Innovative Delinquency Management

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ABSTRACT

This research paper focus into the most challenging aspect of any MFIs that is the evaluation of credit worthiness of a client prior to loan disbursement using credit scoring score card and collection of data regarding the repayment in a very cost effective way. Though this method of grass-root economic development has showed pledge throughout the world but conversely problems may arise if the proper systems are not in place to support the intensification of microfinance. If lending institutions are not well-versed about the credit-worthiness of potential clients, it can lead to negative effects on the performance of MFI loan portfolios and will result in over-indebtedness of clients.

Keywords: Bottom of Pyramid Marketing, Credit Rating, MFIs, Microfinance

INTRODUCTION

Indian microfinance has continued to grow rapidly towards the main objective of financial inclusion, by extending financial services to approximately 80 percent of the population, which has yet to be reached directly by the banks and hence playing a great job in bringing the poor households into the mainstream. Microfinance services have become progressively more imperative tools for financial and social intermediation in the lives of the India's poorest. The number of microfinance institutions (MFI) has been growing rapidly for last couple of decades, by which borrowers are offered a range of lending alternatives. Though this method of grass-root economic development has showed pledge throughout the world but conversely problems may arise if the proper systems are not in place to support the intensification of microfinance. If lending institutions are not well-versed about the creditworthiness of potential clients, it can lead to negative effects on the performance of MFI loan portfolios and will result in over-indebtedness of clients.

Up to now, Most of Indian microfinance lenders have depended almost exclusively on informal & qualitative information, but the credit scoring model will be quite helpful in decision making by the top management level. It not only reduces the risk factor but also saves time in decision making. Depending on the credit worthiness of the client, appropriate products can be designed with suitable repayment periods which will help the client to be able to repay the interest as well as loan amount without burdening his personal financial capability. A timely repayment without default will also help the client to be able to get further financial assistance at the time of his need. Along with this the framework developed can be useful to collect the data of repayment in periodic basis overcoming the hurdles due to infrastructural facilities in the rural areas. In addition to above benefits it will be helpful in reducing the operational cost and the cost

due to bad debt which forms a major part of the interest charged by the MFIS hence resulting in a win-win situation for both the institution & the client .

LITERATURE REVIEW

Microfinance in India is part of the larger financial framework and Microfinance Institutions (MFIs) are emerging as social businesses within this framework, catering to an untapped market segment while creating value form their shareholders. As per a report titled "Inverting the Pyramid" (Oct 2007) published by Intellicap, (a social investment banking firm) MFIs have emerged as the most important channel in Indian microfinance supply with a market share of almost 47 percent, growing rapidly compared to the Self Help Group (SHG)-Bank Linkage channel. In the last five years, Indian MFIs have demonstrated impressive growth rates, compelling financial performances and increasing efficiencies, faring exceptionally well when benchmarked against their Asian counterparts. With very high growth rates, many in the range of 75-100% portfolio growth annually, MFIs are reaching out to their clients faster with higher
loans sizes. The decreasing rates charged to clients and declining cost ratios along with rising competition is making room for competitive pricing in the Indian microfinance space. In addition, such a scenario triggers innovations in financial instruments, delivery channels and business partnerships that overcome the legal and market-related constraints in reaching out to the poor.

   Although the performance of MFI's has been impressive enough, but there are areas to watch out. For instance information regarding the clients in context of portfolio management, loan disbursement, loan recovery, delinquency management etc. is very much essential for the sustainable growth. Hence the need for proper systems regarding

assessment of credit-worthiness is all the more important. So, in case of any default, it not only increases the cost of bad debt but at the same time requires additional efforts to collect delinquent loans. This means additional expenses for closer monitoring, more frequent visits to borrowers, more extensive analysis of the portfolio, legal fees for pursuing seriously delinquent borrowers, and so forth. This concern has been raised and discussed by Joanna Ledgerwood in his book "Microfinance Handbook – An Institutional & Financial Perspective". The more time, effort, and resources that are put into controlling delinquency, the less there are available for the MFI to reach new borrowers and expand services or outreach. Delinquency can result in a slower turnover of the loan portfolio and an inability to pay expenses due to reduced cash flow. If loan principal is not recovered at the scheduled time, loans to other borrowers cannot be made, and payment of some expenses may also have to be delayed. Also, with reduced cash flow, the MFI may be unable to make timely repayment of borrowed funds or meet the demand for savings withdrawals.

The Effect of Delinquency on an MFI's Profitability Clearly, the profitability of an MFI is affected if interest revenue is not received on delinquent loans. However, the most significant effect on profitability occurs when the loan principal is not repaid and loan loss provisions must be made. For every loan lost, many additional new loans must be made to generate enough revenue to replace the lost loan capital. In other words, when a loan is not recovered, the entire principal (and if capitalized, the interest) must be expensed through a loan loss provision. This greatly affects the profitability of the MFI and consequently the amount transferred to the balance sheet as equity. If the MFI records a net loss, the equity is reduced, resulting in fewer funds available to finance additional loans. If operations are to continue, the equity will have to be increased at least to its level before the loss was recorded. Since investors or donors are not likely to be willing to invest in the long term in an MFI that is losing money, the

MFI must work toward generating enough income net of expenses to replace the lost capital (equity). Note that even if loans are funded with debt, the debt still needs to be repaid regardless of whether or not the loans (assets) made to borrowers are repaid to the MFI. If not enough revenue is generated to repay the debt, then equity will be reduced. Hence, delinquency management requires a comprehensive review of the lending methods, operational procedures, and institutional image of the MFI. Delinquency is often a result of poorly designed loan products and delivery mechanisms. For this reason the clients must be screened carefully before loan disbursement.

To address this issue of judging credit-worthiness of prospective clients financial institutions worldwide are using credit scoring model, which analyzes historical client data, identifies links between client characteristics and behavior, and assumes those links will persist to predict how clients will act (Source: www.Wikipedia.org). The technology can help a microfinance institution (MFI) analyze how its clients have behaved in the past to make more reliable loan application decisions, devise more effective collections strategies, better target marketing efforts, and increase client retention. For example, an MFI's credit scoring model might find that its borrowers without business experience have been more likely to default on loans. When the MFI's loan officers use a credit scorecard to evaluate new applications, prospective borrowers without business experience would be given a lower score, making them less likely to qualify for a loan from the institution. Scoring technology systems can be a foundation for advanced capabilities, such as pricing loans based on individual client risks and more accurately provisioning against loan losses.

Most of the financial institutions are using statistical scorecards, in which the client data regarding the repayment history is analyzed using statistical techniques such as linear and logistic regression to identify the importance of certain client variables such as monthly income, family size, educational background, capital assets etc on

repayment behavior. This model generates a scorecard that indicates the probability of default, desertion, or other behavior, based on these unique characteristics (Source: Dean Caire, CFA, and Bannock consulting). This can provide a foundation for more advanced credit risk management applications. Statistical scorecards predict client behavior more accurately, but require much more data, staff time, and expense to develop. But, in Indian context most of the MFIs are dependent on informal sources of information like judgment of the loan officer for deciding the credit worthiness of the client.

Owing to below mentioned gaps that have been identified in the above discussion the need to this project study becomes more prominent. The reasons are –

1) Credit scoring models used in other countries are not applicable in Indian context due to different socio-economic and demographic variables.
2) New MFIs entering Indian microfinance market do not have data regarding the clients and due to unwillingness of existing MFIs to share their own database, evaluation of credit worthiness of clients for these new MFIs is becoming problematic.
3) Additionally Indian MFIs are using more of informal sources on information gathering and decision making vis-à-vis loan disbursement and evaluating credit-worthiness, hence not being able to fully implement the credit scoring models.

To address these gaps the present research was designed with the objective to develop a credit scoring card to evaluate the creditworthiness of a client prior to the disbursement of loan

Benefits of the Research

The outcome of the research will help the stakeholders as follows: MFIs for finding credit worthiness of clients

a) This will help in designing an appropriate customized product
b) Improve the loan collection by reducing risk associated with rate default
c) Reduce the monitoring cost
d) Reduce administrative work related to loan approval process
e) The above reasons would help reduce interest rate for microfinance, the benefits
f) of which can be passed onto clients
g) To quantify the mechanical procedures involved in credit scoring and gain the
h) efficiencies of application processing that comes through automation.
i) To gain control and consistency in lending practices for the entire credit portfolio.
j) To identify the variables which are important in the credit evaluation process?
k) To improve delinquency statistics while maintaining desired approval rates.
l) To maximize the profit and outreach by reducing no. of defaults
m) To expedite the risk management process

Clients, who would like to avail the loan, would be benefited by
a) Timely available of funds
b) Availability of funds for consumption as well as for investment purpose
c) The customized products help in easy repayment schedule
d) Right amount of loan amount reduces financial pressure
e) Good social standing because of debt free position

RESEARCH METHODOLOGY

The steps involved in research are as follows:

1. Selection of variables for the score card
2. Questioner design
3. Data collection from the field & Data analysis using statistical tools
4. Assigning scores to each variable

Selection of Variables for the Scorecard

Information about the important variables, that is indispensible for the assessment of credit worthiness were collected by adopting primary and secondary research methods. Primary research method - knowledge about the important variables was gathered by conducting unstructured discussion with microfinance experts. Secondary research methods - In this method the relevant information pertaining to objective were collected by using many resourceful sources through internet. At the end taking into account the knowledge obtained from primary and secondary research, variables having high degree of discriminative power to differentiate the population were selected to include in the score card. The idea of including a variable is to differentiate a customer from the rest of the population. These variables are as follows:

1. Demographic variables
2. Product variables
3. Business variables
4. Employee variables
5. Rural variables

Criteria considered for selection of characteristics under each variable: The characteristics having high risk discriminative capability, which are very essential to differentiate between "good" and "bad" clients (desirable or undesirable clients for lenders institutions), are chosen for the scorecard. For example, regarding age, it is known that younger clients have a more risky credit behavior, in contrast, older

clients has better risk profile, hence younger clients are more associated to "bad" payment behavior and this client characteristic is considered inside the model for differentiation with the rest of the population (negatively – negative score) and An older client age also will considered inside the model for differentiation with the rest of the population (positively - positive score). Questionnaire was designed to collect the information about the selected variables and to get an insight about the target population and the type of questions used were structured (multiple choice), unstructured, dichotomous type.

Question Arrangement Approach- Funnel Approach

The type of the questions used, were chosen considering the kind of information required and the mode of interview. In designing the order of the questioner funnel approach was adopted in which questions are proceeding from general to specific. The initial questions were aimed at building a rapport with the respondent and putting the person at ease. The respondent was introduced to the broad area of enquiry; an interest in the study was generated, and gradually leads to queries relating to specific queries. During designing of questions simple and unambiguous words were used and highest care was taken to avoid biasing questions and implicit alternatives.

The following steps were taken into consideration while developing the questionnaire. Specify the information needed, Determine the Content of Individual Question, Specify the type Interviewing Method, Design the Questions to Overcome the Respondents Inability to Answer, Design the Question Structure, Design the Question Wording, Arrange the Question in Proper Order, Identify the Form and Layout, Reproduce the Questionnaire, Eliminate Bugs by Pre-Testing.

After the questionnaire was developed, it was pre-tested in a sample size of 30 to find out and eliminate potential problems. All aspects of the question were tested, for example wording, sequence, question difficulty etc. The only change was done in Q.1 in product

variable. Before the question was 'Do you ever taken a loan' but it was seen that most of the people hesitate to express the truth so this was changed to "would you like to take a loan'.

Sample Design

Sampling technique- Non-probability convenience sampling is adopted to collect the data. The following steps were taken into consideration during the sampling process: Define the Population, Determine the Population Size, Select Sampling technique(s), Determine the Sample size, Execute the Sampling Process, Reasons for non probability convenience sampling are: The nature of research was exploratory one to generate ideas and insights about the Population, homogenous population, least time consuming, least expensive and most convenient, sampling units are accessible, easy to measure and cooperative, useful in collecting data using pretested questionnaires.

ALLOCATION OF SCORES TO DIFFERENT CHARACTERISTICS IN QUALITATIVE SCORE CARD

This scoring was exercised based upon the past experience of Microfinance experts using Delphi method in microfinance segment and the knowledge gathered about demographic variables by studying the data collected regarding the target population. In this process different characteristics under each variable were scored taking into account the level of risk attached in disbursing loan to the population having that characteristics. Methodologies adopted for scoring: The constant model 800 was used in scoring the characteristics. The constant in this Model comes from an average % of Bad observed for different Microfinance Institutions across the world. Such average % of Bad customers is around 20%. For this reason the constant was taken as 800 which signify that the usual probability for repayment of a loan is 80%. The common definition of Bad in this segment is the clients

who have a maximum payment delay more than 30 days, and an average payment delay more than 7 days. Average score was taken as 10 (as per the 800 constant models). The characteristic of the major population was not assigned any score because total risk of the population is similar to the risk attached with that characteristic. The weight of scores depends on the expected correlation of a variable characteristic with risk. Each characteristic was either awarded or punished as per the past impression it had concerning the repayment of loan.

Age - The assumption made during assignment scores at initial stage that majority of the population lies between age group of 21 to 40 years, is true in case of MFIS's target population. Hence scores under the mentioned variable is valid in Indian context. But the characteristic "over than 60 years" should be punished by low weight because the life expectancy in Indian condition is close to 60 years and hence more risk is attached.

Marital Status- In the credit evaluation, Single population is normally more risky than the rest of the population, but looking to its important participation in the portfolio, it was weighted averagely. As Married population is the major one so no score was assigned to it, but as per the MFIS experts it was come to the knowledge that this variable has good differentiation capability hence this variable was assigned a low weight. Divorced and widowed population has no strong differentiation capability in the target market so it was not assigned any score.

Gender - The assumption for previously defined scores under this variable was that females have major participation in micro credit segment. But after frequency analysis it was found out that males have major participation as compared to females. Hence no score should be awarded to the male as it is the major population and hence less discriminative capability. In contrast female should be awarded by a low weight.

Language Skills - The client with better English knowledge is associated with better repayment behavior because of its more avenues of being employed; hence these characteristics were awarded with low and average weight as per the level of knowledge in English language Education Qualification- In microfinance, it's being found all around the world that elementary and technical degrees has better risk profile than the rest of the population, so these characteristics were awarded . In contrast, it was found out that the illiterates, graduates and under graduate's population is more risky, hence they were punished.

Insurance Coverage - Clients that uses insurances, not only have better chances of being paid for any inconvenience, but also belongs to a better risk profile population that effectively has better payment behavior and are highly desirable for lender organizations no. of dependents per family - In This variable children were taken as dependents, the reason of including this one instead of total number of dependents was that, number of sons is easier for applicant to lie around for dependents issue. As the most of the population has between 1 and 3 children, hence this population won't help so much in risk discrimination, but the clients with no children is associated to single or common connivance so is an interesting characteristic for punishment. Additionally, clients with 4 and more sons may have more family expenses and have more risky profile as per the microfinance experts. Hence there was a gradual punishment for this population i.e., as the number of sons increases, the punishment increases too.

Number of earning members in the family - Number of earning members in the family are always a point of assurance to others. With the increase in number of earning members the risk attached also reduces proportionately. But no earning member in the family is a matter of concern as far as loan disbursement is concerned; this is the reason for which this characteristic was punished. It was observed that no. of earning members for a family is generally 1 so this was not

scored. In contrast all other were scored as per their relative importance.

Home Ownership - In microfinance market, it was observed that population with own home has better risk profile than the rest of the population, so an award for them, in contrast, rented home is a risky characteristic, and hence it was punished.

Type of house - This variable has an importance in terms of collateral to the lender organization and could be used to recover the loan amount in the case of delinquency. The different characteristics under this variable were scored as their value in the market.

Duration of Stay at current location - Years of stay at a particular location creates a sense of assurance for the lender. Duration of stay up to 1 year is a risky characteristic in view of lender institutions hence it was punished. But in contrast other characteristics were awarded as per the level of security attached in getting the loan back.

Main income seasonality - The person having permanent source of income are more consistent towards their payment behavior hence this characteristic was awarded with average weight.

Additional Income Source - Any additional income source has a positive effect in risk profile of clients, so this characteristic was included for an award with low weight.

Purpose of the Loan - The purpose of the application product is a very important variable that has shown differentiation capability in the past. An average punishment was given for consumption purpose based on previous observation that it is not linked to a financial leverage and naturally not associated to the business activity. Additionally, a punishment was suggested for the loans for prepayment of other loans based on observations and associating this purpose with payment difficulty of previous financial obligations.

Payback period - As the term of repayment increases the risk also increased proportionately hence every lender institutions want their loan to be paid back as soon as possible. It was found out by taking into

account the past data base available that most of the population needs loan or more than 3 months. Hence this characteristic was awarded with low weight for the reason of having good discriminative power among the population.

Repayment Frequency - Reviewing the credit behavior of applicants associated to the payment frequency, it was found that daily and weekly characteristic has better payment behavior than the rest of population, so this characteristic was assigned for an award of low weight.

Experience as Micro entrepreneur - When a client has lower experience as Micro entrepreneur, then the business condition is more risky and this reflects in the credit behavior; so for new Micro entrepreneur population a punishment was suggested. In contrast, clients with more experience in business running will be able to have better business performance and naturally this will be reflected in the credit behavior; so a gradual award was given for this population.

Business Formality - The business formality is the status of the business regarding legal registration and licenses issuing; when a client has some formality level, his risk profile is better than a client that doesn't have it. An additional point considered for the scoring, was that in Indian rural market, most of the population has no legal registration, so it is more effective to award for formal business than a punishment for informal ones.

Business Premises Ownership - When the commercial location of the business is of own, the business and naturally the applicant have more collateral issuing capability, and naturally is a more desirable condition for lender institutions.

Business Age - Based on many statistics, the most of the business that falls into bankruptcy are the "younger" ones; hence they are more risky than the rest of the population, so they received a punishment. In contrast, older businesses are more stable and hence awarded.

Time at Current Location of the business - One of the factors that have shown interesting differentiation capability is the time at the current location of the business. Normally in microfinance markets, the business that are in the current location for under than a year had shown worst payment behavior than the rest of the population; in contrast, the business with over than 5 years shows better risk profile. Regarding this analysis, it was decided to consider a Average Punishment for clients with the less time at current location and a gradual price for clients that have being in the same location for over than 5 years.

Phone Lines - This variable is associated with the possibility of locating a potential client and this is why in this population any collection strategy is more effective; so it was decided a low award for them considering that this characteristics comprehends the minority of the population.

Number of Employees - The number of the employees, is focused on production sector and also is associated with the size of the business, and as is known that bigger business are more trustful than smaller ones, so a gradual award was given starting from 3 employees (different than owners) and over.

Land Ownership - Analogically, to business premises, the land ownership is a very discriminative variable. In MFIS population the minority of population has their own land; so it was awarded with an average-high weight.

Irrigation System Availability - The availability of irrigation system is a key factor in the productivity success, so it was included as a positive characteristic with a low award.

Production variety - This variable gives the idea of the size of production and was scored as per the profit generated from the business. Single production was punished because crop failure might lead to delinquency.

Type of live stock - It was found out that poultry is associated with more risk due to its vulnerability to number of diseases hence it was punished.

Total number of heads - The number of head is associated with the productive capability of applicant, as more amount of heads, as more productive he can be; so an award was given to the higher range of head numbers over than 5.

ANALYSIS OF DATA COLLECTED DURING FIELD SURVEY USING STATISTICAL TOOLS.

The following were the step by step methods adopted for data analysis.

1) Questioner checking: In this initial step all the questions were checked for completeness and interviewing quality.

2) Editing: It was done to review the questioners with the objective of increasing accuracy and precision. It consists of screening questioners to identify illegible, incomplete, inconsistent or ambiguous responses. For example a customer reported monthly income of less than 4000 but having mobile phones more than 2.

3) Treatment to unsatisfactory responses: The respondents with unsatisfactory responses were simply discarded. The reasons for this were: a) The proportion of unsatisfactory answers were under 10 % of the total; b) The sample size was large; c) Responses on key variables were missing.

4) Data cleaning: In this method the missing responses were calculated to smooth the data further. Substitution by a neutral value - A neutral value that is the mean response to the variable was substituted for missing responses. Thus the mean of the variable remains unchanged and other statistics such as correlation was not affected much.

5) Frequency analysis: Frequency analysis was done using Bar charts and Cross tabulation - The reasons of exercising frequency

analysis are as follows: a) To get an insight of the population; b) To find out the major characteristics of the population within a variable
6) Regression Analysis and Correlation Analysis

DATA INTERPRETATION OF THE SAMPLE COLLECTED

Regression model is presented in Tables 1 and 2. Valid sample size is (N=263). From the regression model it was found that the $R^2 > 0.6$.

Table 1. Variables Entered/Removed [b]

Model	Variables Entered	Variable Removed	Method
1	Monthly Income_New		
	Liability_New		
	Occupation	.	Enter
	Asset_New		
	Education,		
	Family size [a]		

a. All requested variables entered.
b. Dependent Variable: Repayment

Table 2. Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.672 [a]	.452	.439	.35706

a. Predictors: (Constant), Monthly Income_New, Liability_New, Occupation, Asset_New, Education, Family size

As the data collected was of social economical in nature, so this value of R^2 can be statistically accepted for drawing statistical conclusions.

Table 3. Coefficients of Six Variables [a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	1.988	.152		13.062	.000
	Occupation	.042	.040	.053	1.042	.298
	Education	-.037	.032	-.062	-1.153	.250
	Family size	-.013	.013	-.060	-1.006	.316
	Asset_New	-.177	.020	-.488	-8.665	.000
	Liability_New	-.061	.052	-.057	-1.181	.239
	Monthly Income_New	-.104	.039	-.166	-2.681	.008

a. Dependent Variable: Repayment

Table 4. ANOVA of Repayment with Predictor Variables [b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	26.875	6	4.479	35.133	.000 [a]
	Residual	32.638	256	.127		
	Total	59.513	262			

a. Predictors: (Constant), Monthly Income_New, Liability_New, Occupation, Asset_New, Education, Family size

b. Dependent Variable: Repayment

OCCUPATION

From the above coefficient table it was found out that occupation has a positive relationship with the repayment. From that we can conclude that as the housewife has more chances to default as compared to the self employed women and who are engaged in labour work. Hence the hypothesis of repayment capacity increases with the increase in

income generating activities holds good. The same can also be inferred from the following cross table. From the above cross table it can be observed that most of the bad payers are housewives but when we look at the good payers the % of housewives also very high as compared to other categories. The reason might be due to the skewed data collected.

Table 5. Repayment * Occupation Cross-tabulation

| | | | Occupation | | |
		labour	Self-employed	Housewife	Total
Repayment	goodpayer	9	62	101	172
	default	7	4	80	91
Total		16	66	181	263

Table 6. Frequency of Labor, Self-employed, Housewife

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	labour	16	6.1	6.1	6.1
	SELFEMPLOYED	66	25.1	25.1	31.2
	HOUSEWIFE	181	68.8	68.8	100.0
	Total	263	100.0	100.0	

Table 7. Correlations of Occupation and Repayment

		Occupation	Repayment
Occupation	Pearson Correlation	1	.213**
	Sig. (2-tailed)	.	.000
	N	263	263
Repayment	Pearson Correlation	.213**	1
	Sig. (2-tailed)	.000	.
	N	263	263

**.Correlation is significant at the 0.01 level (2-tailed).

According to the above correlation table there is a very low but positive correlation between the repayment and the type of employment. The positive correlation signifies that there is a positive correlation between the repayment capacity and the earning capacity of the client.

Table 8. Correlations of Repayment and Education

		Repayment	Education
Repayment	Pearson Correlation	1	-.344 **
	Sig. (2-tailed)	.	.000
	N	263	263
Education	Pearson Correlation	-.344 **	1
	Sig. (2-tailed)	.000	.
	N	263	263

**. Correlation is significant at the 0.01 level (2-tailed).

Table 9. Repayment * Education Cross-tab

		Education					
		ILLITERATE	PRIMARY	higher secondary	secondary	graduation	Total
Repayment	goodpaye	4	11	4	9	2	17
	defaul	7	1	2	3	0	9
Total		11	12	6	1	2	26

From the above regression coefficient table it was found out that education has a negative relationship with the repayment. From that we can conclude that as the literacy level is decreasing the chances of default is increasing. Hence the hypothesis of repayment capacity increases with the decrease in literacy levels does not hold good. As per the hypothesis as the education increases the bargaining power of the customers increases and they are more likely to default but from the

data collected it was found out that the hypothesis is not true and the reason might be as the education level decreases the earning capacity also decreases and has a negative impact on the repayment of the loan.

From the above correlation table it can also be proved that as the education level increases the repayment capacity also increases but if we observe the cross tabulation it can be inferred that most of the good payers belong to the low literacy level group. The contradiction in the above hypotheses stated is there but it can be because of more data on good payers rather than the defaulters.

Table 10. Repayment * family size new Cross-tab

Count

		familysize_new		
		1.00	2.00	Total
Repayment	goodpayer	132	40	172
	default	84	7	91
Total		216	47	263

Table 11. Correlations

		Repayment	familysize _new
Repayment	Pearson Correlation	1	-.193 **
	Sig. (2-tailed)	.	.002
	N	263	263
Family size_new	Pearson Correlation	-.193 **	1
	Sig. (2-tailed)	.002	.
	N	263	263

**. Correlation is significant at the 0.01 level (2-tailed).

As per the regression table for family size, it can be inferred that as the family size decreases the repayment behaviour of the client improves, but according to the hypotheses as the family size increases the liability of the payer increases and it has a negative impact on the repayment behaviour. But the contradiction may be due to non availability of the data on the no. of earning members in the family.

Monthly Income

Table 12. Correlations

		Repayment	Monthly Income_New
Repayment	Pearson Correlation	1	-.463 **
	Sig. (2-tailed)	.	.000
	N	263	263
Monthly Income_New	Pearson Correlation	-.463 **	1
	Sig. (2-tailed)	.000	.
	N	263	263

**. Correlation is significant at the 0.01 level (2-tailed).

Table 13. Repayment * Monthly Income_New Cross-tab

Count

		Monthly Income_New			
		<1500	1500-3000	3000-5000	Total
Repayment	goodpayer	28	91	53	172
	default	64	17	10	91
Total		92	108	63	263

From the above cross table (Monthly Income) we can see that the no. of clients having family members less than four are much higher

than the clients having family members more than four. So it can be one of the reasons for the contradiction to the hypothesis that as the no. of family members increases the liability increases. From the above cross table it was found out that as monthly income increases the repayment capacity of the clients increases.

The same can also be inferred from the correlation table which shows that as the income increases the repayment capacity of the client increases. But the low correlation coefficient may be due to the data collected and the sample size taken for the analysis. Hence the hypothesis that as the income increases the repayment capacity also increases is proved.

Asset

Table 14. Repayment * Asset_New

		Asset_New				
		<2000	20000-	40000-	>70000	Tota
Repayme	goodpay	4	1	4	7	17
	defaul	8	5	1	0	9
Tota		13	1	4	7	26

Table 15. Correlations of Repayment and

		Repayment	Asset_New
Repayme	Pearson	1	- *
	Sig. (2-tailed)	.	.00
	N	26	26
Asset_Ne	Pearson	- *	1
	Sig. (2-tailed)	.00	.
	N	26	26

** Correlation is significant at the 0.01 level (2-tailed).

From the asset correlation table it can be inferred that asset increases the repayment capacity increases. And also the coefficient is statistically significant as it is more than 0.6, which is good for the socioeconomic data analysis. The cross tabulation of asset against the repayment also signifies that as the asset increases the repayment capacity of the client increases.85% of the client having asset less than 20000 were default where as the client having more assets are good payers.

Liability

Table 16. Repayment * Liability_New Cross-tab

Count

		Liability_New			
		<20000	20000-40000	40000-70000	Total
Repayment	goodpayer	154	6	12	172
	default	91	0	0	9
Total		245	6	12	263

Table 17. Correlations of Repayment and Liability_New

		Repayment	Liability_New
Repayment	Pearson Correlation	1	-.189**
	Sig. (2-tailed)	.	.002
	N	263	263
Liability_New	Pearson Correlation	-.189**	1
	Sig. (2-tailed)	.002	.
	N	263	263

**. Correlation is significant at the 0.01 level (2-tailed).

From the liability correlation table it can be inferred that as the liability increases the repayment capacity of the clients are increased.

But it is in contradiction with the general hypothesis that as the liability increases the repayment capacity decreases. Thus it can be inferred that the good payers and the default has no differentiation with regard to the liability they owned. The reason might be due to the fact that there was no data for which they had taken the loan whether it was for consumption or as a working capital. Hence due to non availability of data it is not possible to infer any conclusion that what kind of relationship the liability has with the repayment capacity of the client.

CONCLUSION OF THE DATA ANALYSIS

As per the above analysis the hypothesis taken under scoring the variables for qualitative score card are consistent for the variables like occupation, education & monthly income hence there is no need to change the scores that are assigned. But any conclusion could not be taken out regarding the variables like asset, family size and liability due to some limitation.

Limitations to Data Analysis

In Indian context, till date most of the MFIs are dependent upon the qualitative judgment of their credit officers with regards to give loan to a client or not. This is for the first time an attempt has been taken to develop a statistical score card to evaluate the credit worthiness of a client prior to disbursement of the loan. Hence the data regarding all the variables chosen for the development of the score card is not available with the MFIs , which became an hurdle in proving the statistical significance of the qualitative score card . Apart from that some data for example Asset, family size & Liability are not complete to prove the statistical significance in relation to the repayment behaviour the client and also to assign scores to the variables chosen.

Recommendations for Future Improvement

To develop a score card having statistical significance the following things to be taken into consideration:-

a. The questioner should be filled up at time of enrolment prior to the disbursement of the loan, so after the repayment period the data can be utilized to analyse the impact of different variables on the repayment behaviour of the client.

b. During the data collection utmost care should be taken in collecting information regarding the assets & liabilities. Only those data which have significant contribution towards the repayment behaviour of the client should to considered in calculating the asset and the liability of a particular client.

c. The qualitative score card should be utilized to as a pilot basis for at least for a period of six month to evaluate the relevance of the score card as per the target population.

Strategy for Pilot Implementation of the Qualitative Score card Scorecard

Before the model will be used fully in production, it is recommended to accomplish some steps gradually, in order to minimize mistakes and unexpected events that may affect the lenders confidence regarding the tool. A detailed process flow for pilot implementation is shown in figure 1. The most important steps that should be involved in the pilot implementation, before the massive start are:
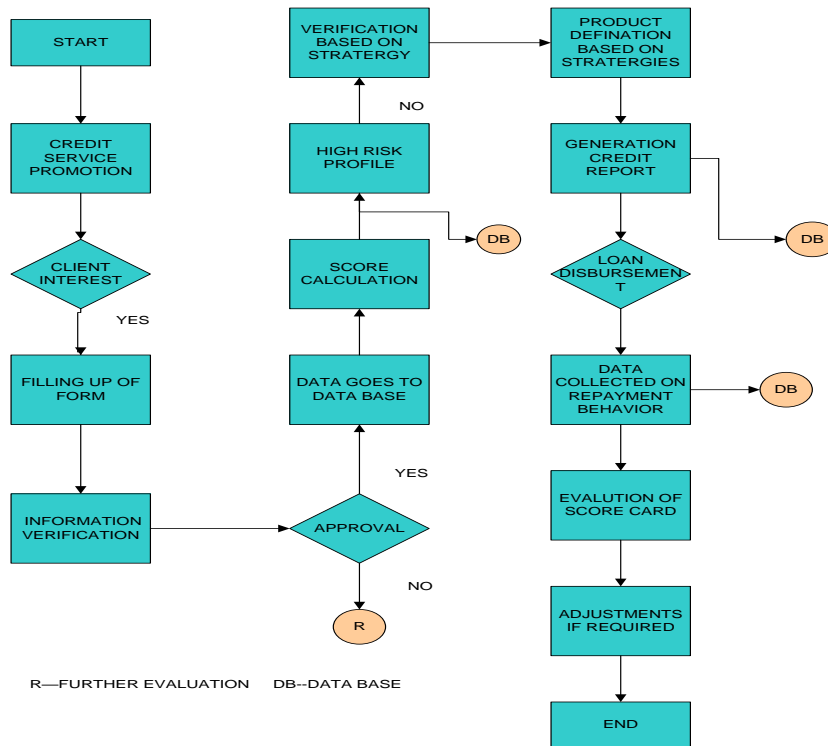
Figure 1 : PROCESS FLOW FOR PILOT IMPLEMENTATION

Figure 1 Process Flow for Pilot Implementation

1) Geographical Selection for Pilot

The first and a very important step is the selection of the right geographical segment to perform the pilot implementation. It is recommended to move forward on the basis of four criteria's for choosing the pilot segment: Average amount of population: Biggest segments may implicate big effort for implementation and could affect important portion of population. On the other hand, small branches may not have enough population for optimal evaluation. Thus, average population geographical segments should be selected. To avoid

analysing unrepresentative population, a segment with similar behaviour as the total population, regarding risk level should be chosen. Follow Up simplicity: In order to allow easy mobilization, the segments selected should be close to the location of the persons in charge of the follow-up. Geographical Segment staff availability: It is important to count on prepared and willing staffs that ensure that the tasks will be done in the right way.

    2) Preparation of the Resources for the Pilot Implementation
The objective of this step is to ensure that the results will be reliable and efficient, so it is important to plan this before the process starts. Standardization of the process flow in the approval and renewal process: This sub-step should be fixed, based on the process flow. The right way of doing all the stages in the granting process will ensure low threat of disappointment.

    3) Associated Staff Training:
Based on the standards established, Loan Officers, Coordinators and IT staff must be trained. Credit Officer (Loan Officer): the Loan Officer will be in charge of the contact with clients so his training must contain at least:
_ Standard way of credit products promotion
_ Standard way of collecting first data
_ Standard of full data collection trough visit
_ Interpretation of results
_ Process for each risk profile
_ Verification process
_ Decision taking (regarding strategies determination based on autonomies)
_ Concept issuing for the referral.
_ Referral to Credit Committee or Managing Board (as for decision as for review)
_ Notification and disbursement process
_ Data Storage.

Credit Department Head:
_ Full understanding of the task of Loans Officers
_ Periodical follow up of credit process
_ Controls in the process
_ Decision taking regarding autonomy
_ Review of application before referral to committee or Managing Board
_ Referral to Credit Committee or to Managing Board
Credit Committee:
_ Decision taking in applicants evaluation based on risk profile
_ Collateral Definition regarding scoring strategies
Managing Board:
_ Decision taking in applicants evaluation based on risk profile
_ Collateral definition regarding scoring strategies
_ Special cases evaluation

4) Pilot Implementation
During pilot implementation utmost care should be taken in accurate saving of the information, which is a key factor for the evaluation reports. Periodical Follow-up: In order to have permanent control of the Scoring Model performance it is suggested to collect daily the application information and to perform weekly reports for systems calibrations. Pilot implementation report: This information will be the main guide line for the latter massive implementation, and should have at least the following:
_ Description of the Pilot Implementation Process carried out at each branch.
_ Evaluation of "Step by Step" process carried out with a specific focus on things to
improve.
_ Proper documentation of process reports.

5) Mass-implementation

Before staring the mass-implementation, this stage must be carefully planned keeping in mind the findings and the outputs from the pilot implementation.

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