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Assessing Financial Sustainability of Microfinance Institutions Through Systems Dynamics

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Abstract

The Indian financial system is strong and provides global financial services. Banks, NBFCs, and other financial institutions have supplied a significant amount of India's financial services. However, MFIs are crucial in getting financial services to underserved areas and getting to the core of the economy. In order for these MFIs to be financially viable in addition to provide financial services to underserved parts in rural and urban areas, they must be more resilient and well-connected. Using systems dynamics modelling, this study aims to examine the sustainability of MFIs by determining the elements that affect their financial sustainability. To do this, a model of a stock flow diagram and causal loop diagram has been created using simulation. The findings indicate a positive correlation between MFIs' sustainability and their financial success.

Keywords: Sustainability of MFIs, Microfinance, System Dynamics, Causal Loop Diagram (CLD), Stock Flow Diagram (SFD), Simulation.

Introduction

Improvements in business inventions have led to progress and expansion in the world economy. However, environmental harm has been caused by technology progress. As a result, countries all over the world have been making a lot of effort to integrate environmental protection, corporate growth, and financing. This blends the concepts of green microfinance, as it is generally called, and sustainable development. By integrating business and finance from an ecological standpoint, a microfinance tool called "green microfinance" (GMF) seeks to maintain strong financial and social performance, attain sustainability goals, and offer incentives to the poor (Huybrechs et al., 2019; Copestake, 2007; Gutierrez-Nieto et al., 2009; Agier & Szafarz, 2013; Mahbouli & Fortes, 2015). In the 1980s and 1990s, the double bottom line approach—which solely highlights the financial and social facets of microfinance—became more and more well-liked. These days, green microfinance (GMF), often known as the triple bottom line, takes into account a company's environmental impact in addition to its financial and social benefits (Abdur Rouf, 2012). Because of this, businesses are able to generate substantial profits (Shahidullah & Haque, 2014; Van Elteren, 2007; Rippey, 2012). Businesses decide to use environmentally friendly practices as a way to fulfil their corporate social responsibility (CSR) obligations.

Human-centred green finance and development that prioritises clean water, renewable energy, life on land and under water, poverty reduction, and a reduction in air pollution is made possible by green microfinance. Microbusiness owners are the major target of green microfinance and microcredit programs, which provide microloans to assist them sustain their enterprises and achieve self-sufficiency through self-employment (Abdur Rouf, 2012). The following goals are the focus of the current study:

- Identify the factors affecting the financial performance and its impact on MFIs.
- Analyse the impact of financial performance of MFIs over the overall sustainability of MFIs through simulation techniques.

The structure of the paper defines the introduction specifies the implications of microfinance industry. The following parts justifies the literature review. The later parts consist of the theoretical model, the research methodology, conclusion and future implications.

Review of Literature

A comprehensive implementation of green practices at the local and national levels can lead to sustainable development in an economy (Allen & Thomas, 2000; Anderson, 2000; Chambers & Conway, 1992; Colbert & Kurucz, 2007; Clarke & Clegg, 1998; Hicks, 2004; McDonald & Oates, 2006; Milani, 2001; Thomas-Slayter, 2003; Torjman, 19982). Microfinance serves as a financial aid that promotes such green growth and sustained development in an economy by offering its range of goods, including microcredit, microinsurance, micro-savings, money transfers, etc. (Ledgerwood, 1998; van Rooyen et al., 2012). By fostering their expansion, it also assists impoverished communities in becoming self-sufficient and aspirational small companies.

Sustainable development is a holistic concept that considers the economics, society, environment, governance, technology, and governance (Garcia-Perez et al., 2018; Dyllick & Hockerts, 2002; Garcia-Perez et al., 2017; Steffen et al., 2015). Microfinance improves socio-environmental relationships when viewed through the lenses of gender equity and environmental concerns (Warnecke, 2015). Regulations and their modifications concerning the connection between financial performance and governance must be thoroughly studied if microfinance is to be used solely to achieve sustainable development (Chakrabarty, 2015; Ramaswamy & Krishnamoorthy, 2016).

The function of external and foreign donors (Garcia-Perez et al., 2018), the diversity of MFIs in terms of their size, location, and legal status (Ledgerwood, 1998), and their unique risk management strategies (Morduch, 1999) are the main characteristics that define microfinance institutions and their financial structure. Among the elements that contribute to the financial perspective are Return on Equity (RoE) and Return on Assets (RoA), which are based on profitability, efficiency, and productivity in the service delivery process. Numerous elements, such as the number of borrowers, the variety of products supplied, the clients' financial situation, the emphasis on female borrowers, the cost of providing microfinance services, and Reichert (2018), all have an impact on the social perspective. In a similar vein, the environmental perspective addresses issues such as climate change, natural disasters, investment in green/climate funds, eco-friendly agricultural practices, renewable energy, and micro-insurance against ecological change-related risks (Dowla, 2018; Agrawala & Carraro, 2010; Fenton et al., 2017; Klomp, 2018; Moore et al., 2019). The United Nations Grand Development Challenges, which were meant to be completed by 2015, were the first to include microfinance under the Millennium Development Goals (MDGs). Microfinance was then included in the Sustainable Development Goals (SDGs) for 2030 (World Health Organisation, 2015). It has been observed that having access to microfinance and renewable energy sources helps to reduce poverty and pave the way for sustainable development (Bunse et al., 2007).

Finding a balance between poverty alleviation and sustainability is a challenge for MFIs (Quatrosi, 2022). A study conducted in Sri Lanka looked at the factors influencing the financial sustainability of MFIs. Financial sustainability is commonly measured using two stages: operational sustainability and financial self-sufficiency (Quayes, 2012; Adhikary & Papachristou, 2014; Chikaza, 2015). Whether or whether they receive subsidies, MFIs are considered operationally viable when they are able to control their operating expenses from their operating revenue (Meyer, 2002). Financially self-sufficient MFIs typically make it through the long term without receiving any subsidies (Le et al., 2020). The productivity of loan officers, the age of MFIs, the type of organisation, the profit margin, the number of clients, competitive interest rates, average loan ticket size, control over cost structure, appropriate monitoring, and timely loan recovery mechanisms are some of the factors that positively impact financial sustainability, even though the operating expenses (OP) ratio and capital structure have an inverse relationship with it (Tehulu, 2022).

MFIs becoming green MFIs, which is best achieved with the support of excellent governance, is closely linked to financial sustainability. In addition to environmental sustainability, which includes initiatives to conserve energy resources and boost the use of renewable energy, financial sustainability includes two aspects of financial development. The target audience, which includes those who are in danger of financial exclusion, is often subject to governmental regulations that promote sustainable development and financial sustainability. A thorough approach that takes into account social, governance, economic, and financial factors has been implemented to address this. MFIs should continue to operationalise at the regional level since it was found that there are

significant regional variances (García-Perez et al., 2020). By funding businesses that produce solar panels, energy-efficient lightbulbs, solar water pumps, waste material recycling and repair, and training and mentoring services, MFIs assist businesses that operate in an ecologically friendly manner (Abdur Rouf, 2012).

According to research, microfinance should be analysed from a social viewpoint, taking into consideration the environmental concerns and ambitions of more marginalised groups (Temper et al., 2018; Martinez-Alier et al., 2016). Women are empowered when they have access to microfinance services through rural MFIs. Additionally, research has demonstrated that microfinance has a good effect on the environment and society. This is due to the fact that lending money to female borrowers who utilise the loan balance to produce or use renewable energy sources tends to empower women, which is advantageous for microfinance's social and environmental components. In this instance, educating female borrowers on how to manage and spend their loan balance more sensibly could act as a stimulant for sustainable and social growth (Lee & Huruta, 2022). Furthermore, it has been found that female borrowers are perceived as more reliable for microloan services than male borrowers when loan terms (including loan amount, loan term, number of lenders, repayment tenure, and recovery) are considered (Dorfleitner & Grebler, 2020).

Green microfinance can solve social concerns in society in addition to financial and environmental ones, according to studies. It provides poor communities with financial security, helps them start profitable microbusinesses, and meets their financial needs. Rural entrepreneurship is therefore essential to the growth and well-being of neighbouring communities. Green social microfinance promotes entrepreneurship and intercommunity networks while preserving a community's traditions, culture, and history (Abdur Rouf, 2012). Additionally, it often benefits stakeholders and potential investors, as well as the growth of the MFI in question (Beisland et al., 2022). The geographic setting, social performance management, social responsibility, outreach, and service quality are some of the common elements that social rating agencies of MFIs consider when determining an MFI's social rating (Beisland et al., 2021).

The literature referred have found significant variables that contribute to the financial sustainability of MFIs. The below table shows which of the variables have been considered with their respective sources:

Table 1 showing the variables and their respective sources from literature

Source: Developed by author

Variable	**Author**
Assets	**(**Rupa, 2015)
Average ticket size (ATS)	(Srikanth & Srinivas, 2022; Rupa, 2015)
Capital/Assets ratio	**(**Rupa, 2015)
Number of active borrowers (NAB)	(Srikanth & Srinivas, 2022; Rupa, 2015)
Yield on Gross Loan Portfolio (YGLP)	(Srikanth & Srinivas, 2022; Rupa, 2015)
Profit Margin (PM)	(Srikanth & Srinivas, 2022; Rupa, 2015)
PAR at 30 days (PAR30)	(Srikanth & Srinivas, 2022)
PAR> 90 days	**(**Rupa, 2015)
Debt to Equity	**(**Rupa, 2015)
Return on Assets (ROA)	(Srikanth & Srinivas, 2022; Rupa, 2015)
Return on Equity (ROE)	(Srikanth & Srinivas, 2022; Rupa, 2015)
Financing Cost Ratio (FCR)	(Agrawal & Sinha, 2010)
Portfolio Outstanding (PO)	(Srikanth & Srinivas, 2022; Rupa, 2015)

Non-Performing assets (NPA)	(Bharat Microfinance Report, 2015-2023)
GLP to total assets	**(**Rupa, 2015)
Average loan balance per borrower/GNI per capita	**(**Rupa, 2015)
Operational Self Sufficiency (OSS)	**(**Rupa, 2015)
Financial revenue/Assets	**(**Rupa, 2015)
Total expenses/Assets	**(**Rupa, 2015)
Financial expense/assets	**(**Rupa, 2015)
Provision for loan impairment/Assets	**(**Rupa, 2015)
Operating expense/assets	**(**Rupa, 2015)
Operating expense/Loan portfolio	**(**Rupa, 2015)
Average salary/GNI per capita	**(**Rupa, 2015)
Cost per borrower	**(**Rupa, 2015)
Loan per staff member	**(**Rupa, 2015)
Personnel allocation ratio	**(**Rupa, 2015)
Risk coverage	**(**Rupa, 2015)
Non- earning liquid assets as a percent of total assets	**(**Rupa, 2015)

Theoretical Model

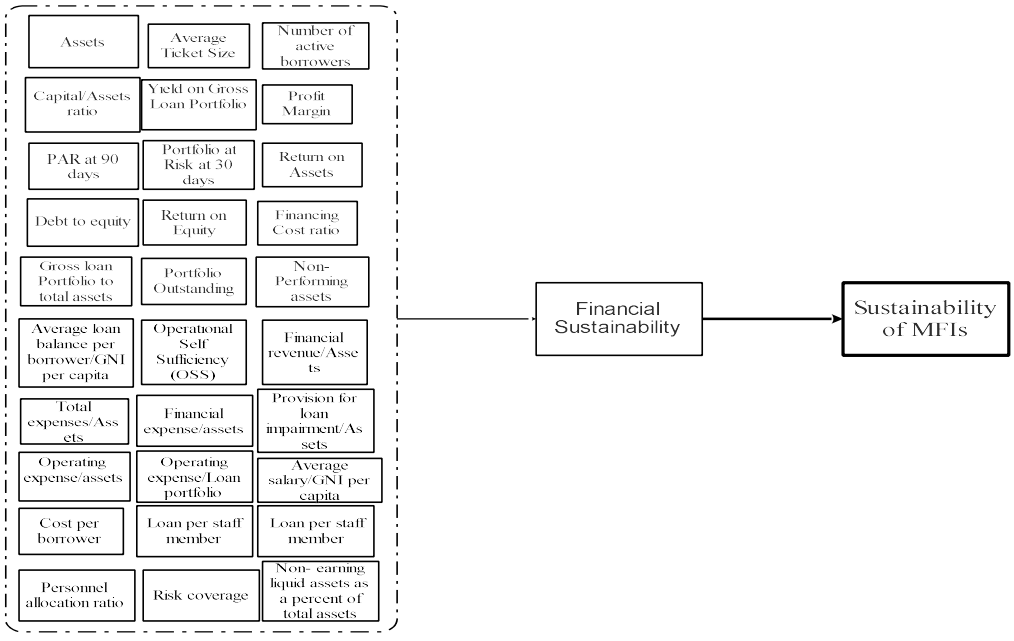


Figure 1 showing theoretical model for financial sustainability of MFIs
Source: Developed by Author

Microfinance is regarded as a potent tool for reducing poverty and fostering social progress and prosperity. When used responsibly, it also contributes to the growth of the economy. However, maintaining the sustainability of the MFIs that provide this microfinance facility would help manage this facility more effectively. Financial,

economic, and social sustainability are the three main determinants of these MFIs' overall viability.

Nevertheless, this study considers only the financial sustainability which indicates the factors that reflects the financial portfolio of the organizations like Assets, Average ticket size (ATS), Capital/Assets ratio, Number of active borrowers (NAB), Yield on Gross Loan Portfolio (YGLP), Profit Margin (PM), PAR at 30 days (PAR30), PAR at 90 days (PAR90), , Debt to Equity, Return on Assets (ROA), Return on Equity (ROE), Financing Cost Ratio (FCR), Portfolio Outstanding (PO), Non-Performing assets (NPA), GLP to total assets, Average loan balance per borrower/GNI per capita, Operational Self Sufficiency (OSS), Financial revenue/Assets, Total expenses/Assets, Financial expense/assets, Provision for loan impairment/Assets, Operating expense/assets, Operating expense/Loan portfolio, Average salary/GNI per capita, Cost per borrower, Loan per staff member, Personnel allocation ratio, Risk coverage, Non- earning liquid assets as a percent of total assets.

The methodology used in this paper is systems dynamics modelling which is a tool based on systems theory, information science, organisational theory, control theory, tactical decision-making etc which follows a causal loop approach which signifies the flow diagram of the interrelationship among the dependent and independent variables stated in dynamic hypotheses. This causal loop flow diagram is then transformed into the stock flow model using simulation approach. The causal loop diagram shows the causal links between the concepts which represents the "mental models" (how people perceive a system's working) (Shepherd, 2014).

In order to understand and measure the sustainability of these MFIs, this paper has tried to build up a Causal Loop Diagram (CLD) Model including all the parameters that impact the financial sustainability of MFIs. The model reflects all the variables and their interrelationship indicating each ones' positive or negative impact on the other or on the overall sustainability. Below is shown the causal loop diagram (CLD) model.

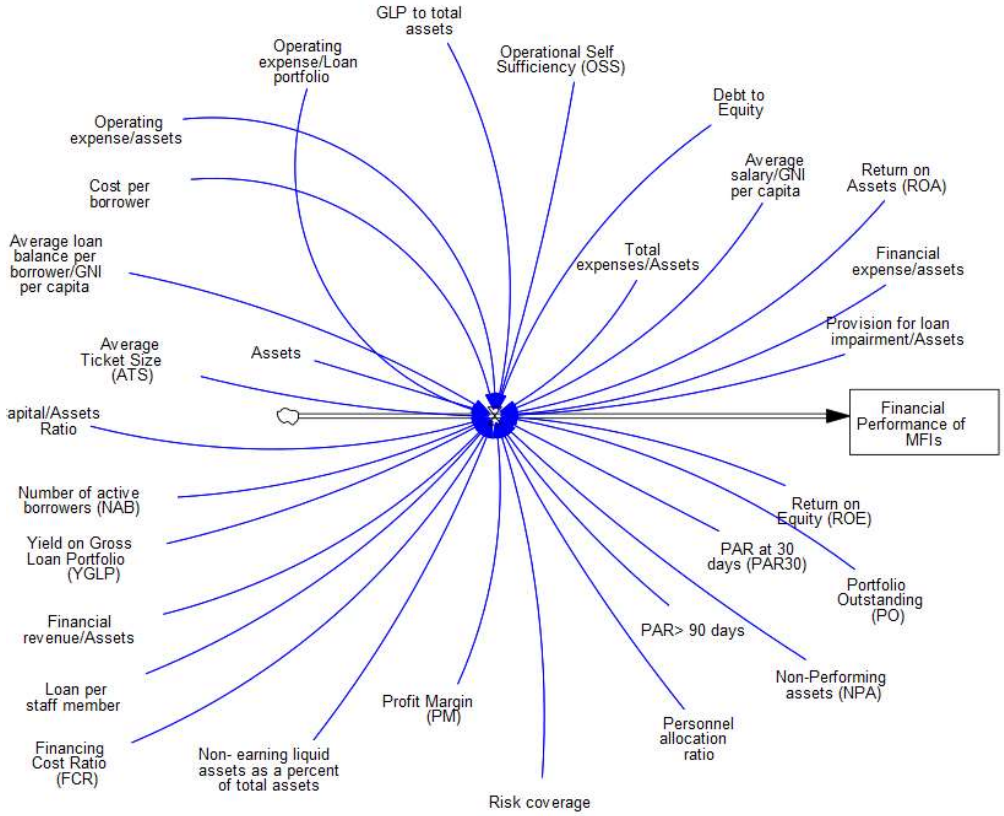


Figure 2 showing Causal Loop Diagram of the factors contributing to financial performance
Source: Developed by author through Vensim 10.1.0

The aforementioned model illustrates how all the variables that are significant from the perspective of MFI sustainability are interrelated. It is primarily demonstrated that the main criteria of financial sustainability have an

impact on the sustainability of MFIs. This perspective has a tendency to improve MFIs' overall sustainability.

The factors influencing financial sustainability measurement indicators separately are investigated in this study. Some of these factors contribute more than others, while others contribute less. First, it is necessary to comprehend individual factors:

The factors that impact the financial sustainability includes:

Assets: Microfinance Institutions (MFIs) typically hold a variety of assets that are crucial for their operations and financial stability.

Average ticket size: Average ticket size or Average loan size is the approximate size of loan offered to the maximum number of microfinance clients. It signifies what amount of loans in an average does the MFI gives to its clients.

Capital/Assets Ratio: The capital/assets ratio, also known as the equity-to-assets ratio, is a key financial metric that measures the proportion of an institution's total assets that are financed by its equity (or capital). It is an important indicator of financial stability and risk management.

Number of active borrowers: This signifies the number of borrowers among the whole portfolio of borrowers who are active in their account showing the timely utilisation and repayment of loan amount. They also depict that the loan amount is used in proper purpose with which the loan was granted.

Yield on Gross Loan Portfolio: The total return or yield obtained on the gross loan portfolio of the MFIs is known to be yield on gross loan portfolio. The yield amount helps the MFIs to sustain their operational and financial activities.

Profit margin: It is the portion of the MFIs revenue generated which is left as profit for the MFI post all its costs. The more the profit margin, the more the MFIs will have disposable income to expend more on improving customer services and product quality or to cover financing costs. This income can even be used for providing more loans.

PAR at 30 days: Portfolio At Risk or PAR at 30 days signifies the what amount of loans of the total loan portfolio are at risk of being delinquent from 30 days. This ratio is basically calculated at 30 days, 60 days and also 90 days relational on the type and size of MFIs. Post 90 days, the account which fails to repay loan is considered under loan delinquent.

PAR at 90 days: It measures the percentage of the loan portfolio that is at risk of default due to borrowers being overdue on their payments.

Debt to Equity: The debt-to-equity ratio (D/E ratio) is a financial metric that compares a company's total liabilities (debt) to its shareholders' equity. This ratio helps assess the financial leverage and risk profile of a company, including microfinance institutions (MFIs).

ROA: Return on assets or ROA depicts how profitable an MFI is in relation to its assets. It shows what profit or return an MFI has from all the assets it has put in. The higher the ROA, better is the profit margin and simultaneously the financial performance of MFIs.

ROE: Return on Equity or ROE signifies what profit or revenue an MFI has generated from the funds utilised from the stakeholder’s money put to use. The higher the ROE, better is the profit margin and thus higher financial performance of MFIs.

Financing Cost Ratio (FCR): It represents the part of revenue used for covering financial expenses particularly interest. A few MFIs offer other financial products also like savings, insurance etc. Thus, these needs interest charges which are paid to clients and are borne by the MFIs. Thus, it is imperative that lesser the FCR more is the profit margin.

Portfolio Outstanding: It signifies the total amount of loans which are yet to be repaid by the borrowers. It represents total loan portfolio like the active and delinquent. It does not include interest receivables and accrued interest.

NPA: Non- Performing Assets or NPAs represents those weak accounts that becomes non repayable for at least 30 days after being delinquent. The lower the NPA better is the total portfolio of the MFI.

GLP to total assets: The Gross Loan Portfolio (GLP) to Total Assets ratio measures the proportion of a financial institution's total assets that are represented by its outstanding loans. This ratio is particularly important for microfinance institutions (MFIs) as it provides insight into how effectively the institution is utilizing its assets to generate revenue through lending.

Average loan balance per borrower/GNI per capita: The average loan balance per borrower to GNI per capita ratio is a metric that compares the average amount of loan given to borrowers with the Gross National Income (GNI) per capita in a country. This ratio provides insight into the affordability and accessibility of microfinance services relative to the income levels of the population.

Operational Self Sufficiency: Operational Self-Sufficiency (OSS) is a key performance metric used to assess the financial sustainability of microfinance institutions (MFIs) and other financial organizations. It measures an institution's ability to cover its operational costs through its operating income, without relying on external funding or subsidies.

Financial revenue/Assets: The financial revenue-to-assets ratio measures the efficiency of a financial institution, such as a microfinance institution (MFI), in generating income from its total assets. It indicates how effectively an organization is using its assets to produce revenue.

Provision for Loan Impairment/Assets: The provision for loan impairment to assets ratio measures the amount set aside for potential loan losses relative to a financial institution's total assets. This ratio is important for assessing the financial health and risk management practices of microfinance institutions (MFIs) and other lenders.

Operating expense/Assets: The operating expense to assets ratio measures the proportion of a financial institution's total assets that are used to cover its operating expenses. This ratio provides insights into the efficiency and cost management of the institution, including microfinance institutions (MFIs).

Operating expense/loan portfolio: The operating expense to loan portfolio ratio measures the operating expenses of a financial institution, such as a microfinance institution (MFI), relative to its total loan portfolio. This ratio provides insights into how efficiently the institution manages its operating costs in relation to the loans it has extended.

Average Salary/GNI per capita: The average salary to GNI per capita ratio compares the average salary of workers in a given country to the Gross National Income (GNI) per capita. This ratio helps to assess income distribution and the relative earning power of workers compared to the overall economic output per person.

Cost per borrower: The cost per borrower metric measures the average operating cost incurred by a financial institution, such as a microfinance institution (MFI), for each borrower it serves. This ratio provides insights into the efficiency and effectiveness of the institution's operations and helps assess its overall sustainability.

Loan per staff member: The loan per staff member metric measures the average amount of loans disbursed by each staff member in a financial institution, such as a microfinance institution (MFI). This metric helps assess the productivity and efficiency of the institution's staff in generating loans.

Personnel Allocation Ratio: The Personnel Allocation Ratio measures the proportion of a financial institution's resources (staff members) dedicated to specific functions or departments relative to the overall staffing. This ratio is useful for assessing how effectively an institution allocates its human resources across various operational areas, such as lending, administration, and support functions.

Risk Coverage: The Risk Coverage Ratio is a financial metric used to evaluate the ability of a financial institution, such as a microfinance institution (MFI), to cover potential losses from its loan portfolio with its reserves and provisions. This ratio helps assess the institution’s risk management practices and overall financial stability.

Non- earning liquid assets as a percent of total assets: The ratio of non-earning liquid assets as a percentage of total assets measures the proportion of a financial institution's total assets that are held in liquid assets that do not generate income. This metric is particularly relevant for assessing the liquidity management and asset allocation

strategy of microfinance institutions (MFIs) and other financial organizations.

It is analysed that the average ticket size of MFI borrowers depicts the average loan size which is given to the MFI clients with respect to a single MFI. This parameter tends to keep positive relation with that of financial performance as more the ticket size more are the number of borrowers and so, better is the financial performance. Financing cost ratio refers to the cost borne by the MFI for financing a client of microfinance. This has negative correlation with financial performance. Similarly, portfolio outstanding, portfolio at risk (PAR) for 30 days, NPA, all of these tend to have inverse relation with that of financial sustainability. We also need to understand the interrelationship among these variables. The number of active borrowers tend to have positive relation with yield on gross loan portfolio whereas it has negative correlation with that of average ticket size as number of borrowers increase the average ticket size will fall down. Yield on GLP impacts profit margin positively as yield increases the profit margin of MFIs will increase which in turn will increase the income generated from the loans offered which can increase staff incentives and thus improving staff productivity. The NPA can be mitigated by establishing a sound loan portfolio management system by maintaining a loan performance system. This can monitor the repayment schedules of the borrowers and can reduce loan delinquencies helping keep in track the repayment of clients.

The assets with the MFIs tend to put neutral impact on MFIs performance as having more assets can reduce the performance of MFIs and vice versa. Capital to assets ratio should practically be more as more of MFIs capital be there more the vested interested of MFI within the portfolio. PAR at 90 days should not be much as it can lead to increase in potential delinquency rate thus reducing financial performance of MFIs. GLP to total assets should always be less as lesser the loan portfolio in comparison to assets, better the productivity and financial stability of the MFIs. Average loan balance per borrower/ GNI per capita should always be more as more the loan balance better the quality of portfolio. Operational self sufficiency should always be more as much the MFI is self-sufficient in its operating margins better the performance. Financial revenue/assets should be more as the revenue made from the underlying assets portfolio depicts the better profit margins. Provision for loan impairment/Assets should be lesser as it depicts that the portfolio is stable and no contingency provisions need to be made on the loans provided. Operating expense/Assets reflects that the operating expenses for the loans provided should be more as it in turn increases the profit margins. Operating expense/loan portfolio reflects that the operating expenses on the loan portfolio provided should be less as it increases profit margin earnings. Average salary/GNI per capita reflects that the average salary should be more which encourages more employee to join MFIs as employees maintaining better employability levels and also increases outreach to the MFIs by increasing employee base. Cost per borrower should be less as it reflects the cost incurred in acquiring and maintaining a client and which in turn makes additional cost to the MFI thus should be maintained at less. Loan per staff member should always be more, as more the loans per staff member more the total portfolio of the MFI. Personnel allocation ratio should always be more as the ratio to which the number of borrowers allocated to a personnel should be less. It means the number of borrowers allocated to per personnel should be less which helps borrowers easy and undivided interaction with the personnel regarding their queries. Risk coverage should always be more as it reflects the cover the MFI maintains to cover optimum risk. Non-earning liquid assets as a percent of total assets should always be less as it tends to reduce the profit margins of the MFIs.

Research Methodology

The sustainability of MFIs basically is impacted by the factors that impact it. The factors of financial performance and their respective factors affects the sustainability of MFIs. In order to understand this dependency, this study has conducted a simulation model run of systems dynamics modelling. The causal loop diagram depicts in Figure 2 has been extended to create a Stock Flow Diagram (SFD) which is then run with simulation to understand the movement of variables over graphs. Firstly, the data collected over the above-mentioned variables from secondary data sources/websites like RBI, NABARD, IBEF, MSME, Bharat Microfinance Reports etc. The time period considered for the data collection was from 2007-2023 keeping in concern the availability of data for all the variables for all the years. The data obtained was analysed finding the descriptive statistics of them including the mean, standard deviation and covariance values etc. These values were then utilised to generate a logical data-based model that signifies the correlation of all the variables with that of main variable. The values found were fed to Vensim software to run a simulation. The below shows the SFD:

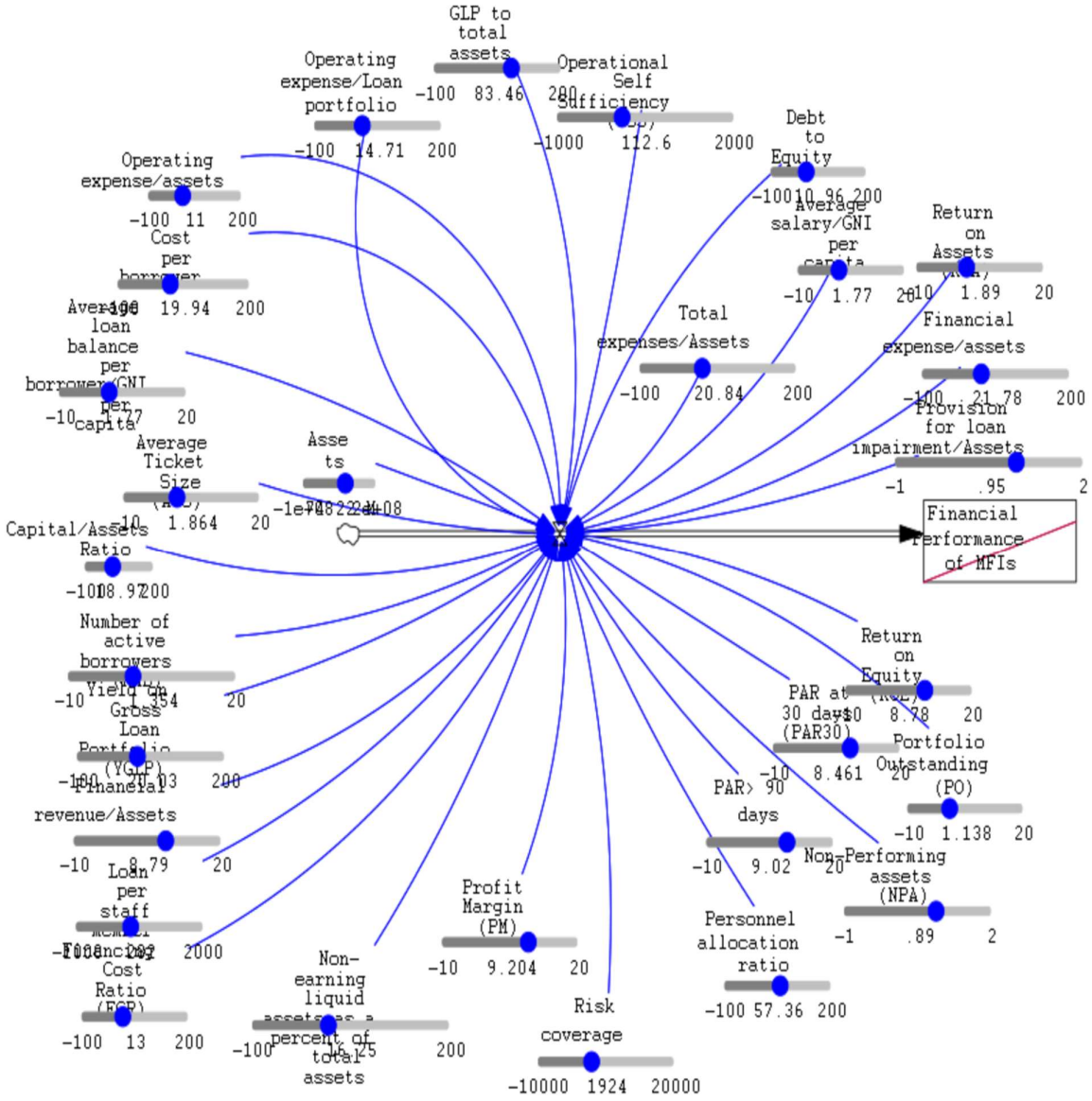


Figure 3 depicting simulation run for the model

Source: Developed by author

Systems Dynamics is a powerful tool that depicts the causal relationships among the independent and dependent variables. This model tends to understand the causal relationship of financial performance, economic performance and social performance on the overall sustainability of MFIs. Thus, Systems Dynamics tends to fulfil that need by depicting these relationships. It also depicts the Causal Loop Diagram (CLD) by showing polarity which shows what positive or negative impact each of the sub variables have on main variables.

The above shown model depicts the simulation run based system dynamics model of how sustainability of MFIs depends on their respective financial, economic as well as the social performance. The aim of the study is to derive the relationship of sustainability of MFIs with that of the financial performance, economic performance and the social performance of MFIs which are directly impacted by the change in their respective sub variables. The individual financial, economic and social performances and the overall sustainability of MFIs have been depicted by the equation as given below:

$$FP(x) = \int_0^x \{74222649.77A + 1.863578ATS + 18.97CAR + 1.354025NAB + 20.027778YGLP + 9.204444PM + 8.461111PAR30 + 9.02PAR90 + 10.96DE + 1.89ROA + 8.78ROE + 13FCR + 1.138332PO + 0.89NPA + 83.46GLPTA + 145.48ALBPB + 12.15ALBPGNI + 112.60OSS + 21.78FRA + 20.84TER + 8.79FER + 0.95PLIA + 11.00OEA + 14.71OELP + 1.77ASGNI + 19.94CPB + 282LPS + 57.36PER + 1924.46RC + 16.25NELATA\}$$

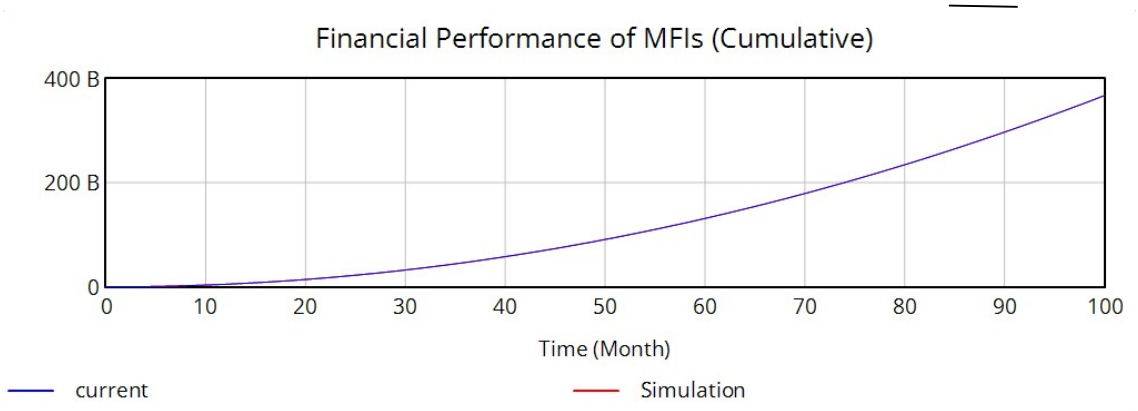
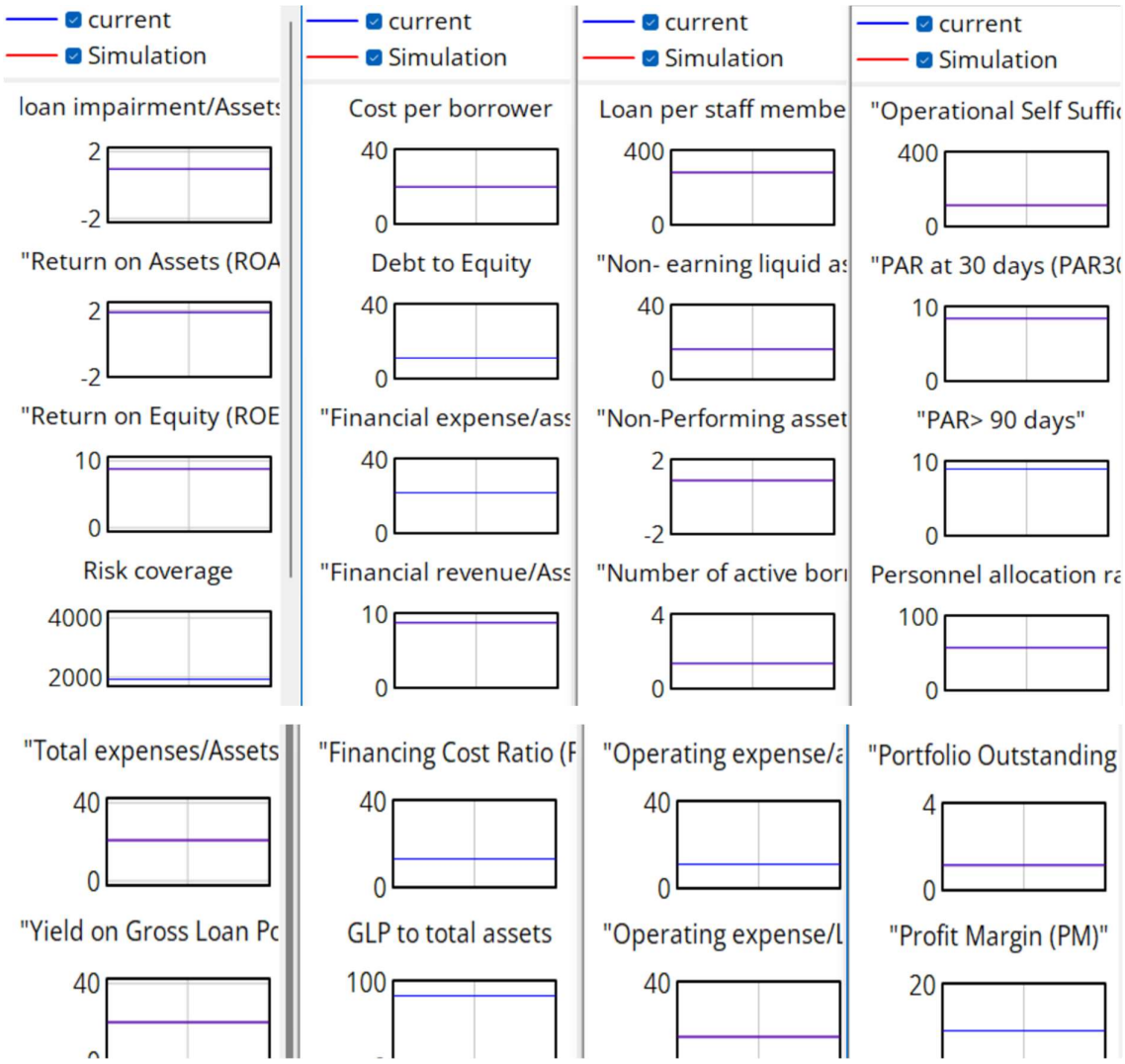


Figure 4 depicting simulation run for Financial Sustainability of MFIs

Source: Developed by author through Vensim 10.1.0

The above shows the simulation run for the model developed which shows the graph of the main variable (Financial Sustainability of MFIs) which is impacted by the financial performance of MFIs. The simulation is done by keeping a fractional length of 5 cycles which are repeating on a total cycle time of 0-100. The above plot shows the normal probability plot of the sustainability of MFIs which is bifurcated into 4 quartiles such as, 1/4th (25), 2/4th (50), 3/4th (75) and 1(100). For each quartile, the number of runs has been depicted for which the graph plotted is a straight line showing the linear association between the independent variables and dependent variable. The below shows the probability density function graph of sustainability of MFIs.



The above graph shows the individual graphs of each parameter considered. The parameters with the flat horizontal lines show that they have insignificant or significant impact on the financial performance of MFIs. The lower horizontal line depict that they less have very less impact whereas the higher horizontal lines show that they impact the financial performance significantly.

Managerial Implications

The results obtained from the study shows that there is linear association of sustainability of MFIs with their financial performance. These results can be used in predicting and managing business operations of various MFIs in India. The MFIs can manage and sustain their businesses in long run by making sure their financial indicators are well managed. Apart from these, they need to increase their outreach in areas that are deprived of the financial services like that of MFIs. They must resolute to make a significant contribution to the GDP of the economy so that the market capitalization of not only banks and non-banking financial companies have a bull share but also MFIs show a significant contribution. Also, the MFIs if they increase their outreach in financially deprived areas like rural areas, they should make sure to lend loans and offer financial services to socially backward and rural clients. They should strive more towards increasing number of female borrowers not only in rural but also urban regions. This will increase women representation in their loan portfolios showing women empowerment and social significance.

These results not only comply with the MFIs in India but also this model can be implemented for Banks as well

as NBFCs to increase their profitability numbers. This will enhance the MFI contribution in economy as well as the economic significance of the country as a whole. This can enhance the working of the microfinance services in India.

Conclusion

MFIs lend day-to-day microfinance loans to entrepreneurs to micromanage their business cycles. They even have replaced the local rural level lenders who offered high interest rates and also compelled borrowers for faster loan repayment. MFIs have eased the repayment schedules helping entrepreneurs make repayments post the profits generated out of their regular business cycles. Still, we see the MFIs have a long way to go as the potential client base is bigger and the outreach of MFIs is quite less. Thus, MFIs should strive to enhance their presence in unexplored areas opening more branches. As the presence of these MFIs is less, it is pretty much obvious that the awareness about these MFIs is also less among rural and financial service deprived areas. Thus, MFIs should run on more awareness campaigns among rural areas that increases the awareness among them about the MFIs, their operability and the products offered by them. The government should also financially aid MFIs or should contribute in conducting such awareness campaigns. The limitations of this study are that the study is conducted in Indian region. This tends to limit the study with the geographical constraints. The future studies can conduct the study on multi country basis or worldwide basis. Also, the study has tries to consolidate all the variables that impact the sustainability of MFIs. Future studies can concentrate on bringing in more factors that impact sustainability of MFIs which must have been missed from author's view.

Future Implications

Globally, microfinance has been proven as an aid the improved basic living conditions of many deprived classes and communities. This study has focussed on understanding how sustainability of MFIs can be achieved through a CLD model. We analysed that a few factors impacted positively whereas a few others have impacted negatively. We suggest that government should implement some stringent rules and policy guidelines in order to establish loan performance and monitoring system that enhances the working and financial sustainability of MFIs. This will in turn enhance the economic performance of MFIs leading to economic development of the country. Secondly, we suggest that the MFIs should try group lending and step lending to the new and/or rural clients which creates a time to understand the credibility of the borrower. This reduces MFIs risk exposure and also leading to the outreach among rural or backward areas. We propose to build an extended model to the further researches including more impacting variables. Plus, countries at global level are focusing at environmental considerations as well and compel all small to large organizations to stick to environmentally friendly practices. When sustainability of MFIs is considered from financial, social and environmental perspective leads to triple bottom line approach. We urge future researches to analyse the relationship between environmental, social and financial sustainability of MFIs.

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