

Original article

Sustainable finances in savings and credit cooperatives



Finanzas sostenibles en las cooperativas de ahorro y crédito

Finanças sustentáveis em cooperativas de poupança e crédito

Luis Arturo Capace Bondarenco¹  0009-0004-3788-4994  luiscapace@gmail.com

¹ University of Jaén. Spain.

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ABSTRACT

This article analyzes the sustainable finances of Ecuadorian savings and credit cooperatives as of the end of 2023. A theoretical investigation was conducted on microfinance, microcredit, and savings and credit cooperatives as entities that benefit from these financial instruments. In addition, the study examined capital adequacy, asset quality, administrative management, profitability, liquidity, and market risks for the fifty-seven institutions comprising segment 2. The results demonstrated the financial soundness of these institutions in terms of their financial performance and within the regulatory framework in which they operate.

Keywords: financial sustainability; microfinance; microcredit; savings and credit cooperatives; CAMELS method.

RESUMEN

En el presente artículo se analizan las finanzas sostenibles de las cooperativas de ahorro y crédito ecuatorianas para finales del año 2023. Se ha realizado una indagación teórica acerca de las microfinanzas, los microcréditos y las cooperativas de ahorro y crédito, como entidades que benefician estos instrumentos financieros. Además, se ha considerado la suficiencia en capital, calidad de los activos, manejo administrativo, rentabilidad, liquidez y riesgos del mercado para las cincuenta y siete instituciones conformantes del segmento número 2. Los resultados permitieron evidenciar una solidez de estas instituciones en cuanto a niveles financieros y en base al marco regulatorio en que se desenvuelven.

Palabras clave: sostenibilidad financiera; microfinanzas; microcréditos; cooperativas de ahorro y crédito; método CAMELS.

RESUMO

Este artigo analisa as finanças sustentáveis das cooperativas de crédito equatorianas ao final de 2023. Realizou-se uma investigação teórica sobre microfinanças, microcrédito e cooperativas de crédito, enquanto entidades que utilizam esses instrumentos financeiros. Além disso, foram analisados a suficiência de capital, a qualidade dos ativos, a gestão administrativa, a rentabilidade, a liquidez e os riscos de mercado das cinquenta e sete instituições que compõem o segmento número 2. Os resultados evidenciaram a solidez dessas instituições em termos de indicadores financeiros e com base no marco regulatório em que operam.

Palavras-chave: sustentabilidade financeira; microfinanças; microcrédito; cooperativas de poupança e crédito; método CAMELS.

INTRODUCTION

The Republic of Ecuador, like other Latin American nations, faces a series of common challenges that hinder or slow its development process. For example, in 2023, the national unemployment rate stood at 3.8 percent; while this figure may be considered low in other parts of the world, it must be noted that only 36.3 percent of the workforce is in adequate or full-time employment; the remainder

consists of underemployment (19.6%), other part-time jobs (28.8%), and unpaid work (9.9%). These data were published by the National Institute of Statistics and Censuses (Inec, 2024) in its Technical Bulletin 01-2024 ENEMDU.

This job instability prevalent among the population was reflected in another Inec indicator for the same period: 55.7% of Ecuadorians are part of the informal economy, as it is known in Ecuador - that is, those who work in businesses with fewer than 100 employees that are not registered with the Single Taxpayer Registry (Inec, 2024). Informality arises as a response to a lack of opportunities and investment, allowing many families to survive on daily earnings from the sale of goods and services without tax or institutional regulations.

Given this situation, both aspiring and established entrepreneurs have been forced to turn to financial institutions to access credit that provides adequate financing at attractive interest rates and repayment terms. Savings and credit cooperatives play a prominent role in this regard. To understand the scale of the transactions these cooperatives carry out in the country, one can cite the sector's loan portfolio balance, which stood at 19.2 billion USD as of December 2023 - representing a decrease of 107.4 million USD from the previous month and an increase of 8.54% compared to December 2022; These figures are periodically reported by the Superintendency of Popular and Solidarity Economy, the public regulatory body, on its website.

Sustainable finance encompasses all initiatives and regulations aimed at facilitating the financing of projects to combat exclusion and improve social cohesion (Canchignia Bassantes & Cárdenas Pérez, 2023). Furthermore, it aims to achieve attractive financial returns alongside a positive environmental, economic, and social impact across three main areas: economic, governance, and socio-environmental. The social and environmental areas are those related to the impacts generated through a sustainable financing product.

Among the types of sustainable finance is microfinance, which, by definition, refers to those sectors of the economy that seek to address financial issues and solutions, but with the distinct focus of serving low-income individuals and those with a lower-middle-class lifestyle, since neither their income nor their expenses have a significant financial impact. Microfinance encompasses microloans, savings services, pensions, payment services, housing loans, insurance, emergency loans, and other private loans intended for low-income individuals and small and medium-sized enterprises.

Microcredit, for its part, became popular in Ecuador starting in 1986, when the country began implementing measures to promote agricultural development and growth through banks such as La Previsora and the Banco Nacional de Fomento, leading to the establishment of the National Financial Corporation for productive loans. The intention was to support the most vulnerable sectors, but in 1998, due to mismanagement and the granting of unsecured loans, some institutions ran out of liquidity. A financial crisis ensued, and the banks lost their credibility. This crisis began to stabilize in 2001 with dollarization, which made its resolution possible (Carvajal Salgado & Espinoza Párraga, 2020).

According to the Monetary and Financial Regulatory Board, microcredit is granted to an individual or legal entity with annual sales of 100,000.00 USD or less, or to a group of borrowers with joint and several liability, intended to finance small-scale production and/or marketing activities, whose primary source of repayment consists of the proceeds from sales or income generated by such activities, as duly verified by an entity within the National Financial System.

In Ecuador, microloans are offered by financial institutions such as traditional banks and savings and credit cooperatives. As for the latter, since they are nonprofit institutions, they use their surplus income to offer members more accessible loans, a higher return on their savings, lower fees, or new products and services (Luque González & Peñaherrera Melo, 2021). In other words, they are entities that carry out banking-type activities but channel their assistance and benefits toward their members. They comprise a group of people who contribute equally to the share capital -understood as that related to shares explicitly defined by communities or collectives based on common objectives that generate a benefit for them.

The Constitution of the Republic of Ecuador (2008), in effect since October 20, 2008, as published in Official Register No. 449, in its Chapter Four, dedicated to Economic Sovereignty, and specifically in Section Eight, dedicated to the Financial System, states in Article 309 that the national financial system is composed of the public, private, and popular and solidarity sectors, allowing them to act as intermediaries for public funds. Article 311 defines this latter sector as comprising savings and credit cooperatives, associative or solidarity-based entities, community banks and credit unions, and savings banks.

In order to recognize, foster, promote, protect, regulate, support, and oversee this set of economic forms and practices, the Ecuadorian government enacted the Organic Law on the Popular and

Solidarity Economy (2011), published in Official Register No. 444 on May 10, 2011. Article 8, regarding forms of organization, establishes cooperative organizations of all types and economic activities, which constitute the cooperative sector. These are classified into: production, consumption, housing, savings and credit, and services.

The internal governing body of savings and credit cooperatives is the General Assembly, which is responsible for making decisions and ensuring their implementation, with the support of the executive board, members, and administrators, in accordance with Article 28 of the Regulations to the Organic Law on the Popular and Solidarity Economy of 2012.

The Monetary and Financial Policy and Regulation Board (2019) issued Resolution 521-2019-F, which established amendments to the Regulation on the Segmentation of Entities in the Popular and Solidarity Financial Sector. According to Article 1 of this resolution, entities in the popular and solidarity financial sector will be classified into the following segments based on the type and balance of their assets (Table 1).

Table 1. Segmentation of Entities in the Popular and Solidarity Financial Sector in Ecuador

Segment	Assets
1	Greater than USD 80,000,000
2	Greater than USD 20,000,000 up to USD 80,000,000
3	Greater than USD 5,000,000 up to USD 20,000,000
4	Greater than USD 1,000,000 up to USD 5,000,000
5	Up to USD 1,000,000

Source: Author's own analysis

Based on this classification, and regarding the trend in the number of savings and credit cooperatives by segment from 2021 to 2023, the following data can be compared (Table 2).

Table 2. Trends in the Number of Credit Unions by Segment, 2019-2023

Year	Segment 1	Segment 2	Segment 3	Segment 4	Segment 5	Total
2021	38	47	91	153	155	488
2022	47	49	91	157	102	446
2023	49	57	97	142	63	408

Source: Author's own analysis

It can be seen that the number of savings and credit cooperatives belonging to the Popular and Solidarity Financial System increased gradually in segments 1, 2, and 3, while sectors 4 and 5 experienced a steady decline in recent years.

Based on the information presented, this article aims to analyze the financial sustainability of Ecuadorian savings and credit cooperatives by the end of 2023. To this end, risk levels were measured in the financial statement balances of the 57 credit unions classified in segment two as of that date, using the CAMELS method, which -as its acronym suggests- comprises the following indicators: capital adequacy, asset quality, management, earnings, liquidity, and market risk.

MATERIALS AND METHODS

The techniques considered include literature reviews, quantitative data analysis, and information analysis, as well as the CAMELS method, which involves quantifying capital, assets, management, earnings, liquidity, and market risks.

Literature reviews play an essential role in the advancement of science due to its cumulative nature. They serve a wide range of functions, including the following:

- They assure reviewers that the authors are familiar with the field of research.
- They serve as the first demonstration that a researcher knows how to handle, analyze, and interpret scientific information.
- They prevent the duplication of research and the use of obsolete or discredited theories.
- They help identify gaps and opportunities in research.
- They provide the evidence base for state-of-the-art reviews and literature reviews.

Quantitative data analysis is characterized by the systematic collection of quantifiable information, followed by rigorous analysis using statistical techniques. Unlike the qualitative approach, which seeks to thoroughly understand social phenomena from the participants' perspective, the quantitative approach focuses on obtaining results that allow for the establishment of causal relationships and behavioral patterns on a large scale (Vizcaíno Zúñiga et al., 2023).

The CAMELS method -an acronym in Spanish for capital (C), asset quality (A), management (M), earnings (E), and liquidity (L)- is known as a unified rating system for financial institutions. It enables the evaluation and synthesis of financial, operational, and compliance factors. It has the advantage of summarizing the overall situation of the financial institution in a single indicator and standardizing the analysis of the status of individual institutions (Calahorrano et al., 2023).

RESULTS AND DISCUSSION

The Central Bank of Ecuador (2015, p. 9) defines the CAMELS method as "one of the off-site methods used by the U.S. Federal Reserve and also applied in many countries as an early-warning model in banking supervision." Originally, it comprised five areas (CAMEL), and since 1997, banking supervisors have added a sixth component (S) to measure sensitivity to market risk. It allows for the measurement, from a quantitative ex-post perspective, of a financial institution's overall risk based on the following indicators:

- a) Capital Adequacy (C): measures a financial institution's ability to maintain an adequate ratio between its capital and the risks it holds or incurs. Adequate capital adequacy indicators would imply the ability to absorb and manage either a decline in asset values or other problems arising from risks or uncontrollable factors such as systemic risks.
- b) Asset quality (A): The analysis of asset quality reflects the extent of existing and potential risk associated with credit and investment portfolios, as well as management's ability to identify, measure, monitor, and control credit risk. The assessment of asset quality must consider the adequate provisioning of reserves for loans that carry a higher risk of delinquency or default.
- c) Administrative Management (M): This assesses a financial institution's ability to measure, identify, and control the risks associated with its activities. It measures levels of risk exposure and seeks to ensure that appropriate policies, procedures, and practices have been established, which -depending on the nature and scope of the institution's activities- must

address some of the following risks: credit, market, operational or transaction, reputational, strategic, compliance, legal, and liquidity risks, among others.

- d) Profitability (E): The assessment of profitability is associated with an institution's potential to generate profits, the return on assets, the balance between the return on assets and the cost of funding, as well as concepts such as return on investment. This component should reflect not only the amount and trend of revenue but also the factors that may affect the sustainability or quality of earnings.
- e) Liquidity Risk (L): This analysis seeks to determine whether an entity is capable of maintaining a sufficient level of liquidity to meet its financial obligations in a timely manner and fulfill its customers' banking needs. Practices should reflect the entity's ability to manage unplanned changes in funding sources, as well as to respond to changes in market conditions that affect its ability to quickly liquidate assets with minimal loss.
- f) Market Risk (S): This measures a financial institution's sensitivity to changes in market risk components, such as changes in interest rates, exchange rates, commodity prices, or stock prices; and how these may affect a financial institution's revenue or economic capital.

The traditional CAMELS method classifies each element to be evaluated using ratios based on five specific scenarios or situations (Table 3). After classifying each component, the entity's overall situation is assessed using the same criteria through a final ratio. The U.S. Federal Reserve's website summarizes the interpretation for each scale.

Table 3. Ratios of the CAMELS Method

Scale	Description
1	Good financial performance; no cause for concern
2	Complies with regulations, stable situation, warrants limited supervision.
3	Weaknesses in one or more areas, unsatisfactory practices, poor performance, but limited risk of bankruptcy.
4	Serious financial deficiencies, inadequate management, and a need for close supervision and corrective action.
5	Extremely unsafe conditions and practices. Deficiencies beyond management's control, bankruptcy highly likely, and external financial assistance required.

Source: Own elaboration based on the Federal Reserve of the United States of America

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Thus, the final indicator would be represented as follows:

$$\text{CAMELS} = \beta 1C + \beta 2A + \beta 3M + \beta 4E + \beta 5L + \beta 6S$$

Breaking down each of its components -for example, capital adequacy ($\beta 1C$)- it results from the inclusion of internal variables, as shown below:

$$\beta 1C = >1C1 + >2C2 + >3C3 \dots$$

Note: The sum of these factors must equal 1 or 100%.

The weighting used was determined by the Central Bank of Ecuador (2015), representing the weight of the ratios for each element and the final ratios for each component, with the following values (Table 4).

Table 4. Weighting of CAMELS Method Indicators

Indicators	Average	CAMELS Weight	Weighting	Approximation
C1	6.36%	12.76%	49.88%	40.00%
C2	6.40%		50.12%	60.00%
A1	4.66%	17.60%	26.51%	30.00%
A2	5.73%		32.53%	30.00%
A3	4.24%		24.08%	25.00%
A4	2.97%		16.88%	15.00%
M1	4.64%	14.61%	31.75%	30.00%
M2	6.43%		44.02%	40.00%
M3	3.54%		24.23%	30.00%
E1	6.03%	27.10%	22.26%	25.00%
E2	6.42%		23.69%	20.00%
E3	6.54%		24.12%	25.00%
E4	6.99%		25.80%	25.00%
E5	1.12%		4.13%	5.00%
L1	7.95%	23.55%	33.74%	35.00%
L2	7.94%		33.69%	35.00%
L3	7.66%		32.57%	30.00%
S1	4.37%	4.38%	100.00%	100.00%

Source: Own elaboration based on data from the Central Bank of Ecuador (2015)

The proposed project involved conducting an assessment using the CAMELS method on Ecuador's 57 savings and credit cooperatives in Segment 2 by the end of 2023, with the aim of evaluating the performance of their financial management to enable sound decision-making at the managerial and executive levels, involving the institution's staff and addressing potential risk events.

It was proceeded to collect the financial information contained in the statements of financial position and income for all of these institutions by summing the balances of the relevant accounts that are part of the unified accounting framework for financial institutions in the popular and solidarity economy.

Based on this, the following formulas have been established for each indicator, which involve specific accounts from the financial statements:

Capital adequacy (C)

$$C = \text{Net Capitalization Ratio (C1: 0.40)} + \text{Equity Coverage of Non-Earning Assets (C2: 0.60)}$$

Where:

$$\text{Net Capitalization Ratio} = \text{Capitalization Factor} / \text{Intermediation Factor}$$

$$\text{Capitalization Factor} = \text{Equity} + \text{Net Income} - \text{Extraordinary Income} / \text{Total Assets}$$

$$\text{Intermediation Factor} = 1 + (\text{Average Gross Non-Earning Assets} / \text{Total Assets})$$

Asset quality (A)

$$A = ((-1) \text{ Percentage of non-performing assets} + 2) (A1: 0.30) + ((-1) \text{ Credit intermediation} + 2) (A2: 0.30) + ((-1) \text{ Credit quality} + 2) (A3: 0.25) + \text{Credit coverage} (A4: 0.15)$$

Where:

$$\text{Percentage of Non-Performing Assets} = \text{Net Non-Performing Assets} / \text{Total Assets}$$

$$\text{Credit Intermediation} = \text{Past-Due Portfolio} * \text{Intermediation Ratio} / \text{Gross Portfolio}$$

$$\text{Lending Ratio} = \text{Gross Portfolio} / \text{Liabilities to the Public}$$

$$\text{Credit Quality} = \text{Past-Due Portfolio} + \text{Non-Interest-Bearing Portfolio} / \text{Gross Portfolio}$$

$$\text{Credit Coverage} = \text{Provisions} / \text{Past-Due Portfolio} + \text{Non-Interest-Bearing Portfolio}$$

Operational management (M)

$$M = ((-1) \text{ Net Interest Margin Absorption Rate} + 2) (M1: 0.30) + ((-1) \text{ Operational Efficiency} + 2) (M2: 0.40) + \text{Administrative Management} (M3: 0.30)$$

Where:

$$\text{Financial Margin Absorption Ratio} = \text{Operating Expenses} / \text{Gross Financial Margin}$$

$$\text{Operational Efficiency} = \text{Operating Expenses} / \text{Average Assets}$$

$$\text{Administrative Management} = \text{Productive Assets} / \text{Cost-bearing Liabilities}$$

Profitability or earnings (E)

$$E = \text{ROA} (E1: 0.25) + \text{Operating ROA} (E2: 0.20) + \text{ROE} (E3: 0.25) + \text{Business Efficiency} (E4: 0.25) + \text{Spread Margin or Rates} (E5: 0.05).$$

Where:

$$\text{Return on Assets (ROA)} = \text{Profitability} / \text{Average Assets}$$

$$\text{Operating ROA} = \text{Operating Income} / \text{Average Assets}$$

$$\text{Return on Equity (ROE)} = \text{Net Income} / \text{Average Equity}$$

$$\text{Business Efficiency} = \text{Ordinary Income} / \text{Average Assets}$$

$$\text{Interest Margin (Rates)} = \frac{\text{Ordinary Income (excluding services)} - \text{Cost of Liabilities}}{\text{Average Liabilities}}$$

Liquidity (L)

$$L = \text{Current Ratio} (L1: 0.35) + \text{Quick Ratio} (L2: 0.35) + \text{Adjusted Current Ratio} (L3: 0.30)$$

Where:

$$\text{Liquidity Ratio} = \text{Liquid Assets (90 days)} / \text{Current Liabilities}$$

$$\text{Adjusted Liquidity Ratio} = \text{Liquid Assets (90 days)} / \text{Liabilities to the Public}$$

$$\text{Quick Ratio} = \text{Cash and Cash Equivalents} / \text{Short-Term Deposits}$$

Market risks (S)

S = Implied Lending Rate (S1: 1)

Where:

Implied Lending Rate = Interest and Fee Income / Average Gross Portfolio

The indicators obtained are as follows (Table 5).

Table 5. Indicators obtained using the CAMELS Method for the 57 savings and credit cooperatives in Segment 2, as of 2023

Component	Weight	Indicators	Weighting	Result of the indicator	Adjustment	Indexes transformed	Sum indicators	Weighting components
C	0.15	C1	0.40	0.1459	0	0.05836	1.53766	0.230649
		C2	0.60	2.4655	0	1.47930		
A	0.20	A1	0.30	0.0544	1.9456	0.58360	1.91928	0.383856
		A2	0.30	0.0147	1.9853	0.59550		
		A3	0.25	0.0371	1.9629	0.49070		
		A4	0.15	1.6632	0	0.24948		
M	0.15	M1	0.30	0.7634	1.2366	0.37090	1.34180	0.201270
		M2	0.40	0.0578	1.9422	0.77680		
		M3	0.30	0.6470	0	0.19410		
E	0.25	E1	0.25	0.0019	0	0.00048	0.04091	0.010228
		E2	0.20	-0.0014	0	-0.00028		
		E3	0.25	0.0128	0	0.00320		
		E4	0.25	0.1323	0	0.03308		
		E5	0.05	0.0888	0	0.00444		
L	0.20	L1	0.35	0.1859	0	0.06507	0.14887	0.029774
		L2	0.35	0.1953	0	0.06836		
		L3	0.30	0.0515	0	0.01545		
S	0.05	S1	1.00	0.0694	0	0.06940	0.06940	0.003470
	1.00							0.859247

Source: Own elaboration

The final weighting is evaluated according to the ratio index established for the CAMELS method. In a scenario where the indicators approach a score of 1, this implies that the credit union or group of credit unions analyzed is performing well financially, and therefore there is no current cause for concern regarding its risk level. Likewise, a score of 2 -despite compliance with regulations and a currently stable situation- requires some limited oversight of the variables that show slight distortions.

The values of each variable have been multiplied by its weight within each indicator; subsequently (for certain specific variables), the respective adjustment is applied by multiplying the result by (-1) and adding (+2). Once the transformed figures are obtained, they are summed by indicator, yielding the ratio for each one. To calculate the component weighting, these results are multiplied by their total proportion.

It has been determined that the variables corresponding to Capital Adequacy (1.53766), Asset Quality (1.91928), and Administrative Management (1.34180) are classified as Stage 2 by approximation; that is, they comply with regulations and, despite presenting a stable situation, warrant limited supervision. However, although they account for 50% of the total, the remaining indicators have low scores: Profitability, at 0.04091; Liquidity, at 0.14887; and Market Risk, at 0.06940 -all of which naturally fall near level 1 on the scale. The overall weighting of the CAMELS indicators is 0.859247, which also corresponds to a score of 1. This indicates that, in terms of risk assessment, the average financial statements of the 57 Ecuadorian credit unions as of the end of 2023 showed strong financial performance, and there were no causes for concern.

The application of the CAMELS method to savings and credit cooperatives in Segment 2 for the year 2023 has confirmed their strong position, due not only to their asset balances but also to their capital adequacy, asset quality, management practices, current profitability and liquidity, and control of market risks. Therefore, based on the available data, this group of organizations possesses the financial sustainability necessary for sound operational management.

Precisely in light of their mission, a series of recommendations for the coming years follows: first, it is essential for Ecuadorian credit unions in these uncertain times to efficiently control risk exposure limits and refine their measurement and management tools, enabling them to identify scenarios of vulnerability and implement strategies to avoid, manage, or mitigate them. Similarly, they must capitalize on the strengths that have solidified their position and, above all, not lose sight of the

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purposes for which they were created; even though their capital is composed of members' contributions, the accumulation of equity and returns on their operations must not take precedence over the socioeconomic impact on their clients. These cooperative principles have prevailed in rural areas, which, unfortunately, lag behind cities in terms of the number of active savings and credit cooperatives.

Finally, to make better use of the loans granted, it is vital to consider strategic alliances with other sectors of society to promote training programs that support and share techniques and knowledge aimed at strengthening the entrepreneurial sector, fostering continuous improvement within the community, assessing its weaknesses, and leveraging its strengths. In this support process, savings and credit cooperatives -through existing regulations- must provide incentives, relax requirements, and adopt less stringent guarantees and procedures for granting financing, alongside regulation and oversight that ensure financially and socially sustainable microfinance for the coming years.

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Conflict of interest

Author declares no conflicts of interest.

Authors' contribution

Luis Arturo Capace Bondarenco wrote the manuscript and approves the version finally submitted.



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