and independent variables at the same time, accommodating both latent and manifest variables in complex models, while effectively managing multicollinearity. The flexibility of this method, which does not rely on many assumptions about the distribution of data and can handle different types of measurements, makes it well-suited for predictive analysis and exploratory research in various fields such as marketing, management, and social sciences. It provides researchers with a versatile tool to understand complex relationships between variables, especially in situations where the sample size is small or the data is not normally distributed. This makes it a perfect technique that may be used in many different study scenarios.

2.4 Model Specification

The current work introduces the sustainability Path model, which comprises two components: the Structural model (also known as the inner model) and the Measurement model (also referred to as the outer model). The Structural model illustrates the connections between the endogenous and exogenous latent constructs. The proposed sustainability model incorporates the Structural model or theory, which illustrates the impact of six exogenous constructions (namely, size, portfolio quality, efficiency, outreach, profitability, and ease of doing business) on the single endogenous construct of sustainability. In contrast, the Measurement model pertains to the assessment of latent variables by means of their observable indicators. The current measurement model exhibits a reflecting aspect, as seen by the directional arrows moving from the constructs towards the indicator variables. An illustration of this may be seen in the measurement of the latent variable Size, which is assessed using two indicator variables, namely Assets and Gross Loan Portfolio (GLP), both of which are measured on a ratio scale. The assessment of portfolio quality is determined by the utilization of observable indicators such as PAR30 and PAR90. The measurement of efficiency in the current microfinance organizations is conducted using measures such as Cost per borrower and Cost per loan. The extent of institutional outreach is assessed by gender-specific indicators, which distinguish between female and male populations, as well as region-specific indicators, which differentiate between rural and urban areas. The assessment of microfinance institutions' profitability is conducted by the examination of two discernible indicators, specifically Return on Assets (ROA) and Return on Equity (ROE). The measurement of Ease of doing business is conducted through the utilization of the singular construct known as the Ease of doing business index. The measurement of the endogenous latent construct sustainability is conducted through the utilization of Operational Self Sufficiency (OSS) and Financial Self Sufficiency (FSS).

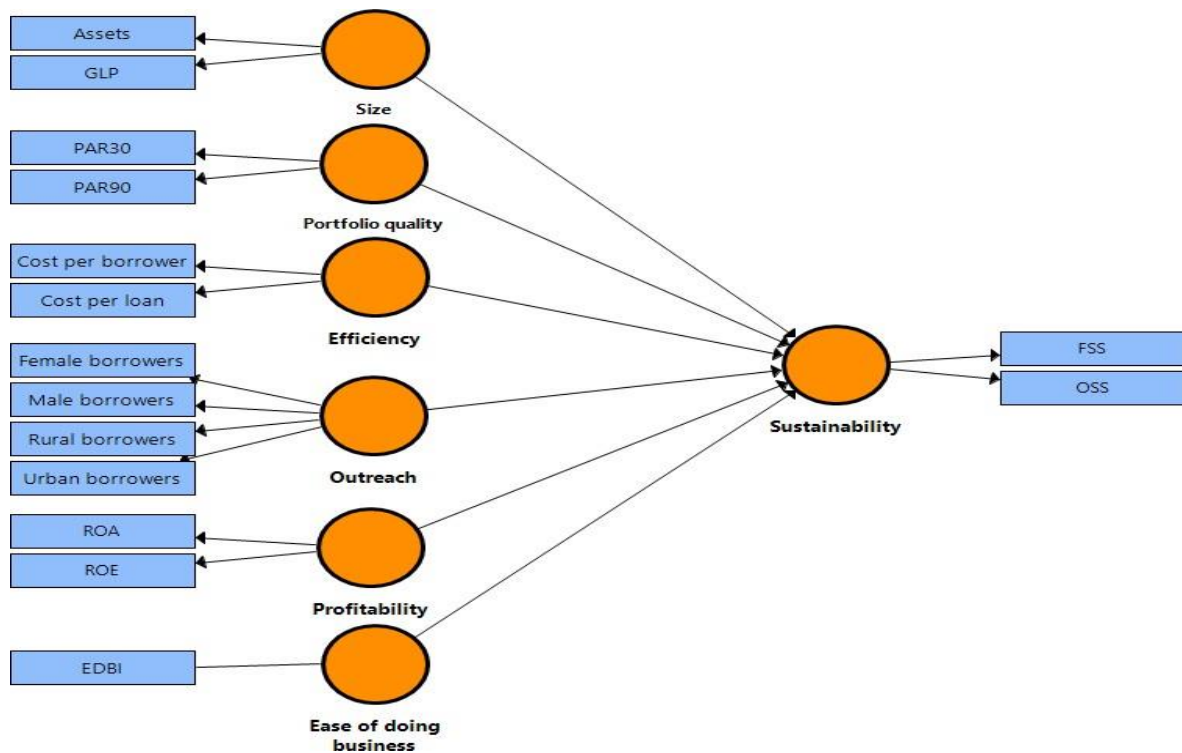


Figure 1: Proposed Sustainability Model

3. RESULTS AND DISCUSSION

The reporting of the PLS path model consists of two distinct components: the reporting of the Reflective Measurement Model and the reporting of the Structural Model.

3.1 Reporting the Reflective Measurement Model

The sustainability model has seven latent variables, which are measured on a reflective scale. These variables consist of six exogenous factors and one endogenous one. The exogenous factors are Size, Portfolio quality, Efficiency, Outreach, Profitability, and Ease of doing business. The endogenous factor is Sustainability. The measurement of outreach may be assessed using four observable indicators: size, portfolio quality, efficiency, and profitability. Additionally, sustainability can be measured through two observable indicators. It is important to note that ease of doing business is a latent construct that is represented by a single item.

3.1.1 Evaluation of Indicator Reliability

An assessment of the indicator reliability for the observable indicators for each latent construct in the reflective model constitutes the initial step in the evaluation of the model. The same is verified using outer loadings, with 0.70 serving as the cutoff value (Hair et al., 2019; Joseph F. Hair et al., n.d.). As seen in Table 3, OSS has the lowest outer loading of 0.717 whereas EDBI, a single item measurable construct, has the highest outer loading of 1.00. All indicator values therefore fall above the 0.70 threshold and are considered to have indication dependability.

Table 3: Result of Indicator Reliability of Sustainability factors

Variables	Size	Outreach	Efficiency	Ease of doing business	Portfolio quality	Profitability	Sustainability
Assets	0.946						
GLP	0.902						
Female Borrowers		0.888					
Rural Borrowers		0.926					
Urban Borrowers		0.733					
Male Borrowers		0.857					
Cost per borrower			0.999				
Cost per loan			0.999				
EDBI				1.000			
PAR30					0.993		
PAR90					0.989		
ROA						0.960	

ROE						0.718	
FSS							0.997
OSS							0.717

3.1.2 Evaluation of Internal consistency and Convergent validity

Cronbach alpha and Composite reliability ratings assess the internal consistency of the exogenous latent constructs. For the purpose of evaluating internal consistency, the Cronbach Alpha values serve as the lower value and the composite reliability scores serve as the upper value. The threshold value for both is 0.70 (Hair et al., 2019). Similar to table 4, it was discovered that profitability had the lowest Cronbach Alpha and Composite dependability scores, with ease of doing business having the greatest scores. AVE values can be used to measure the reflecting constructs' convergence validity. As can be observed in Table 4, all AVE values for the sustainability model are higher than the cutoff of 0.50, showing that the components have convergent validity.

Table 4: Results of Internal consistency and Convergent Validity of Sustainability Indicators

Variables	Cronbach's Alpha	Composite Reliability	Average Variance Extracted (AVE)
Ease of doing business	1.000	1.000	1.000
Efficiency	0.998	0.999	0.998
Outreach	0.875	0.915	0.729
Portfolio quality	0.981	0.991	0.982
Profitability	0.410	0.730	0.595
Size	0.833	0.922	0.855

3.1.3 Evaluation of Discriminant Validity

Using the Fornell Larcker criterion, the discriminant validity of the reflective measurement model of sustainability has been evaluated. The square root of the AVE values for all six latent constructs are greater than the correlation amongst the construct and other latent variables, as determined by the criterion (see Table 5). Indicating the variables' discriminant validity as a result.

Table 5: Results of Discriminant Validity of Sustainability Variables

Variables	Ease of doing business	Efficiency	Outreach	Portfolio quality	Profitability	Size
Ease of doing business	1.000					
Efficiency	0.030	0.999				
Outreach	0.067	0.046	0.854			
Portfolio quality	0.004	0.094	0.074	0.991		
Profitability	0.039	0.227	0.057	0.154	0.771	
Size	0.021	0.034	0.936	0.049	0.042	0.925

3.1.4 Bootstrapping for Reflective Measurement Model

When evaluating the bootstrapping technique for the Reflective measurement model, the null hypothesis posits that the outer weight for the parameter is equal to zero at a predefined level of α . Additionally, the corresponding $(1 - \alpha)$ percent interval encompasses a value of zero (i.e., $H_0: w_1 = 0$). When the confidence interval of a variable does not include 0 in its outer bounds, the null hypothesis is rejected, indicating a significant influence of the parameter. Table 6 reveals that variables such as Ease of doing business, Outreach, and Size have confidence intervals for their 2.5 percent lower range and 97.5 percent upper bound that do not encompass zero. This finding suggests a notable impact of the factors on the proposed sustainability model. In contrast, the latent variables Efficiency, Portfolio quality, and Profitability exhibit confidence intervals that encompass 0, indicating a lack of meaningful impact on the model.

Table 6: Results of Bootstrapping Sustainability Model

Latent Variables	Original Sample(O)	Sample Mean(M)	Bias	2.5%	97.5%
Ease of doing business -> sustainability	0.025	0.022	-0.003	0.009	0.052
Efficiency -> sustainability	0.003	0.004	0.001	-0.025	0.044
Outreach -> sustainability	-0.519	-0.527	-0.007	-0.779	-0.316
Portfolio quality -> sustainability	-0.014	-0.021	-0.007	-0.081	0.008
Profitability -> sustainability	0.026	0.040	0.014	-0.004	0.120
Size -> sustainability	1.428	1.424	-0.004	1.183	1.728

3.2 Reporting the Structural Model

3.2.1 Evaluating the value of R square

The evaluation of the R square of the endogenous latent components in the model serves as the first point for the assessment as well as reporting of the structural path model. In the domain of social research, R square values exceeding 0.75, 0.50, and 0.25 are generally regarded as substantial, moderate, and weak, respectively (Hair et al., 2014, 2019; Joseph F. Hair et al., n.d.). From Table 7, it is clear that all of the exogenous latent variables included in the model significantly contribute to the explanation of the R square of sustainability.

Table 7: Results of R square value

Endogenous variable	R Square	R Square Adjusted
Sustainability	0.926	0.925

3.2.2 Evaluation of F Square

The squared values of F indicate the extent to which the exclusion of a certain construct from the model affects the importance of the endogenous variable. In general, it is commonly accepted that F square values of 0.02, 0.15, and 0.35 correspond to minor, medium, and large impacts, respectively, on a certain endogenous latent construct within the model. According to the findings in Table 8, it can be observed that only the variables of Size and Outreach significantly impact the sustainability of Microfinance institutions on a global scale.

Table 8: Results of F square

Exogenous variables	Sustainability
Size	3.358
Outreach	0.440
Profitability	0.009
Ease of doing business	0.008
Portfolio quality	0.003
Efficiency	0.000

3.2.3 Evaluation of Goodness of Fit

(Joseph F. Hair et al., n.d.) in their book '*A primer on partial least squares structural equation modeling (PLS-SEM)*' considered SRMR as an absolute measure of fit for a given model. The upper threshold value for the same is 0.08. Thus, the SRMR value of 0.074 (see Table 9) which is below the threshold value of 0.08 is a good fit model.

Table 9: Results of Goodness of fit

	Saturated Model	Estimated Model
SRMR	0.074	0.074
Chi-Square	7124.129	7124.129

3.2.4 Evaluation of bootstrapping procedure

Table 10 presents the path coefficients that were examined using a sample size of 5000 in order to determine the sample mean, standard deviation, t statistics, and p-values of the latent variables inside the proposed model of the study. The process of iteratively generating big samples from the initial sample, including replacement, results in the creation of a bootstrapping distribution that closely approximates the sampling distribution. The tests serve as a means to determine whether the null hypothesis pertaining to a specific estimated coefficient is rejected or upheld. When the t statistic for a given variable is determined to be over 1.96, it is judged to have a significant path coefficient at a 5 percent level of significance. The study identified three t statistics that were deemed to be highly significant. These included Size (T Statistics= 9.768, P Value= 0.00), Outreach (T Statistics= 4.204, P Value= 0.00), and Ease of doing business (T Statistics= 2.427, P Value= 0.015). The variables that exhibited an insignificant path coefficient in the proposed model were Profitability (T Statistics= 0.680, P Value= 0.497), Portfolio quality (T Statistics= 0.598, P Value= 0.550), and Efficiency (T Statistics=

0.198, P Value= 0.843). Despite the lack of statistical significance in the current context, the variables have been preserved due to their alignment with existing theories and their relevance in the microfinance industry. Therefore, all the latent components utilised in the proposed sustainability model are preserved and documented in their original form (refer to Table 10).

Table 10: Results of the bootstrapping procedure

Variables	Original Sample(O)	Sample Mean(M)	Standard Deviation(STDEV)	T Statistics (O/STDEV)	PValues
Size -> sustainability	1.428	1.421	0.146	9.768	0.000*
Outreach -> sustainability	-0.519	-0.524	0.123	4.204	0.000*
Ease of doing business -> sustainability	0.025	0.022	0.010	2.427	0.015*
Profitability -> sustainability	0.026	0.041	0.038	0.680	0.497
Portfolio quality -> sustainability	-0.014	-0.021	0.024	0.598	0.550
Efficiency -> sustainability	0.003	0.004	0.016	0.198	0.843

*Significant at 5% level of significance

The current study challenges the belief held by many researchers, policymakers, government organizations, and microfinance institutions that sustainability in the industry can only come from increasing levels of profitability. The study has drawn the attention of all interested parties to the significance of institution size and outreach for promoting sustainability in organizations. The findings are consistent with a small number of prior studies in the sector, reaching out to the poorest masses and maximum number of active borrowers (Bogan et al., 2007; M.S, 2014; SETHI, 2015; Singh, n.d.; Zerai & Rani, 2012), (Abdulai & Tewari, 2017; M.S, 2014; Mahapatra & Dutta, 2016; Rajdev & Bhatt, 2013; Sethi, K., & Khan, 2017; Sethi et al., n.d.). While the results do not support the researchers' presumption that outreach and sustainability must be traded off, they are convinced that a microfinance institution's sustainability will increase if its profitability level, capital structure, portfolio quality, and expense ratio are higher (Aveh et al., 2013; Ayi Gavriel Ayayi & Maty Sene, 2010; Bhanot & Bapat, 2015; Churchill & Marr, 2017; Liu et al., 2021; Rai & Rai, 2012; Sethi, K., & Khan, 2017; Veenapani, 2017). Additionally, the findings indicate that the Ease of Doing Business Index (EDBI), which is calculated based on many external factors that have a substantial impact on the sustainability of microfinance institutions operating globally, has a positive correlation with their performance (Xu, Fu, & Liu, 2019). Measuring the level of outreach and size of the institution at which the sector breaks even for sustainability are some future directions for research.

4. CONCLUSION

The results obtained from the analysis of the sample dataset following the implementation of the statistical technique are as follows: The results of Partial Least Squares Structural Equation Modelling (PLS-SEM) are presented in Table 11. The dimensions of institutional size, outreach, and ease of doing business have been identified as major macroeconomic indicators that impact the viability of microfinance organizations. The study determined that the metrics assessing the quality, efficiency, and profitability of an institution's portfolio did not have a statistically significant influence on the long-term viability of Microfinance institutions. This clearly answers the first research objective laid down in the present study regarding the exploration and analysis of the determinants of sustainability of Microfinance institutions operating in the industry.

Table 11: Hypotheses testing results

H ₀	Research variable	Hypothesis	Rejected/ Failed to reject
H ₀₁	Size	Size of the institution (measured by the total value of Assets and Gross Loan Portfolio) does not have a significant impact on the sustainability of Microfinance institutions operating worldwide.	Rejected
H ₀₂	PortfolioQuality	Portfolio quality of the institution (measured by Portfolio at risk greater than 30 days and Portfolio at risk greater than 90 days) does not have a significant impact on the sustainability of Microfinance institutions operating worldwide.	Failed toReject
H ₀₃	Efficiency	Efficiency of the institution (measured by Cost per borrower and Cost per loan) does not have a significant impact on the sustainability of Microfinance institutions operating worldwide.	Failed toReject
H ₀₄	Outreach	Outreach of the institution (measured by the number of active borrowers subdivided into male, female, rural and urban) does not have a significant impact on the sustainability of Microfinance institutions operating worldwide.	Rejected
H ₀₅	Profitability	Profitability of the institution (measured by Return on Asset and Return on Equity) does not have a significant impact on the sustainability of Microfinance institutions operating worldwide.	Failed toReject
H ₀₆	Ease of Doing Business	Ease of doing business (measured by the Ease of doing business index) does not have a significant impact on the sustainability of Microfinance institutions operating worldwide.	Rejected

Satin Creditcare, a prominent Non-Banking Financial Company-Microfinance Institution in India, commenced its operations in the Microfinance sector in 1990, providing loans to both individuals and small businesses in urban areas. As a result, in 1998, the organization obtained registration with the Reserve Bank of India (RBI) as a Non-Banking Financial Company (NBFC), and subsequently underwent a progressive transformation into an NBFC-Microfinance Institution (MFI) in 2013. The business primarily operates on the Joint Liability Group model, offering collateral-free microcredit facilities to economically engaged women who have limited access to mainstream financial services. Additionally, the organization provides loans to micro, small, and medium enterprises (MSMEs) engaged in product finance for the acquisition of solar lamps. As of January 1, 2023, the company operates 1057 branches, offering loans to around 2.3 million clients. It employs 8801 individuals and maintains an outstanding loan portfolio of Rs. 6798 crores. Out of the entirety, a majority of 58% of the clientele asserted that Satin was the sole lender facilitating them with micro loans for the purpose of engaging in income-generating endeavors. The microfinance institution's sustainability model has been observed to be congruent with the proposed model of the study. The sustainability model of the Non-Banking Financial Company-Microfinance Institution (NBFC-MFI) is primarily influenced by factors such as size, portfolio quality, outreach, and profitability. These factors align with the key indicators of sustainability identified in the current study. Thus, the second research objective of the development of a sustainability model for more efficient operations in the microfinance sector has been hereby elaborated and addressed.

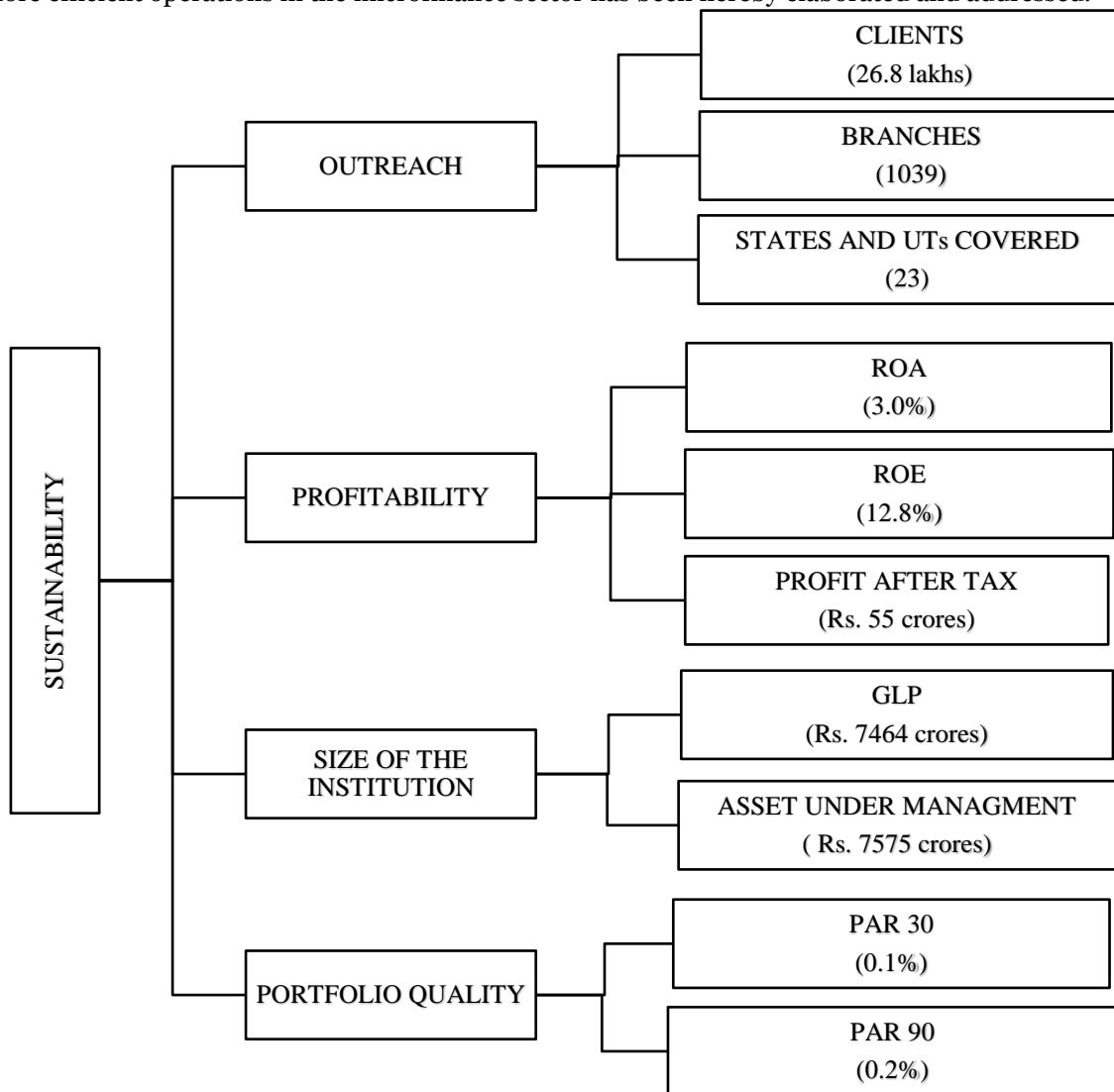


Figure 2: Sustainability Model of Satin Creditcare Ltd.

The limitation of the present study encompasses an examination of the sustainability of microfinance institutions, specifically focusing on non-banking microfinance organizations within the broader category of microfinance institutions. The analysis is based on secondary data obtained from the Reserve Bank of India website. Primary data collection from Non-Banking Financial Companies (NBFCs) and other Microfinance institutions, such as Small Finance Banks, Section 25 Companies, Non-Governmental Organizations Microfinance Institutions (MFIs), was not feasible due to limitations in time and financial resources. However, it is recommended that these entities be included in future research endeavors. The suggested model has the potential to be utilized in conducting cross-country comparisons of the indicators that influence the

sustainability of the microfinance sector. Variables that were not found to be statistically significant in the current study may demonstrate relevance when considering changes in demography, culture, regional differences and the social environment of the microfinance institution. Further exploration of the latest advances in digital payment mechanisms and their impact on sustainability is warranted in order to have a thorough grasp of the sector's sustainability. The suggested sustainability model has the potential to be replicated using primary data sources, across different time zones, and employing various statistical techniques. This approach would provide a comprehensive perspective, allowing for further validation of the model and the formulation of future strategies aimed at achieving holistic and sustainable development within the sector. Furthermore, it is imperative to develop and implement creative and innovative pricing structures within the microfinance industry, particularly in sectors such as digital payments and mobile money. These advancements will contribute to the overall sustainability of the industry (Cull et al., 2018).

References:

1. Abdulai, A., & Tewari, D. D. (2017). Trade-off between outreach and sustainability of microfinance institutions: Evidence from sub-Saharan Africa. *Enterprise Development and Microfinance*, 28(3), 162–181. <https://doi.org/10.3362/1755-1986.16-00014>
2. Adongo Christoph Stork, J. (2005). *Factors Influencing the Financial Sustainability Of Selected Microfinance Institutions in Namibia*. www.nepu.org.na
3. Aveh, F. K., Krah, ; R Y, & Dadzie, P. S. (2013). An Evaluation of Sustainability and Subsidy Dependence of Microfinance Institutions in Ghana. *International Business and Management*, 6(1), 55–63. <https://doi.org/10.3968/j.ibm.1923842820130601.1090>
4. Ayayi, A. G., & Sene, M. (n.d.). *WHAT DRIVES MICROFINANCE INSTITUTION'S FINANCIAL SUSTAINABILITY*. Retrieved July 12, 2023, from <https://www.jstor.org/stable/41428207>
5. Ayi Gavriel Ayayi, & Maty Sene. (2010). What drives microfinance institution's financial sustainability. *The Journal of Developing Areas*, 44(1), 303–324. <https://doi.org/10.1353/jda.0.0093>
6. Azhar, M., Ahmad, I., Ahmad, Z., & Khan, A. A. (2014). *Performance analysis of Microfinance Institutions of India*. <https://go.gale.com/ps/i.do?p=AONE&u=googlescholar&id=GALE%7CA498585473&v=2.1&it=r&asid=b2ef8be3>
7. *International Journal of Social Economics*, 42(4), 387–403. <https://doi.org/10.1108/IJSE-01-2014-0001/FULL/XML>
8. Bogan, V., Johnson, W. A., & Mhlanga, N. (2007). *Does Capital Structure Aect the Financial Sustainability of Microfinance Institutions*.
9. Churchill, S. A., & Marr, A. (2017). SUSTAINABILITY AND OUTREACH: A COMPARATIVE STUDY OF MFIs IN SOUTH ASIA AND LATIN AMERICA AND THE CARIBBEAN. *Bulletin of Economic Research*, 69(4), E19–E41. <https://doi.org/10.1111/BOER.12100>
10. Cull, R., Demirgüç-Kunt, A., & Morduch, J. (2018). The Microfinance Business Model: Enduring Subsidy and Modest Profit. *The World Bank Economic Review*, 32(2), 221–244. <https://doi.org/10.1093/WBER/LHX030>
11. Deb, J. (n.d.). *Assessing Sustainability and Its Determinants of Microfinance Institutions in India*. Retrieved July 12, 2023, from <http://www.publishingindia.com>
12. Deb, J. (2017). Assessing Sustainability and Its Determinants of Microfinance Institutions in India. *International Journal of Banking, Risk & Insurance*, 5(1), 1–9. <http://o->
13. Duramany-Lakkoh, E. K., & Duramany-Lakkoh, E. K. (2021). Measuring Financial Performance for the Sustainability of Microfinance Institutions in Sierra Leone before the Ebola Outbreak. *Journal of Financial Risk Management*, 10(3), 274–297. <https://doi.org/10.4236/JFRM.2021.103016>
14. Fabian, E., & Xianzhi, K. (2013). Sustainability , Profitability and Outreach Tradeoffs : Evidences from Microfinance Institutions in East Africa. *European Journal of Business and Management*, 5(8), 136–149. https://www.researchgate.net/publication/236590480_Sustainability_Profitability_and_Outreach_Tradeo
15. Githaiga, P. N. (2022). Revenue diversification and financial sustainability of microfinance institutions. *Asian Journal of Accounting Research*, 7(1), 31–43. <https://doi.org/10.1108/AJAR-11-2020-0122/FULL/PDF>
16. GUPTA, H. (2012). (PDF) *Determinants of capital structure: Evidence from Indian construction companies*. https://www.researchgate.net/publication/339594165_Determinants_of_capital_structure_Evidence_from
17. Gupta, N. K., & Gupta, H. (2014). Determinants of Capital Structure: Evidence From Indian Construction Companies. *ELK Asia Pasific Journals of Finance and Risk Management*, 5(1), 1–12. https://www.researchgate.net/publication/339594165_Determinants_of_capital_structure_Evidence_from_Indian_construction_companies
18. H, K., Y, L., GNC, M., W, X., LOL, B., MNW, D., & C, M. (2021). *Factors Affecting the Sustainability of*

- Microfinance Institutions: A Case of Malawi Microfinance Institutions.*
<https://doi.org/10.21203/RS.3.RS-373410/V1>
18. Hair, J. F., Ringle, C. M., & Sarstedt, M. (2014). PLS-SEM: Indeed a Silver Bullet. *Https://Doi.Org/10.2753/MTP1069-6679190202*, 19(2), 139–152. <https://doi.org/10.2753/MTP1069-6679190202>
 19. Hair, J. F., Risher, J. J., Sarstedt, M., & Ringle, C. M. (2019). When to use and how to report the results of PLS-SEM. *European Business Review*, 31(1), 2–24. <https://doi.org/10.1108/EBR-11-2018-0203/FULL/XML>
 20. Illangakoon, A. G., Azam, S. M. F., & Jaharadak, A. A. (2022). *Impact of Risk Management towards Sustainability of Microfinance Industry in Sri Lanka: A Case Study.* <https://papers.ssrn.com/abstract=4035708>
 21. Joseph F. Hair, J.-U. of S. A., G. Tomas M. Hult - Michigan State University, U., Christian M. Ringle - Hamburg University of Technology, G., & Marko Sarstedt - Ludwig-Maximilians-University, M. (n.d.). *A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM) | SAGE India.* Retrieved July 12, 2023, from <https://in.sagepub.com/en-in/sas/a-primer-on-partial-least-squares-structural-equation-modeling-pls-sem/book270548>
 22. Jovita Okumu, L. (2007). *THE MICROFINANCE INDUSTRY IN UGANDA: sustainability, outreach and regulation.*
 23. Kwami Awaworyi, S., & Marr, A. (2014). *DEPARTMENT OF ECONOMICS Sustainability and Outreach: A Comparative Study of MFIs in South Asia and Latin America & the Caribbean.*
 24. Liu, N., Liu, C., Da, B., Zhang, T., & Guan, F. (2021). Dependence and risk spillovers between green bonds and clean energy markets. *Journal of Cleaner Production*, 279. <https://doi.org/10.1016/j.jclepro.2020.123595>
 25. Lowry, P. B., & Gaskin, J. (2014). Partial least squares (PLS) structural equation modeling (SEM) for building and testing behavioral causal theory: When to choose it and how to use it. *IEEE Transactions on Professional Communication*, 57(2), 123–146. <https://doi.org/10.1109/TPC.2014.2312452>
 26. M.S, I. (2014). (PDF) *Programmed Initiative, Reaching the Extreme Poor and MFI Sustainability: Mission Drift or Diseconomy?* https://www.researchgate.net/publication/270583821_Programmed_Initiative_Reaching_the_Extreme_Poor_and_MFI_Sustainability_Mission_Drift_or_Diseconomy
 27. Mahapatra, M. S., & Dutta, S. (2016). Determinants of Sustainability of Microfinance Sector in India. *Journal of Rural and Development.*
 28. Makan, L. T., & Kabra, K. C. (2021). Carbon Emission Reduction and Financial Performance in an Emerging Market: Empirical Study of Indian Firms. *Indonesian Journal of Sustainability Accounting and Management*, 5(1), 23–32. <https://doi.org/10.28992/IJSAM.V5I1.292>
 29. Meutia, I., Kartasari, S. F., Yaacob, Z., & Arunachalam, M. M. (2020). Mapping Sustainable Finance: A Detailed Analysis of Banks in Indonesia. *Indonesian Journal of Sustainability Accounting and Management*, 4(1), 13–27. <https://doi.org/10.28992/ijSAM.v4i1.110>
 30. Mohamad Fazli Sabri, & Nurul Farhana Zakaria. (2015). Vol. 23 (4) dec. 2015. *Journal of Social Science & Humanities*, 23(4), 827–848.
 31. Muhmad, S. N., Muhamad, R., & Sulong, F. (2021). Sustainable Development Goals and Islamic Finance: An Integrated Approach for Islamic Financial Institutions. *Indonesian Journal of Sustainability Accounting and Management*, 5(1). <https://doi.org/10.28992/IJSAM.V5I1.286>
 32. Murugan, T., Basri, S., & Domnic, D. D. (2019). Analyzing the Conceptual Model for Exploratory Testing Framework using PLS-SEM. *Advances in Applied Science Research*, 10(1). <https://doi.org/10.21767/0976-8610.101069>
 33. Ngo, T. V. (2015). Microfinance Complementarity and Trade-Off between Financial Performance and Social Impact. *International Journal of Economics and Finance*, 7(11), 128. <https://doi.org/10.5539/ijef.v7n11p128>
 34. Nyamsogoro, G. D. (2010). (PDF) *Financial Sustainability of Rural Microfinance Institutions (MFIs) in Tanzania.* https://www.researchgate.net/publication/267304930_Financial_Sustainability_of_Rural_Microfinance_Institutions_MFIs_in_Tanzania
 35. Oware, K. M. (2022). Effect of CEO Duality and Board Characteristics on the Choice of Sustainability Report Format of Listed Firms in India. *Indonesian Journal of Sustainability Accounting and Management*, 6(2), 213–224–213–224. <https://doi.org/10.28992/IJSAM.V6I2.666>
 36. Pati, A. P. (2009). *Subsidy Impact on Sustainability of SHGS: An Empirical Analysis of Micro Lending Through SGSY Scheme.* <https://papers.ssrn.com/abstract=1630274>
 37. Prakash, S. (2016). Measuring financial sustainability of microfinance institutions in India. *INFLIBNET.* <http://hdl.handle.net/10603/181657>
 38. Rai, A., & Rai, S. (2012). Factors Affecting Financial Sustainability of Microfinance Institutions. *Journal of Economics and Sustainable Development.*
 39. Rajdev & Bhatt. (2013). (PDF) *An Analysis of Sustainability of Microfinance Institutions & Its*

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|---|--|---|------------------|
| https://www.researchgate.net/publication/299512526_An_Analysis_of_Sustainability_of_Microfinance_Institutions_Its_Determinants_Using_Institutionalists_Approach | | | |
| 40. | Rosenberg, R. (2009). | <i>Measuring Results of Microfinance Institutions Minimum Indicators That Donors and Investors Should Track A Technical Guide.</i> | |
| 41. | Samuel, A. K. (2012). | (PDF) <i>FINANCIAL SUSTAINABILITY VERSUS TARGETING THE POOR: EVIDENCE OF MICROFINANCE INSTITUTIONS IN GHANA.</i> | |
| https://www.researchgate.net/publication/255651683_FINANCIAL_SUSTAINABILITY_VERSUS_TARGETING_THE_POOR_EVIDENCE_OF_MICROFINANCE_INSTITUTIONS_IN_GHANA | | | |
| 42. | Sethi, K., & Khan, M. U. (2017). | (PDF) <i>OVERVIEW OF MICRO FINANCE AND ITS STRATEGIC IMPLEMENTATION.</i> | |
| https://www.researchgate.net/publication/331970760_OVERVIEW_OF_MICRO_FINANCE_AND_ITS_STRATEGIC_IMPLEMENTATION | | | |
| 43. | SETHI, K. (2015). | Performance Evaluation of Microfinance Institutions in Selected States of India. <i>Shodhganga.</i> http://hdl.handle.net/10603/326069 | |
| 44. | Sethi, K., Nasreen, R., & Khan, M. (n.d.). | PERFORMANCE EVALUATION OF SELECTED MICROFINANCE INSTITUTIONS OPERATING IN NEW DELHI, INDIA. <i>Asia Pacific Institute of Advanced Research.</i> https://doi.org/10.25275/apjabsv4i1bus20 | |
| 45. | Sethi, K., Nasreen, R., & Khan, M. (2019). | Performance Evaluation of the Microfinance Sector in India and its Neighbouring Countries: A Comparative Analysis. <i>PRAGATI : Journal of Indian Economy</i> , 6(2), 1. https://doi.org/10.17492/PRAGATI.V6I2.186700 | |
| 46. | Singh, P. (n.d.). | <i>Understanding the structure of Micro Finance Institutions in India and suggesting a Regulatory Framework.</i> | |
| 47. | Singh, P. (2010). | Understanding the structure of Micro Finance Institutions in India and suggesting a Regulatory Framework. <i>Finance and Accounting Department, IIM Lucknow</i> , 91–145. http://115.124.122.139/iibf/documents/research-report/Report-24.pdf | |
| 48. | Tehulu, T. A. (2013). | <i>Determinants of Financial Sustainability of Microfinance Institutions in East Africa.</i> 5(17), 152–159. www.iiste.org | |
| 49. | Thapa, G. (2006). | Sustainability and Governance of Microfinance Institutions: Recent Experiences and Some Lessons for Southeast Asia. <i>Asian Journal of Agriculture and Development</i> , 3(1–2), 17–37. https://doi.org/10.37801/AJAD2006.3.1-2.2 | |
| 50. | Tripathi, V., & Tripathi, V. (2014). | Recent Development of Microfinance in India. <i>SSRN Electronic Journal.</i> https://doi.org/10.2139/SSRN.2462251 | |
| 51. | Veenapani. (2017). | <i>Performance and Sustainability of Microfinance Institutions In India.</i> 9519, 72–77. https://www.researchgate.net/publication/340982936_Performance_and_Sustainability_of_Microfinance_Institutions_in_India | |
| 52. | World Bank Group Report. (2020). | Doing Business 2020: Comparing Business Regulation in 190 Economies. In <i>Doing Business 2020: Comparing Business Regulation in 190 Economies.</i> https://doi.org/10.1596/978-1-4648-1440-2 | |
| 53. | Xu, W., Fu, H., & Liu, H. (2019). | Evaluating the sustainability of microfinance institutions considering macro-environmental factors: A cross-country study. <i>Sustainability (Switzerland)</i> , 11(21). https://doi.org/10.3390/su11215947 | |
| 54. | Xu, W., Fu, H., Liu, H., Xu, W., Fu, H., & Liu, H. (2019). | Evaluating the Sustainability of Microfinance Institutions Considering Macro-Environmental Factors: A Cross-Country Study. <i>Sustainability</i> , 11(21), 1–22. https://econpapers.repec.org/RePEc:gam:jsusta:v:11:y:2019:i:21:p:5947-d:280347 | |
| 55. | Xue, P., Wang, Z., Zhang, R., Wang, Y., & Liu, S. (2016). | Highly efficient measurement technology based on hyper-spectropolarimetric imaging. <i>Zhongguo Jiguang/Chinese Journal of Lasers</i> , 43(8), 107–128. https://doi.org/10.3788/CJL201643.0811001 | |
| 56. | Zerai, B., & Rani, L. (2012). | Is There a Tradeoff between Outreach and Sustainability of Micro finance institutions? Evidence from Indian Microfinance Institutions (MFIs). <i>European Journal of Business and Management</i> , 4(2), 90–99. https://www.iiste.org/Journals/index.php/EJBM/article/view/1038 | |