Determinants of Credit Default Risk of Microfinance Institutions in Assosa Zone

Gudata Abara[1] Biniam Mengesha[1] Dr. P.A.K. Reddy[2]
1.Assosa University, College of Business and Economics, Department of Accounting and Finance
2.Wollo University, College of Business and Economics, Department of Accounting and Finance

Abstract
The paper deals with assessment of the determinants of default risks in microfinance institutions in Assosa zone. The problem identified was that microfinance programs performmeagerly because of delay in repayment and high default rates. Hence, it has been essential toestablish if these limitations prevailed in the selected 8 MFIs in the zone schemed bydetermining the default rate and the grounds of the observed series. Therefore, in orderto address those issues, the researchers collected primary data collected through structuredquestionnaire and captured secondary sources of data. The data analysis tools used were descriptive and inferential analysis. The logistic probit model was employed to estimate the determinants of credit default risk and the repayment performance. The finding shows that credit diversion is positively related to number of dependents supported by the borrower, use of financial records, credit/loan size and number of times borrowed(sig 10%) from the same source. Income from other sources than credit/loan, loan supervision made to the borrower and suitability of credit repayment period (1%) were found to be negatively related to loan diversion. The results also pointed out that credit diversion fitted value of credit/loan diversion rate (FITCDR) is significant and negatively related to credit repayment performance. The negative sign probably implies the use of diverted funds for non-income generating purposes, and it is significant at 5%. In addition gender, credit/loan size and number of dependents are all negatively related to the probability of credit repayment. Only suitability of repayment period is significant at 1% level. So, the MFIs are recommended to solve problems observed in its rationing mechanism. Moreover, the processes should be worked out to identify borrower capacity and any obligations that may interfere with repayment. Finally, they should intensify recovery of outstanding balances from defaulters through increased borrower follow-up.
Keywords: MFIs, Credit Default, Credit Diversion, Loan Rationing, Creditworthy.

1.1 Introduction
Microfinance has evolved as an approach to economic development intended to benefit low income women and men. It expanded enormously in 1990s (Ledgerwood, 1999). Policy makers, donors, practitioners and academics underline the role of microfinance as a powerful tool for poverty alleviation and economic development. The formal financial sector has failed to reach the majority of the rural as well as urban poor. This has forced the poor to turn to the informal and semi-formal financial sources. However, credit from such sources is not only inadequate, but also exploitative and costly. In Ethiopia, microfinance services were introduced after the demise of the Derg regime following the policy of economic liberalization. According to Hunte (1996), default problems destroy lending capacity as the flow of repayment declines, transforming lenders into welfare agencies, instead of a viable financial institution. It incorrectly penalizes creditworthy borrowers whenever the screening mechanism is not efficient. Credit default may also deny new applicants access to credit as the bank's cash flow management problems augment in direct proportion to the increasing default problem.

1.2. Statement of the Problem
The major objective of MFIs is to provide banking and credit facilities to the poor and to micro-entrepreneurs, who otherwise would lack access to financial services (Akintoye, 2007) cited in Mojisola Oguntoyinbo (2011). However, lending to micro-entrepreneurs is based on a promise to pay without collateral. Such transactions entail risk to the financial institution: when borrowers fail to pay, the default constitutes loss to the institution concerned, which eventually impacts negatively on the capital of the institution. It is generally accepted that credit, which is put to productive use, results in good returns. But credit provision is such a risky business that, in addition to other reasons of varied nature, it may involve fraudulent and opportunistic behavior.

Given the above mentioned problem, the performance of most microfinance programs, however, has not been encouraging. Many have been plagued with such problems as high default rates, inability to reach sufficient numbers of borrowers, and a seemingly unending dependence on subsidies. Few of them have lived up to their original objective of "including the excluded" (Bhatt, 1997).For such MFIs to be successful, they should be sustainable both financially as well as institutionally. On top of sustainability, one has to include developmental effects like income on the target group as core measure of success. For agencies that are involved in the development or in assisting the development of a microcredit institution, it is recommended that profitability and sustainability should be the final goals, and therefore, the only indicators of success (Rudkius, 1994). Although the performance of the MFIs in the region has been impressive since their establishment, they are experiencing default problems.

As pointed out earlier, it is obvious that many rural credit schemes have sustained heavy losses because of poor credit collection. And yet a lot more have been dependent on government subsidy to financially cover the losses they faced through credit default. But, such dependence will not prove helpful for sustainability. MFIs should rather depend on credit/loan recovery to have a sustainable financial position in this regard; so that they can meet their objective of alleviating poverty. This study endeavored to investigate credit default risk in microfinance institutions. Even though many researchers undertake a research on credit default risk in micro finance institution, the study did not conducted in Asossa zone microfinance institutions regarding the following problems indicated. The problem identified is that microfinance programs perform poorly because of slow repayment and high default rates. Hence, it is important to establish if these limitations prevail in the selected credit and saving institutions of Assosa Zone scheme by determining the average repayment delay and default rate and the causes of the observed trends.

Set the above discussed problems in the credit and saving institution along with the gap in the literature with regard to credit default risk in microfinance, the study attempts to assess the gap in credit repayment with reference to the aforementioned microfinance institutions in Assosa Zone in order to forward suggestions for microfinance institutions as such problems raised.

To solve the mentioned problems the following are research questions:

- What are the causes influencing the credit default problem of borrowers financed by credit and saving institutions?
- What are the determinants of credit default risk and the outcome of credit repayment on MFIs, families, and the community?
- How much screening mechanism microfinance institutions influence default?
- To what extent the default affect the MFIs, families, and the community?

1.3. Objective of the Study

The general aim of this study was to assess the Determinants of credit default risk of Microfinance Industry in Assosa Zone.

The specific objectives were:

- To identify the causes which are influencing the credit default problem of borrowers financed by credit and saving institutions;
- To investigate determinants of credit default risk and the outcome of credit repayment on enterprises, families, and the community;
- To evaluate the impact of selected microfinance institutions screening mechanism on default;
- To assess the effect of default on enterprises, families, and the community.

1.4. Significance of the Study

The importance of the current study cannot be over-emphasized. The study will give greater insight into the activities of Assosa's Zone MFIs and how they pursue their businesses in order to meet the objectives for which they were established. The study will also reveal the weaknesses of the institutions and enable policy changes that will not only energize the organizations concerned, but also strengthen them so that they develop the capacity to surmount identified environmental challenges. Overall, access to microfinance by the poor segment of the society will be enhanced, which will ultimately raise the levels of income, employment, welfare, and national development.

2. Material and Methods

The study adopts a descriptive survey and inferential design. Descriptive research is used to obtain information concerning the current status of the phenomena to describe "what exists" with respect to variables or conditions in a situation. The technique was appropriate as it involved a careful in depth study and analysis determinants of credit default in micro finance industry in Asossa zone. Further, this section organized in to two components. The first section describe about research approach (philosophy).

The base for drawing the sample size is the total number of 11857 customers in Asossa zone micro finance institution. Because of they are from different wereda's the sample size was determined by statistical formula as follow;-

1 If $N \geq 10000$, then sample size= $n = z^2 * pq/d^2$
2 If $N \leq 10000$, then sample size = $n = n/1+n/N$
P= the proportion of the target population estimated to have characteristics being measured or probabilities of success= 0.5
Q= levels probability of failure

q=1-p =1-05=0.5^8
d= the level of statistical significance set= 0.05
z= the standard normal variable at required level of confidence (95=1.96)
n= 1.96^2 *0.5*0.5/0.05^2
n= 384

Then since the sample size is determined from different wereda or strata using proportional method as follow. To select items from each stratum or to allocate the sample size of each stratum/woreda we followed the method of proportional allocation under which the sizes of the samples from the different strata are kept proportional to the sizes of the strata. That is, if *Pi* represents the proportion of population included in stratum *i*, and *n* represents the total sample size, the number of elements selected from stratum *i* is *n* . *Pi*. To illustrate it, let us suppose that we want a sample of size *n* = 384 to be drawn from a population of size *N* = **11,857** which is divided into eight strata of size *N*1 = 3838, *N*2 = 2435, *N*3 = 645, N4 =1169, N5 = 1308, N6= 1137, N7=749 and N8 =576. Adopting proportional allocation, we shall get the sample sizes as under for the different strata (kohatari, 2004).

For strata with *N*1 = 3838, we have *P*1 = 3838/11857 and hence *n*1 = *n*. *P*1 = 384 (3838/11857) = 124. Therefore, the formula stands for all woredas in selecting sample size. In addition, from the offices thirteen (13) managers are purposively selected.

Therefore, the researchers of this work only include five year round of credit disbursement of the maturity of which has passed at the time of data collection to be used i.e. credit extended during the last 5 years of rounds from 2010/11 through 2014/2015. The data will be collected by distributing structured questionnaires i.e. open-ended and closed-ended questionnaires to clients that will be self-administered defaulters and non-defaulters in order to dig out borrower‘s repayment; business performance; and the effect of credit repayment on the enterprise, family, and community. The data collected through questionnaires was tabulated and analyzed using the Statistical Package for the Social Sciences (SPSS) software package 21 these includes mean and standard deviations. Descriptive statistics and regression analysis was used to analyze data.

3. RESULTS AND DISCUSSION

3.1. Operations of the study areas

Table 4.1 Number of clients being served by the elected 8 MFIs

S.No	Branches	Number of customers	Selected samples from customers	Number of employees	Selected sample from officials
1	Assosa	3838	124	10	2
2	Bambasi	2435	79	11	2
3	Mao Komo	645	20	3	1
4	Oda	1169	39	3	1
5	Homosha	1308	42	3	1
6	Mengie	1137	37	4	1
7	Sherkole	749	24	3	1
8	Kurmuk	576	19	4	1
	Zone Head office	-		7	3
	Total	**11857**	**384**	**48**	**13**

Source: Compiled from survey, 2016

As shown in table 4.1 above, the current total number of clients stands at 11,857. The total number of female beneficiaries is 7546 (63.64%), while that of the male beneficiaries is 4311 (36.36%).

3.2 Effect of repayment on enterprises, families, and the community

The study also sought to discover what repayment burdens placed on the enterprise might cause default. Responding to study questionnaires, one-third of the respondents pointed out repayment had no effect on the enterprise. The remaining two-thirds, however, said that repayment had led to a reduction in their stock levels. Some said that they were not able to make any savings because they used profits to repay the credit. Other borrowers said that they were using means beyond business to repay their credits. Some credit recipients even admitted suffering from depression as a result of the repayment burden, and they said the depression was affecting relationships with customers and was leading to poor business performance. As a result of repayment, some businesses had closed their doors. Those who were repaying were doing so to maintain trust with the lending institutions to avoid prosecution. Some borrowers explained that repayment was a burden only when sales were low.

With respect to the burden on borrowers' families, around 20% no effect on the family. The remaining 80% said that repayment reduced family income and that children‘s school fee payments repayment was expensive because they had to spend a lot more on transportation.

Meanwhile, 66.19% of the borrowers also were aware of the effect of their repayment on the community. They said that community members benefited by credit/loan repayments. Some respondents noted that good repayment encouraged other community members to take credits and start businesses that provided needed goods and services to the community. They also pointed out that credit defaults cause the community to lose those goods and services and that poor credit repayment makes community members hesitant to take any credit for development.

3.3 Determinants of credit repayment performance

During the estimation process, the equation for loan diversion was detected to have problem of heteroscedasticity. Hence, this method employs the estimation of interval regression. According to the procedure interval regression is estimated using variables generated from the dependent variable and was shown how such a regression is used to obtain the same results as the Tobit regression. Thus, to obtain the robust standard errors, it is only a matter of adding the robust option to the interval regression. Accordingly, an interval regression is estimated using the variables generated from the dependent variable in the same way as explained above and on the other hypothesized explanatory variables. Next, the robust option is used on the same regression to correct for the problem of heteroscedasticity. The final estimates so obtained are given below.

Table: Maximum likelihood estimation for credit/loan diversion

Number of obs = 337
Wald chi2(8) = 15.64
Log likelihood = -106.99844 Prob > chi2 = 0.0478

	Coefficients	Robust Std. Err.	Z-value	Sig.
D	-0.2056432***	0.113016	-1.81	0.067
CSZ	0.0000411	0.0001404	0.29	0.770
SRP	-0.3266075*	01147342	-2.85	0.004
INCA	-0.0000298	0.0001758	-0.17	0.865
FR	0.1500751	0.1702739	0.88	0.378
SPV	-0.0172498	0.0985662	-0.18	0.861
NDP	0.0004972	0.0191063	0.03	0.979
NTB	0.0754362***	0.0481348	1.57	0.117
Cons	-0.2642259	0.2515055	-1.05	0.293
/sigma	0.5177089	0.0467682		

*significant at 1% ***significant at 10%

The estimated model is significant at the 5% level. As shown in the table 5.1, credit diversion is positively related to number of dependents supported by the borrower, use of bookkeeping, credit/loan size and number of times borrowed from the same source. Education, income from other sources, loan supervision and suitability of credit repayment period were found to be negatively related to loan diversion. Suitability of repayment period was found to be significant at 1%, while education and number of times borrowed were found to be significant at 10%.

The sign of the variable representing the use of financial recording systems has an unexpected sign i.e. positive however insignificant. The reason for this could be the fact that, even the few educated ones are unable to use modern and accurate methods of keeping financial records. The rest of the variables have exhibited the expected signs. Further, the results indicate that education, number of times borrowed and suitability of repayment period are significant determinants of credit diversion.

Imminent to the discussion of the estimates of the probit model for credit default equation, the existence of problem of heteroscedasticity has been detected. This has necessitated the estimation of robust model. The estimation results are presented in table 5.2. Nevertheless, the overall goodness of fit indicates that it is significant at 1%, implying that the explanatory variables used in the regression equation explain the variation in the dependent variable quite well.

Table: Maximum likelihood estimate of a probit model for credit default

Probit estimates

Number of obs = 337
Wald chi2(10) = 53.07
Prob>chi2 = 0.0000
Pseudo R^2 = 0.8070

CD	Coefficients	Robust Std. Err.	Z- value	Sig.
D	1.218347***	0.6817127	1.79	0.074
GEN	-0.1295234	0.6335709	-0.2	0.838
AG	0.0077951	0.1234208	0.06	0.95
AGSR	-0.00043	0.0013922	-0.31	0.757
INCOM	0.0346739	0.0145101	2.39	0.017
SRP	2.166316*	0.6107892	3.55	0.000
NDP	-0.0415804	0.1120186	-0.37	0.710
CSZ	-0.0020723**	0.001014	-2.04	0.041
SPV	0.9705793***	0.5811818	1.67	0.095
FITCDR	-9.794303**	4.710661	-2.08	0.038
Cons	-3.491235	2.933985	-1.19	0.234

*significance at 1% **significance at 5% *** significance at 10%

Explanatory variables used in the estimation of credit repayment performance equation were found significant. According to the estimates, credit diversion fitted value of credit/loan diversion rate (FITCDR) is significant and negatively related to credit repayment performance as expected. The negative sign probably implies the use of diverted funds for non-income generating purposes, and it is significant at 5%.

Consequently, gender, credit/loan size and number of dependents are all negatively related to the probability of credit repayment, none being inconsistent with expected signs. Among these variables, only credit/loan size is significant at 5% level. This shows that the higher the credit/loan size, the lower the probability of repaying the credit/loan. On the other hand age was found to be positive, while age squared turned out to be negative. This shows that, as age increases, the probability of credit repayment increases up to a certain level of age beyond which performance will decline i.e. there is a non-linear relation. Both these variables are statistically insignificant.

Moreover, income from activities financed by the credit/loan and suitability of repayment period are positively and significantly related to loan repayment performance.

3.4 Evaluation of the loan rationing mechanism

Harmonizing table 5.3 below, 6 variables included in the model were found to be significant. According to the estimates presented in the table, credit diverters, borrowers supporting larger number of dependents, borrowers earning more income and literate borrowers are more rationed, i.e. the probability of such borrowers being rationed is high. On the other hand, borrowers who are older, male, apply for larger loan size, perceive supervision as adequate, and perceive the repayment period as suitable. Literacy level, age, suitability of repayment period, number of dependents and credit diversion are found to be significant in the model.

Table 5.3 Maximum likelihood estimate of a logit model for loan rationing
Probit estimates

Number of obs = 337
Wald chi2(10) = 22.95
Prob > chi2 = 0.0180
Pseudo R^2 = 0.1246

Log likelihood = -72.055849

CRAT	Coefficients	Robust Std. Err.	Z- value	Sig.
D	-0.5928361**	0.2545076	-2.33	0.020
GEN	0.1747426	0.2897258	0.6	0.546
AG	0.1202621***	0.064093	1.88	0.061
AGSR	-0.0013319***	0.0007051	-1.89	0.059
INCOM	-0.0073434	0.0050361	-1.46	0.145
SRP	0.5073275***	0.3421386	1.78	0.108
NDP	-0.1135034**	0.0502756	-2.26	0.026
CSZ	0.0002257	0.0004294	0.53	0.599
SPV	0.0408717	0.2420632	0.17	0.866
FITCDR	-2.878546***	1.72271	-1.67	0.095
Cons	-1.534739	1.475238	-1.04	0.298

**significance at 5% ***significance at 10%

With this brief description of the estimation result, the evaluation of the loan rationing (screening mechanism), according to Hunte (1996), if a variable is positively signed in both equations, then the borrower with such a characteristic is correctly identified as creditworthy. If it is negatively signed in both equations, then the borrower with such a characteristic is correctly identified as non-creditworthy and hence should be rationed.

Meanwhile, if on the other hand a variable is positive in the credit repayment equation and negative in the rationing equation, then the screening technique is incorrectly rationing a creditworthy borrower. Likewise, if a variable is negative in the repayment equation but positive in the rationing equation, it implies that the borrower having such a characteristic that results in poor credit recovery is less rationed while he/she must have been rationed more. In view of that, borrowers who are aged perceive the repayment period as suitable, perceive credit/loan supervision as adequate are correctly identified as being creditworthy and were not rationed or are less rationed. Correspondingly, borrowers who are credit diverters and support larger number of dependents are correctly identified as being non-creditworthy, and hence are rationed.

Conversely, borrowers who earn more income from activities financed by the credit/loan and who are more educated are incorrectly rationed despite being creditworthy, while those who applied for larger credit amount and those who are male are less rationed in spite of the fact that they contribute to poor loan recovery rate. Overall according to the evaluation technique given above the screening mechanism employed by selected MFIs seems to be sound, since in most of the variables, the criteria used were correct. In concluding this slice, it is important to point out that although in over half of the criteria discussed above the screening technique was sound in the selected 8 MFIs.

4. Conclusions and Recommendations

The rationale of this last chapter is to review the intact thesis and bring to light future research directions. Accordingly, section one presents an abridgment of the study and its major findings. Section two presents recommendation and section three is about implication for further study.

4.1 Conclusions

Based on the result of the findings the following conclusions were made:

With the aim of identifying the determinants of credit default, an attempt was made to judge against defaulters with non-defaulters. Accordingly, it was found to be on average a bit younger with more proportion of them being male, illiterate, and loan diverters. They also receive a smaller credit amounts, earn smaller income, and support more dependents than the non-defaulters. The difference between the two groups was found to be significant in terms of credit/loan diversion and income.

The findings of the econometric analysis reveal that, education, number of times borrowed and suitability of repayment period are significant determinants of credit diversion.

The gender, credit/loan size and number of dependents are all negatively related to the probability of credit repayment. Among these variables, only credit/loan size is significant at 5% level. This shows that the higher the credit/loan size, the lower the probability of repaying the credit/loan.

Moreover, income from activities financed by the credit/loan and suitability of repayment period are positively and significantly related to loan repayment performance.

It was found that the credit scheme has contributed positively towards improving the income, access to education, and access to health service of borrowers. Overall it seems that the scheme is contributing towards reducing poverty.

4.2 Recommendations

This study has found that improving the selected MFIs performance is a prerequisite to make it more effective in carrying out its mandate and providing technical support to micro-enterprises so as to improve their profitability. To this end, the selected MFIs of Assosa Zone should consider the following recommendations:

- Strengthen its management information systems to produce up-to-date credit/loan repayment statements for borrowers and to enable early detection of potential default problems. Doing so will help the MFIs take quick follow-up actions, such as providing debt counseling or issuing demand notices.
- Toughen its staff by enhancing the capacity of its computer applications. This will enable optimal use of the available computer facilities, speed up loan processing, and ensure timely disbursements and collection of credits.
- Intensify its follow-up on borrowers to improve recovery of outstanding loan balances accruing to slow re-payers and defaulters.
- Revise its borrower appraisal instrument to help identify deserving but vulnerable micro-entrepreneurs.
- Vetting should determine how much debt the borrower can handle comfortably, his or her income streams, and any other obligations that might interfere with repayment. Doing so can enable the selected MFIs board to provide the borrower with appropriate counseling and support to avoid credit default.
- Rationing those with more income could be seen, as a deliberate pro-poor action on the part of the lending institutions, if at all it is done with such an intention. On the other hand, the majority of the institutions clients whose eligibility for participation in the scheme is based on the criteria of being poor are illiterate. Since most of the time literacy and wealth are positively related, and that it seems that the selected lending institutions are focusing more on equity than efficiency by rationing the literate clients more strictly than the illiterate ones.

4.3 Implication for further study

There are a number of issues which deserve further research direction. This study focused on credit default risk of MFIs in BGRS. The relevance of the findings of the study perhaps limited with the selected 8 MFIs. Since from the data collected for this study the number of respondents that reported having access to other credit sources is very few, this finding needs to be further studied. Also there may be a need to test if there is some sort of association between credit repayment and purpose of borrowing.

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