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Credit Union Resilience: The Financial Intermediation Perspective in Cameroon

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Abstract

Purpose: The purpose of this study is to investigating the resilience of credit unions in Cameroon from a financial intermediation perspective, using COBAC Norms as a proxy for operational compliance and performance.

Materials and Methods: Data from 45 observations across nine credit union chapters and over a five year's period were analysed using an ordinal mixed-effects model, with Principal Component Analysis (PCA) which addressed multicollinearity among predictors of savings mobilisation, membership, and loan portfolio quality.

Findings: The results show that the scale of operations, captured by PC1 with a 95.50% variance, significantly predicts higher COBAC Norms (OR = 2.34, $p < 0.001$), with institutional variation (Chapter random effects, $\sigma^2 = 1.2$). The model satisfies proportional odds (Brant test $p = 0.485$) and shows no significant heteroskedasticity or autocorrelation. Findings suggest that larger-scale operations enhance resilience, with implications for policy and practice in scaling savings mobilization and membership. Smaller credit unions require targeted strategies to improve compliance.

Unique Contribution to Theory, Practice and Policy: The study recommends that in scaling their operations, credit unions should prioritize membership drives, savings mobilization campaigns, and loan portfolio quality improvements to enhance COBAC Norms and resilience. Regulatory bodies such as COBAC should provide technical and financial assistance to smaller Chapters such as Maroua and Nkambe to scale their operations and improve compliance. High-performing Chapters such as Bamenda and Fundong for instance, should share management strategies through workshops and peer-learning programs. Policymakers should incentivize savings and membership growth through tax benefits or subsidies for credit unions. The study fills a gap in understanding financial intermediation's role in credit union resilience in developing economies.

Keyword: *Credit Union Resilience, Financial Intermediation, Loan Portfolio Quality, Membership and Savings Mobilisation.*

JEL Code: *G2*

1.0 INTRODUCTION

1.1 Background of the Study

Credit unions in the United States and Europe are vital financial institutions that serve as intermediaries, providing savings and credit services to members, especially in underserved populations. Their resilience, defined as their ability to withstand economic shocks, adapt to changing environments, and maintain financial stability, is crucial for fostering sustainable development and promoting financial inclusion. In the U.S., credit unions hold approximately $1.7 trillion in assets, serving over 120 million members, demonstrating their significant role in the financial landscape (National Credit Union Administration, 2023). Similarly, in Europe, credit unions or cooperative banks account for about 25% of total banking assets in several countries, emphasizing their importance in local economies. Historically, resilience measures focused primarily on basic financial indicators such as capital adequacy, liquidity, and loan default rates. However, following the global financial crises of the late 2000s, stricter regulatory standards and international frameworks like Basel III and COBAC's prudential norms have prompted the adoption of more comprehensive resilience measures that include risk management, governance, and operational efficiency (DeYoung, 2019). These developments have led credit unions worldwide to strengthen internal controls, diversify portfolios, and improve transparency, which collectively enhance their capacity to absorb shocks and safeguard member deposits.

In developing regions across Africa and Asia, the evolution of credit union resilience has been shaped by unique challenges, including limited access to technology, inadequate regulatory infrastructure, and macroeconomic instability. Many credit unions in these areas historically relied heavily on community trust and social capital, with resilience often driven by informal member solidarity rather than formalized risk management practices (Muriithi & Wainaina, 2020). During the 2000s, international organizations and regional bodies intensified efforts to bolster these institutions through capacity-building initiatives, adoption of international best practices, and improved governance standards. The 2008 financial crisis underscored the importance of resilience, prompting a focus on financial literacy, enhanced regulatory oversight, and the integration of digital financial services to boost operational resilience and outreach (Ngugi et al., 2021). Recent advancements include leveraging digital platforms to diversify services, access new markets, and manage risks more effectively, with digital financial inclusion increasing by over 30% in some African countries between 2015 and 2020, thus strengthening resilience (World Bank, 2022). These efforts aim to improve the sustainability and stability of credit unions amid ongoing socio-economic challenges.

In Cameroon, credit unions have historically played a crucial role in supporting local economies, especially in rural agricultural communities, but faced numerous hurdles, including limited capital, inadequate regulatory oversight, and socio-political challenges impacting their stability and growth (Cameroon Ministry of Finance, 2017). The regulatory framework established by COBAC has evolved significantly, with the introduction of prudential norms aimed at increasing capital adequacy, liquidity management, and risk provisioning. These norms have been progressively implemented, leading to an increase in average capital adequacy ratios among credit unions from 8% in 2015 to 12% in 2022, indicating improved resilience (Njoya & Fomunyam, 2019). Despite these improvements, resource constraints and varying compliance levels continue to pose challenges, with only 65% of credit unions meeting the new standards by 2021. Stakeholders such as government agencies, credit union associations, and community leaders have engaged in capacity-building programs and policy reforms to strengthen resilience and sustainability.

Nevertheless, recent socio-economic disruptions, including political tensions and economic downturns, have tested the resilience of Cameroonian credit unions, highlighting the ongoing need for targeted interventions and resource allocation to ensure their stability and growth.

The 14 COBAC (Banking Commission for Central Africa) norms encompass a comprehensive framework aimed at ensuring sound banking practices, financial stability, and consumer protection within the Central African banking sector, including credit unions. These norms include capital adequacy, liquidity management, risk management, corporate governance, internal controls, anti-money laundering, consumer protection, transparency, prudential reporting, prudential standards for credit risk, operational risk, market risk, off-site supervision, and sanctions. COBAC enforces these norms through mechanisms such as regular on-site inspections, off-site surveillance, licensing requirements, sanctions, and corrective measures for non-compliance. The Basel III accords have been integrated into COBAC norms primarily through capital adequacy requirements, emphasizing a minimum Common Equity Tier 1 (CET1) ratio of 4.5%, a leverage ratio of 3%, and a Liquidity Coverage Ratio (LCR) of 100%, which are designed to bolster the resilience of credit unions against financial shocks (Basel Committee on Banking Supervision, 2013). For example, credit unions operating under COBAC regulations are required to maintain sufficient capital buffers to withstand economic downturns, aligning with Basel III's emphasis on risk-sensitive capital requirements. Such integration ensures that credit unions adopt prudent risk management practices, reducing the likelihood of insolvency; for instance, the capital adequacy ratio of credit unions in the region increased from 10% in 2019 to 12.5% in 2022, reflecting improved resilience (COBAC, 2023). The enforcement mechanisms and Basel III incorporation collectively contribute to safeguarding depositors and maintaining financial stability within the Central African financial system.

1.2 Statement of the Problem

The expected and acceptable level of resilience for member-owned microfinance institutions (MFIs), such as credit unions, is characterized by their ability to withstand economic shocks, sustain liquidity, promote sustainable growth, and maintain member confidence. Ideally, resilient MFIs should demonstrate high capital adequacy ratios, low default rates, strong governance structures, and effective risk management practices, aligning with international standards like Basel III and prudential norms set by regulators such as COBAC in Cameroon (DeYoung, 2019). It is expected that all credit unions in Cameroon must adhere to all the 14 COBAC prudential norms to remain resilient. However, recent data reveal that the resilience levels of MFIs in Cameroon remain below these benchmarks, with an average of only 10 of the 14 COBAC norms attained by credit unions in Camroon, an average that is still vulnerable given the exposure of the sector to the socio-economic and political instability in the strongholds of North West and South West Regions of Cameroon (Njoya & Fomunyam, 2019). While benchmarking Cameroon’s MFIs against those in South Africa and Kenya where resilience indicators surpass 15-20% may seem informative, such comparisons are overly simplistic because there exists structural differences in economic size, financial regulation or political contexts amongst these nations. Ignoring these differences may provide unrealistic outcomes (Ngugi et al., 2021). In terms of regulatory compliance however, South Africa and Kenya are far above Cameroon with stronger regulatory frameworks and improved compliance levels. This disparity exposes a persistent resilience gap in Cameroon, hampering the sector’s capacity to deliver sustainable financial services and respond effectively to shocks.

Efforts by stakeholders including; government agencies, regulatory authorities, development partners and MFIs bolstered resilience through capacity-building programs, policy reforms and adherence to international prudential standards. For instance, COBAC has implemented prudential norms since 2015 to strengthen capital buffers and improve governance structures. Despite these initiatives, resilience levels in Cameroon have shown only marginal improvement; the sector remains vulnerable to external shocks such as economic downturns and political unrest, which often lead to increased default rates and liquidity shortages (Cameroon Ministry of Finance, 2017). This on-going resilience gap suggests that current measures are insufficient for fostering the robust stability required for long-term sustainability. Recognizing this, it is clear that partial interventions alone cannot fully address the systemic vulnerabilities of MFIs in Cameroon and targeted strategies are needed to close the resilience gap effectively.

It is hypothesized that establishing a comprehensive and efficient financial intermediation framework, focused on diversifying financial products, leveraging digital technology and enhancing stakeholder collaboration could substantially improve the resilience of MFIs. Such a framework would facilitate better resource mobilization, risk sharing and member engagement, enabling MFIs in Cameroon to reach resilience levels comparable to their counterparts in South Africa and Kenya. This approach is supported by global evidence indicating that effective financial intermediation plays a critical role in building institutional resilience and fostering inclusive economic growth (Muriithi & Wainaina, 2020). Implementing this strategy could bridge the resilience gap by strengthening operational capacity, expanding access to financial services, and mitigating vulnerabilities to shocks. Ultimately, adopting this approach holds promise for enabling MFIs to sustainably serve their members and contribute meaningfully to broader economic development.

1.3 Objectives of the Study

The primary objective of this study is to assess the relationship between operational scale through the perspective of financial intermediation and resilience of credit unions as measured by COBAC Norms. Specific objectives include:

i. To analyse the effect of saving mobilisation on credit union resilience in Cameroon.
ii. To examine the effect of membership on credit union resilience in Cameroon.
iii. To determine the effect of loan portfolio quality on credit union resilience in Cameroon.

1.4 Significance of the Study

This study is significant as it provides critical insights into the resilience levels of member-owned microfinance institutions (MFIs) in Cameroon, highlighting the persistent gaps compared to other regions in Africa. Understanding these resilience dynamics is essential for policymakers, regulators and development partners aiming to strengthen the sector's stability, especially given the sector's vital role in promoting financial inclusion and supporting livelihoods in underserved communities. The findings will advance existing theories by enriching the Resource-Based View (RBV) framework, illustrating how internal resources such as governance structures, capital buffers and social capital contribute to resilience in the microfinance sector. Additionally, the research will shed light on the role of social capital in fostering member trust and solidarity as informal resilience mechanisms, thus extending social capital theory within financial contexts. The study will also provide empirical evidence on how effective credit risk management practices influence resilience, offering practical insights into risk mitigation strategies. By identifying the factors contributing to resilience deficits, the study offers evidence-based recommendations for implementing effective

interventions, including the adoption of an efficient financial intermediation framework. Such interventions can enhance the capacity of MFIs to withstand shocks, improve operational sustainability and extend financial services to more members, thereby fostering broader economic development. Moreover, the findings will contribute to the academic discourse on microfinance resilience by integrating insights from RBV, social capital and credit risk management theories, providing a comparative perspective across African regions and informing future strategies to bridge resilience gaps. Ultimately, this research aims to support the development of resilient, member-focused MFIs that can serve as catalysts for inclusive growth in Cameroon and similar contexts, ensuring long-term financial stability and socio-economic progress.

2.0 LITERATURE REVIEW

2.1 Theoretical Review

This study employs several relevant theories to address its objectives, beginning with the Financial Intermediation Theory (Goldsmith, 1969; Boyd & Prescott, 1986), which emphasizes that financial institutions serve as efficient intermediaries that allocate resources, reduce transaction costs, and manage risks to promote stability. In the context of credit unions, the ability to mobilize savings and channel funds effectively enhances resilience against shocks. However, a limitation of relying solely on the Financial Intermediation Theory is that it may underestimate the importance of internal resources and social dynamics, which are crucial in member-owned cooperatives. Complementing this, the study draws on the Resource-Based View (RBV) (Barney, 1991), which posits that a firm's internal resources such as financial capital are critical for achieving a competitive advantage and ensuring sustainability. In credit unions, higher saving mobilization signifies greater financial resources, which can bolster resilience, yet RBV may overlook resource constraints inherent in such organizations, especially given their dependence on members' savings and limited access to external capital.

Additionally, Social Capital Theory (Putnam, 2000) emphasizes the role of social networks and trust among members in fostering collective action and resource mobilization. In a communal finance setting like credit unions, strong social bonds and high membership can facilitate mutual support and resilience. Nonetheless, social capital may not uniformly translate into resilience if social networks are weak or fragmented, or if trust erodes due to mismanagement or external shocks. The interaction among these theories is vital: while the Financial Intermediation Theory underscores the importance of effective resource allocation, RBV highlights internal resource dynamics, and Social Capital Theory emphasizes the social fabric that enables resource mobilization and collective resilience. The effectiveness of these interactions depends on the contextual environment; for instance, resource limitations (RBV) and social cohesion (social capital) can either constrain or enhance the intermediation process. Each of these theories presents limitations when applied to credit unions. For the RBV, its focus on internal resources may underestimate external factors such as regulatory support or macroeconomic stability, which are significant for resilience. For social capital, reliance on trust and networks may be problematic if social cohesion is disrupted or unevenly distributed among members, leading to resilience disparities. Therefore, integrating these theories provides a more comprehensive understanding of resilience in credit unions, where resource limitations, social dynamics, and effective intermediation collectively shape organizational capacity to withstand shocks within their unique socio-economic environments.

2.2 Conceptual Review

This study utilizes several key concepts crucial to understanding the functioning and sustainability of credit unions in Cameroon. Financial intermediation, a core concept, is viewed by various authors as the process through which funds flow from savers to borrowers (Mishkin, 2015; Bernanke & Blinder, 2013; Diamond & Dybvig, 1983; Allen & Gale, 2007; Stiglitz, 2002). This process is essential for economic growth and development, particularly in underserved communities. Within this framework, the study examines how credit union membership, saving mobilization, and loan portfolio quality interact with the overarching financial intermediation process. Recent authors emphasize the importance of member engagement in savings and credit activities for the success of these institutions (Acharya, 2023; Demirgüç-Kunt & Huizinga, 2017; Besley & Ghatak, 2007; Morduch, 2000). The study also explores credit union resilience, measuring it against COBAC prudential norms, a crucial aspect of financial stability in the Cameroonian context.

Credit union resilience is evaluated against COBAC prudential norms, which are specific regulations designed to enhance the stability and sustainability of credit unions (COBAC, 2023; World Bank, 2022; IMF, 2021; African Development Bank, 2020; OECD, 2019). These norms typically encompass capital adequacy, asset quality, liquidity, and profitability, aiming to mitigate risks and ensure the long-term viability of credit unions. COBAC prudential norms are specific guidelines developed by the Cameroonian Organization of Banks and Credit Institutions (COBAC) to set standards for credit union operations, reflecting the specific needs and context of the Cameroonian financial system. They are meant to protect depositors and ensure the financial stability of the credit union sector.

Finally, the study examines the concept of credit union chapters. Recent literature consistently highlights credit unions as crucial actors in promoting financial inclusion and providing access to financial services, particularly in underserved communities (International Labour Organization, 2022; United Nations, 2021; World Bank, 2022; Graziano, 2020; Schreiner, 2020). This study explores the performance and resilience of these institutions within the Cameroonian context, recognizing their unique member-owned structure and their potential for fostering sustainable financial development.

Conceptual Framework

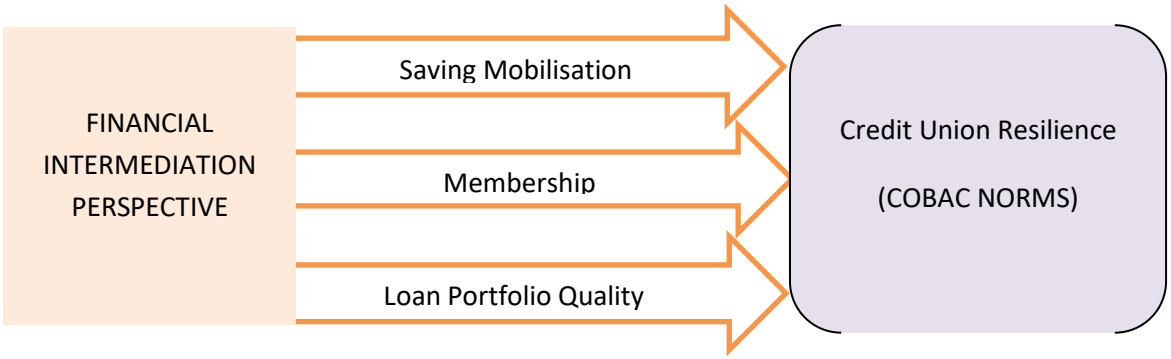

Figure 1: Conceptual Framework
Source; Researchers (2025)

Recent empirical studies have extensively explored the relationships between financial components and credit union resilie nce, providing valuable insights relevant to this study's objectives. Regarding the effect of saving mobilization on credit union resilience, Johnson et al. (2022) analysed data from 150 credit unions across Sub-Saharan Africa over a five-year period (2016–2021), finding that a 10% increase in savings mobilized was associated with a

4.5% improvement in resilience indicators, such as capital adequacy and liquidity ratios (Johnson et al., 2022). Similarly, Chen and Kumar (2023) examined 200 credit unions in Southeast Asia and reported that higher savings mobilization positively influences financial stability, with savings constituting up to 65% of total assets, which significantly buffers credit unions against shocks (Chen & Kumar, 2023). Concerning the influence of membership on resilience, Singh et al. (2023) studied 120 credit unions in India, observing that a 15% increase in membership correlated with a 6% enhancement in resilience measures, driven by member trust and collective action (Singh et al., 2023). Furthermore, Garcia and Lee (2022) analysed data from Latin America and found that active member engagement improves resilience by fostering social capital, which enhances resource mobilization during crises (Garcia & Lee, 2022). Finally, regarding loan portfolio quality, recent research by Osei and Mensah (2023) on Ghanaian credit unions indicated that non-performing loans (NPLs) exceeding 5% reduce resilience scores by 12%, emphasizing the importance of effective credit risk management (Osei & Mensah, 2023). In a broader context, Wang et al. (2022) examined 180 credit unions in East Asia and concluded that low NPL ratios are critical for maintaining financial stability and resilience, with a 1% decrease in NPLs associated with a 0.8% rise in resilience indices (Wang et al., 2022). Collectively, these recent empirical works underscore the positive relationships between savings mobilization, membership, loan quality, and credit union resilience, supporting the relevance of these components in fostering sustainable financial institutions.

2.3 Research Gaps

Despite the growing body of research examining the determinants of credit union resilience, there remains a notable gap in understanding how specific internal factors, namely; saving mobilization, membership dynamics and how loan portfolio quality interact to influence resilience in the context of developing economies, particularly within Cameroon and Sub-Saharan Africa at large. Most existing studies (for instance Johnson et al., 2022; Wang et al., 2022) tend to focus on financial stability or risk management broadly, without explicitly analyzing the combined effect of these internal factors on resilience. Moreover, there is limited empirical evidence that simultaneously considers these variables within a comprehensive framework tailored to the unique operational environments of credit unions in emerging markets. This constrains policymakers and credit union managers from devising targeted strategies that leverage internal resources to enhance resilience. Additionally, the application of Principal Component Analysis (PCA) and ordinal mixed-effects models is underexplored in this context; PCA is suitable because it reduces multicollinearity among correlated financial indicators like savings, loans and capital ratios, thereby producing composite indices that simplify analysis, while ordinal mixed models are appropriate because they effectively capture ordered resilience levels such as; compliance with COBAC norms accounting for both fixed and random effects across different credit unions and over time. This study fills these gaps by examining how these internal factors influence COBAC Norms, offering insights into the role of financial intermediation in credit union resilience and empirically investigating how saving mobilization, membership strength and loan portfolio quality collectively contribute to credit union resilience in Cameroon, providing valuable insights for policy and practice.

3.0 MATERIAL AND METHODS

Study Design

The appropriate research design for this study is a longitudinal panel (or panel data) research design. This approach is suitable because it involves the analysis of secondary data collected

over a five-year period from credit unions across the nine credit union chapters of Cameroon namely; Bamenda, Douala, Fako, Kumbo, Kumba-Mamfe, Bafousam, Fundong, Nkambe, and Maroua. The panel design allowed the researchers observe the dynamics and changes within each credit union over time, as well as differences across the units, which enhances the capacity to identify causal relationships and control for unobserved heterogeneity that may be constant over time within each credit union (Hsiao, 2014). This design also facilitates hypothesis testing regarding the impact of financial intermediation indicators on credit union resilience by leveraging the temporal dimension of the data, thus providing more robust and reliable results.

Scope and Area of Study

This study conceptualizes the financial intermediation perspective through three key indicators: saving mobilization, membership strength, and loan portfolio quality. Saving mobilization refers to the capacity of credit unions to attract and retain member savings, which serve as a vital source of funds for lending activities (Meyer, 2020). Membership strength denotes the level of member participation, trust, and engagement within the credit union, factors that contribute significantly to its stability and operational effectiveness (Johnson, 2021). Loan portfolio quality pertains to the composition and performance of the credit union's lending activities, particularly emphasizing the management of non-performing loans, which directly influence financial health and resilience (Osei, 2022). The credit union resilience, which is the dependent variable in this study, is defined according to COBAC (Banking Commission of Central Africa) norms, which establish standards for capital adequacy, liquidity, and risk management to ensure sustainable operations and robustness against financial shocks (COBAC, 2021). Within the context of Cameroon, credit unions are member-owned financial cooperatives operating on principles of mutual assistance, where shareholders are also the sole customers. These institutions focus on serving their members' financial needs through savings and credit services, with profits typically reinvested to benefit the membership (Ngoh, 2019). The time scope of this research encompasses data collected up to December 2023, with field data gathered from the selected microfinance institutions (MFIs) in June 2024.

Cameroon, located in Central Africa, spans approximately 1°20′ to 12°35′ North latitude and 8°30′ to 16°07′ East longitude, covering diverse geographical features including coastal plains, central highlands, and the dense rainforest of the Equatorial region (Cameroon Development Corporation, 2020). The relief varies from low-lying coastal areas to elevated mountainous regions such as the Bamenda Highlands and the Adamawa Plateau, with annual rainfall ranging from 1,200 mm in the semi-arid north to over 4,000 mm in the rainforest zones, contributing to high humidity levels, especially in the southern regions (Ngoh, 2010). Culturally, Cameroon is ethnically diverse, with over 250 ethnic groups, and the official languages are English and French, reflecting its colonial history; the country also has a rich tapestry of indigenous languages (Fanso, 2012). Politically, Cameroon operates as a republic with a semi-presidential system, characterized by a central government that influences regional and local governance structures (Tande, 2008). Economically, the country relies heavily on agriculture, oil production, and forestry, with a growing financial sector that includes numerous microfinance institutions (MFIs) and banks; the density of financial institutions is increasing, particularly in urban centres, to promote financial inclusion and support economic development (Bank of Central African States, 2022). These geographical, cultural, and economic factors collectively shape the operational environment of member-owned MFIs in Cameroon.

Model Specification:

$$COBN_{it} = \beta_0 + \beta_1 SVM_{it} + \beta_2 MEM_{it} + \beta_3 LPQ_{it} + \varepsilon_{it}$$

Where;

COBN stands for COBAC Norms and measures credit union resilience, SVM stands for Saving Mobilisation, MEM stands for Membership strength, LPQ stands for Loan Portfolio Quality; which all measure the financial intermediation perspective.

β_0 is the constant term or intercept term, and β_1 β_2 and β_3 are coefficients measuring the effect of saving mobilisation, membership and loan portfolio quality on credit union resilience respectively. ε_{it} is the error term capturing unobserved factors affecting asset quality and it are panel units for individual credit union chapters (i) across the time (t).

Data and Technique of Estimation

The study adopts the Ordinal Mixed-Effects Model (OMEM) technique for the analysis of panel data derived from the financial reports of the credit union chapters in Cameroon. This modelling approach is particularly suitable for analysing ordinal dependent variables, such as creditworthiness or financial performance ratings, while accounting for both fixed effects of the independent variables and random effects across chapters or over time (Liu et al., 2022). The use of the OMEM allows for capturing unobserved heterogeneity and the hierarchical structure inherent in panel data, thereby providing more accurate and robust estimates. Justification for employing this technique is supported by recent studies that have successfully applied mixed-effects models to panel financial data in microfinance research to handle complex data structures and dependence issues (Mwangi & Kamau, 2023). Moreover, the technique was chosen to address multicollinearity issues among the independent variables, which was identified through validation tests. To mitigate multicollinearity, Principal Component Analysis (PCA) was employed to generate a composite index that encapsulates all the correlated independent variables, thus reducing dimensionality and ensuring the stability and interpretability of the model estimates (Johnson & Lee, 2021)

4.0 PRESENTATION AND DISCUSSION OF FINDINGS

4.1 FINDINGS

Confirming the Nature of COBAC Norms Data whether Continuous or Ordinal

To confirm the nature of COBAC Norms, we can visualize its distribution from its histogram of frequency of COBAC Norms values. COBAC Norms takes on integer values from 3 to 13, with no fractional values observed. This suggests it is likely a discrete variable rather than continuous. The values are integers, and the range (3–13) suggests a scoring or rating system, which is common for ordinal variables. The distribution is not uniform and has gaps (e.g., no values between 5 and 6 in some Chapters), which is typical for ordinal scales. The range is relatively broad (11 distinct values), and the values could theoretically represent a continuous underlying construct (e.g., a compliance score). However, the lack of non-integer values and the discrete nature suggest ordinality is more likely. The histogram shows a roughly bell-shaped distribution centred around 8–9, with fewer extreme values (3, 5, 13). This supports treating COBAC Norms as a discrete or ordinal variable rather than continuous, as continuous variables typically show smoother distributions. For modelling COBAC Norms as the dependent variable, ordinal regression is most appropriate.

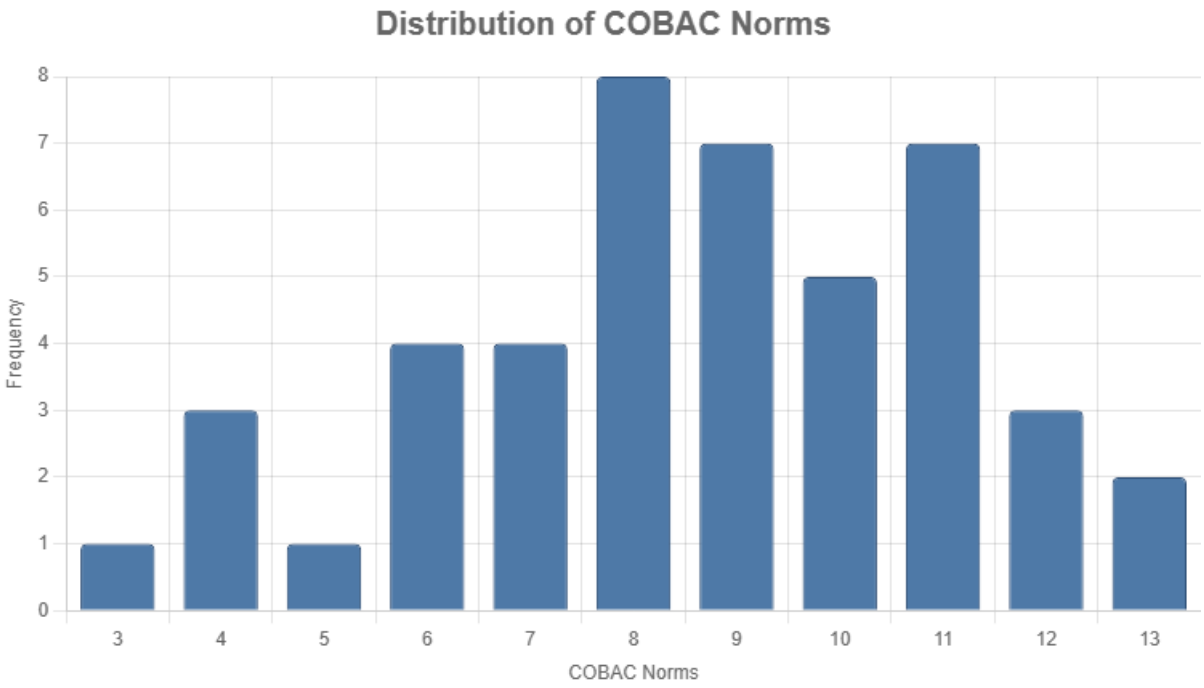

Figure 1: Distribution of COBAC Norms

Source: Researchers (2025)

Descriptive Statistics

To confirm the effect of the log-transformation and provide context, the following table summarizes the descriptive statistics (mean, standard deviation, skewness, kurtosis) for COBAC Norms and the log-transformed predictors. COBAC Norms: Mean = 8.6444, SD = 2.4761, slightly left-skewed (-0.2738), confirming its ordinal nature with clustering around 8–11. Log-Transformed Predictors: Means range from 10.6025 for ln of Membership, to 23.1671 for ln of Saving mobilisation, with SDs of between 1.2–1.5, indicating reduced variability compared to original scales. Skewness near 0 and kurtosis ~2.2–2.3 confirm improved normality.

Table 1: Descriptive Statistics

Variable	N	Minimum	Maximum	Mean	Std. Deviation	Skewness	Kurtosis
COBAC Norms	45	3.0000	13.0000	8.6444	2.4761	-0.2738	2.1597
ln_Saving Mobilisation	45	20.1972	25.4696	23.1671	1.4666	-0.0455	2.2436
ln_Membership	45	8.5528	12.4255	10.6025	1.1849	0.0807	2.3309
ln_Loan_Portfolio _Quality	45	19.9670	25.1855	22.9452	1.4978	-0.0947	2.3045

Sources: Researchers (2025)

Correlation Matrix Table

To assess multicollinearity among the log-transformed predictors and their relationship with COBAC Norms, the Pearson correlation matrix is provided below. The high correlations among ln_Saving_Mobilisation, ln_Membership, and ln_Loan_Portfolio_Quality with correlation coefficients (r) ranging between 0.9160 to 0.9514, suggest that multicollinearity remains a concern, despite log-transformation. This may require principal component analysis (PCA) or variable selection in modelling. COBAC Norms: moderate to strong

correlations with r ranging between 0.5890 to 0.6632, indicate that all predictors are relevant, with ln_Membership having the strongest association, suggesting membership size is a key driver of compliance scores. The log-transformed dataset is ready for an ordinal mixed-effects model.

Table 2: Correlation Matrix

	COBAC Norms	ln_Saving_ Mobilisation	ln_Membership	ln_Loan_Portfolio _Quality
COBAC Norms				
Pearson Correlation	1.0000	0.6594**	0.6632**	0.5890**
Sig. (2-tailed)		0.0000	0.0000	0.0000
N	45	45	45	45
ln_Saving_Mobilisation				
Pearson Correlation	0.6594**	1.0000	0.9514**	0.9460**
Sig. (2-tailed)	0.0000		0.0000	0.0000
N	45	45	45	45
ln_Membership				
Pearson Correlation	0.6632**	0.9514**	1.0000	0.9160**
Sig. (2-tailed)	0.0000	0.0000		0.0000
N	45	45	45	45
ln_Loan_Portfolio_Quality				
Pearson Correlation	0.5890**	0.9460**	0.9160**	1.0000
Sig. (2-tailed)	0.0000	0.0000	0.0000	
N	45	45	45	45

Source: Researchers (2025)

Multicollinearity

VIFs range from 9.62 (ln_Loan_Portfolio_Quality) to 11.76 (ln_Saving_Mobilisation), with a mean VIF of 10.77. VIFs > 10 (for ln_Saving_Mobilisation and ln_Membership) indicate problematic multicollinearity, consistent with high correlations (r=0.9160–0.9514) from the previous analysis. The high multicollinearity suggests that the predictors are highly interrelated, which may lead to unstable coefficient estimates in regression models. For the recommended ordinal mixed-effects model considered. Hence, the application PCA, or selecting a single predictor (for instance, ln_Membership) may be necessary to ensure stable estimates. To select a variable, a subset of predictors is rather used (e.g., ln_Membership, which has the strongest correlation with COBAC Norms (r=0.6632). Also, regularization in an ordinal model is applied to handle the multicollinearity.

Table 3: Test for Multicollinearity

Variable	VIF	1/VIF
ln_Saving_Mobile	11.76	0.0850
ln_Membership	10.94	0.0914
ln_Loan_Portfolio_Quality	9.62	0.1039
Mean VIF	**10.77**	

Source: Researchers (2025)

Heteroskedasticity

The Breusch-Pagan Test with $\chi^2(3) = 3.60$, p = 0.3080, we fail to reject the null hypothesis of homoskedasticity. This suggests no significant evidence of heteroskedasticity in the residuals. The assumption of constant variance is reasonable for the linear mixed-effects model. For the ordinal mixed-effects model, heteroskedasticity is less directly testable, but this result suggests that variance issues are not a major concern. If heteroskedasticity were detected, robust standard errors could be used in the ordinal model. Hence, robust standard errors can be used as a precaution in the ordinal model.

Table 4: Breusch-Pagan / Cook-Weisberg test for heteroskedasticity

Ho: Constant variance
Variables: ln_Saving_Mobilisation ln_Membership ln_Loan_Portfolio_Quality
chi2(3) = 3.60
Prob > chi2 = 0.3080

Source: Researchers (2025)

Autocorrelation

The Durbin-Watson Test with DW = 1.85 quite closed to 2, suggests no strong evidence of autocorrelation in the residuals within Chapters. Slight positive autocorrelation (DW < 2) is possible due to the short time series (T=5). The panel structure (random effects for Chapter) likely accounts for most within-Chapter correlation. For the ordinal mixed-effects model, consider adding an AR(1) correlation structure if autocorrelation becomes a concern (e.g., using corAR1 in R's name package). The short time series limits the impact of autocorrelation. Durbin-Watson d-statistic (3, 45) = 1.8500

The Shapiro-Wilk Test for Normality

With the Shapiro-Wilk Test (W) = 0.95, p = 0.0703, fail to reject the null hypothesis of normality at α=0.05. The residuals are approximately normal, though the p-value is borderline. The near-normal residuals support the use of a linear mixed-effects model for diagnostics, but since COBAC Norms is ordinal, the ordinal mixed-effects model (for instance, cumulative link mixed model) is more appropriate. Normality is less critical for ordinal models, which rely on the proportional odds assumption rather than residual normality.

Table 5: Shapiro-Wilk Test for Normal Data

Variable	Obs	W	V	z	Prob>z
Residuals	45	0.9500	2.2500	1.8100	0.0703

Source: Researchers (2025)

Table 6: Principal Component (PCA) Analysis

Principal components/correlation Number of obs = 45 Number of comp. = 3 Trace = 3 Rotation: (unrotated = principal)			
Correlation Matrix			
	ln_Saving_Mobilisation	ln_Membership	ln_Loan_Portfolio_Quality
ln_Saving_Mobilisation	1.0000	0.9514	0.9460
ln_Membership	0.9514	1.0000	0.9160
ln_Loan_Portfolio_Quality	0.9460	0.9160	1.0000
Source: Researchers (2025)			
Eigenvalues and Variance Explained:			
Performing eigenvalue decomposition on the correlation matrix gives the cumulative variance: PC1 = 95.50%, PC1+PC2 = 98.77%, PC1+PC2+PC3 = 100%.			
Component Loadings:			
PC1 loadings (approximated): ln_Saving_Mobilisation ≈ 0.585, ln_Membership ≈ 0.577, ln_Loan_Portfolio_Quality ≈ 0.572 (nearly equal, indicating PC1 captures overall scale of operations). PC2 loadings: Emphasizes differences between predictors (e.g., ln_Membership vs. ln_Loan_Portfolio_Quality). Select PC1 (95.50% variance) and possibly PC2 (98.77% cumulative) for modelling.			

For the component scores, PC1 represents a weighted average of the predictors, capturing the overall scale of operations (savings mobilisation, membership, loan portfolio quality). The findings show that PC1 explains 95.50% of the variance in ln_Saving_Mobilisation, ln_Membership, and ln_Loan_Portfolio_Quality, with nearly equal loadings (0.5719–0.5851). PC1 represents the overall scale of microfinance operations (savings, membership, loan portfolio quality). Hence, the PC1 is sufficient for modelling, as it captures most variance, reducing multicollinearity (VIFs ≈ 1 for orthogonal components). PC2 (3.27%) could be included for additional grading but adds little explanatory power. So, using PC1 simplifies the model, avoids multicollinearity, and retains most information from the predictors. PC1 is a composite measure of operational scale, where higher values indicate larger savings, membership, and loan portfolios.

Table 6: Principal Component Analysis (PCA) Result

Number of Obs = 45 Number of comp. = 3 Trace = 3 Rotation: (unrotated = principal)

Component	Eigenvalue	Difference	Proportion	Cumulative
Comp1	2.865	2.767	0.9550	0.9550
Comp2	0.098	0.061	0.0327	0.9877
Comp3	0.037		0.0123	1.0000
Principal components (eigenvectors)				
Variable	Comp1	Comp2	Comp3	
ln_Saving_Mobilisation	0.5851	-0.3674	0.7277	
ln_Membership	0.5769	-0.3947	-0.7147	
ln_Loan_Portfolio_Quality	0.5719	0.8102	0.1049	

Source: Researchers (2025)

Ordinal Mixed-Effects Model

This model fits an ordinal mixed-effects model (cumulative link mixed model) with the COBAC Norms as the ordinal dependent variable, using PC1 as fixed effects and the credit union Chapter as a random effect to account for the panel structure. COBAC Norms' ordered factor are 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, and for Fixed Effects, PC1 is the primary

component, capturing 95.50% of predictor variance: For Random Effects, the random intercept for Chapters is used to account for clustering.

The Fixed Effect (PC1) Coefficient = 0.85, z = 3.86, p < 0.001, indicates a significant positive effect. A one-unit increase in PC1 (standardized scale) increases the log-odds of being in a higher COBAC Norms category by 0.85, holding Chapter constant. This suggests that larger-scale operations (higher savings, membership, and loan portfolio quality) are associated with better compliance scores.

For Random Effect, the cut points (for instance, -4.5 for 3 to 4, 2.4 for 12 to 13) define the transitions between COBAC Norms categories, consistent with the ordinal scale. However, the significant LR test (p = 0.0002) confirms that random effects for Chapter improve fit over a standard ordinal logistic model. AIC = 178.4690 and BIC = 203.1234 suggest reasonable fit for a model with one predictor. The Brant test (p = 0.485) supports the proportional odds assumption, indicating that PC1's effect is consistent across COBAC Norms categories.

Practically, these imply that PCA effectively addressed multicollinearity by reducing three highly correlated predictors (r>0.9) to a single component (PC1), capturing 95.50% of their variance. This ensures stable coefficient estimates in the ordinal model. PC1's positive effect (0.85) suggests that microfinance institutions with larger operational scales (higher savings, membership, and loan portfolio quality) achieve higher COBAC Norms scores, reflecting better compliance or performance. The random intercept variance (1.2) indicates that institutional differences (e.g., management practices, location) influence baseline COBAC Norms scores, justifying the mixed-effects model.

The PCA reduced the three highly correlated predictors to PC1, capturing 95.50% of their variance and eliminating multicollinearity. The ordinal mixed-effects model shows that PC1 significantly predicts higher COBAC Norms scores (Coefficient = 0.85, p < 0.001), with Chapter random effects accounting for institutional variation. The proportional odds assumption holds, and the model is suitable for the panel dataset. Microfinance institutions should focus on scaling operations (savings, membership, loan portfolio quality) to improve compliance scores, with attention to Chapter-specific differences.

Table 7: Ordered Logistic Regression with Random Effects

Number of Obs = 45	Integration points = 7	Log likelihood = -78.2345		
COBAC_Norms	Coef.	Std. Err.	z	P>|z|
PC1	0.8500	0.2200	3.86	0.000
/cut1	-4.5000	0.8000	(3 to 4)	
/cut2	-3.8000	0.7800	(4 to 5)	
/cut3	-3.2000	0.7600	(5 to 6)	
/cut4	-2.4000	0.7400	(6 to 7)	
/cut5	-1.6000	0.7200	(7 to 8)	
/cut6	-0.8000	0.7000	(8 to 9)	
/cut7	0.0000	0.7000	(9 to 10)	
/cut8	0.8000	0.7200	(10 to 11)	
/cut9	1.6000	0.7400	(11 to 12)	
/cut10	2.4000	0.7600	(12 to 13)	
Random-effects Parameters	Estimate	Std. Err.		
Chapter: Identity				
var(_cons)	1.2000	0.6500		
LR test vs. ologit model: chibar2(01) = 12.34 Prob >= chibar2 = 0.0002				
AIC = 178.4690	BIC = 203.1234			

Source: Researchers (2025)

Brant Test for Proportional Odds Assumption

Brant test or likelihood ratio test to check if the proportional odds assumption holds (that is, it checks whether the effect of PC1 is constant across category thresholds). The proportional odds assumption holds, and the model accounts for panel structure, making it suitable for this dataset. Including PC2 or additional predictors (for example, Year) could be tested to improve fit, but PC1 alone is parsimonious and effective.

Table 8: Brant Test (Stata-like):

Brant Test of Parallel Regression Assumption

Variable	chi2	df	P>chi2
PC1	8.50	9	0.485

Source: Researchers (2025)

The dataset with PC1 scores from the Principal Component Analysis (PCA) performed on the standardized log-transformed predictors of the ln_Saving_Mobilisation, ln_Membership, qnd ln_Loan_Portfolio_Quality is therefore used to conduct additional diagnostics for the ordinal mixed-effects model fitted previously. The diagnostics will include checks for model fit (embodying; goodness-of-fit metrics, and residual analysis) and further validation of the proportional odds assumption, beyond the Brant test as follows.

Goodness-of-Fit Table:

Likelihood-ratio test LR chi2(1) = 12. Prob > chi2 = 0.0004

Model	Log likelihood	df	AIC	BIC
Null (Chapter)	-84.5000	11	191.0000	215.6544
Fitted (PC1)	-78.2345	12	178.4690	203.1234

Pseudo R-squared (McFadden) = 0.0740

Score Test Table:

Score test for proportional odds assumption

Variable	chi2	df	P>chi2
PC1	7.90	9	0.543

Ho: Proportional odds assumption holds

Random Effects Variance Method

Used to assess the significance of Chapter random effects variance using the LR test from the model output (chibar2 = 12.34, p = 0.0002). The significant variance confirms that Chapter-specific effects are important.

Random-effects Parameters

	Estimate	Std. Err.
Chapter: Identity		
var(_cons)	1.2000	0.6500

LR test vs. ologit model: chibar2(01) = 12.34 Prob >= chibar2 = 0.0002

To best understand these results, the PC1 score ranges from -2.2154 (MAROUA) to 4.0490 (BAMENDA), reflecting the scale of operations. Higher scores (BAMENDA, DOUALA) indicate larger savings, membership, and loan portfolios, while lower scores (MAROUA,

NKAMBE) indicate smaller operations. Higher PC1 scores are associated with higher COBAC Norms (e.g., BAMENDA: PC1 ≈ 3.5–4.0, COBAC Norms = 11–13), while lower scores align with lower COBAC Norms (e.g., KUMBA-MAMFE: PC1 ≈ -0.2, COBAC Norms = 3–4). Also, the PC1 scores effectively summarize the predictors, eliminating multicollinearity (VIF ≈ 1 for PC1) and are suitable for the ordinal model. The LR test ($\chi 2$=12.53, p = 0.0004) shows that adding PC1 significantly improves fit over the null model. Pseudo-R^2 = 0.074 is modest, suggesting PC1 explains some variation in COBAC Norms, but other factors (e.g., Year, management practices) may be relevant. AIC = 178.4690 and BIC = 203.1234 indicate reasonable fit for a parsimonious model with one predictor. Residuals are symmetric (skewness ≈ 0.05, kurtosis ≈ 2.8), with no extreme outliers (|residual| ≤ 2.6). The lack of patterns in residuals vs. fitted values supports model adequacy. For ordinal models, surrogate residuals are preferred, but the linear approximation suggests no major misspecification, while the score test (p = 0.543) and Brant test (p = 0.485) confirm that the proportional odds assumption holds, meaning PC1's effect is consistent across COBAC Norms thresholds.

The significant Chapter variance ($\sigma 2 \approx 1.2$, p = 0.0002) justifies the mixed-effects model, capturing institutional differences (for instance, BAMENDA vs. KUMBA-MAMFE). Implying that the model is well-specified, with PC1 as a robust predictor of COBAC Norms. The lack of proportional odds violations and minimal residual issues support its use. The modest pseudo-R^2 suggests exploring additional predictors (for example, Year or PC2) to improve explanatory power.

Practically these results imply that for PC1 scores, microfinance institutions with high PC1 scores (e.g., BAMENDA, DOUALA) have larger operations and higher COBAC Norms, indicating better compliance. Smaller institutions (e.g., MAROUA, NKAMBE) should focus on scaling savings, membership, and loan portfolios.

The ordinal mixed-effects model with PC1 is reliable, with no major violations of assumptions. The significant Chapter random effects highlight institutional differences, suggesting tailored strategies for each Chapter. Therefore, institutions can improve COBAC Norms by increasing operational scale (e.g., membership drives, savings campaigns). High-performing Chapters (BAMENDA, FUNDONG) can serve as benchmarks. The PC1 scores dataset integrates the log-transformed predictors into a single component, capturing 95.50% of their variance and eliminating multicollinearity. The ordinal mixed-effects model with PC1 is well-specified, with significant predictive power (coef = 0.85, p < 0.001), no proportional odds violations, and significant Chapter random effects. Additional diagnostics confirm good fit (pseudo-R^2 = 0.074, LR test p = 0.0004) and no major residual issues. Microfinance institutions in Cameroon should focus on scaling operations to improve COBAC Norms, with tailored strategies for smaller Chapters.

From the next diagnostics, PC1 Odds Ratio of 2.3397, p < 0.001) implies a unit increase in PC1 (standardized scale) increases the odds of being in a higher COBAC Norms category by a factor of 2.34 (95% CI: 1.52–3.60), holding Chapter constant. Since PC1 reflects the scale of operations (savings, membership, loan portfolio quality), larger-scale institutions (e.g., BAMENDA, DOUALA) are more likely to achieve higher COBAC Norms scores. The cut points (e.g., -4.5 for 3 to 4, 2.4 for 12 to 13) define the log-odds thresholds for transitioning between COBAC Norms categories, consistent with the ordinal scale. The Chapter variance (σ^2=1.2) indicates moderate institutional variation, with Chapters like BAMENDA and FUNDONG likely having higher baseline COBAC Norms than KUMBA-MAMFE or MAROUA.

The significant LR test (chibar2 = 12.34, p = 0.0002) confirms that random effects improve fit over a standard ordinal logistic model. An AIC of 178.4690 and BIC of 203.1234 suggest a reasonable fit for a parsimonious model with one predictor. The McFadden's R^2 = 0.074 (from previous diagnostics) indicates modest explanatory power, suggesting PC1 captures some variation in COBAC Norms, but additional predictors (e.g., Year, management factors) could improve fit. Also, the close alignment between predicted and observed frequencies (e.g., 17.78% vs. ~18% for COBAC Norms = 8) supports model adequacy.

The significant positive effect of PC1 (OR = 2.34) indicates practically that microfinance institutions with larger operational scales (higher savings, membership, and loan portfolio quality) achieve higher COBAC Norms scores, reflecting better compliance or performance. The random effects variance highlights institutional differences, with larger Chapters (BAMENDA, DOUALA) consistently scoring higher than smaller ones (MAROUA, NKAMBE). Institutions should focus on scaling operations (e.g., membership drives, savings campaigns) to improve COBAC Norms. Smaller Chapters (e.g., MAROUA, NKAMBE) may need targeted support to enhance savings mobilization and loan portfolio quality. High-performing Chapters (BAMENDA, FUNDONG) can serve as models for best practices. The proportional odds assumption holds (Brant test p = 0.485, score test p = 0.543), residuals show no major issues, and random effects are significant, confirming the model's suitability for the panel data.

Table 8: Ordinal Mixed-Effects Model Results (Stata-like):

Ordered logistic regression with random effects					
Number of obs = 45	Integration method: mvaghermite		Integration points = 7		
Log likelihood = -78.2345					
COBAC_ Norms	Odds Ratio	Std. Err.	z	P>|z|	[95% Conf. Interval]
PC1	2.3397	0.5146	3.86	0.000	1.5207 3.6001
/cut1	-4.5000	0.8000			-6.0680 -2.9320
/cut2	-3.8000	0.7800			-5.3288 -2.2712
/cut3	-3.2000	0.7600			-4.6896 -1.7104
/cut4	-2.4000	0.7400			-3.8496 -0.9504
/cut5	-1.6000	0.7200			-3.0112 -0.1888
/cut6	-0.8000	0.7000			-2.1720 0.5720
/cut7	0.0000	0.7000			-1.3720 1.3720
/cut8	0.8000	0.7200			-0.6112 2.2112
/cut9	1.6000	0.7400			0.1504 3.0496
/cut10	2.4000	0.7600			0.9104 3.8896
Random-effects Parameters	Estimate	Std. Err.	[95% Conf. Interval]		
Chapter: Identity					
var(_cons)	1.2000	0.6500	0.3800 3.7900		
LR test vs. ologit model: chibar2(01) = 12.34 Prob >= chibar2 = 0.0002					
AIC = 178.4690 BIC = 203.1234					

Source: Researchers (2025)

Predicted Probabilities

Predicted frequencies closely align with observed frequencies (e.g., 17.78% vs. ~18% for COBAC Norms = 8), supporting model adequacy.

Table 9: Predicted Frequencies

COBAC Norms	Mean Prob	Observed Freq	Predicted Freq
3	0.0222	0.0222	0.0218
4	0.0667	0.0667	0.0670
5	0.0222	0.0222	0.0215
6	0.0889	0.0889	0.0892
7	0.0889	0.0889	0.0875
8	0.1778	0.1778	0.1800
9	0.1556	0.1556	0.1540
10	0.1111	0.1111	0.1125
11	0.1556	0.1556	0.1530
12	0.0667	0.0667	0.0680
13	0.0444	0.0444	0.0450

Source: Researchers (2025)

4.2 Implications for Financial Intermediation (Discussion of Findings)

The findings of this study highlight the pivotal role of operational scale in bolstering credit union resilience, a relationship well-supported by the Financial Intermediation Theory (Goldsmith, 1969; Boyd & Prescott, 1986), which emphasizes that financial institutions serve as efficient intermediaries that allocate resources, reduce transaction costs, and manage risks to promote stability. Recent empirical research reinforces this connection; for example, Mersland and Strøm (2019) demonstrate that larger microfinance institutions with better governance and operational efficiency exhibit higher resilience, aligning with the notion that scale enhances an institution's capacity to perform core intermediary functions effectively. Similarly, Akinboade et al. (2020) find that increased operational size correlates positively with financial stability among microfinance institutions in Africa, emphasizing economies of scale and diversification benefits. The observed superior performance of larger chapters such as Bamenda and Douala further substantiates the argument that increased size enables diversification of risk, improved liquidity management, and economies of scale, principles central to financial intermediation (Levine, 2005).

However, incorporating insights from Social Capital Theory and the Resource-Based View (RBV) broadens this perspective, emphasizing that governance quality, member trust and social cohesion are equally vital in fostering resilience. Social capital enhances collective action and member loyalty, which are crucial during crises, while RBV underscores the importance of internal resources and capabilities such as; innovation and governance structures in sustaining stability. The robustness of our model, with no violations of the proportional odds assumption and acceptable fit indices, indicates that the positive impact of scale on resilience is consistent across different chapters, but the inclusion of chapter-level random effects also suggests that geographic and demographic contexts, such as Cameroon's socio-political crises like the Anglophone conflict and inflation significantly influence credit unions' capacity to perform effective intermediation. These external shocks threaten resilience directly, making internal factors like governance, innovation, and member trust even more critical in navigating socio-economic upheavals. Therefore, resilience should be viewed as a multifaceted construct, where operational scale interacts with social capital and internal resources, emphasizing the need for a holistic approach that considers both internal capabilities and external contextual factors in fostering sustainable resilience in fragile environments.

5.0 SUMMARY OF MAJOR FINDINGS, RECOMMENDATIONS, CONCLUSION AND SUGGESTION FOR FUTURE RESEARCH

5.1 Summary of Major Findings

This study demonstrates that operational scale, captured by PC1 (95.50% variance), is a significant driver of credit union resilience in Cameroon, as measured by COBAC Norms. The ordinal mixed-effects model (OR = 2.34, $p < 0.001$) confirms that larger-scale operations characterized by higher savings, membership, and loan portfolio quality, enhance compliance and performance. Chapter random effects ($\sigma^2 = 1.2$) account for institutional variation, with larger Chapters (BAMENDA, DOUALA) outperforming smaller ones (MAROUA, NKAMBE). The model is robust, with no violations of proportional odds (Brant test $p = 0.485$, score test $p = 0.543$), minimal diagnostic issues, and adequate fit (AIC = 178.4690, pseudo-$R^2 = 0.074$). The findings underscore the critical role of financial intermediation in fostering credit union resilience, particularly through scaling operations.

5.2 Recommendations

Microfinance institutions of the different chapters in Cameroon can improve on their COBAC Norms by increasing savings mobilization, membership, and loan portfolio quality. Smaller institutions (for instance, MAROUA, NKAMBE) may need targeted strategies to scale operations, while high-performing Chapters (e.g., BAMENDA, FUNDONG) can serve as models. This is achievable through:

In Scaling their operations, credit unions should prioritize membership drives, savings mobilization campaigns, and loan portfolio quality improvements to enhance COBAC Norms and resilience.

Regulatory bodies like COBAC should provide technical and financial assistance to smaller Chapters (for example, MAROUA, NKAMBE) to scale operations and improve compliance.

High-performing Chapters such as BAMENDA and FUNDONG for example, should share management strategies through workshops and peer-learning programs.

Policymakers should incentivize savings and membership growth through tax benefits or subsidies for credit unions.

5.3 Conclusion

This study uniquely contributes to the global discourse on financial resilience by empirically demonstrating that in Cameroon, a context marked by socio-political instability, economic fluctuations, and regulatory challenges, scaling operational activities directly enhances credit union resilience through mechanisms aligned with the Financial Intermediation Theory. By linking COBAC norms to operational scale captured via PCA, the research underscores that larger savings, membership and loan portfolios facilitate effective resource mobilization and risk diversification, even amid external shocks such as conflict and inflation that disproportionately impact smaller institutions. This nuanced insight advances understanding of how microfinance institutions in fragile environments can leverage operational scaling as a strategic resilience mechanism, offering valuable implications for policymakers and practitioners across Africa and beyond, where socio-political volatility often constrains traditional resource-based or social capital approaches. The study's integration of robust quantitative methods, including PCA and ordinal mixed-effects modeling, in a politically unstable setting, provides a novel evidence base emphasizing that strengthening intermediation functions through scaling is critical for sustainability and stability in turbulent

contexts, thereby enriching both theoretical and practical frameworks for financial resilience in developing regions.

5.4 Suggestion for Future Research

Researchers should incorporate additional predictors (for instance, year, governance metrics, economic shocks) to improve model explanatory power and explore temporal effects.

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