

Credit Risk Analysis and Microfinance Loan Quality in Rwanda: A Case Study of Cooperative COPEDU Ltd

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Abstract

The key objective of Microfinance Institutions (MFIs), like any other business organization is to maximize profits. However, the increased rates of non-performing loans (NPLs) hinder microfinance institutions from achieving their main objective. This study aimed to examine the effect of credit risk analysis on the quality loan portfolio of Microfinance Institutions in Rwanda. The credit risk analysis was measured using collection policy, loan policy and client credit appraisal. On the other hand, the loan quality portfolio was measured by Non-performing Assets (NPAs). A descriptive research design was used to describe the relationship between the study variables. A total of 30 respondents consisting of managers and credit officers were purposively selected. Data was collected from primary and secondary sources using questionnaires and financial reports. Data was analyzed by using both descriptive and inferential statistics. The results from the survey indicated that all aspects of credit risk management have got an effect on the quality loan portfolio, as evidenced by an R-square of 34.8% and a P-value of 0.01. Findings further revealed that poorly formulated Credit policy and lack of monitoring of loans through inadequate loan appraisal and loan collection procedures were identified as the main causes of Non-Performing Loans (NPLs), at 43.3%; 66.7%; 53.3%, respectively, further evidenced by the P-values of 0.01, 0.012 and 0.000. The researchers further found that management decisions, conditions, and procedures have the greatest effect on non-performing loans at M=4.30; SD .887; and M=4.23; SD= .679, respectively. To address the danger of non-performing loans in the MFIs, the following measures were recommended to the management of COPEDU LTD. Effective monitoring of loans, credit training programs, tight security requirements and seeking the services of credit reference bureau and committed debt collectors.

Key Words: Risk Management, Non-performing loans, Non-performing Assets, MFIs, Loan Quality.

Introduction

The success of Microfinance institutions (MFIs) mostly depends on the strength of their credit management structures. This is because the main source of income of the microfinance institutions is the interest that is received loan disbursed to them. The National Bank of Rwanda

(2010) indicated an occurrence of credit risk as revealed by the increasing levels of Non-Performing Loans (NPLs) in the last ten years of MFIs. This has disapprovingly influenced the success of MFIs. This movement impends not only the viability and sustainability of financial institutions but also delays the accomplishment of its objectives for that they were intended, which are providing credit to the countryside inhabitants and tying the breach of finance in the ordinary financial area. Research on MFIs' recovery system and credit methodology has attracted much attention from many researchers. Much of the academic work conducted in this area of study has concentrated mainly on the credit model used by Microfinance and its consequences on productivity (Migiri, 2012; IMF, 2019).

Poor loan quality remains a problem for the Rwandan microfinance sector. The central bank of Rwanda's annual supervision report indicated that 13.7% of the MFIs in Rwanda are only able to maintain loan quality portfolio at risk >30 days ratio of less than 5%. This high frequency of credit risk is reflected in the rising levels of NPLs by the MFIs in the year 2014 (BNR, 2014). The report further shows that 'MFIs' non-performing loans augmented to 7.6% by the end of June 2014, up from 6.8% registered at the end of December 2013", said John RWANGOMBWA, the Central Bank Governor of Rwanda. The sector's profitability decreased by 32.8% due to increased NPLs. The sector's revenue decreased from Rwf 5.09 billion in 2013 to Rwf 4.02 billion in the same period in 2014. This reduction was mainly linked to NPLs.

The lack of empirical research on credit risk management and loan quality portfolio in Rwanda, coupled with the acknowledgement of the serious roles played by MFIs in the economy, was a great inspiration and interest-driven this study. The study will add to the existing literature by examining the effect of credit risk management on the quality loan portfolio of MFIs in Rwanda. This research has the following main aims (1) to establish how credit policies influence loan quality portfolio, (2) To find out if the loan appraisal process contributes to loan quality portfolio (3) To assess how recovery loan procedure could affect loan quality portfolio, and (4) To establish the impact of overall institutional aspects on loan quality portfolio in COPEDU LTD.

Literature Review

This study was underpinned by two important theories in credit risk management, which are Portfolio theory and credit rationing theory. The scholars of the Portfolio theory point out that the risk of a particular loan and its role towards the riskiness of the entire loan portfolio gives the

most information about loan costing. However, credit rationing theory shows that the agreement interest rates a client is willing to accept act as a signal of loan quality and predict the MFI's expected return on loan given (Yuhuan & Sheng, 2019).

Loan quality portfolio, Credit Risk and Non-Performing Loans

The study by Korankye (2014) revealed that a loan-quality portfolio comprises poor appraisal, inadequate loan size, high-interest rate, lack of monitoring and inappropriate client selection. Sheila (2011) reported that insufficient financial analysis, and inadequate loan support, were among the reasons for the quality of the loan portfolio. The study conducted by Nguta & Guya (2013), in Kenya showed that great cases of loan quality portfolio of credit reimbursement remained common (67.9%) in the industrial subdivision, 64.0% in the service in the service manufacturing and 58.3% in the agriculture zone; the business zone was recognized as the least 34.9% circumstances of debt reimbursement.

In the study done by Ahmed and Malik (2015), loan risk management is affected by different factors: loan conditions and loan policy, customers' appraisal, recovery policy, and credit risk. Basel Accord of 2019 stated that loan risk supervising requires creating an appropriate credit risk model, where stakeholders approve loan policy and establish methods and strong administration strategies for implementing international credit risk management standards.

To operate well, MFIs must adopt the procedures of identification of risk issues, evaluation of risks using debtors' monetary and refined replicas, monitoring doings of identified danger matters, and implement monitoring actions by older managers to evade or decrease unwanted penalties of risks (Moranga & Omagwa, 2017). Quality loan portfolio can be measured as the collection of loans at danger (PAR) above 30 days. Performing credit portfolio looks at relationships of productivity and ratio of yield on diverse advanced products. That is the purpose of the sum of credits and the price of administering these loans ((Loona & Zhong, 2014).

Alton and Hazen (2001) stated that NPLs are debts that are 90 days or extra historical unpaid or non-lengthier accumulating earnings. The main commercial of monetary establishment is to loan out cash. This has a return, which revenue received on debt advanced. In the occasion that a considerable quantity of advances disbursed out is not reimbursed as per the put-down agreement, then the MFIs loses on revenue; henceforth flagging the organization(s)' liquidity.

The study by Mingaleva et al. (2014) presents the main reasons for NPLs, including poor administration and pure evil fluke in the form of outside self-governing issues. The existence of price rises, non-rule and exceptional market circumstances can direct to deprive loaning choice that, in return, conducts to non-performing loans. Economic growth and macroeconomic reliability are related to a decline in non-performance credits. In contrast, the opposing situation in macroeconomics is linked to the growing scope of non-performance loans (Laeven & Valencia, 2018).

Literature Review

The study by Nikolaidou and Vogiazas (2014) shows that MFIs needed to come across approaching supervisory necessity for the hazard of risk capacity and funds. These findings concur with the findings by Kargi (2011), who establish that loan hazard control greatly influences the successfulness of Nigerians MFIs. Non-Performing Loans positively influence profit and Return on Assets, while the capital capability ratio positively influences Net Interest Margin ((IMF 2016, 2019). However, the findings from the research done by Karugu, Ntoiti (2015), on the Effect of Credit Risk Management Practices on the Profitability of Listed Commercial Banks in Kenya; indicated that the sum of the advances and NPLs does not influence a large part of the incomes of MFIs. Hence, they found out that other factors (variables) other than credit and NPLs were the ones that had a greater impact on profits.

The study conducted by Orua (2009), found that short-term obligation meaningfully affected MFI outreach positively; The customer's appraisal and credit terms have a positive influence on advanced performance, whereas recovery strategies and loan danger control have an affirmative and unimportant influence on credit performance. According to Olomole (2002), the reimbursement presentation is influenced by the debtor's physiognomies, moneylenders 'physiognomies and advances characteristics. This reimbursement problem is found in lending crime and quality portfolios. In addition to other variables that affect loan quality portfolio, the current study will contribute to the existing knowledge by adding client appraisal, conditions and management style and determine to what extent they affect the portfolio.

In addition, previous researchers concentrated on the consequence of loan danger controlling and credit risk nursing, and others researched on risk management and performance of MFIs. Still, they did not consider the influence that loan hazard administration might have on the quality loan

portfolio of MFIs. This research is the first to analyze the effect of those factors ignored by previous studies in Rwanda. Furthermore, the association between credit risk management and loan quality portfolio in Rwanda has not received attention, as no recent empirical research has analyzed this relationship for many MFIs from various economic activities.

Methodology

The study adopted both descriptive survey design and correlation to analyze the connection between the variables even though the relationship plan is utilized to measure the forte of association between dependent and independent variables. The target population comprised branch managers and staff from the credit department of COPEDU LTD. The total sample size was 30 respondents: the credit director, ten credit officers, ten branch managers, four credit analysts and five credit recovery officers. Purposive sampling determined the study sample to include only people with particular skills related to this study.

Primary data was collected using organized and semi-organized surveys that constituted closed and open-ended questions. On the other hand, secondary data was obtained via National Bank of Rwanda (NBR) published reports, Microfinance's loan guiding principal leaflets, as well as statements of financial statements. In addition, inferential statistics were used in the analysis to determine the influence of loan hazard administration on the quality loan portfolio of COPEDU LTD. The following regression model guided this study:

$$Z = \beta_0 + \beta_1(b_1) + \beta_2(b_2) + \beta_3(b_3) + \beta_4(b_4) \dots + \epsilon$$

Whereby:

Z = Quality loan portfolio.

b₁ = Credit policies

b₂ = advances appraisal

b₃ = Loan reimbursement techniques

b₄ = Overall institution aspects

B₀: is the Z intercept,

β_1to β_3 are variables coefficient

ϵ = error term

Variables Interconnectivity

The current research examines the consequence of loan hazard administration and the advanced quality collection of MFIs. The loan quality portfolio of MFIs was taken as a dependent variable, while credit risk management was considered independent. The association amid the effect of loan danger administration and loan quality portfolio of MFIs (loan requirements, consumer assessment, loan hazard control and recovery policy about good loan quality and gross non-performing loan).

Credit risk management indicators under study were client's appraisal, collection policy and credit policies. Credit policies included mainly credit terms, the condition under which an MFI extends credit to its clients. This term specifies the credit period and interest rate at the time of disbursement. This, consequently, will influence loan enactment; meanwhile, it specifies the period of reimbursement from now, creating a well-timed settlement and a decline in quality portfolio rates. Clients' appraisal, as it enables MFIs to know their clients, will help to increase loan performance.

Research Findings and Discussion

The findings from the survey indicate that most respondents strongly agreed that poor loan policies affect the loan quality portfolio of the MFIs, as shown by a mean of 4.07. Respondents strongly agreed that strict repayment policies affected loan quality portfolios, as reflected by a mean of 3.17. Furthermore, the results from the survey show that respondents strongly agreed that well-formulated and flexible loan policies affect the loan quality portfolio, as shown by a mean of 2.87%. The results further indicated that respondents were moderate on whether poor record keeping affects the quality of the loan portfolio of the MFIs, as evidenced by a mean of 2.60. The results indicated that respondents strongly agreed that credit policies generally affected loan quality portfolios, as shown by the mean of 3.27.

The findings from the survey on whether loan policies contribute to loan quality portfolio indicate that 3.3% of the respondents point out that weak loan policies do not have any contribution to loan quality portfolio, 20% indicated that it at least contributes to the loan quality

portfolio, 43.3% indicated that it has great influence and 33.3% of the respondents specified that it has a great influence on the loan quality portfolio. The respondents were also asked whether strict repayment policies contribute to loan quality portfolio; the results from the survey show that 3.3% indicated that it has no contribution, 23.3% showed low contribution, and 33.3% indicated great and greater influence, respectively, whereas 6.7% indicate it exerts the greatest influence. On whether well-formulated policies influence loan quality portfolio, 13.3% indicated it has no contribution, and 23.3% indicated a low and greater contribution, respectively. In comparison, 33.3% stated it has a great impact, whereas 6.7% said it has the greatest impact.

The results from the survey on whether flexible advance policies influence loan quality portfolios show that 10% of the respondents indicated no influence, 26.7% indicated low influence, 40% indicated great effect, and 13.3% indicated a greater impact. The results further revealed that 16.7% of the respondents said that poor record-keeping policies do not impact loan quality portfolios, and 43.3% indicated a low contribution. In comparison, 20% said it has a great contribution, and only 3.3% said it has a greater contribution. 43.3% of respondents stated that the overall credit policies influenced the loan quality portfolio. The findings of this study contradict those of Sheila (2011), who found that industrial companies convey careful loan policy and performance and found that the absence of loan policies affects the advanced quality portfolio.

Credit techniques used in client appraisal

The research findings on how information credit techniques are used in scrutinizing loan applications and appraisal revealed that fifty per cent (50%) of the respondents indicated using 5C's credit appraisal model. Six-point seven per cent (6.7%) of the respondents use the credit-scoring model, and forty-three-point three per cent (43.3%) use credit-referencing bureaus. This information implies that most microfinance institutions mainly use 5Cs credit appraisal model and credit referencing bureaus to scrutinize loan applications and loan appraisal. The results of this study coincide with Chen and Pan, (2012) who found out that enhancement of credit techniques is better classification than use of traditional techniques and would be suitable for MFIs who would deal with customers from weaker sections. It also agrees with Abedi (2005) who reported that 5Cs client appraisal model is used to scrutinize creditworthiness of loan applicant.

Loan appraisal process

The study also examined the effects of various indicators of client appraisal on loan quality in COPEDU LTD. From the results, it is indicated that 100% of the respondents concurred that client appraisal affects loan quality portfolios. This is shown by a mean response of 4.53 and a standard deviation of 0.730 from the respondents who strongly accepted that client appraisal greatly affects the loan quality portfolio. Concerning the statement that credit officers and branch managers considered collaterals whose values are overstated or impaired when carrying out client appraisal, 80% of respondents said it affects loan quality portfolio largely, as indicated by an average response of 4.73 and a standard deviance of 0.640 suggesting a high variation in response. Besides, 56.7% of respondents agreed that Poor test of accuracy and creditworthy of applicants affected loan quality portfolio to the greatest contribution, 40% indicated that it has greater influence, while 3.3% said it has a great contribution. This is shown by an average response of 4.53 with a standard nonconformity of 0.571, which shows a moderate variation in response. 43.3% of respondents said that using false information to acquire a loan greatly contributes to a loan quality portfolio, and 50% indicated a greater contribution.

In comparison, 6.7% of respondents said it has the greatest contribution. This is shown by mean responses of 4.37 and a standard deviation of 0.67, which displays 61.5% variations in feedback. 56.7% of respondents said that falsified past business financial performance has a greater contribution to the loan quality portfolio, 26.7% indicated it has the greatest influence, and 13.3% and 13.3% stated it has a great impact. In comparison, 3.3% stated it has the least influence. This was confirmed by mean responses of 4.07 to a great extent and its standard deviation of .740, which showed a 74% variation in response.

Previous studies have also found that client appraisal could improve loan performance since it safeguards clients' willingness and aptitude to reimburse a credit. For instance, Abedi (2009) found that MFIs habitually utilize 5Cs exemplary of loans to assess a client equally likely mortgagor to increase loan performance. The results reported in this study also agree with the findings in a study by Kamau (2011) which reported that the credit-scoring model had been successfully utilized to allocate credit candidates to good or bad credit risk classes. In addition, Inkumbi (2009), denotes that a client's appraisal could help identify whether clients have

collateral trying to access equity capital. Kibet (2013) has made similar conclusions that the assessment of a customer should involve the assembly of relevant info on the candidate and analyzing information to determine creditworthiness as well as making decisions to expand credit and to what tune.

The results of this study concur with Kurui and Kalio (2012), who found that client appraisal helps improve loan quality portfolios by properly screening information given by loan applicants, as also noted in Bandura (1995). It also concurs with Nawai and Shariff (2013), who found out that issues impacting the capability of debtors to reimburse loans are commercial factors, borrowers 'character toward their credits, amount of loan received, another debt burden, business experience, family background and commercial formality.

Loan Collection Techniques

The researchers also investigated how loan recovery procedures impact non-performing loans. The results from the survey show that 40% of the respondents indicated low listening to customers' excuses to spend period to influence NPL, and 30% agreed to great contribution and greater influence, respectively. When requested about uncommitted debt collectors, 43.3% indicated it has greater influence, 40% agreed to great influence, and 16.7% agreed to greatest influence. When asked about the long recovery period, 43.3% indicated that it contributes greatly to NPLs, 33.3% indicated greater influence, 13.3% indicated it has the greatest influence, 6.7% indicated a low influence, and 3.3% indicated no contribution. The results on whether corrupt staff influences NPLs in MFIs show that 46.7% of the respondents agreed to a great extent that corrupt staff exists influences NPLs, and 20% indicated that it influences a greater extent. In comparison, 13.3% indicated that it contributes to a lower extent.

Other descriptive statistical findings to complement the frequency distribution using mean and standard deviation show that the mean value of listening to quality portfolio excuses extending period is 2.40; this signifies that the mean reply of the respondents is in covenant to listening excuses to expand period. Yet, the results are varying from candidate to candidate as standard deviation .845, which means the 84.5% change is in the sequence of the listening to client's excuses extending period. The average series of the uncommitted debt collectors is 3.77 which mean the means responses of the respondents are agreeing to the uncommitted debt collectors.

Yet, the responses are changing from respondent to respondents as shown through the significance of the standard deviance existent in statistics of uncommitted debt collectors, that is 78, which means 72.8% changes is there in the series of uncommitted debt collectors. The means value of the long recovery period is 3.47, which means the average answer of the respondents agrees with the long-recovery period. However, the answer changes from one respondent to another, as displayed by the high standard deviancy of 93.7% of the long recovery period. Dishonoured credit staffs are showing an average of 3.73, varying from the single defendant to extra, as portrayed in the worth of standard nonconformity, i.e., 0.944, which means 94.4% dispersion in the data of corrupted credit staffs.

The institutional aspects of Loan quality portfolio

The results from the survey show that the majority (63.3%) of the respondents have reported that credit risk management pointer affects loan quality to a greater extent compared to 30% of the respondents who indicated that credit risk management pointer used in COPEDU LTD affected loan quality portfolio to the greatest extent, and 6.7% of the respondents indicated a great extent. The results revealed that loan danger management factors used in COPEDU LTD affect loan quality portfolios to a greater extent, as represented by most respondents.

The findings on how credit risk management affects NPLs of loan quality portfolio indicated that 53.3% of the respondents said that it does to a greater extent, 33.3% said to the greatest extent, and 6.7% said the great extent and lower extent, respectively. The results on whether loan appraisal processes affect loan quality portfolios show that 50% indicated that it affects the greatest extent, 43.3% indicated a greater extent, and 6.7% said it has great. Furthermore, the results on how credit policy affects loan quality portfolio show that 56.7% of the respondents indicated a greater extent, 33.3% indicated the greatest extent, 6.7% said the great extent and 3.3% indicated a lower influence. When the respondents were asked about loan recovery procedure, 53.3% stated it has a greater influence on loan quality portfolio, 33.3% indicated greatest influence, and 13.3% said great influence. On whether the level of interest influences the loan quality portfolio, results show that 3.3% indicated that it influences at lower extent, 6.7% indicated a great influence, and 46.7% stated it has a greater influence. In comparison, 40% stated it has the greatest influence. When requested about management decisions, 50% argued it

has the greatest impact, 36.7% argued it has greater influence, and 6.7% stated it has great and least influence, respectively.

Analysis of Trend of Non -Performing Loan figures (2013-2017) - this should come before multiple regression analysis

Table 1: tabular and pictorial representation of the NPLs figures from 2013 to 2017

Item /year	2013	2014	2015	2016	2017
Loan	4,926,151,226	6,010,531,605	7,633,498,091	9,256,464,577	10,879,431,063
Impairment	280,649,920	163,052,917	134,445,003	147,031,323	167,620,968
Ratio of impairment to total loan portfolio	5.69%	2.7%	1.76%	1.6%	1.54%

Source: Annual and financial statements, 2013-2017

The analysis of results from the survey indicated that the provision for credit losses expressed as a percentage of the total loan portfolio were 5.69%, 2.7%, 1.76%, 1.6% and 1.54% for 2013, 2014, 2015, 2016 and 2017, respectively. It is seen from the table that the ratio of NPLs decreased from 5.69% in 2013 to 2.7% in 2014. The ratio, however, declined significantly from the previous figure of 2.7% in 2014 to just 1.54% in 2017. This massive decline in the ratio represents an improvement in the quality of the loan portfolio is, however, attributable to renegotiated loans in 2016 and 2017, not the recovery of delinquent loans, according to one of the respondents.

All renegotiated loans are treated as new loans and therefore treated as current or standard credit facilities. 2016 the ratio declined sharply from 1.6% in 2017 to 1.5%. This sharp decline is unsurprising, considering the high increase in disbursed loans. This means most of the renegotiated loans slipped into adverse classification in the following year. It is instructive to observe that in absolute terms, the non -performing loan figure for 2017 is smaller than the figures for all the remaining years put together. The main reason for this huge figure is that if renegotiated loans are not tracked specially and separately, an indication of the borrower's

repayment problem (difficulty) will disappear, and he/she is likely to renege on their repayment proposal again.

In 2017, there was a marked improvement in the quality of the loan portfolio, as only 1.5% of the total loan was classified as nonperforming. According to one respondent, management was getting worried about the growing trend of the ratio of NPLs to loan portfolio and instituted measures aimed at halting the trend and which resulted in a significant reduction in the growth of the ratio of NPLs in 2013. The findings show that from 2013 to 2017, the company expanded its loan portfolio by over 100%, and this was done without corresponding expansion in logistics such as vehicles and motorbikes and hiring additional field officers (credit officers) for effective monitoring. The loan portfolio increased by more than 100%, and the provision for credit losses increased by 285% in the same period.

Table 2: Moving Trend Analysis of the NPLs

Item /year	2013	2014	2015	2016	2017	% Change 13-14	% Change 14-15	% Change 15-16	% Change 16-17
Loan	4,926,151,226	6,010,531,605	7,633,498,091	9,256,464,577	10,879,431,063	22%	27%	21%	18%
Impairment	280,649,920	163,052,917	134,445,003	147,031,323	167,620,968	-42	-18	9	14
Ratio of impairment to total loan portfolio	5.69%	2.70%	1.76%	1.60%	1.54%				

The findings show that the NPLs increased by 18% from 2014 to 2015. If this trend continues, it will hurt the operations of COPEDU Ltd. The percentage increase of 27% from 2013 to 2014 in the loan portfolio was significantly high, which must have partly accounted for the huge provision made for impairment in 2014. In 2015, it was evidenced from the survey that aside from the fact that loanable funds for the year 2015 were reduced by the huge provision made for credit losses in the year 2014, management is said to have made a conscious effort to slow down on granting of loans and rather focused attention and direct energy towards the recovery of the existing due and overdue loans and advances. This effort yielded some dividends in 2017 as there was an improvement in the quality of the loan portfolio. Between 2016 and 2017, the provision for impairment rose astronomically by 9%, which was worrying because the total loan

portfolio increased by just 21% from 2015 to 2016. The deteriorating trend of the portfolio improved significantly from 2016 to 2017, which saw a decrease of 18% in the impairment figure. All in all, the general trend has been erratic even though huge amounts of money have been provisioned as non-performing loans and with the recent figure being a decline of 18% from the previous year's figure.

Table 3: Correlation Analysis-This should come before regression model results

		Loan Quality Portfolio	Credit Policy	Loan Appraisal	Loan recovery procedures
Loan Quality Portfolio	Pearson Correlation	1.0000			
	Sig. (2-tailed)				
Credit Policy	Pearson correlation	.451*	1.0000		
	Sig. (2-tailed)	.012			
Loan Appraisal	Pearson correlation	-.517**	-.579**	1.0000	
	Sig. (2-tailed)	.003	.001		
Loan recovery procedures	Pearson correlation	-.419*	-.414*	.338	1.0000
	Sig.(2-tailed)	.021	.023	.068	

*. Correlation is significant at the 0.05 level (2-tailed)

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

The correlation between variables shows an important optimistic association between credit policy and non-performing assets ($r=.451^*$, $p<0.05$) with a 95.0% sureness level. The results revealed that credit policy positively impacts the level of non-performing assets. Results revealed a significant negative relationship between loan appraisal, loan recovery procedures and non-performing Assets ($r = -.517^{**}$; $-.419^*$, $p<0.05$; $p<0.01$) at a 95.0% confidence level. The high-to-high stages of NPLs interpret the high levels of significance that accrue to loan recovery procedures. This, therefore, deprives the loan quality portfolio. The findings from the survey portray that advanced valuing of loan advances influences the quality portfolio in the logic that it upsurges the level of NPLs of MFI. When the variables that affect credit risks are high, the level of NPL increases, thus, influencing loan quality because of the rise in credit hazard organisations

in general. The findings concur with results from previous studies. The study conducted by Drua (2009), IMF (2016, 2019) and Olomole (2002) show a significant effect between credit risk analysis and loan quality.

Regression analysis

Table 4: Model Summaries

Model	R	R square	Adjusted r square	Standards error of the Estimate	Change statistics					
					R Square Change	F Change	Df1	Df2	Sig. F Change	Durbin-Watson
1	.590 ^a	.348	.273	.590	.348	4.631	3	26	.010	1.763

a. Predictor: (constant), Loan collection techniques, Loan Appraisal, Credit Policy

b. Dependent variable: quality loan portfolio

A coefficient of determination (R^2) was used to define the power of correlation amongst dependent and independent variables as displayed: Loan recovery procedures, loan appraisal, and credit policy meaningfully account for 34.8% variation in the level of NPA.

Table 5: ANOVA

Model		Sum of squares	Df	Mean square	F	Sig.
1	Regression	4.829	3	1.610	4.631	.010 ^a
	Residual	9.037	26	.348		
	Aggregate	13.867	29			

c. predictors: (constant), loan recovery procedures, loan appraisal, credit policy

d. dependent variable: Loan Quality Portfolio

Interpretation of ANOVA results missing

A test of model fit to predict the strength of the relationship between was done using ANOVA the results show an F-statistics of 4.631 and a P- value <0.05. This means that the model is statistically significant and can be able to predict the relationship between variables. Financial organizations attach dissimilar credit risk management strategies to their various loan facilities.

The loan recovery procedures, credit policy and loan appraisal frequently mention the acceptance of advances and impact the refund of the identical at a similar period. If the fee of advances is in height, there is sure to be a financial institution report an alteration in the level of non-performing loans. The level of non-performing assets defines the excellence of the advanced portfolio. According to the BNR report (2012), the administration of non-performing assets by MFIs leftovers a zone of anxiety, mostly due to the likelihood of it deteriorating the excellence of efficient advances. Therefore, it is of great significance that Microfinance institutions provide extra heaviness to credit risk management ever since, as of the results, additional alterations in the level of NPLs, henceforth influencing advanced quality portfolio.

Regression coefficients

Coefficients of willpower clarify the degree to that variation in the dependent variable can explain by variations in the independent variable or the ratio of change in the dependent, which is explained by independent variables.

Table 6: Coefficients (a) of Regression

Model	Unstandardized Coefficients		Standardized Coefficients		Sig.
	B	Std. error	Beta	t	
1 (Constant)	4.873	1.703		2.862	.008
Credit policy	.216	.092	.150	2.348	.012
Loan Appraisal	-.216	.021	-.350	-10.28	.000
Loan recovery procedures	-.142	.005	-.239	-2.841	.000

Dependent Variable: Loan Quality Portfolio

The investigator piloted regression examination research to define the connection amid NPLs and forecaster variable that included credit policy, loan recovery procedures and loan appraisal.

The equation below was obtained: determination

$$Z = 4.873 + 0.216X_1 - 0.216X_2 - 0.142X_3 + \varepsilon$$

Holding credit policy, client appraisal, and collection recovery policies constant MFIs NPA would be 4.873, $p < 0.05$. Independent variables from the regression equation reveal that a unit increase in credit policy led to a decrease in non-performing loans of COPEDU LTD by 0.216 units and is positive significantly at .467. This means that holding well-formulated loan policies, strong record keeping, strict repayment policies and flexible loan repayment policies decrease non-performing loans. In addition, a piece increase in the client's loan appraisal led to an increase in NPLs of COPEDU LTD by -.216 units, but positively significant at 0.086. This means that Poor tests of accuracy and creditworthy of applicants, the use of false information given by applicants to acquire loans, using falsified past business financial performance and tolerant securities whose value are exaggerated increase non-performing loans. In addition, a piece augmented in collection recovery policies led to an increase in non-performing loans of COPEDU LTD by -0.142 units. This means that not listening to clients' excuses to extend the repayment period, the presence of corrupt credit officers and having uncommitted debt collectors increases non-performing loans. Hence, credit assessment reduces value of the portfolio that would have been held at risk in MFIs in COPEDU LTD.

Conclusion

The study aimed to explore how credit risk management practices contributes to loan quality portfolio in MFIs in Rwanda, a case of COPEDU Ltd. The researchers examined three aspects of credit risk management practices: loan strategy, advance assessment procedure, and advance retrieval procedures, whereas the loan quality portfolio was analysed using NPLs. To evaluate the study's objectives, the investigators carried out a correlation between study variables. First, the correlation was revealed among lending policies alongside advanced quality portfolios. Thus, this implies that credit policy influences loan quality portfolios. The results further revealed that lending strategy influences advanced quality portfolios. The researchers also found that lending quality affects advanced assessment procedures.

Finally, the researchers examined the effect of advance collection procedures on the loan quality portfolio ratio of COPEDU Ltd. The loan recovery procedures were regressed alongside the loan quality portfolio; the results revealed that all the tested independent variables were statistically

significant. This, therefore, means that credit risk management influences loan quality portfolio ratio of MFIs.

Recommendations

Active credit risk management is vital to the long-lasting sustainability of microfinance institutions. Based on the results and conclusions COPEDU Ltd largely adopted credit standards, credit policy, loan appraisal and collection policy. The researchers therefore recommended that before giving out any disbursement MFIs should analyze customers' repaying capacity status of business, and cash flow must be evaluated. COPEDU LTD should develop and keep a credit administration purpose that offers direction to anyone involved in the credit function of the organization and to make sure protections are in place to manage the loan portfolio. Approval of credit should be made by a chastely critical approach by only reviewing the application form details of the demander.

Furthermore, COPEDULTD should develop appropriate credit policies to ensure credit administration succeeds, especially loan repayments and bad debt recovery procedures. Training packages should be arranged for credit employees, particularly in the zone of loan hazards management and administration of NPLs. It is also strongly recommended that management always give a thoughtful courtesy to the appropriateness of loan portfolio, resources and credit officers to stop loans sliding into adverse classification.

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Appendix

Appendix 1: Descriptive statistic table of factors of Credit policies

	N	Mean	Std. Deviation
Poor loan policies	30	4.07	.828
Strict repayment policies	30	3.17	.986
Well formulated policies	30	2.87	1.137
Flexible loan policies	30	2.87	1.106
Poor record keeping policies	30	2.60	1.303
To what extend do credit policies affect loan quality	30	3.27	.944
Valid N (listwise)	30		

Appendix 2: Frequency distribution table of extent to which credit policies do affect loan quality portfolio

Variables	No-contribution	Least contr.	Great contr.	Greater contr.	Greatest contr.
Poor loan policies	0%	3.3%	20%	43.3%	33.3%
Strict repayment policies	3.3%	23.3%	33.3%	33.3%	6.7%
Well formulated polices	13.3%	23.3%	33.3%	23.3%	6.7%
Flexible loan	10%	26.7%	40%	13.3%	10%

policies						
Poor record keeping	16.7%	43.3%	20%	3.3%	16.7%	
To what extent do credit policies affect loan quality	6.7%	10%	36.7%	43.3%	3.3%	

Source: Research Data

Appendix 3: Extent to which client appraisal Effects on loan quality portfolio in MFIs

Statements	N	GTC	GRC	GC	LC	NC	Mean	Std.
Poor test of accuracy and creditworthy of applicant	30	17(56.7%)	12(40%)	1(3.3%)	0	0	4.53	.571
Use of false information to acquire loans	30	13(43.3%)	15(50%)	2(6.7%)	0	0	4.37	.615
Falsified past business financial performance	30	8(26.7%)	17(56.7%)	4(13.3%)	1(3.3%)	0	4.07	.740
Accepting collaterals whose value are over stated	30	24(80%)	5(16.7%)	1(3.3%)	0	0	4.73	.640
To what extent do loan appraisal affect loan quality	30	20(66.7%)	6(20%)	4(13.3%)	0	0	4.53	.730

Source: Research Data

Key: GTC= Greatest contribution; GRC=Greater Contribution; GC=Great Contribution; LC=Least Contribution; NC=No Contribution

Appendix 4: Frequency Distribution and Descriptive statistics of Loan recovery procedures Variables

Statements	N	NC	LC	GC	GTC	GTST	Mean.	Std.
Listening to client's excuses to extend period	30	0%	40%	30%	30%	0	2.90	.845
Uncommitted debt collectors	30	0%	0%	40%	43.3%	16.7%	3.77	.728
Long recovery period	30	3.3%	6.7%	43.3%	33.3%	13.3%	3.47	.937
Presence of corrupt credit officers/Staffs	30	0%)	13.3%	20%	46.7%	20%	3.73	.944

Source: Investigation data

Appendix 5: Descriptive Statistics of overall factors affecting loan quality portfolio

	GTSTC	GTC	GC	LC	NC	Mean	Std. Deviation
Credit Terms	33.3%	53.3%	6.7%	6.7%	0	4.13	.819
Loan Appraisal process	50%	43.3%	6.7%	0%	0	4.43	.626
Credit Policies	33.3%	56.7%	6.7%	3.3%	0	4.20	.714
Loan recovery procedure	33.3%	53.3%	13.3%	0%	0	4.20	.664
Lever of interest rates	40%	46.7%	6.7%	3.3%	3.3%	4.17	.950
Management decisions	50%	36.7%	6.7%	6.7%	0	4.30	.877
Conditions and procedures	36.7%	50%	13.3%	0%	0	4.23	.679

Source: Research Data