SOCIAL PERFORMANCE OF CREDIT COOPERATIVES IN BRAZIL: A QUANTITATIVE APPROACH BASED ON INDICATORS AND MULTICRITERIA ANALYSIS[1]

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ABSTRACT

This study proposes to measure the social performance of Brazilian credit cooperatives by constructing an index. A standardized secondary database was used, with data from 3,583 active single cooperatives between 2016 and 2020, collected from the Central Bank, IBGE, and FGCoop. Sixteen indicators grouped into five theoretical dimensions were mobilized. Exploratory Factor Analysis (EFA) was applied to reduce dimensionality and, subsequently, the TOPSIS multicriteria method was used to rank performance. The results revealed three main factors: breadth of reach, depth of access to financial products/services, and depth related to borrower poverty. The model showed satisfactory internal consistency and explained variance greater than 80%. Empirically, an average social performance of 35.6% was observed, with indices ranging from 0.039 to 0.841, indicating significant heterogeneity among the cooperatives analyzed. The proposal contributes by offering a replicable index, capable of supporting public policies, regulatory decisions, and management strategies aimed at strengthening the social function of credit cooperatives.

Keywords: Credit cooperatives. Social performance. Factor analysis. TOPSIS.

DESEMPENHO SOCIAL DAS COOPERATIVAS DE CRÉDITO NO BRASIL: UMA ABORDAGEM QUANTITATIVA BASEADA EM INDICADORES E ANÁLISE MULTICRITÉRIO

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RESUMO

Este estudo propõe mensurar o desempenho social das cooperativas de crédito brasileiras a partir da construção de um índice. Utilizou-se uma base secundária padronizada, com dados de 3.583 cooperativas singulares ativas entre 2016 e 2020, coletados no Banco Central, IBGE e FGCoop. Foram mobilizados 16 indicadores agrupados em cinco dimensões teóricas. Aplicou-se Análise Fatorial Exploratória (AFE) para redução da dimensionalidade e, posteriormente, o método multicritério TOPSIS para ranqueamento do desempenho. Os resultados revelaram três fatores principais: amplitude do alcance, profundidade quanto ao acesso a produtos/serviços financeiros e profundidade relacionada à pobreza dos mutuários. O modelo apresentou consistência interna satisfatória e variância explicada superior a 80%. Em termos empíricos, observou-se desempenho social médio de 35,6%, com índices variando entre 0,039 e 0,841, indicando significativa heterogeneidade entre as cooperativas analisadas. A proposta contribui ao oferecer um índice replicável, capaz de subsidiar políticas públicas, decisões regulatórias e estratégias de gestão voltadas ao fortalecimento da função social do cooperativismo de crédito.

Palavras-Chave: Cooperativas de crédito. Desempenho social. Análise fatorial. TOPSIS.

1 INTRODUCTION

When addressing organizational performance, the concepts of effectiveness and efficiency are often used. According to Neely, Gregory, and Platts (1995), both are considered measures of performance. Effectiveness refers to the extent to which requirements are met, while efficiency indicates the degree of economy in the use of resources to achieve those requirements. These dimensions, although relevant, do not exhaust the possibilities for measuring performance, which may also involve social, environmental, and strategic indicators.

Credit cooperatives operate under a hybrid logic, balancing social mission and economic viability. Focusing exclusively on one of these dimensions can negatively impact their members (Santos, Pache & Birkholz, 2015), which reinforces the need to evaluate their performance from both perspectives.

The measurement of the economic and financial performance of credit cooperatives is already widely addressed in the national literature, with studies exploring different methodologies and efficiency indicators. Bressan et al. (2010) highlight the usefulness of the PEARLS system as a tool for diagnosing and monitoring financial soundness, allowing for comparison between credit cooperatives and the monitoring of prudential goals. Since then, several authors have been using this model or adaptations of it to assess the economic sustainability of the sector (Gollo & Silva, 2015; Maia, 2022; Vieira, 2023; Souza, 2024). This tradition of research focused on financial performance demonstrates the maturity of economic and accounting measurement in Brazilian credit cooperatives, which justifies this study's focus on the analysis of social

performance, a dimension that is still in its infancy but essential to a comprehensive understanding of the dual mission of these organizations.

Social performance, in line with Martínez-Campillo, Fernández-Santos, and Sierra-Fernández (2016), reflects the ability of cooperatives to generate value for their members and society by meeting the needs of groups traditionally excluded from the financial system and acting as agents of social cohesion, in line with cooperative principles. Thus, social performance transcends the logic of profit, incorporating measurable social impacts that contribute to collective well-being and territorial sustainability.

Given this, this study seeks to answer the following research question: what is the social performance of Brazilian credit cooperatives? To this end, the objective is to measure the social performance of Brazilian credit cooperatives based on the construction of an index.

The main contribution of this study is the proposal of a Social Performance Index (SPI) for credit cooperatives, integrating multiple indicators from a systemic perspective. Although Gollo and Silva (2015) applied a similar approach to economic and financial performance, the measurement of social performance from this perspective is still in its infancy in the literature.

Performance measurement, in general, faces methodological and operational limitations, whether due to data availability or time and resource constraints (Carneiro et al., 2005). In the case of the social performance of credit cooperatives, many studies draw on the literature on microfinance institutions (MFIs), such as Amersdorffer et al. (2015), due to the conceptual affinity between these organizational models. Although not all credit cooperatives can be classified as MFIs, there is a theoretical and methodological convergence between the measurement criteria applied to these institutions and those used to evaluate credit cooperatives.

Approaches that use secondary accounting and economic data predominate, with indicators such as financial inclusion and customer socialization (Campillo & Santos, 2016; Campillo, Santos & Fernández, 2016). Tools based on primary data, such as Social Performance Indicators (SPI), although relevant, apply to a more restricted number of institutions (Amersdorffer et al., 2015). SPI is an instrument originally developed to measure the social performance of microfinance institutions through the direct collection of information on mission, management practices, and social outreach. Despite its analytical scope, its application requires qualitative and operational data obtained from the organizations themselves, which limits its use in large-scale comparative analyses. Given these restrictions, this study adopts indicators based on Navajas et al. (2000), Schreiner (2002), and Rosenberg (2009), exploring standardized and accessible secondary data.

Additionally, it should be noted that, unlike financial statements (which follow uniform accounting standards and allow for broad comparability), the disclosure of social actions by cooperatives lacks standardization, making it difficult to assign scores and perform comparative analysis between institutions and over time.

Historically, cooperativism was recognized in the 1988 Federal Constitution as an organization that's important from an economic and social point of view. Even so, structural and political challenges remain that limit the full realization of this recognition (Becho, 2022). This scenario reinforces the need to improve mechanisms for measuring and communicating social performance, especially in a sector that enjoys tax benefits based on its socioeconomic relevance.

In this scenario, the proposal contributes by offering a comparable, replicable, and theoretically grounded evaluation system capable of generating empirical evidence to support public policies, regulatory decisions, and management practices aligned with the social function of credit cooperatives. From a theoretical point of view, the study broadens the understanding of the performance of credit cooperatives by integrating concepts from the microfinance literature (Navajas et al., 2000; Schreiner, 2002; Rosenberg, 2009) with the Brazilian reality, proposing a model aimed at measuring social performance.

In the practical field, the Social Performance Index (SPI) offers an objective tool for monitoring the fulfillment of the social mission of cooperatives, based on public and standardized indicators, allowing for comparisons and sectoral diagnoses. From a social perspective, the study highlights the role of credit cooperatives in financial inclusion and local development, strengthening their legitimacy as agents of transformation and promotion of socioeconomic equity.

In addition, it highlights the central role of accounting in enabling the measurement of the social performance of credit cooperatives. Accounting information, by providing standardized, auditable, and comparable data over time, constitutes the main empirical basis for the construction of social indicators derived from secondary data. In the context of credit cooperatives, variables such as loan volume, surpluses, number of members, portfolio composition, and results before statutory allocations allow us to infer relevant social dimensions, such as financial inclusion, depth of reach, and economic return to members. Thus, accounting not only supports the analysis of economic and financial performance, but also acts to operationalize the social function of these organizations, increasing transparency, accountability, and the ability to monitor compliance with the cooperative mission.

2 SOCIAL PERFORMANCE IN CREDIT COOPERATIVES

Based on studies by Navajas et al. (2000), Schreiner (2002), and Rosenberg (2009), it appears that the assessment of the social performance of microcredit organizations has been based on the concepts of reach and sustainability.

Reach consists of the social value of the results of a microfinance organization's activities in terms of depth (value and cost to users), breadth, extent, and scope (Navajas et al., 2000). Objectively, depth consists of the social value of net gain (net gain results from value to customers minus cost to customers); breadth is the number of customers; length is years of service; and scope is types of contracts (Rosenberg, 2009). Thus, the social benefit of a microfinance organization's reach is the net gain weighted by depth, added to the breadth of customers and the scope of contracts, and discounted over time (duration) (Schreiner, 2002).

Sustainability, on the other hand, refers to permanence. Sustainable organizations tend to improve well-being more, while unsustainable microfinance organizations inflict costs on the poor in the future as a result of the excess gains enjoyed by the poor now. Thus, sustainability affects reach, as permanence tends to affect the incentive and constraint structures that lead all stakeholder groups in a lender to act in ways that increase the difference between social value and social cost. Therefore, sustainability is not an end in itself, but a means to improve social welfare (Navajas et al., 2000).

Following the theoretical precepts of Navajas et al. (2000), Schreiner (2002), and Rosenberg (2009), the following is a theoretical deepening of the aspects of reach and sustainability. Added to these is the dimension of contribution to society and to cooperative members, identified as complementary, due to the use, in some studies, of metrics that do not apply to the concepts of reach and sustainability presented, and which also integrate social aspects of performance.

Depth of Reach (PA): The depth of reach is the value that society attributes to the net gain from the use of microcredit by a given borrower. In welfare theory, depth is the weight of a customer in the social welfare function. Therefore, given that society attaches more weight to the poor than to the rich, poverty is a good indicator of depth (Navajas et al., 2000; Schreiner, 2002).

Typically, greater depth increases not only social value but also social cost. This is the case with poverty, since as income and wealth decline, it costs more for the lender to assess the risk of a loan (Navajas et al., 2000; Schreiner, 2002). However, deeper reach may increase only social value and not social cost when a lender finds better ways to assess risk at a lower cost, resulting in savings through better judgment and increased access (Navajas et al., 2000).

Given the difficulty of directly measuring net gains, proxies such as poverty, gender, location, and education are used to indicate depth of reach, associating greater social value with more vulnerable profiles (Schreiner, 2002).

The most common proxy for depth of reach is loan size, which can be measured in five different ways: the amount disbursed, the term to maturity, the installment amount, the time between installments, or the average outstanding amount, in terms of real per year, of borrowed purchasing power. In all approaches, lower values indicate greater depth. Although the amount disbursed is the most commonly used metric in practice, the measure considered most accurate is the average outstanding amount adjusted for time and purchasing power (Schreiner, 2002).

Amplitude of Reach (AA): Microfinance institutions aim to increase the coverage of their services, which makes them excel in serving a large number of clients, especially those considered less privileged (Araújo & Carmona, 2015). The scope given to budgetary constraints must be noted, as the desires and needs of the poor exceed the resources allocated to them (Schreiner, 2002). In other words, scope is important, since there are many poor people, but the financial resources available for lending are limited (Navajas et al., 2000).

Thus, if everything else remains constant, the breadth of poverty outreach depends on the level of resources it can attract (Schreiner, 2002). To this end,

according to Rosenberg (2009), the best measure of outreach breadth is the number of customers or accounts that are active at a given time.

Reach Extension (RE): Reach extension, according to Navajas et al. (2000), refers to the period of time during which a microfinance organization produces loans. Its importance is justified by society's concern for the welfare of the poor, both now and in the future, so that without a long reach, a microfinance organization can improve social welfare in the short term but destroy its ability to do so in the long term. (Navajas et al., 2000; Schreiner, 2002).

Scope of Reach (AM): The scope of reach consists of the number of types of financial contracts offered by a microfinance organization. The organizations with the best scope are those that produce small loans and deposits (Navajas et al., 2000). Therefore, the scope of reach covers loans and savings services, whether for groups or individuals, through contracts with different terms (Navajas et al., 2000; Schreiner, 2002).

Although credit is widely recognized as a tool for inclusion, deposits are also essential, as all poor people can save, while not all are considered creditworthy. In addition, deposits reinforce sustainability and extension, as their maintenance depends on depositors' confidence in the institution's solvency (Navajas et al., 2000).

Contribution to Society and Members (CSC): Other indicators used to measure social performance, but which are not linked to depth, breadth, scope, and reach, have been observed in the literature and relate to the measurement of contributions that credit cooperatives offer to society and their members. The indicators proposed for this additional dimension are incorporation of cooperatives, social and statutory contributions, and results per member.

Sustainability: The dimension of sustainability, according to Rosenberg (2009) and Navajas et al. (2000), refers to the ability of microfinance organizations to remain in operation over time. For Rosenberg (2009), it is a matter of verifying whether the institution is sufficiently profitable to sustain and/or expand its operations without continuously relying on subsidies. Navajas et al. (2000), in turn, understand sustainability as a means—not an end—aimed at maximizing net social value, discounted over time. Although they do not propose specific metrics, Rosenberg (2009) presents financial indicators associated with profitability. However, the application of these indicators to Brazilian credit cooperatives is limited by the scarcity of data. In this context, we propose an integrated analysis of the social dimensions listed above with economic and financial dimensions, based on metrics such as those of the PEARLS system.

Finally, these dimensions were related to a set of indicators widely used in the literature that addresses the social performance of credit cooperatives, which are listed in Table 1.

Table 1
Social indicators based on social dimensions

Ind.	Objective	Calculation	Suggestion	Basis
PA 1.1	**Customer poverty level:** identify the poverty level of customers served by the credit cooperative.	$p_I = 1 - \left(\frac{Ki - Min\ (K)}{Amplitude(K)}\right)$ Where K is the average loan value; i is an indicator associated with a given institution; Min(K) is the minimum value among all i, while Amplitude(K) is the maximum value of K among all i minus the minimum value of K among all i. **Expressed in:** %.	The bigger, the better	Gutiérrez-Nieto, Serrano-Cinca, e Mar Molinero (2009); Kaur (2016); Araújo e Carmona (2015); Silveira (2017); Agostinho (2022); Vieira (2023)
PA 1.2	**Customer socialization:** reflecting the direction of credit cooperatives' asset operations to their membership.	Loans / Number of Active Accounts **Expressed in:** R$ thousand per member	The smaller, the better	Belmonte-Ureña e Plaza-Úbeda(2008); Belmonte-Ureña (2012); Campillo, Santos e Fernández (2016); Campillo e Santos (2016).
PA 2	**Women's empowerment:** revealing the depth of social outreach through women's access to financial intermediation services.	Number of female cooperative members / Total number of individual cooperative members **Expressed in:** %.	The bigger, the better	Agostinho (2022); Vieira (2023); Souza (2024)
PA 3.1	**Financial inclusion:** assessing the commitment of cooperatives	Number of PACs in municipalities with fewer than 25,000 inhabitants / Total de PAC **Expressed in:** %.	The bigger, the better	Campillo e Santos (2016); Belmonte-Ureña (2012).
PA 3.2	**Access to financial services:** assess the presence of cooperatives in municipalities underserved by financial institutions.	Number of PACs in municipalities without branches / Total de PAC **Expressed in:** %.	The bigger, the better	Baseado em: Navajas *et al.* (2000); Schreiner (2002).
PA 3.3	**Average number of transactions per borrower:** assess access to credit services by the largest number of customers in relation to the number of credit transactions signed.	Number of active transactions / Number of customers with active transactions **Expressed as:** quantity per member.	The closer to 1, the better.	Santos *et al.* (2019)

AA 1	**Number of clients served:** identify the breadth of reach by making the social benefits of microcredit available to as many clients as possible.	The number of clients with active credit operations. **Expressed in:** quantity.	The bigger, the better	Araújo e Carmona (2015); Silveira (2017); Rosenberg (2009); Vieira (2023)
AA 2	**Membership growth:** measuring the growth or increase in the cooperative's membership, indicating how much the cooperative has progressed or regressed in relation to its membership.	Number of members in the current year / Number of members in the previous year **Expressed in:** %.	The bigger, the better	Santos e Neves (2019); Vieira (2023)
EA 1	**Duration:** identifying the period of time during which an MFI produces loans	Current Year – Year of Foundation **Expressed in:** quantity.	The bigger, the better.	Navajas *et al.* (2000)
EA 2	**Leftovers:** signal some ability to purchase resources in the market, maintaining your long-term reach.	∑ (0,33 per year with surpluses in the last 3 years) **Expressed in:** %.	The bigger, the better.	Schreiner (2002)
EA 3	**Long-term loans:** flag credit agreements with terms exceeding 15 years as an indication that you will maintain your long-term reach.	Amounts due over 5400 days / Total active credit portfolio **Expressed in:** %.	The bigger, the better.	Navajas *et al.* (2000) e Schreiner (2002)
AM 1	**Number of loans:** identify the social benefits of microcredit through a higher number of transactions.	The number of active credit transactions. **Expressed in:** quantity.	The bigger, the better	Schreiner (2002); Fried, Lovell e Eeckaut (1993)
AM 2	**Variety of loans:** identify the social benefits of microcredit through the widest possible variety of credit operations.	Number of types of loans offered / Maximum types in class **Expressed as:** %.	The bigger, the better	Fried, Lovell e Eeckaut (1993)
CS C 1	**Incorporation of cooperatives:** identify the incorporation of cooperatives contributing to society and to the members of the incorporated cooperative.	1 if another cooperative was incorporated during the period, 0 otherwise	The bigger, the better	Bauer, Miles e Nishikawa (2009); Vieira e Bressan (2023)

CS C 2	**Social and Statutory Contributions:** identify the proportion of social and statutory obligations in relation to surpluses.	Social and Statutory Obligations / Income before taxes **Expressed in:** %.	The bigger, the better	Com base em Campillo, Santos e Fernández (2016) Souza (2024)
CS C 3	**Profit per member:** identify the financial resources resulting from financial intermediation operations that are returned to members.	Earnings before taxes / Total number of members **Expressed in:** %.	The bigger, the better	Maia (2022)

Notes: PA – Depth of Reach; AA – Amplitude of Reach; EA – Extension of Reach; AM – Scope of Reach; CSC – Contribution to Society and Cooperative Members; PAC – Cooperative Service Station; PF – Individual.
Source: Prepared by the authors (2025).

3 METHODOLOGICAL PROCEDURES

The unit of analysis in this study comprises individual credit cooperatives operating between 2016 and 2020, defined according to data availability. After excluding observations with missing or invalid information, a sample of 3,583 credit cooperatives/year was obtained.

Sixteen indicators were used, grouped into five social dimensions according to the literature, whose data were extracted from the Central Bank of Brazil (2023a, 2023b), IBGE (2023), and the Credit cooperative Guarantee Fund [FGCoop] (2023). The indicators were standardized on a scale of 0 to 1, considering the meaning of each one (the higher, the better or worse), in order to reflect the relative performance of each cooperative.

Exploratory Factor Analysis (EFA) was applied with Principal Component Analysis extraction and Varimax orthogonal rotation with Kaiser normalization, using IBM SPSS Statistics Software®. The adequacy of the models was verified by the Kaiser-Meyer-Olkin (KMO) statistic, Bartlett's sphericity test, and a test to assess the internal consistency of the variables for each factor, Cronbach's alpha.

Based on the factors extracted via EFA and the variance explained by each one, an annual Social Performance Index (SPI) was constructed using the TOPSIS method (Yoon & Hwang, 1985). This multi-criteria technique ranks alternatives according to their proximity to the ideal positive solution and distance from the negative one, using as weights the proportion of variance explained by each dimension. The scores were organized into a decision matrix, allowing the cooperatives to be ranked based on their relative social performance.

4 ANALYSIS AND DISCUSSION OF RESULTS

The results of the analysis of social performance dimensions indicated the presence of three factors, composed of seven indicators, which together measure Social Performance.

DDS_1 (Scope of Reach): The first Social Performance Dimension resulting from the AFE grouped the indicators "number of customers served" (AA1) and "number of loans" (AM1). The grouping of these indicators reveals aspects of the social dimension of Scope of Reach, as they allow for the measurement of how comprehensive the range of financial products offered by credit cooperatives is.

The indicator "number of customers served" (AA1) allows for the identification of the scope of reach by making the social benefits of microcredit available to the largest possible number of customers. This is because, using limited resources, the cooperative expands its reach by prioritizing serving a large number of customers (Navajas et al., 2000; Araújo & Carmona, 2015).

The indicator "number of loans" (AM1) identifies the social benefits of microcredit through the largest possible number of credit operations. Given the cooperative's limited resources, the greater the number of loans provided, the greater its reach, thus providing services to a wider range of financial needs and increasing the volume of resources that members can attract based on their needs (Schreiner, 2002). In other words, a greater number of operations carried out by cooperatives allows them to better meet the demands of their members, indicating a greater capacity to reach more customers (Vieira, 2023).

DDS_2 (Depth of Reach in terms of access to financial products/services): The second Dimension of Social Performance resulting from the AFE grouped the indicators "financial inclusion" (PA3.1), "access to financial services" (PA3.2), and "variety of loans" (AM2). These indicators aim to capture the depth of reach in terms of access to financial products/services.

This division of depth of reach metrics into two social dimensions is due to the difficulty of measuring depth of reach directly through income or social wealth generated by weighting net gains (Schreiner, 2002). As a result, simple and indirect proxies were used, which are: borrower poverty (preferably the poorest) in the case of DDS_3 and access to public services (preferably lack of access) addressed in this dimension.

The "financial inclusion" indicator (PA3.1) allows for the assessment of credit cooperatives' commitment to combating the financial exclusion of customers in sparsely populated municipalities by identifying the proportion of service outlets in municipalities with fewer than 25,000 inhabitants. Due to the strong relationship between financial development and economic growth (Jacques & Gonçalves, 2016), financial inclusion is a necessity for the population. Smaller municipalities, where only savings banks and credit cooperatives are located, would be underserved by financial intermediation services because they are not economically attractive to traditional financial institutions, were it not for the presence of these institutions (Belmonte-Ureña, 2012).

Similarly, the indicator "access to financial services" (PA3.2) assesses access to financial intermediation services through the presence of credit cooperatives in municipalities that are underserved by traditional financial institutions. Credit cooperatives are indicated as alternative institutions for the provision of credit in view of their particular characteristics, such as: assuming the risks of their investments for the benefit of the community, promoting local development

through the formation of savings and microcredit directed at local business initiatives (Jacques & Gonçalves, 2016).

The "variety of loans" indicator (AM2) identifies the social benefits of microcredit through the widest possible variety of credit operations. Although this indicator is classified in the scope dimension, it is understood that it contributes to the depth of scope in terms of access to financial products/services, since a greater variety of loans made available by the credit cooperative allows its members to choose the type of loan that best suits their individual circumstances (Fried; Knox Lovell & Eeckaut, 1993). In other words, a greater variety of credit modalities means greater access to financial services/products.

DDS_3 (Depth of Reach in terms of borrower poverty): The third Social Performance Dimension resulting from the AFE grouped the indicators "customer poverty level" (PA1.1) and "customer socialization" (PA1.2). This dimension reveals the depth of outreach in relation to borrower poverty. In general, it is relevant to note that depth of outreach reflects a weighting of net gain, that is, the value attributed by society to the net gain of a given person, in this case based on their income characteristics (Navajas et al., 2000). Given that society attaches more weight to the poor than to the rich, poverty is a good indicator of depth (Navajas et al., 2000; Schreiner, 2002).

The "customer poverty level" indicator (PA1.1) aims to identify the poverty level of customers served by the credit cooperative by relating the average loan balance per active account to the GDP per capita of the municipality in which the credit cooperative is based. Thus, this indicator allows a comparison of how deeply credit cooperatives reach their own income distributions to the poorest clients (Rosenberg, 2009).

The "customer socialization" indicator (PA1.2) reflects the targeting of credit cooperatives' equity operations to their social base. By dividing the value of loans by the number of accounts in active credit portfolios, it shows the average value of loans. Although it is not a perfect measure of poverty levels, it is understood to be an excellent indicator of depth of reach, given the strong positive correlation between income level and loan size, i.e., the poorer the borrower, the smaller the loan amount (Quayes, 2012).

Thus, we move on to the presentation of detailed statistical results, beginning with the assessment of the internal consistency of the variables used in the extraction of factors, using Cronbach's alpha. The first factor (DDS_1) presented values above 0.95 in all years analyzed, while the third factor (DDS_3) maintained values above 0.90 in the same period. The second factor (DDS_2) obtained an alpha greater than 0.70 between 2017 and 2020, with the exception of 2016, whose value was 0.662. These results indicate satisfactory internal consistency of the factors, validating the suitability of the items for measuring the respective constructs.

Furthermore, the overall adequacy of the factor extraction was verified using the Kaiser-Meyer-Olkin (KMO) statistic and Bartlett's sphericity test. The statistical tests confirmed the adequacy of the data for CFA. The KMO test showed values above 0.50 for all years (2016–2020), and Bartlett's sphericity test was significant, indicating sufficient correlations between the variables.

AFE revealed three factors with eigenvalues greater than 1, which together explain more than 80% of the total variance. The first factor explained about 29%, the second between 27% and 28%, and the third between 26% and 27%. These factors were maintained according to Kaiser's criterion, consolidating a structure that adequately synthesizes the original indicators.

The communalities confirmed the good explanatory power of most variables for all years analyzed. "Number of customers served" (AA1) and "Number of loans" (AM1) had commonalities greater than 0.95. "Variety of loans" (AM2), on the other hand, shows a lower explanatory power of the extracted factors, just above 0.50, which is still acceptable. In general, all variables contributed to the factor structure, with no relevant cross-loadings.

Table 2 shows the rotated matrix of the components. Indicators with loadings greater than ±0.50 were considered relevant in the composition of the factors. The first factor (DDS_1) is associated with AA1 and AM1; the second (DDS_2) with PA3.1, PA3.2, and AM2; and the third (DDS_3) with PA1.1 and PA1.2—with the order reversed between 2016 and the other years.

Table 2
Rotated component matrix

2016				2017				2018				2019				2020		
	1	2	3		1	2	3		1	2	3		1	2	3		1	2	3
AM1	.981	.007	.070	**AM1**	.984	.070	.005	**AM1**	.984	.069	.019	**AM1**	.984	.061	.031	**AA1**	.983	.054	.063
AA1	.975	.058	.036	**AA1**	.978	.037	.062	**AA1**	.980	.044	.063	**AA1**	.980	.046	.066	**AM1**	.981	.044	.039
PA12	.006	.968	.008	**PA31**	.050	.901	.041	**PA31**	.043	.901	.023	**PA31**	.037	.906	.041	**PA31**	.032	.909	.054
PA11	.034	.967	-.038	**PA32**	-.091	.839	.062	**PA32**	-.093	.848	.088	**PA32**	-.094	.860	.067	**PA32**	-.095	.862	.078
PA31	.046	.052	.881	**AM2**	.318	.645	-.266	**AM2**	.326	.654	-.223	**AM2**	.340	.662	-.212	**AM2**	.359	.632	-.179
PA32	-.082	.049	.814	**PA12**	.012	.010	.964	**PA12**	.014	.020	.966	**PA12**	.022	.020	.970	**PA11**	.056	-.012	.965
AM2	.330	-.259	.631	**PA11**	.047	-.047	.961	**PA11**	.055	-.045	.963	**PA11**	.059	-.042	.967	**PA12**	.023	.027	.964

Notes: number of clients served (AA1); number of loans (AM1); financial inclusion (PA3.1), access to financial services (PA3.2); variety of loans (AM2); client poverty level (PA1.1) and client socialization (PA1.2).
Source: Prepared by the authors (2025).

Consistency was observed in the composition of social performance dimensions, with three main factors explaining more than 80% of the variance of the seven indicators analyzed over five years. DDS_1 represents Breadth of Reach, DDS_2 reflects Depth of Reach in access to financial products/services, and DDS_3 captures Depth of Reach in relation to borrower poverty. AFE proved effective in simplifying the data and highlighting patterns in the social performance dimensions of individual Brazilian credit cooperatives.

After applying the TOPSIS method to measure social performance indices, descriptive statistics for these indices were calculated according to the system, the Classic or Full classification, and the region where the credit cooperative is headquartered (Table 3).

Table 3
Descriptive statistics of IDS by System

System	Nº	Mean	Standard deviation	Median	Minimum	Maximum
Sicredi	562	.374	.040	.370	.263	.594
Sicoob	1436	.354	.036	.351	.064	.488
Unicred	131	.336	.034	.334	.260	.404
Cresol	452	.361	.029	.359	.294	.416
Independent	1002	.350	.058	.351	.039	.841
Classic	3365	.356	.044	.354	.039	.841
Full	218	.367	.050	.369	.088	.479
South	1339	.367	.046	.362	.224	.841
Southeast	1401	.353	.037	.351	.088	.434
North	157	.339	.040	.343	.192	.423
Northeast	323	.351	.033	.348	.234	.420
Midwest	363	.343	.062	.348	.039	.461
Total	3583	.356	.044	.355	.039	.841

Source: Prepared by the authors (2025).

Given these initial results, it is pertinent to further discuss the IDS, characterizing the 10 credit cooperatives with the worst and best IDS (Table 4). For this analysis, the IDS were ranked from highest to lowest, and based on this ranking, the 10 cooperatives with the best and worst performances were selected, and the table was systematized, listing the cooperatives, some characteristics, and their performance indices. To contribute to the analysis, all the performances measured for these cooperatives were added.

The analysis in Table 4 highlights the impressive performance of the cooperative with code "82639451," whose IDS exceeded 80% in all years analyzed (2016–2020). This is a classic cooperative, based in Santa Catarina (southern region), independent (not linked to systems such as Sicredi, Sicoob, Unicred, or Cresol). This cooperative achieved the best performance in DDS_1, presenting the highest values in number of customers served (AA1 = 1) and number of loans (AM1 = 1). It also achieved high results in DDS_3, with PA1.1 and PA1.2 above 0.95, demonstrating strong performance with low-income audiences. However, the results for DDS_2 were less impressive, with low inclusion (PA3.1) and access (PA3.2) indices indicating the possibility of improving the depth of its social reach in terms of access to products/services.

Table 4
Characterization of credit cooperatives with the 10 worst and 10 best IDS

Order	Code	Classification	State	Region	System	Social Performance Index - IDS				
						2016	2017	2018	2019	2020
1	82639451	Classic	SC	South	Indepen-dent	.841	.832	.826	.823	.817
2	79342069	Classic	PR	South	Sicredi	.498	.493	.534	.594	.511
3	78414067	Classic	PR	South	Sicredi	.463	.425	.469	.527	.456
4	81099491	Classic	PR	South	Sicredi	.433	.388	.420	.488	.434
5	78825270	Classic	SC	South	Sicoob	.446	.409	.440	.488	.436
6	88894548	Classic	RS	South	Sicredi	.462	.416	.434	.480	.417
7	91586982	Full	RS	South	Sicredi	.445	.390	.417	.479	.418
8	3459850	Classic	PR	South	Sicoob	.416	.360	.397	.464	.418
9	1658426	Classic	DF	Midwest	Indepen-dente	.461	.401	.414	.451	.388

10	79457883	Full	PR	South	Sicredi	.416	.370	.399	.456	.399
799	1572667	Classic	RS	South	Indepen-dente	.314	.232	.253	.314	.261
800	26563270	Classic	MT	Midwest	Indepen-dente	.291	.222	.217	.313	.288
801	4388688	Classic	GO	Midwest	Indepen-dente /Sicoob	.297	.165	.184	.311	.244
802	24795049	Classic	GO	Midwest	Indepen-dente	.303	.208	.222	.271	.201
803	5439425	Classic	AC	North	Indepen-dente	.297	.200	.217	.237	.192
804	71207740	Classic	MG	Southeast	Sicoob	.281	.147	.155	.196	.144
805	44469161	Full	SP	Southeast	Indepen-dente	.190	.088	.153	.274	.276
806	968602	Classic	GO	Midwest	Indepen-dente	.056	.056	.123	.239	.211
807	50848910	Classic	SP	Southeast	Indepen-dente	-	-	-	-	.108
808	37255049	Classic	GO	Midwest	Indepen-dente /Sicoob	.040	.045	.039	.050	.064

Source: Prepared by the authors (2025).

Among the cooperatives with the highest IDS scores, the southern region predominated (9 out of 10), with the Sicredi System (6) standing out, followed by Sicoob (2) and independent cooperatives (2). Among the ten with the worst performance, seven were independent. This configuration suggests that networking can positively influence social performance, although independent cooperatives can also achieve high scores when well structured. The lack of standardization in governance aspects may explain the positive and negative extremes observed among unaffiliated cooperatives. The overall average SDI (35.6%) indicates low social performance among the cooperatives analyzed. Considering that each dimension has a similar weight in the composition of the index, it can be inferred that many cooperatives concentrate their efforts on only one dimension, with insufficient performance in the others. This scenario reinforces the need for systematic monitoring of social performance, which is not yet evident in the practice of Brazilian cooperatives.

Although there are alternative measurement methodologies—such as the Universal Standards for Social Performance Management (GDS)—the scarcity of data limits their application. Thus, there is a clear need to create a public database with social data on cooperatives, similar to what already exists for economic and financial data. Such an advance would not only allow for monitoring by managers and regulators, but also greater alignment with the social objectives of cooperatives.

In short, the results indicate that the social performance of Brazilian credit cooperatives is still limited, both by measurement challenges and by the lack of effective monitoring. The development of comparable indicators and indices, such as the proposed IDS, is essential to foster strategies aimed at strengthening the social role of these institutions.

5 CONCLUSIONS

This study measured the social performance of Brazilian credit cooperatives by constructing an index, considering their hybrid nature and the challenges of balancing social mission and economic sustainability. Using secondary data, it was possible to structure a replicable and comparable approach, contributing methodologically to the field.

The results point to low average performance (IDS of 35.6%), which may indicate a focus on only one of the social dimensions and a lack of systematic monitoring. Cooperatives linked to systems, especially in the southern region, performed better, although independent cooperatives also stood out.

The integrated analysis allows for the identification of opportunities for improvement in the social performance of cooperatives and provides input for managers and policymakers. It also reinforces the need for a public database with standardized social data to increase transparency and monitoring of social performance in the sector.

One limitation is the dependence on secondary data, which, although enabling the replicability and comprehensiveness of the analysis, imposes restrictions on the depth of some variables. Future research may advance in the application of qualitative or mixed methodologies, as well as explore more specific regional and interinstitutional aspects.

Finally, it should be noted that the systematic adoption of standardized social indicators is essential to help consolidate credit cooperatives as an effective instrument for financial inclusion and socioeconomic development. The dissemination of transparency and social measurement practices could strengthen the legitimacy and sustainability of these institutions in the long term.

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