UFSM

REVISTA DE ADMINISTRAÇÃO DA UFSM
Brazilian Journal of Management
ReA UFSM

ISSN 1983-4659
OPEN ACCESS

Rev. Adm. UFSM, Santa Maria, v. 18, n. 3, e2, 2025 https://doi.org/10.5902/1983465992358
Submitted: 06/06/2025 • Approved: 09/03/2025 • Published: 09/12/2025

Original Article

Evaluation of the competitiveness of agro-industrial cooperatives: a case study in Goiás state, Brazil

Avaliação da competitividade de cooperativas agroindustriais: estudo de caso no estado de Goiás, Brasil

Osmar de Paula Oliveira Junior[I], **Alcido Elenor Wander**[I]

[I] Universidade Federal de Goiás, Goiânia, GO, Brazil

ABSTRACT

Purpose/objective: This study examines the application of the Cooperative Competitiveness Index (CCI) Model as a tool for measuring the competitiveness of agro-industrial cooperatives.
Design/methodology/approach: This study investigated two cooperatives by analyzing key sub-factors and drivers of competitiveness, using one as a benchmark and the other as the subject of assessment. Quantitative sub-factors were compared between the cooperatives, while qualitative ones were evaluated through a structured questionnaire with closed yes/no questions.
Findings: The results indicate that the assessed cooperative demonstrates local-level competitiveness; however, it faces several challenges that require strategic improvements. The findings support the CCI Model as a viable and promising tool for enhancing competitiveness management in agro-industrial cooperatives.
Research limitations/implications: This study considered only two cooperatives. Therefore, it is essential to further test this recent, promising tool (CCI Model) to ensure it provides practical management insights on aspects that cooperative management should focus on to improve the cooperative's competitiveness.
Originality/value: This is the first known application of the CCI Model in practice, yielding valuable insights for the management of agricultural cooperatives to enhance their competitiveness in their respective sectors.

Keywords: CCI Model; Competitiveness sub-factors; Competitiveness drivers; Management tool

RESUMO

Finalidade/objetivo: Este estudo examina a aplicação do Modelo do Índice de Competitividade Cooperativa (ICC) como ferramenta para mensurar a competitividade de cooperativas agroindustriais.
Desenho/metodologia/abordagem: Este estudo investigou duas cooperativas, analisando os principais subfatores e impulsionadores da competitividade, utilizando uma como referência e a outra como objeto de

avaliação. Os subfatores quantitativos foram comparados entre as cooperativas, enquanto os qualitativos foram avaliados por meio de um questionário estruturado com perguntas fechadas de sim/não.
Constatações: Os resultados indicam que a cooperativa avaliada demonstra competitividade em nível local; no entanto, enfrenta diversos desafios que exigem melhorias estratégicas. Os resultados corroboram o Modelo ICC como uma ferramenta viável e promissora para aprimorar a gestão da competitividade em cooperativas agroindustriais.
Limitações/implicações da pesquisa: Este estudo considerou apenas duas cooperativas. Portanto, é essencial testar mais profundamente esta ferramenta recente e promissora (Modelo ICC) para garantir que ela forneça insights práticos de gestão sobre os aspectos nos quais a gestão cooperativa deve se concentrar para melhorar a competitividade da cooperativa.
Originalidade/valor: Esta é a primeira aplicação conhecida do Modelo CCI na prática, gerando insights úteis para a gestão de cooperativas agrícolas para melhorar sua capacidade de competir em seus respectivos setores.

Palavras-chave: Modelo ICC; Subfatores de competitividade; Direcionadores de competitividade; Ferramenta de gestão

1 INTRODUCTION

According to Souza et al. (2011) and Ilha et al. (2018), studies on the competitiveness of agro-industrial cooperatives have gained increasing relevance in the academic landscape, particularly in relation to regional development and local productive sectors. In this context, research that enhances the understanding of the phenomena affecting the competitiveness of agro-industrial cooperatives can lead to practical advances in managing these businesses, thereby contributing to the development and consolidation of agro-industrial cooperativism.

It is well known that the environment in which agro-industrial cooperatives operate, especially those involved in commodity production, has become increasingly demanding. This has created a scenario of heightened international competition characterized by decreasing profit margins and growing pressure for increased scale and efficiency. Research on the competitiveness of agro-industrial cooperatives needs to be translated into practical procedures or instruments that can assist managers in their activities.

Thus, studies aimed at establishing procedures for identifying areas for improvement and supporting planning and decision-making, as well as identifying

best practices and/or developing or adapting specific management tools for the administrative context of agro-industrial cooperatives, are included in this context. It is important to emphasize that such initiatives should always be aligned with the need for agro-industrial cooperatives to achieve social and business objectives simultaneously.

Given this scenario, the objective of this study was to test the instrument for measuring the competitiveness of agro-industrial cooperatives called the CCI Model, as proposed by Oliveira Júnior and Wander (2024). Thus, this study comprises an application report, which describes, in detail, all the procedures and criteria adopted during the empirical testing of the CCI Model and the results obtained. Notably, the final product of applying this methodology is the Cooperative Competitiveness Index (CCI), which justifies the nomenclature applied to the model.

2 APPLICATION REPORT

From here on, the procedures adopted during the empirical application of the instrument for measuring the competitiveness of agro-industrial cooperatives, structured by Oliveira Júnior and Wander (2024), will be reported. The steps taken will be described separately to facilitate understanding of the process. This empirical test is expected to validate the model and identify areas for improvement and calibration of the instrument on which it is based.

The methodology used Oliveira Júnior & Wander (2024) involves compiling elements present, particularly in four previous works that presented instruments for measuring competitiveness in agribusiness and agro-industrial cooperatives. From the outset, these elements were incorporated into a model designed to assess the competitiveness of agro-industrial cooperatives. Table 1 summarizes the contributions of each of the four works mentioned above and the evolution provided by the CCI Model.

Table 1 – Main empirical contributions used in the CCI Model

Authors	Purpose and contributions
Van Duren et al. (1991)	**Purpose**: to analyze the competitiveness of various sectors of the Canadian agri-food industry. **Contributions**: - Competitiveness drivers; - Performance indicators; and - Level of controllability of factors.
Silva and Battle (1999)	**Purpose**: to analyze Brazil's beef agro-industrial chain's efficiency and competitiveness. **Contributions**: - Competitiveness subfactors; - Methodology divided into 3 stages; - Qualitative assessment of the impact of subfactors: MD, D, N, F and MF; - Association of qualitative results with the *Likert scale* (-2, -1, 0, +1 and +2); and - Delphi technique for calculating scores.
Fish and Protil (2007)	**Purpose**: to analyze the competitiveness of agro-industrial cooperatives in Paraná. **Contributions**: - Performance variables are divided into two dimensions: business and social; and - Use of Benchmarks for comparative analysis.
Oiagen et al. (2013)	**Purpose**: to measure the competitiveness of beef cattle production systems in the Southern Region of Brazil. **Contributions**: - Assigning *scores* through the application of questionnaires with binary answers (positive or negative); and - Introduction of the IC (competitiveness index).
CCI Model	**Purpose**: to measure the competitiveness of an agro-industrial cooperative. **Contributions**: - Identification, through the meta-synthesis process, of 38 competitiveness subfactors appropriate to the reality of agro-industrial cooperatives; - Grouping of subfactors into 5 competitiveness drivers, equally aligned with the reality of the object of study; - Analysis of numerically expressed subfactors, through the adoption of the benchmark; and - Introduction to the CCI (Cooperative Competitiveness Index).

Source: authors

This test assessed the competitiveness of a mixed agro-industrial cooperative based in the state of Goiás, which will be referred to hereafter as Cooperative A (the evaluated cooperative). Cooperative A was chosen, firstly, because it meets the

criterion established by Oliveira Júnior and Wander (2024) of undergoing regular audits. Furthermore, it was found to operate in the same segments as the benchmark Cooperative (or, simply, Cooperative B), whose selection criteria will be explained later. Finally, the presence of individuals belonging to the researcher's network of contacts confirmed the choice of Cooperative A. Thus, while the two participating cooperatives operate similarly, it is believed that the results obtained accurately reflect reality.

The application of this model, as proposed by Silva and Batalha (1999), was operationalized in three stages, which are described in the following sections. It is noteworthy that a good part of the activities related to Stages 1 and 2 were developed throughout previous works Oliveira Júnior & Wander (2020, 2021, 2022), in particular, Oliveira Júnior and Wander (2024), and this space is dedicated to the inclusion of additional information and/or a brief revisit of the method.

2.1 Step 1: Characterization and Diagnosis

As reported, the characterization and diagnosis of the object were developed throughout previous works that make up a larger project. During the process, we sought to identify everything from the classical and doctrinal concepts and aspects of cooperativism to the particularities and managerial challenges affecting agro-industrial cooperatives today. Additionally, the relevance of agro-industrial cooperativism in agribusiness was highlighted through its contextualization in the Brazilian Central-West Region Oliveira Júnior & Wander (2020). Furthermore, significant evidence was gathered regarding the probable key success factors influencing agro-industrial cooperatives and the importance of business performance as a source of competitiveness and social impact. Thus, the characterization and diagnosis of the object served as a starting point for identifying key elements, which, as part of the meta-synthesis process Cronin et al. (2008), helped bring together the analytical elements that completed the CCI Model.

Therefore, it is now necessary to complete the characterization and diagnosis of the object by presenting a brief description of Cooperative A, whose level of competitiveness was assessed through the empirical application of the CCI Model.

Cooperative A was founded in the 1970s by 31 pioneers. Its goal was to bring together farmers and ranchers interested in jointly defending their economic and social interests. To this end, it sought to offer storage and processing conditions that would provide its members with access to markets and, consequently, better financial results, which could be reinvested in social benefits and the activity itself.

2019, Cooperative A had 1,534 members and 260 direct employees OCB-GO (2019). It receives and stores grains and milk, manufactures feed and mineral supplements for animals, processes seeds, and markets grains, inputs, agricultural implements, and genetically selected cattle. Its activities were carried out in 23 units, including 10 stores selling agricultural inputs and products, three industrial facilities, six storage facilities, a headquarters, an administrative center, and a recreational club.

In its 2019 annual financial statements, duly audited by a third-party company, Cooperative A, reported net equity of R$55.5 million, revenue of R$387 million, and a net surplus of R$2.6 million. Given the statutory allocations of the surpluses, R$375.8 thousand remained available for the Annual General Meeting.

2.2 Step 2: Establishing Competitiveness Drivers and Subfactors

The establishment of competitiveness subfactors was carried out through the identification of common key elements present in both other works of this project and a collection of empirical studies on competitiveness in the scope of agribusiness and agro-industrial cooperatives, as presented by Oliveira Júnior and Wander (2024). This process, known as meta-synthesis Cronin et al. (2008), enabled the identification of key elements and facilitated their interpretation and integration into the CCI Model, as suggested by Polit and Beck (2006).

Thus, 38 competitiveness subfactors were listed (Table 2), which served as a basis for calculating the CCI of Cooperative A. According to the classification proposed by Van Duren et al. (1991), the procedure was designed to analyze the competitiveness of a cooperative. Therefore, all subfactors were considered controllable or nearly controllable by the firm. However, it is worth noting that despite this instrument being intended for firms, the systemic dimension of competitiveness was not overlooked, as it is represented in the Marketing and Transaction Costs drivers, as seen below.

To facilitate data collection, aggregate comparisons, identification of areas for improvement and, most importantly, the assignment of relative weights to subfactors considered most important, as well as to consider the need for cooperatives to obtain economic and social results, five competitiveness drivers were defined: cooperative management and governance (CMG), production (PR), marketing (MKT), transaction costs (TC) and members' framework (MF). This grouping was made relatively arbitrarily, according to a criterion designated by Silva and Batalha (1999) and Oiagen et al. (2013) for analytical convenience. Thus, subfactors with common characteristics were identified, and a term was coined to represent these characteristics. Thus, the second stage related to applying the CCI Model is concluded.

2.3 Step 3: Qualitative Assessment of Competitiveness Drivers and Subfactors

The first step in the third stage was assigning relative weights to the competitiveness drivers. Thus, the sum of the relative weights was equal to 10, considering that the CCI calculated should range from 0 to 10 Oiagen et al. (2013). Thus, following the criteria adopted by Peixe and Protil (2007), the competitiveness drivers CMG and MF, as they are those most closely linked to the dual nature of cooperatives, received the highest relative weights, 2.5 each. The driver TC, in turn, due to the relevance of agro-industrial cooperatives for coordinating production

chains Bialoskorski Neto (1999); Iliopoulos et al. (2016), received an intermediate weight of 2.0. Finally, given that they represent the dimensions in which agro-industrial cooperatives most resemble traditional firms, the PR and MKT drivers received a weight of 1.5 each.

In the case of subfactors, the same logic was applied to assign relative weights. Thus, the more relevant they are for differentiating the agro-industrial cooperative from traditional firms and/or cooperatives in other sectors, the higher the values assigned. The value of the sum of the subfactors belonging to each driver was equal to 1, thereby reflecting their share of importance in the total score for the evaluated driver Oiagen et al. (2013) (Table 2).

Once the relative weights were assigned to calculate the scores, the subfactors were classified into two types: numerically quantifiable (NQ) and purely qualitative (PQ) (Table 2). To enable the calculation of scores for the NQ-type subfactors, it was necessary to identify a benchmark (Cooperative B), represented by a reference cooperative that could serve as a parameter for comparison. The criteria adopted for choosing Cooperative *B* were aligned with the studies by Konstantinidis et al. (2008) and Souza et al. (2011), who concluded that, in the agro-industrial sector, the largest cooperatives tend to be the most competitive. Thus, the variables net equity and number of members were adopted as selection criteria, which were also easily determined, given that they are publicly available information in the annual financial statements of the cooperatives. As for the PQ factors, their evaluation depends on qualitative variables. Thus, a script for data collection was developed, which will be presented later, and served as the basis for preparing a questionnaire along the lines proposed by Oiagen et al. (2013). Table 2 summarizes the progress of applying the CCI Model thus far.

Table 2 – Drivers, competitiveness subfactors, relative weights and evaluation

Drivers, competitiveness subfactors, relative weights and evaluation					
Cooperative Management and Governance Benato (1992); Zylbersztajn (1994); Bialoskorski Neto (2004); Antonialli & Souki (2005); Peixe & Protil (2007); Souza et al. (2011); Oiagen et al. (2013); OCB (2015); Ilha et al. (2018)	**Relative Weight** **2.5**		**Production** Hart & Milstein (2004); Tilman et al. (2011); Leite et al. (2014); Martinez-Carrasco Pleite & Eid (2015); Borgen & Aarset (2016); Leite & Batalha, (2016)	**Relative Weight** **1.5**	
Professionalization	0.1	PQ			
Transparency	0.1	PQ			
Self-management	0.1	PQ	Differentiation	0.1	PQ
Compliance	0.1	PQ	Innovation capacity	0.15	PQ
Strategic planning	0.1	PQ	Sustainability	0.15	PQ
Training of managers	0.05	PQ	Employment and diffusion of new technologies	0.15	PQ
Social responsibility	0.1	PQ	Technical and managerial assistance	0.2	PQ
Total asset turnover	0.1	NQ	Quality strategies	0.1	PQ
Return on equity (ROE)	0.1	NQ	Productivity	0.15	NQ
General debt ratio	0.05	NQ			
Self-financing index	0.1	NQ			
Total	1.0		Total	1.0	
Marketing Kontogeorgos (2012); Pinto et al. (2012); Estevam et al. (2015)	**Relative Weight** **1.5**		**Transaction Costs** Zeuli (1999); Moreira et al. (2012); Briggeman et al. *(*2013); Iliopoulos et al. (2016); Delarmeline & Sales (2016)	**Relative Weight** **2.0**	
Demand response capacity	0.2	PQ	Risk and volatility management	0.2	PQ
Brand recognition and prestige	0.2	PQ	Coordination capacity	0.2	PQ
Marketing channels	0.2	PQ	Logistics	0.1	PQ
Capacity to receive all the production of cooperative members	0.2	PQ	Legal advice	0.1	PQ
Market share	0.2	NQ	Strategies for attracting and retaining members	0.2	PQ
			Diversification of production	0.2	PQ
Total	1.0		Total	1.0	
Membership Framework (Peixe & Protil, 2007; Verhees et al., 2015)	**Relative Weight** **2.5**				
Loyalty	0.1	PQ			
Leadership	0.1	PQ			
Lines of communication	0.1	PQ			
Representativeness	0.1	PQ			
Average growth of the cooperative's membership	0.2	NQ			
Percentage of active members	0.1	NQ			
Billing per member	0.1	NQ			
Investment in education	0.1	NQ			
Investment in services to cooperative members	0.1	NQ			
Total	1.0				

Source: authors

2.3.1 Cooperative B

Cooperative B, which served as the benchmark in this study, was also founded in the 1970s. At the time, 50 pioneers came together to transform agricultural activities in their region by introducing new production and trade practices. To this end, the founders sought to create a culture that encouraged the adoption of modern inputs and innovations. Thus, their activities began with the installation of storage units, which quickly evolved into the processing and industrialization of raw materials.

Headquartered in Goiás, Cooperative B had 8,674 members and 2,626 employees in 2019 OCB-GO (2019). Its main activities included receiving, storing, and processing grains, producing fertilizers, animal feed, and supplements, and operating retail stores. Cooperative B had units in 16 municipalities, all in Goiás.

According to data published in its 2019 financial statements, which were duly audited by a third-party company, Cooperative B had net assets valued at approximately R$1.6 billion. With total revenues equivalent to R$4.6 billion, Cooperative B achieved a net surplus of R$113 million in the fiscal year.

2.3.2 Scoring

A comparison with Cooperative B was necessary for the NQ-type subfactors. Thus, the values of the subfactors related to the two cooperatives (B and A) were determined. Then, the values of Cooperative B were allocated in a neutral position (5.0). For comparison purposes, the distances between the results of both cooperatives were measured, which indicated the scores of Cooperative A. Table 3 shows the criteria used to assign NQ-type scores.

Table 3 – Criteria for assigning NQ scores

Reference Score Values	Score Assigned to the Comparative Cooperative Subfactor
≤ -51% (very unfavorable)	0.0
Between -16% and -50% (unfavorable)	2.5
Between -15% and +15% (neutral)	5.0
Between +16% and +50% (favorable)	7.5
≥51% (very favorable)	10.0

Source: authors

For the PQ type factors, scores were assigned by answering 4 (four) objective questions with binary answers (yes or no), with each positive answer adding 2.5 points to the score of the subfactor evaluated. Scores ranged from 0 (zero) to 10 (ten) Oiagen et al. (2013) (Table 4).

Table 4 – Criteria for assigning PQ scores

Number of Positive Responses in the Questionnaire	Score Assigned to the Comparative Cooperative Subfactor
00 (very unfavorable, MD)	0.0
01 (unfavorable, D)	2.5
02 (neutral, N)	5.0
03 (favorable, F)	7.5
04 (very favorable, MF)	10.0

Source: authors

2.3.2.1 Data Collection Roadmap

Here, we present the script developed for collecting the data needed to evaluate the competitiveness subfactors and assign scores, an integral part of applying the CCI Model. Thus, for each subfactor, the classification regarding the nature of the evaluation (NQ or PQ) was demonstrated, indicating the data source (documentary or questionnaire). Additionally, the procedures for assessing the NQ subfactors were described. As for those of the PQ type, the objective questions were presented (04 for each), which served to compose the evaluation questionnaire, according to the methodology by Oiagen et al. (2013). From this point forward, the parameters used to collect data and assign scores to each evaluated subfactor will be described.

Table 5 – Driver: Cooperative Management and Governance (CMG)

Subfactor	Assessment	Data source	Questions/procedure
Professionalization	PQ	Questionnaire	1. Is there a separation between institutionalized and implemented control and ownership?* 2. Is there an institutionalized procedure for selecting candidates for executive positions? 3. Do the hired managers have the autonomy to make executive decisions? 4. Is there an institutionalized program with a defined frequency for monitoring managers' performance? * If the answer to question 1 is negative, the score for the subfactor evaluated is automatically reset, as the lack of separation between control and ownership also renders professional management nonexistent.
Transparency	PQ	Questionnaire	1. Does the cooperative have an official, public domain vehicle for disseminating information? 2. Is the information consultation free and is there a specific response effort? 3. Is there periodic publication of balance sheets and partial financial statements (quarterly, for example)? 4. Does the cooperative disclose information beyond that established by legal provisions?
Self-management	PQ	Questionnaire	1. Are there members from all segments and geographic areas covered by the cooperative participating in the representative bodies? 2. Are there institutionalized mechanisms that guarantee the conditions for alternating power (limit on the number of reelections, for example)? 3. Is the board of directors responsible for selecting executives? 4. Are there institutionalized mechanisms with defined frequency for monitoring the performance of governance agents?

Continues

Table 5 – Driver: Cooperative Management and Governance (CMG)

Subfactor	Assessment	Data source	Questions/procedure
Compliance	PQ	Questionnaire	1. Does the cooperative carry out internal audits periodically, with the results being published? 2. Does the cooperative undergo periodic external audits, with the results being published? 3. Is the Fiscal Council active and independent, presenting periodic reports on its performance? 4. Does the cooperative have an Ombudsman?
Strategic planning	PQ	Questionnaire	1. Does the cooperative have a properly documented and institutionalized strategic plan?* 2. Is the strategic planning process participatory, involving all sectors of the cooperative and civil society? 3. Is there a plan for a systematic review of strategic planning? 4. Does the cooperative have a specific structure to control and monitor actions relevant to strategic planning? * If the answer to question 1 is negative, the *score* for the subfactor evaluated is automatically reset, given that the lack of strategic planning makes it impossible to answer the other questions.
Training of managers	PQ	Questionnaire	1. Are managers professional executives? 2. Do the managers have previous experience in managing traditional companies or cooperatives in other segments? 2. Do the managers have academic training? 3. Do managers have specific academic training for managing cooperatives?
Social responsibility	PQ	Questionnaire	1. Does the cooperative have a specific program aimed at planning and carrying out socially responsible actions? 2. Is there a specific budget for the development of social responsibility actions? 3. Does the cooperative have partnerships with other organizations for the joint development of social responsibility actions? 4. Are there institutionalized procedures for monitoring the results of social responsibility actions and/or programs?

Continues

Table 5 – Driver: Cooperative Management and Governance (CMG)

Continuation

Subfactor	Assessment	Data source	Questions/procedure
Total asset turnover	NQ	Balance sheet, income statement, and annual financial statements.	This measures the efficiency in the use of assets. The higher the number, the more efficient the cooperative. It is calculated using the formula: $TAT=\frac{NR}{TA}$ Where: TAT = total asset turnover; NR = net revenue; and TA = total assets.
Return on equity (ROE)	NQ	Balance sheet; Income statement; Annual financial statements.	This is a performance indicator that aims to measure the generation of value for the cooperative and its members using their own resources. The higher the value, the better the company's performance. ROE is calculated using the formula: $ROE=\frac{NS}{NE} . 100$ Where: ROE = return on equity; NS = net surplus; and NE = net equity.
General debt ratio	NQ	Balance sheet, income statement, and annual financial statements.	It represents the proportion of total assets that are committed to covering the company's debt with third parties (payable liabilities). The lower the debt, the more competitive the cooperative will be. $GI=\frac{TL}{TA} . 100$ Where:GI= general indebtedness; TL = total liabilities; and TA = total assets.
Self-financing index	NQ	Balance sheet, income statement, and annual financial statements.	It represents the proportion of investments made by the cooperative using its own resources. The higher the IA, the lower the cost of capital for the cooperative. $SFI=\frac{IOR}{TI} . 100$ Where: SFI = self-financing index; IOR = investment with own resources; and TI = total investment.

Source: authors

Table 6 – Driver: Production (PR)

Subfactor	Assessment	Data source	Questions/procedure
Differentiation	PQ	Questionnaire	1. Does the cooperative add value to the products it receives from its members? 2. Does the cooperative sell products aimed at specific market niches? 3. Do you have products with unique features that your competition is unable to replicate? 4. Do you conduct market research to determine the preferences and behaviors of your target audiences?
Innovation capacity	PQ	Questionnaire	1. Does the cooperative have its own R&D department? 2. Do you have a partnership with a university and/or other research institutions? 3. Is there a specific budget to promote innovative actions? 4. Does the cooperative have or is it a partner in any innovation incentive program?
Sustainability	PQ	Questionnaire	1. Does the cooperative have a properly institutionalized environmental management program? 2. Do you have employees with academic training in environmental management? 3. Do you implement measures to promote sustainable practices among cooperative members? 4. Do you pay different prices for products that are proven to be sustainably produced?
Employment and diffusion of new technologies	PQ	Questionnaire	1. Does the cooperative regularly promote technological training courses? 2. Does the cooperative promote fairs, seminars or exhibitions aimed at disseminating new technologies? 3. Does the cooperative produce teaching materials aimed at disseminating new technologies? 4. Is there a line of credit offered by the cooperative itself or through a partnership intended for members to finance the implementation of new production technologies?

Continues

Table 6 – Driver: Production (PR)

Continuation

Subfactor	Assessment	Data source	Questions/procedure
Technical and managerial assistance	PQ	Questionnaire	1. Does the cooperative provide technical and managerial assistance to members through their own resources or partnerships?* 2. Do you have employees specifically hired to provide technical and managerial assistance? 3. Are technical and management assistance services provided free of charge to members? 4. Does the cooperative have an institutionalized and regular program for monitoring the results and level of satisfaction of members with technical and managerial assistance services? *If the answer to question 1 is negative, the score for the subfactor evaluated is automatically reset, given that the lack of technical and managerial assistance makes it impossible to answer the other questions.
Quality strategies	PQ	Questionnaire	1. Does the cooperative have an institutionalized and implemented quality control program? 2. Do you have employees with academic training in quality management? 3. Do you perform laboratory tests on the products received? 4. Do you carry out satisfaction surveys with customers and employees?
Productivity	NQ	Balance sheet, income statement, and annual financial statements.	It represents the relationship between total income and total costs in the cooperative. The higher the index, the more productive the cooperative will be. Productivity is calculated using the following formula: $P=\frac{TR}{TC}$ Where: P = productivity; TR = total revenue; and TC = total cost.

Source: authors

Table 7 – Driver: Marketing (MKT)

Subfactor	Assessment	Data source	Questions/procedure
Demand response capacity	PQ	Questionnaire	1. Does the cooperative have a duly institutionalized expansion plan in progress or in the development phase? 2. Do you have guaranteed sources of resources to finance the expansion plan? 3. Was the cooperative able to fulfill all purchase orders made in the last year? 4. Does the cooperative have a duly institutionalized production plan that considers the seasonality affecting agribusiness?
Brand recognition and prestige	PQ	Questionnaire	1. Does the cooperative have a brand management structure? 2. Do you have employees dedicated to public relations management? 3. Do you sell products under your brand? 4. Do you carry out customer relationship management with duly institutionalized procedures?
Marketing channels	PQ	Questionnaire	1. Does the cooperative have access to various marketing channels? 2. Do you have access to international sales channels? 3. Do you have institutionalized partnerships with sales channels? 4. Do you have institutionalized supply chain management planning?
Capacity to absorb the production of cooperative members	PQ	Questionnaire	1. Was the cooperative able to absorb 100% of the cooperative members' production in the last year? 2. Is there a plan or schedule in place for receiving production? 3. Does the cooperative make estimates regarding the future productivity of its members to inform planning and expansion of absorption capacity? 4. Does the cooperative have a duly institutionalized contingency plan to absorb the production of its members in the event of total exhaustion of its own capacity?
Market share	NQ	Annual financial statements; Mauro Borges Institute (IMB); National Supply Company (CONAB); Brazilian Institute of Geography and Statistics (IBGE).	It is measured by the representativeness of the cooperative's production compared to the total production of the state in which it is headquartered. It can be calculated using the formula: $MS = \frac{CP}{TPHS} . 100$ Where: MS = market share; CP = cooperative production; and TPHS = Total Production of the Host State.

Source: authors

Table 8 – Driver: Transaction Costs (TC)

Subfactor	Assessment	Data source	Questions/procedure
Risk and volatility management	PQ	Questionnaire	Hedging operations? Does the cooperative carry out mutual securitization operations? Is the production diversified and aimed at different target audiences? Does the cooperative have a specific structure for analyzing and monitoring markets?
Coordination capacity	PQ	Questionnaire	Does the cooperative have vertical integration contracts? Are there joint planning actions between the cooperative and other agents in the production chain? Does the cooperative have partnerships and/or strategic alliances with other cooperatives in the same sector? Are cooperative X's external customer and cooperative member transactions governed by formal contracts?
Logistics	PQ	Questionnaire	Does the cooperative have sufficient storage capacity to store the full production of its members? Does the cooperative have access to various modes of transportation, particularly non-road transportation? Is there a contingency plan, duly institutionalized, in case the cooperative's logistical capacity is exhausted? Is there a budget for regular investments in improving the cooperative's logistics infrastructure?
Legal advice	PQ	Questionnaire	Does the cooperative have its own legal advice or is it outsourced through a continuous service provision contract? Does the cooperative provide legal assistance services to its members? If you offer legal assistance to members, is it free? Are all contracts signed by the cooperative duly monitored by legal counsel?

Continues

Table 8 – Driver: Transaction Costs (TC)

Continuation

Subfactor	Assessment	Data source	Questions/procedure
Strategies for attracting and retaining members	PQ	Questionnaire	Does the cooperative have a properly institutionalized plan to expand its membership? Does the cooperative conduct surveys among terminated and/or inactive members, with a view to planning improvements in the services provided? Is there a specific budget for developing actions to attract and retain members? Does the cooperative regularly promote advertising campaigns to attract new members?
Diversification of production	PQ	Questionnaire	Is the cooperative's production diversified?* Does the cooperative systematically evaluate its product *mix* to verify its suitability for the adopted market positioning? Is there a structured approach and budget for developing new products? Do the products offered by the cooperative have a presence in diverse market channels, serving both industrial and retail segments? If the answer to question 1 is negative, the score for the subfactor evaluated is automatically reset, as the lack of production diversification renders it impossible to answer the other questions.

Source: authors

Table 9 – Driver: Members' Framework (MF)

Subfactor	Assessment	Data source	Questions/procedure
Loyalty	PQ	Questionnaire	Does the cooperative establish criteria and/or restrictions for new member membership? Is the average membership period for cooperative members longer than 5 years? Does the cooperative establish formal contractual obligations with its members? Is the average frequency of transactions between members and the cooperative at least 1 per semester?

Continues

Table 9 – Driver: Members' Framework (MF)

Subfactor	Assessment	Data source	Questions/procedure
Leadership	PQ	Questionnaire	Does the cooperative have a leadership training program? Are sector leaders involved in the strategic management process? Is there formal and informal leadership? Does the cooperative have systematic and institutionalized processes for evaluating the performance of formally constituted leaders?
Lines of communication	PQ	Questionnaire	Does the cooperative have communication channels accessible to all stakeholders? Is there a structure for planning and managing internal communications? Does the cooperative carry out systematic information dissemination actions? Is there a periodic and institutionalized assessment of the effectiveness of information sharing mechanisms within the cooperative?
Representati-veness	PQ	Questionnaire	Is there a guarantee of equal conditions of representation for all members in the assembly, councils and committees? Are there mechanisms that guarantee the periodic alternation of representation? Are there systematic and institutionalized evaluation procedures regarding the performance and effectiveness of boards and committees? Are there properly formalized flows for evaluating and forwarding decisions made by boards and committees?
Average growth of the cooperative's membership	NQ	Annual accounting	It represents the average percentage of growth in the number of members over the last 3 years. It is calculated using the simple arithmetic mean: $AGM = \frac{GM1+GM2+GM3}{3}$ Where: AGM = average growth of the number of members; GM1 = growth in the number of members in year 1; GM2 = growth in the number of members in year 2; and GM3 = growth in the number of members in year 3.

Continues

Table 9 – Driver: Members' Framework (MF)

Continuation

Subfactor	Assessment	Data source	Questions/procedure
Percentage of active members	NQ	Annual accounting	Represents the portion of members considered active by the cooperative in the last year.
Revenue per member	NQ	Balance sheet; Income statement; Annual financial statements.	Represents the average revenue per cooperative member in the last year. It is calculated as: $RM=\frac{TR}{NAM}$ Where: RM = revenue per member; TR = total revenue; and NAM = number of active members.
Investment in education	NQ	Balance sheet, income statement, and annual financial statements.	It represents the amount invested by the cooperative in educational activities for its members over the last year. To eliminate noise resulting from differences in size between the cooperatives analyzed, the average investment per member is calculated. Thus, the following is calculated: $IE=\frac{TIE}{NAM}$ Where: IE = investment in education; TIE = total investment in education; and NAM = number of active members.
Investment in services to cooperative members	NQ	Balance sheet, income statement, and annual financial statements.	It represents the amount invested by the cooperative in the last year in actions to improve the services provided to its members. To eliminate noise resulting from differences in size between the cooperatives analyzed, the average investment per member is determined. Thus, the following is calculated: $IS=\frac{TIM}{NAM}$ Where: IS = investment in services to cooperative members; TIM = total investment in services to members; and NAM = number of active members.

Source: authors

Following the guidelines of this guide, the values through which the NQ subfactors are expressed were determined for both cooperatives. This made it possible to compare

and, applying the criteria described in Table 3, assign the scores to the NQ subfactors related to Cooperative A. The results obtained will be described in the next section.

Furthermore, in line with the parameters expressed in the script, the questions related to the PQ subfactors were organized into a structured questionnaire, composed of closed questions with binary answers (yes/no) Oiagen et al. (2013). The questionnaire was administered during a videoconference meeting, facilitated by the researcher, with the president and two directors of Cooperative A. To ensure the possibility of reviewing the information, the meeting was recorded. The responses were evaluated according to the criteria presented in Table 4, allowing for the calculation of the PQ scores for Cooperative A. The results will be presented in the following section.

It should be noted that some questions in the questionnaire may be similar or even identical due to the vaguely defined boundaries between certain PQ-type subfactors.

3 RESULTS AND DISCUSSIONS

From this point forward, the results of applying the CCI Model will be described, with a focus on assigning scores to the subfactors and drivers of competitiveness. Information about the process is detailed in Tables 5-9, which separate the competitiveness drivers. Once the procedures for assigning values to the subfactors were completed, the final scores of the drivers were calculated by applying equation 1, described by Oliveira Júnior and Wander (2024).

$$ND_i = \sum_{j=1}^{n} \frac{SS_j}{PS_j} x PD_i \qquad (1)$$

where:

ND_i represents the final grade of driver *i*;

SS_j corresponds to the score assigned to subfactor *j*;

PS_j is the relative weight associated with subfactor *j*; and

PD_i the relative weight given to driver *i*.

As a result, the calculation of the CCI is presented and interpreted in accordance with the classification also presented by Oliveira Júnior and Wander (2024), which ultimately determines Cooperative A's competitive position.

3.1 Calculation of the final score of the CMG driver

Table 10 summarizes the data relating to the calculation of scores for the subfactors belonging to the Cooperative Management and Governance (CMG) driver.

Table 10 – Assigning scores to the CMG driver

Cooperative Management and Governance (CMG)	**Relative Weight**	**Assessment**		**Responses**	**NQ Values**		**Score**	**Score x Weight**	**Qualitative Assessment**
	2.5	**PQ**	**NQ**	**-**	***B***	**A**	**-**	-	**-**
Professionalization	0.1	X	-	0	-	-	0.0	0.0	MD
Transparency	0.1	X	-	3	-	-	7.5	0.75	F
Self-management	0.1	X	-	2	-	-	5.0	0.5	N
Compliance	0.1	X	-	2	-	-	5.0	0.5	N
Strategic planning	0.1	X	-	2	-	-	5.0	0.5	N
Training of managers	0.05	X	-	2	-	-	5.0	0.25	N
Social responsibility	0.1	X	-	3	-	-	7.5	0.75	F
Total asset turnover	0.1	-	X	-	1.6	1.8	5.0	0.5	N
Return on equity (ROE)	0.1	-	X	-	4.1%	4.8%	7.5	0.75	F
General debt ratio	0.05	-	X	-	44.5%	73.8%	0.0	0.0	MD
Self-financing index	0.1	-	X	-	4%	8.8%	10.0	1.0	MF
Total	1.0				Total Driver		57.5	5.5	N

Source: authors

By applying equation 1, we have:

$$ND_{CMG}=\frac{0.0+0.75+0.5+0.5+0.5+0.25+0.75+0.5+0.75+0.0+1.0}{1}\ x\ 0.25$$

$$ND_{CMG}=\frac{5.5}{1}\ x\ 0.25$$

$$ND_{CMG}=1.4$$

As negative highlights, regarding the results obtained for the CMG driver, the subfactors of Professionalization and General Debt Index stand out. Both received a score of 0. As for the first, verifying the separation between control and ownership in the management of Cooperative A was impossible. Thus, the lack of professionalization was evident, which may be causing the decision-making process to be slower and more susceptible to political interference. During the interview, the directors reported having plans to implement professionalized management.

Regarding debt, Cooperative A's level is 60% higher than the benchmark. This is indeed concerning, considering that such substantial debt could delay future investment plans and have financial costs that negatively impact the business's profitability. A viable alternative to reducing leverage would be to accelerate the expansion of cooperative membership, increase share capital, and, consequently, decrease the debt-to-equity ratio.

Cooperative A's best performance was in the Self-Financing subfactor, with a perfect score of 10, slightly higher than the benchmark at 8.8%. However, this performance should be viewed with caution, given that the high level of debt may be affecting its ability to raise new funds, forcing it to increase the amount of investments with its own resources.

Furthermore, the following positive aspects stand out: Transparency, Social Responsibility, and ROE, all of which received scores of 7.5. Regarding the first two, Cooperative A has developed effective and consistent actions, duly institutionalized and with a specific budget, presenting only minor issues regarding the implementation of performance controls and the utilization of results for planning future actions. Although not an extraordinary number, the ROE (4.8%) indicates that Cooperative A has successfully generated value for its members. Furthermore, given the statutory allocations made to a large part of the operational surpluses, it is common for agro-industrial cooperatives to present significantly lower return on equity (ROE) ratios when compared to traditional companies.

Within the CMG driver, the case exhibits strong performance on transparency and social responsibility (both scoring 7.5) and a solid ROE (7.5), but very low

professionalization (0.0) and a weak general debt ratio score (0.0), alongside a strong selffinancing index (10.0). This configuration is consistent with cooperative studies showing that clearer governance arrangements and professionalized management reduce political interference and improve intertemporal performance OCB (2015); Bialoskorski Neto (2004). At the same time, higher leverage relative to benchmark values tends to raise the cost of capital and compress margins, which can constrain investment cycles. Conversely, a stronger self-financing capacity mitigates this constraint Bialoskorski Neto (2004). Managerially, this suggests prioritizing a formal professionalization agenda (role definitions, executive selection and evaluation) and a calibrated deleveraging path while preserving transparency practices already in place OCB (2015).

3.2 Calculation of the final PR driver score

Table 11 summarizes the data used to calculate the scores of the subfactors belonging to the Production (PR) driver.

Table 11 – Assigning scores to the PR driver

Production (PR)	**Relative Weight**	**Assessment**		**Responses**	**NQ Values**		**Score**	**Score x Weight**	**Qualitative Assessment**
	1.5	**PQ**	**NQ**	**-**	***B***	**A**	**-**	**-**	**-**
Differentiation	0.1	X	-	3	-	-	7.5	0.75	F
Innovation capacity	0.15	X	-	0	-	-	0.0	0.0	MD
Sustainability	0.15	X	-	0	-	-	0.0	0.0	MD
Employment and diffusion of new technologies	0.15	X	-	4	-	-	10.0	1.5	MF
Technical and management assistance (ATEG)	0.2	X	-	3	-	-	7.5	1.5	F
Quality strategies	0.1	X	-	3	-	-	7.5	0.75	F
Productivity	0.15	-	X	-	1.15	1.05	5.0	0.75	N
Total	1.0				Total Director		37.5	5.25	N

Source: authors

Applying equation 1, we have:

$$ND_{PR}=\frac{0.75+0.0+0.0+1.5+1.5+0.75+0.75}{1}\ x\ 0.15$$

$$ND_{PR}=\frac{5.25}{1}\ x\ 0.15$$

$$ND_{PR}=0.8$$

The results obtained for the PR driver indicate, as negative highlights, the subfactors of Innovation Capacity and Sustainability, which received scores of 0. Cooperative A does not have an R&D program or department or partnerships with research institutions, universities, or innovation programs. Additionally, there is no budget allocation for promoting innovation. Thus, the cooperative can no longer profit from participation in registrations and patents, in addition to losing the potential for competitive advantages arising from pioneering. On the other hand, the subfactor "Employment and Dissemination of New Technologies" received the best evaluation within the scope of the PR driver, achieving a perfect score of 10. The good performance is due mainly to educational initiatives, the production of teaching materials, and the intermediation of a line of credit intended for technology investments. Thus, there is evidence that Cooperative A is competent in appropriating and disseminating third-party innovations but does not have the same capacity to produce its own.

Returning to the sustainability factor, which was previously highlighted as a negative aspect, it was found that Cooperative A does not have an environmental management program or employees with specific training in this area. Furthermore, it does not promote actions aimed at promoting sustainability among its members, nor does it charge differentiated prices for products of proven

sustainable origin. In addition to future productivity issues, the sustainability gap may, in the medium term, damage Cooperative A's image.

Finally, the Differentiation, Technical and managerial assistance and quality strategies subfactors also received above-average ratings, obtaining scores equivalent to 7.5. Technical and managerial assistance stands out as the PR driver's subfactor with the highest weight. Cooperative A has a broad, effective, and free ATEG program, yet again leaving much to be desired regarding performance assessment and the incorporation of results into future action planning and improvements. Regarding the other two factors mentioned, the good results are linked explicitly to value-added strategies through industrialization and the maintenance of quality programs.

In the PR driver, the cooperative combines high scores for technology employment and diffusion (10.0), technical/managerial assistance and quality strategies (both 7.5), with very low scores in own innovation capacity and sustainability (both 0.0), and a moderate productivity result (5.0). The pattern fits the role of cooperatives as effective diffusers of incremental innovation among members, even when inhouse R&D is limited Borgen & Aarset (2016). Literature on sustainable value creation suggests that embedding measurable ESG practices and moving from reactive diffusion to a portfolio of innovation projects tends to unlock market access and operational efficiency over the long run Hart & Milstein (2004); Tilman et al. (2011). Priority actions include formalizing sustainability metrics and developing cooperative or partnered R&D efforts to complement the existing diffusion capacity.

3.3 Calculation of the final score of the MKT driver

Table 12 summarizes the data for calculating the scores of the subfactors belonging to the Marketing (MKT) driver.

Table 12 – Assigning scores to the MKT driver

Marketing (MKT)	Relative Weight	Assessment		Responses	NQ Values		Score	Score x Weight	Qualitative Assessment
	1.5	PQ	NQ	-	*B*	A	-	-	-
Demand response capacity	0.2	X	-	3	-	-	7.5	1.5	N
Brand recognition and prestige	0.2	X	-	3	-	-	7.5	1.5	F
Marketing channels	0.2	X	-	1	-	-	2.5	0.5	D
Capacity to absorb the production of cooperative members	0.2	X	-	1	-	-	2.5	0.5	D
Market share	0.2	-	X		12.8%	1.9%	0.0	0.0	MD
Total	1.0				Total Driver		17.5	4.0	D

Source: authors

Applying equation 1, we have:

$$ND_{MKT}=\frac{1.5+1.5+0.5+0.5+0.0}{1}\ x\ 0.15$$

$$ND_{MKT}=\frac{4.0}{1}\ x\ 0.15$$

$$ND_{MKT}=0.6$$

The MKT driver received the worst evaluation among the five that make up the CCI Model, with its overall situation assessed as unfavorable. In addition to the low market share, it was evident that Cooperative A's sales channels are not very diversified, with no partnerships for product sales or initiatives aimed at managing the supply

chain. Likewise, regarding the subfactor' Capacity to absorb the cooperative members' production', there was evidence that Cooperative A cannot receive all the production from its members. There is also no contingency plan or partnership in place for absorption in the event of capacity exhaustion, which leads cooperative members to seek alternative business partners. Thus, in a way, there is an incentive for opportunistic behavior since the cooperative member has relationships with several potential buyers.

Marketing performance demonstrates good demand response and brand recognition (both 7.5), but weak channel diversification and capacity to absorb members' production (both 2.5), as well as a very low market share (0.0 relative to the benchmark). Evidence indicates that building brands and credible quality signals strengthens cooperatives' competitive positions in demanding markets Kontogeorgos (2012). Thus, the observed brand asset can be leveraged through the expansion of sales channels and partnership portfolios, reducing dependence on a few buyers and improving value capture. In practical terms, targeted channel development and certification strategies should accompany brand management to translate recognition into scale.

The subfactors, Responsiveness to Demand and Brand Recognition and Prestige, stood out positively, achieving scores of 7.5. Regarding the first, the positive result is due to Cooperative A's ongoing expansion plan for its industrial plant, which is currently underway but does not yet have all the necessary resources guaranteed for its completion. There are also indications that production management is efficient, which ensured that Cooperative A could meet all the orders received in 2019. Finally, there are indications that Cooperative A's brand is recognized and prestigious, a fact that is due, in part, to the existence of a specific structure aimed at managing customer relationships and its brand.

3.4 Calculation of the final TC driver score

Table 13 summarizes the data used to calculate the scores of the subfactors belonging to the Transaction Costs (TC) driver.

Table 13 – Assignment of scores to the TC driver

Transaction Costs (TC)	Relative Weight	Assessment		Responses	NQ Values		Score	Score x Weight	Qualitative Assessment
	2.0	PQ	NQ	-	*B*	A	-	-	-
Risk and volatility management	0.2	X	-	1	-	-	2.5	0.5	D
Coordination capacity	0.2	X	-	3	-	-	7.5	1.5	F
Logistics	0.1	X	-	1	-	-	2.5	0.25	D
Legal advice	0.1	X	-	2	-	-	5.0	0.5	N
Strategies for attracting and retaining members	0.2	X	-	2	-	-	5.0	1.0	N
Diversification of production	0.2	X	-	2	-	-	5.0	1.0	N
Total	1.0				Total Driver		27.2	4.75	N

Source: authors

Applying equation 1, we have:

$$ND_{TC}=\frac{0.5+1.5+0.25+0.5+1.0+1.0}{1}\ x\ 0.2$$

$$ND_{TC}=\frac{4.75}{1}\ x\ 0.2$$

$$ND_{TC}=0.9$$

In TC, coordination capacity scores high (7.5), whereas risk/volatility management and logistics score low (2.5 each), with legal advice and related structures at an intermediate level (5.0). Lower capability to hedge risks and to ensure logistical reliability exposes the cooperative to higher transaction costs and potential opportunism along the chain Zeuli (1999). By contrast, a strong coordination capacity aligns with the cooperative's role as a network coordinator, which can reduce bilateral hazards through contracts and partial

vertical integration Iliopoulos, Cook, & Chaddad (2016). Managerially, instituting hedging policies, mutual insurance mechanisms, and contingency logistics plans would reduce volatility, in turn supporting member loyalty and stable throughput.

Regarding the assessment of the TC driver, the Risk and Volatility Management and Logistics subfactors stood out with the worst performances, receiving scores equivalent to 2.5. The resources for Risk and Volatility Management employed by Cooperative A are limited and poorly diversified, with insufficient securitization and market monitoring. Likewise, logistics are restricted to road transport, and there is no contingency plan in place for unforeseen events that may disrupt the production flow. Additionally, storage capacity is nearing its limit, pending the completion of the expansion plan. By applying the CCI Model, two critical points for improving Cooperative A's competitive performance are highlighted here. Better management of transaction costs, in addition to improving profitability and reducing uncertainty, may increase loyalty among cooperative members. They will be discouraged from engaging in opportunistic behavior through the perception of lower risks.

On the other hand, the Coordination Capacity subfactor stands out as a positive highlight, receiving a score of 7.5. Given the importance of agro-industrial cooperatives as coordination agents, good performance in this subfactor was, in a sense, expected. Success is primarily linked to the existence of vertical integration and the contractualization of cooperative relationships, both within cooperative-client and cooperative-member contexts. However, Cooperative A does not have partnerships or strategic alliances with other cooperatives in the same sector, which prevented it from receiving a perfect score for the relevant subfactor.

3.5 Calculation of the final MF driver score

Table 14 summarizes the data used to calculate the scores of the subfactors belonging to the Members' Framework (MF) driver.

Table 14 – Assigning scores to the MF driver

Members' Framework (MF)	Relative Weight	Assessment		Responses	NQ Values		Score	Score x Weight	Qualitative Assessment
	2.5	PQ	NQ	-	*B*	A	-	-	-
Loyalty	0.1	X	-	3	-	-	7.5	0.75	F
Leadership	0.1	X	-	3	-	-	7.5	0.75	F
Lines of communi-cation	0.1	X	-	3	-	-	7.5	0.75	F
Representa-tiveness	0.1	X	-	2	-	-	5.0	0.5	N
Average growth of the	0.2	-	X	-	7.6%	5.1%	2.5	0.5	D
Percentage of active members	0.1	-	X	-	93%	65%	2.5	0.25	D
Billing per member	0.1	-	X	-	R$ 569.3	R$ 388.7	2.5	0.25	D
Investment in education	0.1	-	X	-	R$ 62.50	R$ 194.00	10	1.0	MF
Investment in services to cooperative members	0.1	-	X	-	R$ 737.00	R$ 226.00	0.0	0.0	MD
Total	1.0				Total Driver		45	4.75	N

Source: authors

Applying equation 1, we have:

$$ND_{MF}=\frac{0.75+0.75+0.75+0.5+0.5+0.25+0.25+1.0+0.0}{1}\ x\ 0.25$$

$$ND_{MF}=\frac{4.75}{1}\ x\ 0.25$$

$$ND_{MF}=1.2$$

In the assessment of the MF driver, the best performance was achieved by the subfactor Investment in education, which received a perfect score of 10. In 2019, Cooperative A invested nearly three times more per member than the benchmark. This factor may explain part of the success in disseminating new technologies involving educational processes. On the other hand, the result should be viewed with reservations, since, given the higher number of active members of Cooperative B (8,066 compared to 997 of Cooperative A), there may be a more significant dilution of costs, which results in a lower value per member, but not necessarily because Cooperative A's investment was more effective or obtained better results.

Furthermore, Loyalty, Leadership and Lines of Communication subfactors are positive highlights. There are indications that the success of these subfactors is related to the average membership time of over 5 years, the adoption of selection and retention criteria for members, the contractualization of cooperative *versus* member relationships, the existence of a leadership training program and the operation of varied and efficient internal and external communication channels.

Regarding negative highlights, the worst performance was observed in the subfactor' Investment in services to cooperative members,' which was assigned *a* score of 0. Cooperative A invested almost 3.5 times less per cooperative member than the benchmark. This may reflect the high level of debt verified, which could lead to the contingency of investments in the evaluated area.

Furthermore, with scores of 2.5, the following subfactors stood out negatively: average growth in the number of members, Percentage of active members, and Revenue per member. Given the weight of the MF driver, the CCI Model identified three crucial points for improvement here. First, compared to the benchmark, the average growth in the number of members was low over the last three years, constituting a point of special attention for Cooperative A's planning. Improving this index involves increasing the share capital and self-financing capacity while reducing the debt ratio. Likewise, the percentage of active members is relatively low. This may result from deficiencies in risk and volatility

management, low investment in services to members, and insufficient production absorption capacity, contributing to the possible explanation for the Revenue per member.

3.6 Calculation of CCI

Once the scores for the five competitiveness drivers have been calculated, the CCI can finally be calculated. Equation 2 is used for this purpose.

$$CCI=ND_{CMG}+ND_{PR}+ND_{MKT}+ND_{TC}+ND_{MF} \quad (2)$$

where:

CCI is the numerical value of the cooperative competitiveness index;

ND_{CMG} score from the driver cooperative management and governance;

ND_{PR} production drive score;

ND_{MKT} marketing driver score;

ND_{TC} transaction costs driver score; and

ND_{MF}s score from the drive of the members' framework.

Thus, transferring the values to equation 2, we have:

$$CCI=1.4+0.8+0.6+0.9+1.2$$

$$CCI=4.9$$

When considering the CCI classification criteria which should reveal the competitive position of an agro-industrial cooperative:

CCI≤2 non-competitive;

2<CCI≤4 not very competitive;

4<CCI≤6 competitive at local level;

6<CCI≤8 competitive at national level; and

CCI>8 competitive at international level.

Taken together, the five drivers portray a cooperative with transparent governance and solid coordination and diffusion capabilities, but with constraints in

professionalization, leverage management, own innovation, sustainability practices, channel breadth, market share, risk management, logistics, and memberservice intensity. This set of results points to a coherent managerial agenda: (i) governance professionalization and capital structure optimization; (ii) innovation and ESG formalization; (iii) commercial diversification with brandtochannel execution; (iv) risklogistics mitigation; and (v) member value proposition enhancement—an agenda aligned with the literature relating sustained cooperative competitiveness to the balance between economic performance, social member value, and efficient coordination Hart & Milstein (2004); Iliopoulos et al. (2016); Oliveira Júnior & Wander (2021).

In MF, loyalty, leadership and communication lines are strong (7.5 each), while representativeness is moderate (5.0), and growth, percentage of active members, and billing per member are low (all 2.5); investment in education is very strong (10.0), whereas investment in services to members is weak (0.0). Research has shown that member education is linked to higher engagement and active membership, provided that the perceived service bundle is compelling Verhees, Sergaki, & Van Dijk (2015). The observed combination indicates latent engagement potential that is undermonetized, which is consistent with national evidence on success factors in Brazilian cooperatives Oliveira Júnior & Wander (2021). A practical agenda is to expand service offerings and track membercentric KPIs (e.g., service usage, NPS, participation rates) to convert education efforts into retention and economic intensity.

By obtaining a CCI of 4.9, Cooperative A is classified as competitive at the local level. According to the general analysis of the case, this is believed to reflect reality and aligns with the evaluation range proposed by the CCI Model.

4 FINAL CONSIDERATIONS, MANAGERIAL IMPLICATIONS AND PROPOSED RESEARCH AGENDA

As the competitive environment becomes increasingly demanding and challenging, developing management tools specifically designed to support the

management of agro-industrial cooperatives also becomes increasingly important. The increased speed of market changes necessitates transformations in administrative processes that must be aligned with new planning concepts and a market-oriented approach. In this context, agro-industrial cooperatives must understand the aspects related to their competitiveness, recognize their strengths and weaknesses, and implement strategies and actions that maximize their performance.

Thus, the CCI Model was designed primarily to enable an agro-industrial cooperative to identify and evaluate its competitive position through its calculation. Furthermore, during the process, it is possible to identify bottlenecks and areas for improvement, which can provide important support for planning and implementing enhancements aimed at gaining competitiveness. Thus, to verify its validity, this study aimed to test the instrument for measuring the competitiveness of agro-industrial cooperatives, specifically the CCI Model.

This study successfully achieved its objective. The instrument's empirical test was conducted within the expected parameters, and the final product was determined by calculating the CCI, as anticipated. Furthermore, the empirical application showed that the model is functional and viable and can be applied to any agro-industrial cooperative. Moreover, the CCI Model proved to be adaptable and flexible, which could further expand its potential applications.

The CCI calculation provided a comprehensive view of Cooperative A's competitiveness, revealing that it is currently competitive at the local level. Additionally, the CCI Model revealed important areas for improvement, which should receive greater attention and efforts from the cooperative in the coming years, namely: overall debt ratio, innovation capacity, sustainability, marketing channels, capacity to absorb members' production, risk and volatility management, logistics, average growth in the number of members, percentage of active members, revenue per member, and investment in services to members.

Because of the above, the CCI Model has proven promising as a tool to support administrative and planning actions. The cooperative under evaluation may establish the CCI as a control parameter to monitor the evolution of its competitive position. Thus, it is believed that, in addition to contributing to the development of science, the CCI Model also offers practical utility and may aid in the competitive development of agro-industrial cooperatives.

Despite the apparent progress presented, it is essential to acknowledge that this study has several limitations. Among them, it is worth highlighting that it is an isolated study, applied to only one specific case so far, with its generalization depending on replication in a larger and more varied number of cases. Furthermore, the questionnaire used to determine the scores of the PQ factors was applied only to the directors of Cooperative A, which may have introduced a certain level of bias into the responses obtained. Finally, due to delays and modifications made to the original project due to the Covid-19 pandemic, the data used in the model are from 2019, which allows us to infer that the results may no longer be the same. However, this fact does not negatively interfere with the objective of this study, which was to test the model.

Finally, as a research agenda, it is recommended that this study be replicated in a larger number of agro-industrial cooperatives, preferably located in different geographic areas. To reconcile the responses, it is also suggested that, in future studies, the questionnaires be applied not only to managers but also to employees and cooperative members.

REFERENCES

Antonialli, L. M., & Souki, G. C. (2005). Princípios cooperativistas e modelo de gestão: um estudo sobre conflitos de interesses entre grupos de produtores rurais. *Anais do XLIII CONGRESSO DA SOBER: Instituições, Eficiência, Gestão e Contratos no Sistema Agroindustrial.* Brasília: SOBER.

Bialoskorski Neto, S. (1999). A nova geração de cooperativas e a coordenação dos sistemas agroindustriais. *II Workshop Brasileiro de Gestão de Sistemas Agroindustriais*. Ribeirão Preto: FEA/USP.

Bialoskorski Neto, S. (2004). *Economia das organizações cooperativas: uma análise da influência da cultura e das instituições*. Ribeirão Preto. Tese (Livre Docência) – Faculdade de Economia, Administração e Contabilidade de Ribeirão Preto da Universidade de São Paulo. 178p.

Benato, J. V. A. (1992). *Cooperativas e sua Administração*. São Paulo: OCESP.

Borgen, S. O. & Aarset, B. (2016). Participatory Innovation: Lessons from breeding cooperatives. *Agricultural Systems*, 145, 99-105. https://doi.org/10.1016/j.agsy.2016.03.002

Briggeman, B., Shanoyan, A., Harmon, B., Harris, K., Haverkamp, J., Heier, R., Holder, J., Kniebel, C., Jackson, K., Lutz, T., Warta, T., & Wendelburg, A. (2013). Cooperative Innovation: The Case of Team Marketing Alliance. *Selected Paper prepared for presentation at the Agricultural & Applied Economics Association's 2013 AAEA & CAES Joint Annual Meeting*, Washington, DC, August 4-6, 2013.

Cronin, P., Ryan, F., & Coughlan, M. (2008). Undertaking a literature review: a step-by-step approach. *British Journal of Nursing*, 17(1), 38-43. https://doi.org/10.12968/bjon.2008.17.1.28059

Delarmelina, N., & Salles, A. O. T. (2016). Um estudo sobre a comercialização da produção de cooperativas agropecuárias sob a ótica da Teoria dos Custos de Transação. *Custos e @gronegócio online*, 12(4), 34-71.

Estevam, D. O., Salvaro, G. I. J., & Busarello, C. S. (2015). Espaços de produção e comercialização da agricultura familiar: as cooperativas descentralizadas do Sul Catarinense. *Interações*, 16(2), 289-299. https://doi.org/10.1590/151870122015205

Hart, S. L., & Milstein, M. B. (2004). Criando Valor Sustentável. *GV-Executivo*, 3(2), 65-79. https://doi.org/10.12660/gvexec.v3n2.2004.34820

Ilha, P. C. S., Piacenti, C. A., & Leismann, E. L. (2018). Uma Análise Comparativa da Competitividade Econômico-financeira das Cooperativas Agroindustriais do Oeste do Paraná. *Revista de Economia e Sociologia Rural*, 56(1), 91-106. https://doi.org/10.1590/1234-56781806-94790560106

Iliopoulos, C., Cook, M., & Chaddad, F. (2016). Agricultural cooperatives in netchains. *Journal on Chain and Network Science*, 16(1), 1-6. https://doi.org/10.3920/jcns2016.x003

Konstantinidis, C., Sergaki, P., Mattas, K., & Kontogeorgos, A. (2008). Factors Affecting the Competitiveness of the Greek Wine Enterprises and Cooperatives. *European Association of Agricultural Economists, International Congress, August 26-29, 2008, Ghent, Belgium*.

Kontogeorgos, A. (2012). Brands, quality badges and agricultural cooperatives: how can they co-exist? *The TQM Journal*, 24(1), 72-82. https://doi.org/10.1108/17542731211191230

Leite, A. E., Castro, R., Jabbour, C. J. C., Batalha, M.O., & Govindan, K. (2014). Agricultural production and sustainable development in a Brazilian region (Southwest, São Paulo State): motivations and barriers to adopting sustainable and ecologically friendly practices. *International Journal of Sustainable Development & World Ecology*, 21, 422-429. https://doi.org/10.1080/13504509.2014.956677

Leite, A. E., & Batalha, M. O. (2016). Agricultura Sustentável e Cooperativismo: Quais Ligações Possíveis? *Interciencia*, 41(10), 660-667.

Martinez-Carrasco Pleite, F., & Eid, M. (2015). Agri-food cooperatives in Spain: quality strategies and differentiation of the sector. *Revista Mexicana de Ciencias Agrícolas*, 6(2), 375-389. https://doi.org/10.29312/remexca.v6i2.724

Moreira, V. R., Silva, C. L. D., Moraes, E. A. D., & Protil, R. M. (2012). O cooperativismo e a gestão dos riscos de mercado: análise da fronteira de eficiência do agronegócio paranaense. *Revista de Economia e Sociologia Rural*, 50(1), 51-68. https://doi.org/10.1590/s0103-20032012000100003

OCB - Organização das Cooperativas Brasileiras. (2015). *Manual de Boas Práticas de Governança Cooperativa*. Brasília: OCB.

OCB/GO - Organização das Cooperativas Brasileiras Unidade Goiás. (2019). *Censo do Cooperativismo Goiano 2018*. Goiânia: OCB/GO.

Oiagen, R. P., Barcellos, J. O. J., Soares, J. C. R., Lampert, V. N., Gottschall, C. S., Marques, P. R., & Tavares, H. R. (2013). Beef Cattle Production System Competitiveness in the South of Brazil. *Archivos de Zootecnia*, 62(238), 161-170. https://doi.org/10.4321/S0004-05922013000200001

Oliveira Júnior, O. P., & Wander, A. E. (2020). Cooperativismo agroindustrial: diagnóstico atual da região centro-oeste brasileira. *Revista Gestão e Organizações Cooperativas*, 7(13), 146-162. https://doi.org/10.5902/2359043238585

Oliveira Júnior, O. P., & Wander, A. E. (2021). Factors for the success of agricultural cooperatives in Brazil. *Journal of Agriculture and Rural Development in the Tropics and Subtropics (JARTS)*, 122(1), 27-42. https://doi.org/10.17170/kobra-202102113202

Oliveira Júnior, O. P., & Wander, A. E. (2022). Agricultural cooperative system: management challenges and feasible solutions. *Revista de Administração da UFSM*, 15(3), 411-433. https://doi.org/10.5902/1983465968884

Oliveira Júnior, O. P., & Wander, A. E. (2024). Cooperative Competitiveness Index: a tool to assess the competitiveness of agro-industrial cooperatives. *Revista de Administração da UFSM*, 17(4), e4. https://doi.org/10.5902/1983465986241

Peixe, J. B., & Protil, R. M. (2007). Eficiência Econômica e Social das Cooperativas Agroindustriais Paranaenses: proposta de um modelo de avaliação. *Informe Gepec*, 12(2), 1-11. https://doi.org/10.48075/igepec.v11i2.1296

Pinto, L. B., Lourenzani, A. E. B. S., Lourenzani, W. L., & Mochiuti, J. C. (2012). Aspectos históricos e organizacionais da agricultura familiar no desenvolvimento da região Nova Alta Paulista. *Revista Brasileira de Gestão e Desenvolvimento Regional*, 8(2), 130-150.

Polit, D., & Beck, C. (2006). Essentials of Nursing Research: Methods, Appraisal and Utilization. *Nurse Researcher*, 13(4), 91-92. https://doi.org/10.7748/nr.13.4.91.s11

Porter, M. (2005). *Estratégia competitiva*. 2. ed. Rio de Janeiro: Elsevier.

Silva, C. A. B., & Batalha, M. O. (1999). Competitividade em sistemas agroindustriais: metodologia e estudo de caso. *Anais do II Workshop Brasileiro de Gestão de Sistemas Agroalimentares – PENSA/FEA/USP, Ribeirão Preto*, 9-20.

Souza, U. R. D., Braga, M. J., & Ferreira, M. A.M. (2011). Fatores associados à eficiência técnica e de escala das cooperativas agropecuárias paranaenses. *Revista de Economia e Sociologia Rural*, 49(3), 573-597. https://doi.org/10.1590/s0103-2003201100030000

Tilman, D., Balzer, C., Hill, J., & Befort, M. L. (2011). Global food demand and the sustainable intensification of agriculture. *Proceedings of the National Academy of Sciences of the United States of America*, 108(50), 20260-20264.

Van Duren, E., Martin, L., & Westgren, R. (1991). Assessing the competitiveness of Canada's agrifood industry. *Canadian Journal of Agricultural Economics*, 39(4), 727-738. https://doi.org/10.1111/j.1744-7976.1991.tb03630.x

Verhees, F. J. H. M., Sergaki, P., & Van Dijk, G. (2015). Building up active membership in cooperatives. *New Medit*, 1, 42-52.

Zeuli, K. A. (1999). New risk-management strategies for agricultural cooperatives. *American Journal Agricultural Economics*, 81(5), 1234-1239. https://doi.org/10.2307/1244113

Zylbersztajn, D. (1994). Organização de Cooperativas: desafios e tendências. *Revista de Administração*, 29(3), 23-32.

Authors

1 – Osmar de Paula Oliveira Junior

Institution: : Universidade Estadual do Tocantins – Palmas, Tocantins, Brazil

Doctor of Agribusiness from Federal University of Goias (UFG)

Orcid: https://orcid.org/0000-0001-7884-6311

E-mail: juniorfaj@yahoo.com.br

2 – Alcido Elenor Wander

Institution: Universidade Federal de Goiás – Goiânia, Goiás, Brazil

Doctor of Agricultural Sciences from Georg-August University of Göttingen (Germany)

Orcid: https://orcid.org/0000-0001-9656-8773

E-mail: alcido.wander@embrapa.br

Contribution of authors

Contribution	[Author 1]	[Author 2]
1. Definition of research problem	√	
2. Development of hypotheses or research questions (empirical studies)	√	
3. Development of theoretical propositions (theoretical work)	√	
4. Theoretical foundation / Literature review	√	√
5. Definition of methodological procedures	√	√
6. Data collection	√	
7. Statistical analysis	√	√
8. Analysis and interpretation of data	√	√
9. Critical revision of the manuscript		√
10. Manuscript writing	√	√
11. Translation and final revision		√

Conflict of Interest

The authors have stated that there is no conflict of interest.

Copyrights

Authors of articles published by ReA/UFSM retain the copyright of their works.

Plagiarism Check

The ReA/UFSM maintains the practice of submitting all documents approved for publication to the plagiarism check, using specific tools, e.g.: Turnitin.

Edited by

Jordana Marques Kneipp