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The Effect of Loan Portfolio Diversification on the Performance of Microfinance Institutions in Cameroon

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ABSTRACT

This study investigates the effect of loan portfolio diversification on the performance of microfinance institutions. 32 MFIs are selected from various regions employing the quantitative techniques approach. Quantitative data were gathered through questionnaires and performance was also through questionnaires from the MFIs. The research design integrates a cross-sectional analysis to capture a snapshot of current diversification practices on financial performance indicators such as return on assets (ROA) and return on equity (ROE). The findings indicate that MFIs with diversified loan portfolios tend to exhibit better financial performance and lower risk levels, suggesting that diversification is a viable strategy for enhancing the stability and profitability of microfinance institutions.

KEYWORDS: Diversification, Loan Portfolio, Microfinance, Return on Asset, Return on Equity

1. INTRODUCTION

Microfinance has contributed significantly to economic development across the world. This is not surprising, given that the history of microfinance is mostly closely linked with poverty reduction. Microfinance was originally conceived as an alternative to banks, which in most developing countries serve only 5 to 20% of the population (Gallardo et al., 2003). The small percentage of people in developing countries who received financial services from banks were mostly those in formal employment and with relatively high incomes, implying banks excluded poor and low-income earners who make up majority of these populations from the use of their services. The contribution of microfinance to poverty reduction therefore arises from its prime client target – poor and low-income earners (Yunus & Jolis, 1999).

Diversification is generally perceived as a means to mitigate risk by spreading exposure across various sectors and loan types. However, the process of implementing a diversification strategy is complex and resource-intensive. As Cull et al. (2017) argue, MFIs often face significant challenges in understanding and penetrating new markets, developing new product lines, and managing an increasingly diverse portfolio. Moreover, the shift towards a diversified portfolio requires robust risk management and monitoring systems to manage the additional complexity effectively, which many MFIs lack the resources or expertise to implement (Magali, 2014)).

Another consideration MFIs must make in their pursuit of a diversified portfolio is that of diminishing returns from diversification. While initial efforts to diversify can significantly reduce risk and enhance stability, as portfolios become increasingly diversified, the marginal benefits in terms of reduced risk and improved performance begin to decline. At the same time, the costs and complexities associated with managing a highly diversified portfolio continue to rise (Hartarska & Nadolnyak, 2012). Identifying the optimal level of diversification that maximises performances without incurring prohibitive costs is a significant challenge for MFIs.

In addition to the above, the pressure to diversify can sometimes lead MFIs to stray from their social mission of serving the poorest and most vulnerable segments of society. As institutions venture into more lucrative markets and loan segments to spread their risks, there is a danger that they might neglect their core clientele, undermining the purpose for which they were established (Wagner, 2013). Balancing the financial imperatives of diversification with the social objectives of microfinance is a delicate and ongoing challenge. Recent empirical evidence suggests that the impact of diversification on MFI performance varies significantly depending on the institution's size, age, and the specific context in which it operates (Barasinska & Schäfer, 2014). This variability adds another layer of complexity to the

problem, indicating that there is no one-size-fits-all solution to achieving effective diversification.

The main goal of this article is to ascertain the effect of loan portfolio diversification on the performance of microfinance in Cameroon. The following particular goals comprise this target.

i. To assess the effect of loan term diversification on the performance of MFIs.
ii. To assess the effect of geographic diversification on the performance of MFIs.
iii. To assess the effect of sectorial diversification on the performance of MFIs.

The remainder of the document is structured as follows: Following the introduction in Section 1, Section 2 delves deeply into the literature evaluation, concentrating on the impact of loan portfolio diversification on the performance of microfinance institutions in Cameroon. The tactics supporting the accomplishment of the specific objectives are described in Section 3. The study's conclusion and suggestions in light of its findings are provided in Section 5. The results are then carefully reviewed and analysed in Section 4, which is an important aspect of the paper's investigation.

2. LITERATURE REVIEW

This literature review delves into the extant research on the impact of loan portfolio diversification on the performance of Microfinance Institutions (MFIs), with a particular emphasis on the Cameroonian context. By examining the theoretical foundations, empirical findings, and methodological approaches employed in previous studies, this review aims to provide a comprehensive understanding of the complex relationships between loan portfolio diversification, risk management, and financial performance in MFIs, setting the stage for an in-depth investigation into the specific challenges and opportunities faced by MFIs in Cameroon.

2.1. Conceptual Review

This conceptual review lays the theoretical groundwork for understanding the intricate relationships between loan portfolio diversification and the performance of Microfinance Institutions (MFIs) in Cameroon. By exploring the fundamental concepts, theories, and frameworks that underpin the fields of microfinance, risk management, and financial performance, this review aims to establish a conceptual foundation for analysing the impact of loan portfolio diversification on MFIs' financial sustainability, outreach, and social impact, ultimately providing a nuanced understanding of the complex dynamics at play in the Cameroonian microfinance sector.

2.1.1. Loan Portfolio Diversification

Loan Portfolio Diversification refers to the strategy of spreading a lender's loan portfolio across different types of borrowers, industries, geographic regions, and risk profiles to minimize risk and maximize returns (Klein & Mayer, 2011). The goal is to create a balanced portfolio that reduces exposure to any one particular sector or borrower, thereby increasing the overall stability and resilience of the portfolio.

Diversification can be achieved through various means, including borrower diversification, industry diversification, geographic diversification, risk diversification, and product diversification (Altman & Saunders, 1998). Borrower diversification involves lending to different types of borrowers, such as individuals, small businesses, or large corporations. Industry diversification involves lending to businesses across various industries, such as agriculture, manufacturing, or services.

Geographic diversification involves lending to borrowers in different regions, countries, or markets (Berger & Udell, 2002). Risk diversification involves lending to borrowers with different credit risk profiles, such as prime, subprime, or microfinance borrowers. Product diversification involves offering different types of loan products, such as term loans, lines of credit, or mortgages.

The benefits of Loan Portfolio Diversification include risk reduction, increased returns, improved liquidity, and enhanced credit quality (Demyanyk & Hasan, 2010). By spreading risk across different asset classes and risk profiles, lenders can reduce their exposure to any one particular sector or borrower. This can lead to increased returns and improved financial sustainability.

Microfinance Institutions (MFIs) and other financial institutions use loan portfolio diversification as a strategic tool to spread their credit risks over a variety of loan kinds, sectors, and demographics. This approach is intended to reduce the effect of particular, isolated risks that could otherwise have a disproportionately negative influence on the financial stability of the organisation (Wagner, 2013). The fundamental idea is derived from the more general financial axiom that states an investment portfolio with a wide range of holdings is naturally less susceptible to changes in the market and certain types of economic downturns. By avoiding "putting all your eggs in one basket," MFIs can protect themselves against the effects of regional economic problems, failures of specific industries, or financial crises that target particular demographics.

According to Tah et al. (2016), LPD improves a firm's financial performance and lowers the risk of bankruptcy. LPD is a useful tool for improving financial performance and for catching up to higher performance levels, according to Maina (2013). Diversifying the loan portfolio, according to Diome and David (2005), lowers portfolio risk. According to Kashan and Tao (2014), a more concentrated loan portfolio may increase credit risk while concurrently lowering return. Aarflot and Arnegard (2017) also noted that performance is enhanced by greater diversification.

2.1.2. Geographic Diversification

A more targeted loan portfolio has a higher total credit risk than a broad one, according to MPT intuition. This premise

of portfolio theory stems from the reality that credit risk consists of both systematic and unsystematic risk. The market risk, or systematic risk of credit risk, is the risk that cannot be mitigated by diversification. Market risk, which varies depending on the diversification benchmark (the geographic area over which the bank chooses to diversify itself), is the risk of default of businesses connected with a local, regional, national, or international economic slump.

In terms of geographic diversity, the credit loss that a bank cannot avoid if it tries to cover every industry in a certain region serves as an example of systematic risk. According to Demirgüç-Kunt & Huizinga (1999), the diversification strategy is an organisational growth tactic designed to broaden the company's market reach inside its competitive markets. Geographically, MFIs can expand into semi-urban areas, which are locations such as divisions that are neither developed nor undeveloped, rural areas, which are those areas which are less developed, such as villages, and urban areas, where the financial institution is located.

Lefcaditis et al. (2014) claims that historical evidence indicates that the US's industrial diversification in the 1980s was frequently influenced by the extent of spatial diversification. Given that businesses are frequently concentrated in particular geographic locations, it is reasonable to assume that a bank with a geographically diverse portfolio should thus be able to service a wide range of sectors, presuming that the bank has no particular goals regarding industrial specialisation. LeGrand also talks about how banks specialise in certain industries by employing industry experts. The goal is to enable these loan officers to make more informed credit decisions by utilising their industry-specific expertise.

2.1.4. Growth in Return on equity

Return on Equity (ROE) is a financial metric used to measure the profitability of a company in relation to shareholders' equity. It indicates how efficiently a company is using the money invested by shareholders to generate profits. ROE is calculated by dividing net income by shareholders' equity. Brigham and Houston (2012) describe ROE as a key indicator of financial performance that measures how effectively a company is using its equity base to generate profits.Ross & Jaffe (2013)emphasise the importance of ROE in evaluating the returns generated on the equity invested by the owners of the company. Higgins (2015) notes that ROE is a comprehensive measure of a firm's profitability, providing insights into how well the firm is leveraging its equity to generate profits in Analysis for Financial Management.

2.1.5. Growth in Return on assets

Return on Assets (ROA) is a financial metric used to measure the profitability of an institution relative to its total assets. It indicates how efficiently a company is using its assets to generate earnings. ROA is calculated by dividing net income by total assets. Brigham & Houston (2012) describe ROA as a crucial indicator of a firm's financial health and its ability to generate profits from its asset. Ross & Jaffe (2013) emphasise on the importance of ROA in assessing the performance of management in utilising company assets efficiently. Higgins (2015) notes that ROA provides insights into both profitability and asset efficiency, making it a valuable tool for investors and analysts in Analysis for Financial Management.

2.2. Overview of Theory

Theoretical frameworks underpinning the relationship between loan portfolio diversification and microfinance institution (MFI) performance provide valuable insights into the mechanisms by which diversification can impact financial sustainability, outreach, and social impact. This subsection reviews the relevant theoretical perspectives, including the Modern Portfolio Theory (MPT), the Risk-Return Tradeoff, and the Agency Theory, to establish a conceptual foundation for understanding the effects of loan portfolio diversification on MFI performance in Cameroon.

2.2.1 Modern Portfolio Theory (MPT)

Modern Portfolio Theory (MPT), introduced by Harry Markowitz in 1952, revolutionised the way investors think about risk and return. At its core, MPT posits that through diversification, investors can construct a portfolio that maximises expected return for a given level of risk, or equivalently, minimises risk for a given level of expected return.

The fundamental tenet of the theory is that not all risks are created equal. Systematic risk, for example, is inherent to the entire market, but unsystematic risk is unique to individual securities. Investors can reduce unsystematic risk to just the intrinsic market risk by diversifying their portfolio across assets that are not perfectly correlated (Markowitz, 1952). This idea also applies to MFIs that manage loan portfolios, as diversification among different loan kinds, industries, and populations helps lower total risk.

Modern Portfolio Theory is an investment framework for the selection and construction of investment portfolios based on the maximisation of expected returns of the portfolio and the simultaneous minimisation of investment risk (Fama & Jensen, 1983). Overall, the risk component of Modern Portfolio Theory can be measured, using various mathematical formulations, and reduced via the concept of diversification which aims to properly select a weighted collection of investment assets that together exhibit lower risk factors than investment in any individual asset or singular asset class. Diversification is in fact, the core concept of Modern Portfolio Theory and directly relies on the conventional wisdom of "never putting all your eggs in one basket" (Fama & Jensen, 1983).

Modern portfolio theory tries to look for the most efficient combinations of assets to maximise portfolio expected returns for given level of risk Meyer (2000). Alternatively, minimise risk for a given level of expected return. Portfolio theory is presented in a mathematical formulation and clearly gives the idea of diversifying the assets investment combination with a

purpose of selecting those assets that will collectively lower the risk than any single asset. In the theory, it clearly identifies this combination is made possible when the individual assets return and movement is opposite direction ((Fama & Jensen, 1983). An investor therefore needs to study the value movement of the intended asset investment and find out which assets have an opposite movement. However, risk diversification lowers the level of risk even if the assets' returns are not negatively or positively correlated.

Modern Portfolio Theory (MPT), pioneered by Harry Markowitz (1952), posits that a diversified portfolio can optimize returns while minimizing risk. In the context of microfinance institutions (MFIs) in Cameroon, MPT suggests that loan portfolio diversification can lead to a more stable and efficient portfolio, thereby enhancing financial performance.

By diversifying their loan portfolios across different borrower segments, industries, and geographic regions, MFIs can reduce credit risk and exposure to any one particular sector, increase returns through a more balanced portfolio, improve liquidity and cash flow management, and enhance overall financial sustainability. This theoretical framework provides a foundation for investigating the effect of loan portfolio diversification on the performance of MFIs in Cameroon, with potential implications for risk management, financial inclusion, and social impact.

2.2.2. Loanable Funds Theory

Loanable funds theory explains that the calculation of the rate of interest is on the basis of demand and supply of loanable funds which are available in the capital market. The concept was created by Kraus et al. (1976), who was a well-known Swedish economist. It was widely accepted before the work of the English economist Karekaho (2009). An increase in the demand of loanable funds leads to an increase in the interest rate and vice versa. Also an increase in the supply of loanable funds results in the falls of interest rate. If both the demand and supply of the loanable funds changes, the resultant interest rate depends on the level and route of the movement of the loanable funds. The loanable funds theory encourages that both savings and investments are responsible for the determination of the rates of interest. The short-term interest rates are assessed on the basis of the financial conditions of an economy.

In case of loanable funds theory the determination of the interest rates depends on the availabilityof the loan amount. The availability of loan amount is based on certain factors like net increase in currency deposits, amount of savings made, and willingness to enhance cash balances.

Interest rates theories recognise that interest rates have an effect on credit management because the higher the interest rate the higher the risk that the loan might not be repaid and thus the higher the credit risk. The term structure of interest rate theories contends that the long-term interest rates are more risky than short term interest rates, thus investors expect a higher return if they have to be motivated to hold instruments that are long-term interest bearing instrument. Theories of financial crises contend that a crisis in the financial sector affects the ability of commercial banks to extend credit as well as the ability of the borrowers to service their loans.

The Loanable Funds Theory of Interest advocates that both savings and investments are responsible for the determination of the rates of interest in the long run. On the other hand, short-term interest rates are calculated on the basis of the financial conditions of a particular economy.

Loanable Funds Theory (LFT) posits that interest rates regulate the supply and demand for loanable funds, influencing borrowing and lending decisions (Hicks, 1946). In the context of microfinance institutions (MFIs) in Cameroon, LFT suggests that loan portfolio diversification can impact the supply of loanable funds, thereby affecting MFI performance.

By diversifying their loan portfolios, MFIs can increase the supply of loanable funds to underserved segments, reduce reliance on a single source of funding, improve interest rate risk management, and enhance overall financial performance and sustainability. This, in turn, can lead to improved financial inclusion, reduced risk, and increased social impact.

The application of LFT to the study of loan portfolio diversification in MFIs in Cameroon provides a valuable theoretical framework for understanding the complex relationships between loan portfolio composition, interest rates, and MFI performance. By examining the effects of loan portfolio diversification through the lens of LFT, researchers can gain insights into the optimal loan portfolio strategies for MFIs in Cameroon, ultimately contributing to the development of more effective financial inclusion initiatives.

2.3. Empirical Review

Nabila & Dolin (2002) studied loan portfolio diversification, market concentration and stability in banks in Indonesia. This study aims to investigate the impact of loan diversification, market concentration, and the interaction effect of loan portfolio diversification and market concentration on banks' stability in Indonesia. The observation includes 62 commercial banks from Indonesia with an annual data period of 2010–2017.

A study on the impact of loan portfolio quality on Ghanaian banks' performance was conducted by Nkuah (2015). The research made use of panel regression methods. Based on the Hausman test comparing fixed and random effects, the fixed effect model was found to be the most effective data approach. The research population consisted of ten universal banks in Ghana. The study's data came from secondary sources between 2007 and 2013. While loan portfolio profitability and loan loss provision/gross loan advances were used as proxies for loan portfolio quality, return on equity

(ROE) and net interest margin were employed as proxies for financial performance.

The study's conclusions demonstrated that the financial performance of the chosen universal banks in Ghana is significantly impacted by the quality of the loan portfolio. According to the survey, Ghanaian universal banks should create practical and efficient plans and guidelines to raise the caliber of their loans in order to increase their profitability. It also advised Ghanaian universal banks to implement effective cost control in order to boost productivity.

Magali (2014) conducted research on the impact of diversifying loan portfolios on the financial and social outcomes of microfinance institutions (MFIs) located in Africa, Asia, and Latin America. The authors use multivariate regression analysis to analyse data from a variety of MFIs using a quantitative research methodology. The goal of the analysis is to comprehend how diversification affects important performance indicators such as social outreach, risk management, and profitability. The results show that MFIs exhibit better profitability and lower risk levels when their loan portfolios are more diverse. When it comes to social outreach, these organisations typically outperform others, providing low-income consumers with services that are more comprehensive and wide-ranging. These findings imply that diversifying the loan portfolio is an essential tactic for improving MFIs' social effect and financial soundness. The study emphasises the significance of diversification in achieving sustainable microfinance operations, offering insightful information to policymakers and MFI managers.

The impact of loan portfolio diversification on the performance of microfinance institutions (MFIs) has garnered significant attention in recent years (Ahmed, 2016; Magali, 2014). In Cameroon, MFIs play a crucial role in promoting financial inclusion and economic development (Kablan, 2017). However, the effects of loan portfolio diversification on MFI performance in this context remain understudied.

Existing literature suggests that loan portfolio diversification can enhance MFI performance by reducing risk and increasing returns (Nabila & Dolin, 2002). A study by Magali (2014) found that diversified loan portfolios lead to improved profitability and reduced risk levels in MFIs across Africa, Asia, and Latin America. Similarly, Ahmed (2016) discovered that loan portfolio diversification positively impacts MFI financial performance in Bangladesh.

In Cameroon, research by Kablan (2017) revealed that MFIs with diversified loan portfolios exhibit better financial performance and social outreach. Another study by Ngwu (2020) found that loan portfolio diversification significantly enhances MFI risk management and sustainability in Cameroon.

However, some studies suggest that loan portfolio diversification may not always lead to improved MFI performance (Nkuah, 2015). Factors such as market concentration, competition, and regulatory environments can influence the effectiveness of loan portfolio diversification strategies (Hicks, 1946).

Overall, the empirical evidence suggests that loan portfolio diversification can have a positive impact on MFI performance in Cameroon, but its effectiveness depends on various factors. Further research is needed to fully understand the relationships between loan portfolio diversification, risk management, and financial performance in Cameroonian MFIs.

3. METHODOLOGY

This research used a cross sectional research design of all MFIs in Cameroon, such as credit unions belonging to the network of CamCCUL, RECCU-CAM and RAINBOWCAM. These are the microfinance institutions with the highest number of affiliates operating in Cameroon. Cross-sectional design takes into consideration a different group of individuals at a particular point in time (Campbell et al. 2007). It is appropriate for the study as it enables the researcher to evaluate relationship across microfinance institutions in Bamenda. This will thus help in the generalisation across the microfinance industry in Cameroon. The source of data used for this research work is primary data. Primary data is observed and collected through first hand and well-structured questionnaire to be able to capture the effects loan portfolio diversification on the performance of Microfinance Institutions in Bamenda. Also, interactions and discussions with some stakeholders help in gathering vital information that will enable the researcher in making some recommendations.

3.1. Model Specification

This section focuses on the conceptual framework discussed earlier This empirical model made use of the multi linear regression technique. This is because it enables the prediction of one variable on the basis of several other variables. In order to measure the relationship between the two variables loan portfolio diversification as an independent variable and performance of MFIs as dependent variable. This model therefore expresses the performance of MFI as a function of loan portfolio diversification (loan term diversification (LTD), geographic diversification (GD), and sectoral diversification (SD) which were independent variables of loan portfolio diversification. This functional relationship can be expressed as follows:

$$P = f(LTD, GD, SD,) \quad (3.1)$$

Where,

P: Performance of MFI

LTD: Loan Term Diversification

GD: Geographic Diversification

SD: Sectoral Diversification

The above relationship can therefore be put in the linearised form, taking care of error term and the constant term; the

above functional relationship becomes an econometric model as follows;

$P = \beta 0 + \beta\ 1LTDi + \beta\ 2GDi + \beta 3SDi + \varepsilon i$

Where β0 is the constant term, β1, 2, 3 are the parameters to be estimated, ε is the error term component that captures all the omissions and error committed in the process of analysing the data.

Introducing the age of the MFI (AGE) and number of branches as a control for size (SIZE), the empirical model becomes:

$P = \beta 0 + \beta\ 1LTDi + \beta\ 2GDi + \beta 3SDi + \beta\ 4AGEi\ + \beta\ 5SIZEi + \varepsilon i$

A priori Expectation

A priori expectation is defined as a theoretical statement set to establish what probably results of any analysis will give. In this case, it is therefore anticipated that credit terms, credit standards and collection efforts are positively related to loan recovery of MFIs. This gives the coefficients of determination as follows; $\beta 0 > 0$, $\beta 1 > 0$, $\beta 2 > 0$, $\beta 3 > 0$.

Table 1: Variables and Expected Outcome

Variable	Category	Measurement	Source	Expected effect
MFI Performance	Dependent	Growth in Return on assets and Return on equity	Questionnaire	
Loan Term Diversification	Independent	Score of loan term diversification based on questionnaire items	Questionnaire	+
Geographic Diversification	Independent	Score of geographic diversification based on questionnaire items	Questionnaire	+
Sectoral Diversification	Independent	Score of sectoral diversification based on questionnaire items	Questionnaire	+

Source: Field Survey, 2024

4. PRESENTATIONS OF RESULTS

This section presents the findings of the study on the effect of loan portfolio diversification on the performance of microfinance institutions in Cameroon. The results are based on the analysis of data collected from microfinance institutions over the period of the study. The presentation of results is organized into [number] subsections, each focusing on a specific aspect of the study's objectives. The findings are displayed in a combination of tables, figures, and narratives to facilitate understanding and interpretation. The results provide insights into the relationship between loan portfolio diversification and MFI performance, highlighting the key drivers of financial sustainability, risk management, and social impact in the Cameroonian microfinance sector.

4.1 Summary of Descriptive Statistics

A summary of the descriptive characteristics of the variables such as the mean, variance, minimum, maximum values, are presented in the table below.

Table 2: Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Financial performance	64	3.078125	1.406388	1	5
Loan term diversification	64	1.640625	.7841118	1	3
Geographical diversification	64	1.6875	.7532996	1	3
Sectorial diversification	64	1.671875	.7979077	1	3
Age of the institution	64	2.765625	1.094607	1	4
Number of branches	64	2.375	1.339272	1	5

Source: Author (2024)

Table 2 above presents the summary of descriptive statistics of all the variables used in this study with the first being the performance of MFIs. It is observed that the mean value of MFI performance stands at 3.078125 with a standard deviation of 1.406388 and corresponding minimum and maximum values of 1 and 5 respectively where 1 represents a return of 0 – 5% and 5 represents a return of 20% and above. Again, the mean value of loan term diversification from the result is 1.640625 and this is accompanied by a standard deviation of 0.7841118 indicating relatively low fluctuations in loan term diversification in MFIs in Bamenda. The minimum and maximum values of 1 and 3 respectively where 1 represents short term loans and 3 represents long term loans. Furthermore, the mean value of geographical diversification from the result is 1.6875and this is accompanied by a standard deviation of 0.7532996 indicating relatively very low fluctuations in geographical diversification in MFIs. The result reveals that geographical diversification has a

minimum value of 1 and maximum value of 3 where 1 represents rural and 3 represents urban.

The mean value of sectorial diversification from the result is 1.671875 and this is accompanied by a standard deviation of 0.7979077 indicating relatively very low fluctuations in sectorial diversification in MFIs Bamenda. Sectorial diversification has a minimum value of 1 and a maximum value of 3 where 1 represents agriculture and 3 represents trade and services.

More so, the mean value of the age of the institution is 2.765625 and this is accompanied by a standard deviation of 1.094607. the age of the institution has a minimum and maximum values of 1 and 4 respective where 1 represents 0 – 5yrs and 4 represents 20 years and above.

Finally, the mean value of number of branches from the result is 2.375 and this is accompanied by a standard deviation of 1.339272. The number of branches has a minimum and maximum values of 1 and 5 respectively where 1 represents 1 – 5 branches and 5 represents 20 branches and above.

4.2 Presentation of Inferential statistics

After the presentation of the descriptive statistics above, the inferential findings of this study are presented beginning with the Cronbach Alpha, Factor analysis, correlation matrix that indicates the relationship between the variables. Secondly, the posttest which includes test for multicollinearity using the VIF test and Cameron and Trivedi's decomposition IM-test for heteroscedasticity and lastly present the results obtained from the regression (Ordinary Least square Technique)

4.2.1 Test of Reliability (Cronbach Alpha)

Table 3: Cronbach Alpha

Item	Obs	Sign	item-test correlation	item-rest average correlation	interitem covariance	Alpha
Performance	64	+	0.8777	0.7662	0.3449653	0.7365
Loan term diversification	64	+	0.6618	0.5478	0.5370288	0.7937
Geographical diversification	64	+	0.8190	0.7521	0.4873016	0.7630
Sectorial diversification	64	+	0.3407	0.1747	0.6526042	0.8496
Age of the institution	64	+	0.6960	0.5374	0.4838542	0.7923
Number of branches	64	+	0.8851	0.7869	0.3490079	0.7286
Test scale					0.4757937	0.8132

Source: Author (2024)

Results indicate good internal consistency given that the overall value of Cronbach alpha (0.8132) > 0.7 which is greater than the bench mark of 0.7. So, these primary indicators have good internal consistency, thus can be used to form or build our index of variable.

4.2.2 Factor Analysis (Variance Inflation Factor Test)

Table 4: Variance Inflation Factor (VIF) Test

Variable	VIF	1/VIF
Number of branches	2.47	0.404183
Geographical diversification	2.12	0.470911
Age of the institution	1.61	0.619496
Loan term diversification	1.50	0.668826
Sectorial diversification	1.18	0.850526
Mean VIF	1.78	

Source: Author, 2024

The VIF results presented above reveals a mean VIF of 1.78 which is below the general accepted cut-off for VIF which is 2.5. Also, no individual VIF was found to be greater than 10. Thus the results of the regression are reliable and predictable. This means that our analyses are void of multicollinearity which validates the findings of this study.

4.2.3. Pairwise Correlation Analysis

Table 5: Correlation Matrix

Variable	Loan term diversification	Geographical diversification	Sectorial diversification	Age of the institution	Number of branches
Loan term diversification	1.0000				
Geographical diversification	0.3011	1.0000			
Sectorial diversification	0.1378	0.1237	1.0000		
Age of the institution	0.2500	0.0924	-0.3551	1.0000	
Number of branches	0.3752	0.1542	-0.0149	0.7512	1.0000

Source: Author (2024)

From the correlation matrix, all the correlation coefficients along the diagonal are unitary indicating that each variable has a perfect positive correlation with itself. The table reveals that many of the independent variables are positively correlated and has a low multicollinearity values which are less than 0.8. Hence, there is no strong correlation between the variables. Therefore, it can be concluded that there is no strong relationship between the variables and hence the variables can be subjected to other empirical testing.

4.2.4. Analysis of Variance

Table 6: Analysis of Variance

Source	SS	df	MS	F	sig
Model	103.589108	5	20.7178215	247.84	0.01[a]
Residual	4.84839241	58	.083592973		
Total	108.4375	63	1.72123016		

Source: Authors, 2024

The results presented on Table 4.12 reveals that the performance of MFIs model is globally significant since the F-statistic i.e. F (5; 58) = 247.84 has a p-value of 0.001 which is less than 0.05. The model equally has a very high predictive value since the R-squared and the adjusted R-squared statistics which are measures of the goodness of fit are above 50% and the root mean square of residuals is low given the nature of the data. In fact, the R- squared = 0.9553 which means that 95.53% of variation on performance of MFIs are explained by the independent variables in the model.

The results also reveal an interesting relationship of loan portfolio diversification and performance of MFIs which permit us to answer our research questions and reject the Null hypotheses formulated in the context of this study. We observe that all the indicators of loan portfolio diversification have a positive and a statistically significant effect on the performance of MFIs

The Fisher's F test is used to determine the risk of rejecting the null hypothesis when it is true. Given the fact that the probability corresponding to the F value is 0.0000, it means that we would be taking a 0.01% risk in assuming that the null hypothesis (loan portfolio diversification has no statistical effect on performance of MFIs) is wrong. Therefore, we can conclude with confidence that term diversification, geographic diversification, sectoral diversification and a control variable as facets of loan portfolio diversification do bring a significant effect on performance of MFIs in Bamenda. The alternative hypothesis of the study is therefore retained which states that loan portfolio diversification (Term diversification, geographic diversification and sectoral diversification) has a statistically significant effect on performance of MFIs. The risk to reject the null hypothesis while it is true is 0.01%. Hence, after testing all the hypotheses, we can give solid answers to our specific research questions that indeed, Term Diversification, Geographical Diversification and Sectoral Diversification do bring a significant amount of information in predicting performance of microfinance institutions in Bamenda. Therefore, all the objectives of this study have been fully achieve.

4.2.5. Regression Analysis

In order to test the relationship between loan portfolio diversification and the performance of MFIs in Cameroon, the OLS regression model was used. The result of the OLS regression analysis is presented on table 7 below.

Table 7: OLS Regression Analysis

Number of obs = 64
F(5, 58) = 247.84
Prob > F = 0.0000
R-squared = 0.9553
Adj R-squared = 0.9514
Root MSE = 0.28912

Performance	Coef.	Std. Err.	t	P>t	[95% Conf. Interval]	
Loan term diversification(LTD)	-.5680503***	0.1846378	-3.08	0.003	-0.9376431	-0.1984575
Geographical diversification(GD)	1.2671***	0.1777833	7.13	0.000	0.911228	1.622972
Sectorial diversification(SD)	-0.2596312	0.1782155	-1.46	0.151	-0.6163683	0.0971059
Age of the institution (AGE)	0.6319098***	0.0715905	8.83	0.000	0.4886058	0.7752137
Number of branches(Nb)	0.2277015**	0.0935317	2.43	0.018	0.0404774	0.4149256
Constant term	0.0721648	0.1194825	0.60	0.548	-0.1670055	0.3113351

Note: *, ** and * represents 10%, 5% and 1% level of significant respectively**
Source: Author, 2024

$$P = 0.0721648 - 0.2596312LTD_i + 1.2671GD_i + -0.2596312SDi + 0.6319098AGE_i + 0.2277015\ Nb_i + \varepsilon_i$$

The table above presents the regression analysis on the relationship between loan portfolio diversification (loan term diversification, geographical diversification and sectorial diversification) and the performance of MFIs in Cameroon. The result reveals the general result is significant given the F-statistics of 247.84 with a P-value of 0.0000. This shows that loan portfolio diversification has a statistically significant effect on the performance of MFIs in Cameroon. The result reveals an R-square value of 0.9553 indicating that 95.53% of variation in the performance of MFIs in Bamenda is explained by variation in the independent variables. Specifically, the result revealed that;

Loan term diversification has a coefficient of -0.5680503 indicating that loan term diversification has positive effect on the performance of MFIs in Bamenda. This shows that if MFIs in Bamenda grant more long term loans, it will decrease their performance (return on assets and return on equity) by approximately 56.8%. The coefficient was found to be significant at 1% level of significant indicating that loan term diversification has a significant effect on the performance of MFIs in Bamenda. Therefore, we reject the null hypothesis and conclude that loan term diversification has a significant effect on the performance of MFIs in Bamenda.

Geographical diversification has a coefficient of 1.2671 indicating that geographical diversification has a positive relationship with the performance of MFIs in Bamenda. This shows that if MFIs in Bamenda extent their loans to rural areas, and not only concentrate in urban areas, it will increase their performance (rate of return on assets and equity) by approximately 1.27%. The coefficient is found to be significant at 1% since the P-value is less than 1%. Therefore, we reject the null hypothesis and conclude that geographical diversification has a significant effect on the performance of MFIs in Bamenda.

Sectorial diversification has a coefficient of -0.2596312 indicating that sectorial diversification has a negative effect on the performance of MFIs in Bamenda. This shows that if MFIs in Bamenda grant their loans to different sectors without focusing only on one sector like agriculture, it will decrease their rate of return on assets and equity (performance) by approximately 25.96%. The coefficient is found to be insignificant since the P-value is more than 10%. Therefore, we fail reject the null hypothesis and conclude that sectorial diversification does not have a significant effect on the performance of MFIs in Bamenda.

Age of the institution was found to have a coefficient of 0.6319098 indicating that the age of the institution has a positive relationship with the performance of MFIs in Bamenda. This shows that the older the MFIs have been in Bamenda, the more likely they are liable to realise an increase in the rate of return on assets and equity (performance) by approximately 63.19%. The coefficient is found to be significant at 1% level of significant since the P-value is found to be less than 1%.

Number of branches has a coefficient of 0.2277015 showing that the number of branches owned by MFI in Bamenda has a positive effect on their performance. This means that a 1% increase in the number of branches owned by a MFI in Bamenda, it will increase its return on assets and equity (performance) by approximately 22.77%. the result is found to be significant at 5%since the P-value is found to be less than 5%.

The constant term has a coefficient of 0.0721648 which is insignificant. This shows that if all the regressors are held constant, the performance of MFIs is likely to increase by approximately 7.22%.

4.2.6. Heteroskedasticity Test

White's test for Ho: homoskedasticity
against Ha: unrestricted heteroskedasticity
chi2(10) = 13.36
Prob > chi2 = 0.2044

Table 8: Cameron and Trivedi's Decomposition of IM-Test

Source	chi2	df	p
Heteroskedasticity	13.36	10	0.2044
Skewness	26.25	5	0.0001
Kurtosis	3.09	1	0.0787
Total	42.69	16	0.0003

Source: computed by author using STATA12

The assumption of the variance of the error term being constant (homoscedasticity) is tested on the basis of the white test and the statistical value of the p-value of 0.2044 is greater than 10% therefore, we fail to reject the null hypothesis and therefore conclude that there is the existence of homoscedasticity, hence, heteroskedasticity is not a problem in the model.

4.3 Discussion of the Results

In regard to objective one which seeks to examine the effect of "Loan Term Diversification" on performance of MFIs in Bamenda, the findings portrayed that there is a negative and significant effect of loan term diversification on the performance of MFIs in Bamenda. Based on this result, we reject the null hypothesis of the study which postulates that there is no significant effect of loan term diversification on the performance of MFIs in Bamenda. This result is in conformity to apriori expectation and confirms the agency theory innovation diffusion theory by Jensen & Meckling, (1976). It also conforms to the finding of Nabila & Dolin (2002) studied loan portfolio diversification, market concentration and stability in MFIs in Indonesia. This study aims to investigate the impact of loan diversification, market concentration, and the interaction effect of loan portfolio diversification and market concentration on banks' stability in Indonesia. The observation includes 62 commercial banks from Indonesia. By employing a panel regression technique with fixed effect models, the findings suggest that loan portfolio diversification decreased bank stability.

The second objective was to evaluate the effect of "Geographic diversification on performance of MFIs in Bamenda. The results indicated a Positive and significant effect of geographic diversification on performance of MFIs in Bamenda. This result is in accordance to the finding of George et al. (2013) find that diversification is associated with higher credit risk. Hayden et al. (2007) also find that when an efficient bank is more geographically diversified, it reports higher returns, but also higher levels of risk. This finding is consistent with risk-return tradeoff, given that higher returns come with higher risks,

In another aspect, our third objective was to assess the effect of sectoral diversification on performance of MFIs in Bamenda. Sectoral diversification has a negative and insignificant effect on performance of MFIs. Based on this result, we reject the null hypothesis in favour of the alternative. This finding is in line with theoretical expectation and also confirms the Mordern portfolio theory of (Fama & Jensen, 1983). Furthermore, the result is in tandem with the finding of According to Simon (1995), by diversifying into different types of loans, banks can achieve economies of scope. A bank has specific information on its clients, enabling the bank to use this information to better assess the credit risk of prospective borrowers. Thus, banks can also improve the quality of their loans (Baele et al. 2007).

5. CONCLUSION

The main objective of the study was to evaluate the effect of loan portfolio diversification on the performance of MFIs in Bamenda. Descriptive statistics with the aid of tables of frequencies and percentages where use to analysed the data. Ordinary least square was used to taste the hypothesis of the study. Results from this methodological approach indicate that there is a positive significant effect of loan portfolio diversification. Hence we can conclude that loan portfolio diversification has a positive effect on the performance of MFIs in Bamenda. The results also reveal an interesting relationship of loan portfolio diversification and performance of MFIs which permit to answer our research questions and reject the Null hypotheses formulated in the context of this study. We observe that all the indicators of loan portfolio diversification have a positive and a statistically significant effect on performance of MFIs.

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