

Agricultural Credit Risk Management and Microfinance Performance in Cameroon

Mbu Daniel Tambi¹ and Nono Defo Eddy Damaris²

1. Assistant Professor, Department of Economics, University of Bamenda, Cameroon, E-mail: tambi2015@yahoo.co.uk (corresponding author)
2. Research Scholar, Department of Agricultural Economics, University of Dschang, Cameroon, P O Box: 222 FASA. E-mail: damaris.nono@yahoo.fr

Abstract

Risk management with a view to improving financial performance is one of the major challenges currently faced by Microfinance Institutions. Methodologically, the study make used of the multiple correspondence analyses to construct an agricultural credit risk management indicator and used ordered probit model to estimate the result, using data collected on a sample of 100 microfinance personnel. The result shows that risk management has a positive and significant impact on the financial performance of Microfinance Institutions in Cameroon. In terms of policy, lenders should intensify follow up on borrowers in order to minimize credit risk, while the decision makers should subsidize Microfinance Institutions and farmers to alleviate poverty and reduce interest rate.

Keywords: *Agricultural credit, Cameroon, Financial performance Microfinance, Risk*

JEL Classification: *M1, D2, T3*

1. Introduction

Issues on agricultural credits are at the top of the debate in all countries that rely on agriculture for their external incomes. Over the centuries, three major types of popular financial systems have developed around the world. The oldest, Catholic-inspired is the pawnshop which is in fact a pawnbroker system with a minimal interest rate, intended solely to cover the costs of running the business (Lhériau, 2009); the first pontiff was founded in Italy in 1468. From the second half of the 19th century, on the initiative of notables and sometimes the state, a real movement of mass

banking made its emergence with mutual credit systems and savings and cooperative credit. It was during this period that the very first savings and mutual credit were created by Raffaisen in Rhémanie (Cornee, 2006).

In the 1970s and early 1980s, new financial systems were created to combat usurers' practices. Guaranteed by a solidarity guarantee system, these financial systems were based on microcredit for productive activities. They subsequently developed various financial services, including collecting savings while maintaining the priority of productive credit on hoarding. It is from this that we have witnessed the birth of modern concepts of microcredit or micro finance institution (Djoumbi, 2013). Before the mid 80s crisis in Cameroon, the rural sector depended on the administered economy in place as part of the five-year economic and social development plans. Agricultural policy in this context relies mainly on three orientations (Epo, 2012): maintaining and consolidating food self-sufficiency, developing export crops, improving living conditions in rural areas. Meanwhile, the financing of the rural sector in this period is marked by a succession of more or less specialized bodies in this field, which have had rather mixed results in terms of improving production, increasing yields, increase in incomes of the peasants despite the colossal amounts distributed (Moulende, 2003).

In Cameroon, microfinance in its traditional form (tontine) dates from more than a century (Creusot, 2006) began in formal form in 1963 with the creation of the first credit union (credit union) in the English-speaking area of Cameroon under the impetus of Dutch missionaries. These credit unions are now grouped together under the Cameroon Cooperative Credit Union League (CamCCUL), the largest network of Microfinance Institutions in Cameroon, which in 2000 established a commercial bank, known as the Union Bank of Cameroon (UBC). They have now developed remarkably and diversified thanks to the laws n° 90/053 of 19th December 1990 on freedom of association and n°92/006 of 14 August 1992 on co-operative societies and joint initiative groups.

Microfinance in Cameroon and many African countries are an important economic activity. Most nations now rely on micro and small enterprises in the private sector for a real economic recovery (Djoumbi, 2013). In view of the financing difficulties encountered by the government, microfinance is presented as the appropriate solution. It offers services and products to populations living essentially on the margins of the traditional banking system. As many of these people are poor, microfinance has become a privileged mechanism for combating poverty and promoting small entrepreneurship. Several experiments show that microfinance can help the poor to increase their incomes, create viable enterprises. By facilitating access to financial services, microfinance plays an important role in addressing the many dimensions of poverty reduction (Creusot, 2006). For example, income generated by an activity financed by micro-finance not only allows this activity to develop, but also contributes to household income and thus to food security and healthcare. Thus, microfinance addresses one of the most important economic problems in poor countries, namely high cost and difficult access for the vast majority of people (Onomo, 2004). It must be said that today microfinance is attracting a great deal of interest from several investors, given the complexity of the banking sector in terms of capital requirements, on the one hand, and high cost of banking services such as credit, savings, health insurance that were once reserved only to the rich. It should be noted that less than 5% of Cameroonians have access to the traditional banking system (COBAC, 2011). Credits in general and agricultural credit in particular are considered to be the main activity of the MFIs in Cameroon though this involves several risks. Management of these risks is necessary to improve the financial performance of the MFI.

According to the regulation N°01/02/CEMAC/UMAC/COBAC concerning the conditions of exercise and control of the activity of Microfinance in the Economic and Monetary Community of Central Africa (CEMAC), microfinance is an activity carried out by authorized entities not having the status of a bank or a financial institution and which traditionally

engage in credit and savings collection operations and offer specific financial services to populations. The Microfinance Establishment abbreviated EMF refers to the entities that carry out the microfinance activity in the CEMAC zone, elsewhere, they are called Microfinance Institutions (MFIs). Both MFIs and banks are exposed to a number of risks in the course of their activities. The risk for the financial firm as for any other is the potential magnitude of the difference between the value actually created and the value creation objective that has been set. Risk here, is defined as the probability of loss to which the firm or institution is exposed. However, to achieve the objectives it is worthwhile risk-taking (COBAC, 2011).

The presence of risk implies management of the latter in order to guarantee the sustainability of the company. The fact that an EMF lends money to people to create value immediately creates a risk of non-repayment by borrowers. The literature on the management of credit risk and the financial performance of the EMFs have always focused on the determinants of the financial performance (Tchuigoua and Nekhili, 2012), contractual and regulatory risk management arrangements and performance of microfinance institutions (Lahcen, 2010). Churchill and Dan (2001) also showed how to manage microfinance risks through a description of the types of risks, the risk assessment framework and the risk management process. Very little attention has been paid on the effect of agricultural credit risk management and the financial performance of MFIs. This study is therefore interested at highlighting the determinants of agricultural credit risk; show the influence of credit risk management on the financial performance of MFIs and to determine the constraints faced by MFIs in granting agricultural credits.

2. Literature Review

The concepts of risk management and financial performance are widely used in microfinance. These concepts cannot be addressed without reviewing a few authors who have already addressed either risk management or the financial performance of Microfinance Institutions (MFIs). Churchill

and Dan (2001) noted that risk is exposure to a high probability of loss. This is not a bad thing in itself, it is true that it is essential to take risk for the smooth running of microcredit activities, but it is very important to take calculated risks. This reduces the likelihood of achieving and reduces the degree of loss in case this happens. In other words, risk management is very important in the activities of MFIs and as such it involves the prevention of potential problems and the anticipated decision. Microfinance risk management is a continuous process because vulnerability changes over time. They propose three steps to manage a risk: identify current and future vulnerabilities; monitoring the effectiveness of controls; design and implement controls to mitigate risks. The first step in limiting the risk of financing involves choosing clients to ensure they have the will and ability to repay the loan. Thus, in order to analyze the client's profile in relation to credit, the use of the five Cs is necessary for better identification of the client (character, capacity, capital, consent and conditions).

Azokly (2010) in a study of the contingent factors of the repayment rate within an MFI, the case of Togo shows that contingent factors such as credit rank, loan object, place of residence of the borrower and the age of the borrower have a significant influence on the rate of credit repayment. Nzongang et al (2010) introduced limits in terms of the repayment performance of credit in a credit mutual company in Cameroon. They identified the determinants of the default rate in this institution by a multiple regression analysis on the data collected on a sample of loan files granted to mutuality. They show that factors related to borrowers (age, disposition of supplementary income, etc) and to the institution (credit amount, credit duration, etc) unpaid in that institution. The work of Azokly (2010) grouped the causes of delinquencies into three categories: causes related to the institution (insufficient follow-up of clients financed, poorly studied loan files, violations by the staff of policies and procedures credit set-up, agent fraud); causes related to the borrower (mismanagement of the company, non-investment of credit in the company, bad faith); external

causes (natural disaster such as floods, drought, invasion of migratory locusts, earthquake, illness of the debtor, death of a close relative/himself).

Credit risk was the first banking and financial risk placed at the center of prudential regulation (Lahcen, 2010). In 1988, the Basel Committee on Banking Supervision recommended that the financial institution comply with a Cooke solvency ratio according to which the ratio of regulatory capital to weighted assets should be at least 8%. However, even if the capital requirements introduced in 1988 were considered a good bulwark against financial instability, the numerous bank failures that occurred during the year 1990 (Dietsch and Petey, 2003). Sardi (2002) showed that the cost of banking crises in terms of lost activity would reach 20% of the Gross Domestic Product. In addition, in the face of changing credit risks, the Cook ratio mechanism has shown its shortcomings due to the lack of relationship between capital requirements and actual credit risk to the economy. In particular, the ratio does not take into account or differences in the quality of private borrowers, since virtually all loans to the private sector bear capital costs corresponding to 8% of the loans, irrespective of the maturity of loans, their size and the financial soundness of their beneficiaries or the potential reduction in risk arising from portfolio diversification, collateralization or credit insurance. There is a multitude of risk of bank loans. Their classification, typology differs according to the authors, mainly because of the strong interdependencies that exist between the risks, some may entail the others but the same denominations for the risks of the credits. Sardi (2002) therefore listed ten of the risks of bank loans, which he group into five categories: counterparty risk, risk to a customer or an operational risk of interest rates, corporate or professional risk and general risk.

There are two main types of credit risk: a risk of default (the risk that a borrower is no longer able to meet its obligations and/or the principal of a debt); a risk of depreciation of credit quality: this is due to the deterioration of the financial strength and the counterparty and consequently the quality of

the signature. As for Sardi (2002) it is possible to distinguish two main types of risk of credit: risk of default or default which corresponds to the debtor's inability or refusal to fulfill or to ensure in good time his financial obligations to his creditor in respect of the interest or principal (of the claim); risk of deterioration in credit quality: is defined as the risk that the quality of credit perceived deteriorates, without the fact that the default is a certain event (Modou, 2011). Several authors have inventoried the components of credit risks in different ways but what draws our attention is the management of credit risk. In order to minimize credit risk losses, institutions adopt a well-defined risk management policy, given the complexity of credit management; we will be satisfied with presenting some good practices in the field of credit risk management. For CARE international (2001), the risk management process must include three phases: (1) identify vulnerabilities, before managing risk within an organization, it is important to identify beforehand the weaknesses, limitations, current and potential threats of the organization.

An important aspect of risk management is to anticipate the likely risks of organizing in the short, medium and long term; (2) design and implement control systems, once the MFI has identified vulnerabilities, design and implement control measures to reduce them and (3) monitor the effectiveness of the control systems put in place, once the control system has been implemented, MFIs must be able to monitor and assess its degree of functionality and effectiveness. Further, Frederic et al (2006) noted that risk management follows four phases: (1) identifying threats identifies threats to the institution that are at the root of the risks, (2) the prioritization of the risks identified, taking into account that it is impossible to eliminate all risks for reasons of cost and also because the risk is inherent in the conduct of business. DFSs must prioritize risks according to their severity and likelihood of achievement; (3) the treatment of risks that will allow us to reduce the risk with the possibility of acting on the probability of its realization by setting up prevention actions, reducing the impact of

the risk through protective measures, act on both probability and severity and (4) the alignment of risk management with the scale of responsibility.

3. Methodology of Research

The study was carry-out in the Menoua division of the West region of Cameroon. The division covers an area of 1380km² with a population of 372244 inhabitants in 2017. Primary data was collected in this zone using a detailed questionnaire that was administered to 100 microfinance managers and loan officers. The questionnaire was administered by some trusted persons under strict personal co-ordination. We collected quantitative data that was analyzed to have robust results. Some qualitative data was equally collected as well as interviews to complement the quantitative variables. This qualitative information was processed and interpreted directly to ensure robust result.

3.1 Econometric Model

In linking agricultural credit risk management and financial performance of MFIs, the ordered probit model was used as commissioned and proposed by Becker et al (1992) and reformulated by Greene (2012). Mainly, the ordered probit is a generalization of the widely used probit analysis for the case of more than two results of an ordinary dependent variable (a dependent variable for which potential values have a natural order) (Greene, 2012). In the case of this study, the dependent variable known as financial performance follows a natural order of three ordinal outcomes namely: decrease, continue to be the same, and increase. This command of the dependent variable (financial performance) in relation to agricultural credit risk management, which is the principal independent variable and other exogenous characteristics, can be formulated as follows:

$$FP^* = \lambda GRC_i + \varepsilon_i \quad (1)$$

From Equation one, *FP* is simply financial performance of MFIs presented in an ordinal manner, *GRC* is the management of agricultural

credit risks, which is the main independent variable. However, following the complementary hypothesis, there is a host of variables belief to be complementing agricultural credit risk management in either, negatively or positively correlating with financial performance of MFIs or they may not even be related at all. These variables are: the characteristics of the respondents (age, sex, marital status, level of education, position, credit management training), the characteristics of the MFIs (the area where microfinance is located, the status of the institution, the size of the branch in terms of workers, the proportion of clients taking agricultural credit, the age of the structure, participation in the loan decision, level of financial intermediation, area of intervention). The variables used in this study are based on the work of Lahcen (2010), Adair and Berguiga (2010) and Sardi (2002). The estimator is the vector of the regression coefficients that we want to estimate and the error term.

Due to the ordinal nature of the financial performance variable, although PF^* cannot be observed, the different categories of responses can now be observed. These categories of responses can be estimated in the following equations:

$$\begin{aligned}
 PF = & \begin{cases} 0 & \text{if } PF^* \leq 0 \\ 1 & \text{if } 0 < PF^* \leq \mu_1 \\ 2 & \text{if } \mu_1 < PF^* \leq \mu_2 \\ \dots \\ N & \text{if } \mu_{N-1} < PF^* \end{cases} \quad (2)
 \end{aligned}$$

From equation 2, we use observations on PF through the ordered probit technique, which are a form of censored data on PF^* to adapt and estimate the parameters of the vector. As already shown in the literature, the model cannot be systematically estimated using Ordinary Least Squares (OLS), it is usually estimated using the maximum likelihood (Greene, 2012). Becker et al (1992) have already demonstrated in the literature that the ordered probit technique is more reliable for estimating financial

performance than the multinomial probit especially as it has an ordinal natural occurrence. The reduced form of the ordered probit specification can be used to obtain the Ordinary Square Least Model which will be used to estimate the determinants of agricultural credit risk. The simple linear regression model derived from equation 2 above can be formulated as follows:

$$GRC_i = \alpha + \beta X_i + \varepsilon_i \quad (3)$$

Here, X_i represents the explanatory variables that are the determinants of the risk of agricultural credit such as client education, client age, credit management training, financial intermediary, experience, level of education, maturity of microfinance personnel, the area of intervention, the method of the loan, the status and location of the establishment. The β is the coefficient showing the extent to which the determining factors will affect the management of agricultural credit risk is simply a constant and error term.

3.2 Agricultural credit risk management and the computation of the synthetic variable

Credit risk management is a set of methods and techniques that enable MFI managers to organize or regulate debt collection opportunities on a permanent and proactive basis. In most cases, risk management is considered to be an operation that cannot really be captured within the EMF. Faced with this situation and in the framework of this study, a risk management indicator that takes into account risk management variables has been constructed for the purpose of this study using Multiple Correspondence Analysis (MCA). The MCA approach has been popularized in the field of multidimensional analysis of poverty by Asselin (2005) and in the current literature. The MCA is applied in the multidimensional well-fair analysis as in the case of Cameroon by Njong and Ningaye (2008) and Epo and Baye (2011).

Technically, MCA is obtained using the standard correspondence

analysis on a matrix of indicators by selecting the synthetic variable as well as the different modalities comprising the variable. It should be noted that in o case, the modalities used to construct the synthetic variable meet the basic requirements described by Asselin and Tuan (2005). The modalities or indicators used have a regular order in accordance with their contributions in the first factorial axis as indicated in the health literature. For the synthetic variable, which is the management of agricultural credit risk, eight variables were chosen, each with three modalities and placed in an increasing ordinal order. The indicators selected for the synthetic variable, which represent the management of agricultural credit risk (see table 1).

From these variables an indicator was constructed using the MCA and it is the constructed indicator that will be used in this study to evaluate the effect of credit risk management on financial performance of MFIs. The dependent variable of this study, noted PF *, is financial performance. This variable takes the value 1 for «increase», 2 for «decrease», 3 for «remain the same». For the explanatory variables, we have credit risk management, which is a set of eight variables (Table 1).

Table 1: Variables Used to Construct Agricultural Credit Risk Management Indicator

| Variables | Modalities |
|---|---|
| What is the method of financing credit in your structure? | 1 = payment of the full amount 2 = payment per tranche 3 = other to be specified |
| What is the method of credit repayment? | 1=annual, 2=monthly, 3 = other to be specified |
| What kind of agriculture do you finance? | 1 = Commercial agriculture 2 = Consumer 3 = Others |
| What kind of culture do you fund? | 1 = cash crop 2 = food crop 3 = other to be specified |
| What is the loan methodology in your structure? | 1 = Individual loan 2 = Loan to CIGs 3 = Others |
| What is your area of intervention? | 1 = rural area, 2 = urban area 3 = both |
| What do you do after giving a typical loan? | 1 = Warn/counsel the client, 2 = Monitor, 3 = Keep in touch |
| What form of Collateral Guarantee do you consider to give a loan? | 1 = fixed asset, 2 = surety or witness, 3 = no guarantee |

Source: Author's Compilation

4. Empirical Result

4.1 Socioeconomic Characteristics of MFIs Workers

The results in Table 2 show that MFIs in general and credit in particular are predominantly managed by male experts (57%). This is partially caused the bank policy given that the decisions taken in relation to risk are delicate, strict and implicating. About 64 percent of officials are married versus 35% single and 1% widow, which express the fact that managers of credit in the targeted financial institutions are mostly responsible persons. This result is consistent with that of Modou (2011) who observed that nearly 75% of microfinance institutions are managed by men and especially married couples. About 57% of managers are literate with 43% having secondary education, meaning that credit management requires a certain level of knowledge and mastery of the management tool.

The majority of those responsible are between the ages of 31 and 50 (57%). The proportion of under-30s is 39%, since microfinance credit management requires a certain maturity that reaches its peak at a certain age. This can also be explained by the fact that the banking profession requires a lot of work and attention and by the fact that the field of finance in general needs a level of maturity. This result is also consistent with that of Sardi (2002) who showed that more than 59% of managers are between the ages of 26 and 45.

Considering the workers of the MFIs surveyed, 24% heads of microfinance agencies, 20% are accountants, 20% are cashiers, 20% are loan officers and 13% are cashiers of customers. In terms of training in credit management, 89% of managers were trained, 11% managers were not trained. This is due to the fact that credit management in the MFIs is a very risky activity and very different from other activities such as collection, savings and money transfer necessary to minimize risk in order to improve the financial performance of the MFI. Further, 86% of MFIs in the Menoua division grant agricultural credit and the remaining 14% represent MFIs not

granting agricultural credit. As for the proportion of agricultural customers, 54% of establishments have a large proportion of agricultural customers.

Table 2: Distribution of MFIs Workers by sex, marital status and level of education

| Variables | Characteristics | Observations | Frequency in % |
|--------------------|-----------------------------|--------------|----------------|
| Sex | Male | 57 | 57 |
| | Female | 43 | 43 |
| | Total | 100 | 100 |
| Marital status | Married | 64 | 64 |
| | Single | 35 | 35 |
| | Widow | 1 | 1 |
| | Total | 100 | 100 |
| Level of education | Primary | 0 | 0 |
| | Secondary | 43 | 43 |
| | University | 57 | 57 |
| | Total | 100 | 100 |
| Age | Less than 30 years | 39 | 39 |
| | 31-50 years | 57 | 57 |
| | > 50 years | 4 | 4 |
| | Total | 100 | 100 |
| Size of workers | small (size< 5workers) | 35 | 35 |
| | Average (5<size<10 workers) | 55 | 55 |
| | Large (size< 10 workers) | 10 | 10 |
| | Total | 100 | 100 |

Source: Author's Compilation

4.2 Factors Influencing Agricultural Risk Management in MFIs

The results of the linear regression are summarized in Table 3; there are several significant relationships between institutional management variables and agricultural credit risk. The male gender is significantly and positively influencing the risk of agricultural credits at 1% threshold, meaning that when credit is managed by men, the risk of non-reimbursement is reduced. Further, the age of customers is also significantly impacting the risk of agricultural credits, thus, giving credit to above 39 years age group reduces the likelihood of the risk. This result is similar to that of Soro (2014), who notes that age significantly influences the likelihood of access to formal sources of finance. Practically,

the probability of access to banks increases with age up to 55 years and decreases beyond. This is due to the fact that the older the farmers are, the less likely they are to engage in physical activities and do not like to be indebted, so MFIs are reticent to give credit to old people because the risk of non-reimbursement among them is high.

Table 3: Factors influencing Agricultural Credit Risk Management

| Independent variables | Estimation Method: Ordinary Least Square | | |
|---|--|----------------|--------------|
| | Dependent Variable: Agricultural Credit Risk | | |
| | Coefficient | Standard Error | T -Statistic |
| Sex | 0.105*** | 0.030 | 3.500 |
| Age of clients | 0.183*** | 0.066 | 2.777 |
| Education of clients | 0.150* | 0.077 | 1.958 |
| Status of the business | 0.036 | 0.027 | 1.320 |
| Place of business | -0.029 | 0.036 | -0.825 |
| Loan method | 0.041** | 0.019 | 2.169 |
| Zone of intervention | 0.107*** | 0.029 | 3.704 |
| Credit Management Training | 0.443*** | 0.091 | 4.879 |
| Maturity | 0.193*** | 0.059 | 3.281 |
| Level of study | 0.115* | 0.071 | 1.628 |
| Experience | 0.099* | 0.060 | 1.651 |
| Financial intermediary | 0.109 | 0.074 | 1.477 |
| Constant | 1.469*** | 0.394 | 3.743 |
| R ² | 0.841 | | |
| F stat | 36 [12 ; 0.000] | | |
| Number of observations | 86 | | |
| *Significance at 10% ** significance at 5% *** Significance at 1% | | | |

Source: Author's Compilation

The education of customers correlates with the risk of agricultural credit. This may be explained by the fact that the more educated the clients are, the more likely they are to meet the objective for which the loan was granted. This result corresponds to the results of Sardi (2002) who noted that education has a significant influence on access to credit. The

method of Loan corroborates positively with the risk of agricultural credits at a threshold of 5%. Thus, when credit is granted to groups of people, the risk of non-repayment is reduced because the group credit contract, considered to be one of the major innovations in microfinance, is one of the mechanisms enabling MFIs to minimize risk anti-selection and moral hazard in the credit relationship. When the loan is granted to a group of people, the group tends to monitor each other and the reimbursement is assured. The zone of intervention with a coefficient of 10.7 percent influences positively and significantly at 1% level of risk of agricultural credit. So extending credit beyond the spring area decreases the likelihood of the risk. Training in credit management, which has a coefficient of 44.3 percent is significantly correlating the risk of agricultural credits at 1% threshold. When the manager is trained in credit management, he or she is better able to apply the risk management elements and thereby reduces the risk of non-repayment.

The maturity of the financial structure with a coefficient of 19.3 percent is significantly influencing agricultural credits risk management at 1% level of significance. So the more mature the company, the better it is to manage credit risk and reduce the risk of non-repayment. The level of education of the respondent is another important element correlating with the risk of agricultural credits at 10%, due to the fact that a manager with a high level of education is endowed with theoretical insight that permit them to manage their credit risk. The experience of respondents with a coefficient of 9.9 percent is a strong determinant of credit. When the credit management operation is carried out by experienced workers; the probability of the risk of non-payment by the customer decreases. This can also be explained by the fact that the banking profession requires a lot of work and attention, and that it is necessary to be awake in order to carry out the actions. The value of R-squared (0.841) and the F-statistics further reveals that the result is robust, globally significant and valid for inference.

4.3 Agricultural Risk Management and Financial Performance

Focusing on Table 4, credit risk management is significantly influencing the financial performance of MFIs. This simply means that if risk management is assured in MFIs, the risk of credit non-repayment is reduced by 3.3 percent and hence improving the financial performance of Micro financial institutions. The method of financing credit, repayment of loans, nature of agricultural activity finance and the form of collateral security are most relevant in the performance of MFIs. Other factors in association to risk management contributing to increase the performance of MFIs are enormous. The acquisition of training in credit management with a coefficient of 20.6 percent influences positively the financial performance of MFIs. This result shows that the more a manager is trained in credit management, the more efficient MFIs becomes. This is due to the fact that managers with credit management training have the technical means to manage credit and improve the financial performance of the MFIs.

Table 4: Risk Management and financial performance of MFIs

| Independent variables | Dependent Variable: Financial Performance |
|-------------------------------------|---|
| | Estimation Method: Ordered probit |
| Agricultural Credit Risk Management | 0.033 ^{***} (3.57) |
| Sex | 0.009 (1.04) |
| Age of clients | -0.161 ^{**} (-2.03) |
| Education of clients | 0.045 ^{**} (2.32) |
| Business status | -0.221 [*] (-1.65) |
| Business location | 0.261 ^{**} (1.98) |
| Loan method | 0.119 ^{***} (4.91) |

| | |
|----------------------------|------------------------|
| Intervention zone | -0.221* (-1.65) |
| Credit Management Training | 0.206*** (11.46) |
| Level of education | 0.008 (0.88) |
| Maturity | 0.016** (2.08) |
| Experience | 1.417*** (13.20) |
| Financial Intermediary | 0.044*** (13.16) |
| Constant | -1.697* (-10.48) |
| Pseudo R ² | 0.3504 |
| Wald Test | 10.826[15 ; 62; 0.000] |
| Number of observations | 86 |

Source: Author using survey data and STATA 13.1. Notes: (·) represent t-stat. ***, ** and * indicates the different levels of significance respectively at 1%, 5% et 10%.

The method of delivering the loan method has a similar effect on MFIs, thus, reflecting on the fact that granting loans to groups as well as loan worthy persons increases the probability of loan repayment. This is consistent with the result of Tchuigoua and Nekhili (2012) that had shown with regard to the procedure of delivering loan that credit contracted with common initiative groups, associations... improved financial performance of the loan institutions. The client level education with a coefficient of 4.5 percent influences positively and significantly at the 5% threshold the financial performance of MFIs. Thus granting credit to well-educated clients increases the financial performance of the MFIs because they are better able to use credit for productive purposes that warrant repayment. The location of the institution is also significant at the 5% threshold in impacting the financial performance of the MFIs.

The maturity age of the MFIs is strongly correlating with the performance of financial institutions with a coefficient of 1.6 percent. Micro-

finance, like all human activities, is subject to apprenticeship. It seems logical to think that the longer an MFI matures, the more experience it becomes, the better it manages its costs and the better the risk management mechanisms. This result corresponds to that of Adair and Berguiga (2010) who has shown that the age of MFIs positively influences their financial performance. On the other hand, the results of Lahcen (2010) showed that the age of the MFI is negatively correlated with the return on assets. In the same way, the workers experience and financial intermediary are playing the same role as the other factors. Given that the most experienced managers are better and able to manage the MFIs, thereby improving their financial performance. This is explained by the fact that MFIs acting as financial intermediaries realize a profit which is the difference between interest paid by borrowers and interest paid to savers (financial intermediation theory). This corresponds to the results of Tchuigoua and Nekhili (2012), which showed that MFIs playing the role of financial intermediaries have a significant operational performance higher than those that are not. In the same way, variables such as zone of intervention, age of customers and the status of the institution are negative and significantly correlating with MFIs.

This result is contrary to that of Adair and Berguiga (2010) who found that the intervention area improves financial performance and that of Lahcen (2010) who found that the scope of microfinance programs of MFIs positively impacts financial performance. However, the result corresponds to that of Adair and Berguiga (2010) which showed that the institution's status tends rather to improve the social performance of the MFIs. The R-squared value of 0.6504 and the Wald Test of 10,826, globally revealed our result is robust and valid.

4.4 Constraints for granting agricultural credit risk

Considering the constraints MFIs faced in granting loans, it is found that 33% insufficient funds is considered a constraint in the granting of agricultural credits as against 66% who regard it as not a constrained. The difference between these two percentages (33%) makes it possible to

conclude that the lack of funds is not a major constraint in the granting of agricultural credits by the MFIs of the Menoua division. Regarding the inappropriate guarantee, 88% of respondents consider it a constraint against 11% who consider it a non-constraint. The difference between these two percentages (-77%) means that the inappropriate guarantee is one of the major constraints of the granting of agricultural credits by the MFS in the department of Menoua. For 17% of managers, the complicated decision of the EMF is considered a constraint against 82% who consider it as an unconstrained one. The difference between these two percentages (65%) makes it possible to conclude that the complicated decision of the MFS is not a constraint to the granting of agricultural credits by the MFS of the department of Menoua.

43% say that fear of credit default is seen as a constraint on the granting of agricultural credits, while 56% consider it unconstrained. The difference between these two percentages (13%) means that the fear of credit default is not a constraint on the granting of agricultural credits by the MFS of the Menoua department. More than half (56%) of those responsible say that the age of clients is considered a constraint on the granting of agricultural credits, compared to 43% who consider it as unconstrained. The difference between these two percentages (-13%) means that the age of the clients is a constraint on the granting of agricultural credits by the MFS of the department of Menoua. For 98% of those surveyed, the repayment capacity is one of the constraints to the granting of agricultural credits against 1% which considers it as a non-constraint. The difference between these two percentages (-97%) means that the repayment capacity is one of the major constraints to the granting of agricultural credits by the MFIs in the department of Menoua.

Table 5: Constraints to granting of agricultural credits in Cameroon

| Variables | Obs | Contraints (1) | Non constraint s (2) | Difference (3)=(2)-(1) | % |
|-------------------|-----|----------------|-------------------------|---------------------------|-----|
| Insufficient fund | 86 | 0.33 (29) | 0.66 (57) | 0.33 | 33% |

| | | | | | |
|---|----|--------------|--------------|-------|--------|
| Inappropriate collateral security | 86 | 0.88 (76) | 0.11 (10) | -0.77 | (77%) |
| No clear time definition of MFIs | 86 | 0.17 (15) | 0.82 (71) | 0.65 | 65% |
| Fear of credit default | 86 | 0.43 (37) | 0.56 (49) | 0.13 | 13% |
| Age of Client | 86 | 0.56 (49) | 0.43 (37) | -0.13 | (13%) |
| Capacity to repay the loan/after loan | 86 | 0.98 (85) | 0.01 (1) | -0.97 | (97%) |
| Demand of loan not back by activity | 86 | 1 (86) | / | -1 | (100%) |
| Client not patient to follow loan procedure | 86 | 0.26 (23) | 0.73 (63) | 0.47 | 47% |

Source: Author's Compilation

As for the after-loan (100% of those surveyed consider it a constraint and the difference obtained is (100%). This difference makes it possible to conclude that post-loan is one of the major constraints to the granting of agricultural credits by the MFS of the Menoua department. 26% of those surveyed consider the long period before payment to be a constraint on the granting of agricultural credits, compared to 73% for whom the long period before payment is not a constraint. The difference between these two percentages (47%) makes it possible to conclude that the long period before the payment is not a constraint to the granting of agricultural credits by the MFS of the department of Menoua.

5. Conclusion

The main objective of this study was to show the effect of credit risk management on the financial performance of MFIs in the department of Menoua. To achieve this, the primary data were collected from the micro-finance managers of the study area and helped to achieve the specific objectives set. Descriptive statistics helped to achieve the first objective of establishing the socio-economic characteristics of the MFSs in the study area. The sample for respondent-related characteristics shows that men dominate with 57%. Similarly, 64% are married, the level of university study has a predominance with 57%. It also appears that

the dominant age group in this zone is that in the interval 31 to 50 years. As for the characteristics related to MFIs, it is clear that 51% of MFIs are involved in both urban and rural areas. Similarly, 74% are headquarters, 86% are agricultural loans, 66% are mature, and 87% are of the first category.

The second objective of identifying the determinants of agricultural credit risk was achieved through the use of a linear regression model. The significant variables influencing agricultural credit risk are gender, client age, client education, lending method, area of intervention, credit management training, maturity, level of study and experience of the manager. The R^2 is 84% reflecting the fact that the dependent variable, which is the risk of agricultural credits, accounts for 81.4% of the explanatory variables of the model. Using an ordered probit model, the third objective concerning the influence of credit risk management on the financial performance of MFIs was achieved. The results obtained show that the characteristics related to managers (experience, level of education and training in credit management), the institution (farm credit risk management, establishment status, (client age, client education) have a significant impact on the financial performance of MFIs in the department of Menoua. The R^2 is 65.04%, reflecting the fact that the dependent variable, which is financial performance, is accounted for by 65.04% by the explanatory variables of the model.

The final objective of this work, which was to determine the constraints faced by MFIs in granting agricultural credits, was achieved through a proportional model. The main constraints are: inappropriate collateral, age of customers, repayment capacity and after-loan. Given the contribution and importance of microfinance in agricultural credit in particular, it is important to show the influence of the management of agricultural credit risk on the financial performance of the MFIs more specifically in the department of Menoua. With the results obtained in this study, some recommendations were proposed.

References

- Adair P. and Berguiga I (2010). The Determinants of Social Performance and Financial Performance of Microfinance Institutions in the MENA Region. Regional Development.
- Asselin M (2005): Multidimensional Poverty Measurement Multiple Correspondence Analysis, paper presented at the international Conference: Many Dimensions of poverty, Brasilia, Brasil, 29 – 31 August.
- Asselin L and Tuan A (2005): Multidimensional poverty in Vietnam 1993 – 1998, According to CBMS indicators; *Vietnam Socio-Economic Development Review*, No 41.
- Azoly R. (2010). Successful innovations in the collection of unpaid MFIs. International Fund for Agricultural Development (IFAD), Working paper No: 011
- Becker, Willian E., Kennedy, Peter E. (1992). A graphical exposition of the ordered probit. *Econometric Theory*, 8(1), 127-131.
- Churchill C. et Dan C. (2001). Handbook of Microfinance Risk Management. The Atlas for the Conservation of Tropical Forests in Africa, Edition 2, pp 23
- COBAC. (2011). Microfinance institutions in Cameroon, Activity and financial situation. November 2011 Report, Vol. 2, pp 56
- Cornee S. (2006). Microfinance: Between market and solidarity. Analysis of the convergence between financial performance and social performance. Brief presented in IRG-IAE (pp. 6-8). University of Rennes.
- Creusot A.C. (2006). The state of microfinance in Cameroon. BIM Report Vol.9, pp 1-5.
- Diestch M. and Petey T (2003). Measurement and management of credit risk in financial institutions. *Bank Review*, Paris, 308.
- Djombi P.A. (2013). Risk Management in Microfields Establishments in Cameroon. Yaoundé II Soa ,: Master 2 Accounting
- Frederic B., Gayraud R., Rousseau L. (2006). Internal Control Fraud Risk Management, 2nd ed., Maxima Edition, Paris, 925p.

Epo B and Baye M (2011): Constructing Multidimensional Education and Health Welfare indexes in Cameroon: A multiple Correspondence Analysis. *African Journal of Science, Technology, Innovation and Development*. Vol 3 No. 2, 168 – 188.

Greene, Willian H. (2012). *Econometric analysis (seventh edition)*. Boston: Pearson Eslu Cafran.

Hudon M. and Ouro-Koura T. (2008). Study of the contingent factors of the reimbursement rate within a microfinance institution: the case of Togo. *Annals of Public and Cooperative Economics*, 77 (1), 301-322.

Lahcen E.K. (2010). Determining the Financial Performance of Microfinance Institutions in Morocco: An Empirical Analysis. Cream, EA4702 University of Rouen.

Lan Ha. (2002). Solving information problems in microfinance – Annal use based on the strategy of Vital-Finance Benin. *World in Development*, 30 (119), 47-62.

Lheriau L. (2009). Precise regulation of microfinance. 2nd edition French Development Agency, 23-33.

Modou. S (2011). Practices and analyzes of agricultural credit within IMFS. Case of Credit Mutuel Senegal, School of Commerce and Management, Dakar. Working paper no 64

Moulende F.T. (2003). Financing mechanisms in rural Cameroon: An analysis of the determinants of demand for household financial services. Saint Quentin en Yveline (FRA): Taken, University of Versailles.

Njong A and Ningaye P (2008): Characterizing weights in the measurement of multidimensional poverty: An application of data-driven approaches to Cameroonian data. OPHI Working Paper No. 21

Nzongang J., Djoutsu L., Wamba A., Takoudjou N. (2010). Determination of outstanding payments in microfinance institutions in urban zonr: case of the MUFFA network (Mutuelle des Femmes Africaines) in Cameroon Jel.

Onomo C. (2004). Credit granting policy of microfinance institutions in Cameroon.

Sardi A. (2002). Audit and internal banking control. AFES Edition, Paris. Working paper 45

Soro A. (2014). Analysis of the determinants of access to microfinance: the case of savings and credit cooperatives in Cote d'Ivoire. University of Nantes.

Chuiguoua H.T. and Nekhili M. (2012). Risk management and performance of microfinance institutions. *Development Review*, Vol. 24 (2), pp 127-148.