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Strategic behavior and the use of management control systems in agro-industrial cooperatives

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Abstract

Purpose – This study aims to identify the combinations of MCSs used with different strategic behaviors adopted by agro-industrial cooperatives.

Theoretical framework – Miles and Snow's strategic behavior model and Simons' management control systems model (1995).

Design/methodology/approach – A survey was carried out of 100 managers of agribusiness cooperatives in the dairy sector in the southern region of Brazil. Fuzzy set qualitative comparative analysis (fsQCA) was applied to the data collected.

Findings – The results partially confirmed the propositions established in the study. Different combinations of belief systems, limits, diagnostic control, and interactive control were observed depending on whether the cooperative adopted defender or prospector strategic behaviors. Control of the cooperative's strategy is achieved by combining the MCSs, since their strength lies in their joint use and their complementarity.

Practical & social implications of research – The combined use of rigid and flexible controls allows agro-industrial cooperatives to simultaneously target operational efficiency and the pursuit of innovation.

Originality/value – By demonstrating that not all MCSs are individually relevant to different strategic behaviors, with evidence of equifinality in MCS combinations, the study provides an original contribution.

Keywords – Strategic behavior. Management control systems. Levers of control.

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1 INTRODUCTION

The relationship between strategy and management control has been a long-standing concern in the literature on management accounting. Most of the studies follow a contingency approach to establish systematic associations. Although the literature has been relatively successful in identifying associations between strategy and individual management control practices, little progress has been made in understanding the choice and consequences of combinations of management control systems (MCSs) in different strategic contexts (Langfield-Smith, 2008).

Investigations such as those of Grabner e Moers (2013), Indjejikian, Matějka e Schloetzer (2014), Abernethy, Dekker, and Schulz (2015), Erkens and Stede, (2015), and Henri and Wouters (2020) have considered MCS practices in isolation. Indjejikian, Matějka e Schloetzer (2014) explain that the assumed prevalence of complementarity between management control practices within a package is probably overestimated. However, MCSs that are seen as beneficial in isolation need to be simultaneously present in a package, which suggests that relying solely on the results of independent analysis is insufficient to understand the constitution of effective packages (Henri & Wouters, 2020).

This research is guided by the need to understand the combinations of the MCSs that are considered relevant independently in order to find out if they are relevant when analyzed simultaneously, as a package, in different strategic contexts. Hence, we adopt the following research question: what are the combinations of MCSs from the Simons model used with the different strategic behaviors foreseen in the Miles and Snow model, in the case of agro-industrial cooperatives? Thus, the objective was to identify the combinations of MCSs used with the different strategic behaviors adopted by agro-industrial cooperatives.

The investigation provides a number of contributions. First, evidence is presented that MCSs can be combined for organizations that operate in different strategic contexts. The results suggest the control practices used as central and peripheral in each specific strategic context (Ragin, 2009), providing evidence of equifinality. Second, we adopted the suggestion of Bedford, Malmi, and Sandelin (2016) of using other normative MCS structures, opting for the traditional and consolidated levers of control from the Simons model (1995). The results extend the knowledge of these four levers by suggesting configurations that form specific control packages for different strategic contexts.

As for the field, we sought to understand the specificities of cooperatives as a differentiating element in the relationship between strategic behavior and MCSs. Cooperatives play a role in spreading technology and managing rural properties, which directly affects the competitiveness, scale of production, and quality of the dairy chain. This field stands out for its culture of low innovation and resistance to change, especially with regard to entrepreneurship (Beber, Theuvsen, & Otter, 2018).

This study also contributes by providing relevant information about the management process with a view toward business continuity, since the levers of control provide information that allows for the coordination of activities (Müller-Stewens, Widener, Moller, & Steinmann, 2019). It follows that agro-industrial cooperatives need to be competitive to face any challenges that arise and respond to changes in structure and competition in order to maintain their position in the market, as highlighted by Beber et al. (2018). The evidence from the empirical research can contribute to managers better understanding the functionalities related to the independence and interdependence of MCSs, within a package of specific controls, according to the organizational priorities.

2 THEORETICAL FOUNDATION AND PROPOSITIONS

2.1 Miles and Snow's strategic behavior model

Chenhall (2003) describes the most prominent strategic positions adopted by organizations in relation to their task environments, these being closely related to the contingent conditions that influence the MCS choices. Miles and Snow's proposition is a widely used strategic typology, with an extensive body of literature that investigates different market and product orientations (Langfield-Smith, 2008). It maintains robust empirical correspondence (Langfield-Smith, 2008) and is applicable to a wide range of organizations (Behling & Lenzi, 2019).

Organizations seek to constantly review their goals, to adapt them to new realities, and to interact in the best way with their environment. However, the dynamic process of adjusting to the environment is complex and involves decision making at different levels of the organization. With the intention of overcoming

this complexity, we propose to establish the behavioral patterns of organizations to describe the organizational adaptation process (Miles et al., 1978).

Kober et al. (2007) show that Miles and Snow indicate four strategic types and provide a detailed description of the organizational characteristics associated with each strategy. Their typology offers explanations of how organizations behave in their environments, how they respond to problems of the adaptive cycle, and how they seek solutions (Chan, Ngai, & Moon, 2017). It comprises the following strategies: prospector, defender, analyzer, and reactor.

If it adopts the prospector strategy, the organization operates in a more dynamic environment and is committed to a constant search for innovation, new products, and market opportunities. Innovation can be even more important than high profitability. This behavior is perceived in creative organizations, which modify and provide changes and uncertainties, to which the competition has to adapt and respond (Kober et al., 2007). If it adopts the defender typology, the organization maintains a stable environment, by producing only one set of products aimed at a specific segment of the market, and its success stems from the efficient way it serves that market (Walker, 2013).

Miles et al. (1978) explain that the analyzer typology involves a specific organizational structure and processes to accommodate stable and dynamic areas of operations. Organizations that adopt this strategy combine aspects of the defender strategy (efficient market consolidation) and the prospector strategy (expansion of services and offer in new markets). When the organization is in a state of permanent instability, given the environmental characteristics, it has a reactive typology. This is typical of organizations that do not have a coherent relationship between strategy and structure (Miles et al., 1978).

In summary, the prospector strategy is characterized by the search for new markets and innovation of products and processes. The defender strategy corresponds to restricted market and product domains, which allows greater attention to be paid to efficiency. The analyzer strategy combines both the prospector and defender strategies, with more stable areas and others that are more dynamic. And the reactive strategy represents those organizations that react impulsively to events (Walker, 2013). Therefore, the prospector and defender strategies are at opposite ends of the spectrum and are more clearly defined, which justifies them being the focus of analysis in this study.

2.2 Simons' (1995) management control systems model

MCSs consist of formalized mechanisms that provide information to maintain or modify organizational management standards (Simons, 1995). The model proposed by Simons (1995), called Levers of Control (LOC), is formed of four types of systems: belief systems; boundary systems; diagnostic control systems; and interactive control systems.

Belief systems comprise the explicit set of organizational definitions that managers systematically communicate and reinforce to provide basic values, purpose, and direction to the organization (Simons, 1995). According to Widener (2007), these systems communicate the essential values to inspire and motivate employees to research, explore, create, and expend efforts engaging in appropriate actions. However, in dynamic environments, there must be some restriction on the employees to prevent them from engaging in high-risk behavior.

This restriction is given by boundary systems. Simons (1995) explains that boundary systems indicate rules and limits of behavior that are accepted in the organization. Their use induces a cautious process of innovation and creativity among employees, since the systems communicate the organizational risks and the previously accepted limits for carrying out tasks (Heinicke, Guenther, & Widener, 2016). Boundaries are included in the codes of conduct (Kruis et al., 2016).

Diagnostic control systems seek to motivate employees to perform and align their behavior with organizational objectives. Information on critical success factors allows managers to focus their attention on the organizational motivators that should be monitored to achieve the intended strategy (Widener, 2007). It allows managers to benchmark against goals. Similarly to the boundary systems, diagnostic control systems act as a boundary for employee behavior (Simons, 1995).

Interactive control systems provide active dialogue between members of the organization with a view to discussing forms of strategic positioning (Widener, 2007). Their use promotes organizational learning and the search for opportunities (Henri, 2006).

Integration of the four levers is essential in strategy control, since their strength does not lie in how

each one is used individually (Widener, 2007). Bedford and Malmi (2015) argue that in their investigations researchers should approach control systems holistically, since different organizations can use different control system configurations.

Previous research has identified a relationship between strategic behavior and MCSs, but it has examined them in isolation (Kober et al., 2007; Bedford & Malmi, 2015). Chenhall and Moers (2015) suggest that several accounting practices can coexist in organizations and propose new research in this direction. For this reason, this study examines combinations of levers of control in different strategic contexts.

2.3 Development of research propositions

The literature on strategic typologies that combines strategy with MCSs (Bedford et al., 2016) has been able to empirically capture the complex patterns of action and the specific skills that make up an organization's strategy (Chapman, 1997). This study uses the typology of strategic behavior suggested by Miles and Snow, but the research is limited to the defender and prospector strategic contexts.

Miles et al. (1978) explain that the defender strategy seeks strict control of the organization to ensure efficiency, through a combination of structural and procedural mechanisms considered as mechanistic. These mechanisms include senior management being dominated by specialists in production and cost control, cost-oriented planning, structures characterized by extensive divisions of labor, centralized control, and communication through formal hierarchical channels. Organizations with this strategic behavior are characterized by conservatism, cost leadership, and efficiency, combined with mechanistic structural controls (Langfield-Smith, 2008). They can use belief and boundary systems in a complementary way to diagnostic control systems.

The use of diagnostic control systems is centered on financial and cost metrics and the use of performance-based compensation (Bedford et al., 2016). The use of boundary systems is centered on the concern with strategy as a position, ensuring its dominance and that behavioral risks are recognized and addressed in codes of conduct (Kruis et al., 2016). In their use of belief systems, organizations aim to inform the set of organizational definitions to provide the goals and direction (Simons, 1995). Thus, the first research proposal is formulated as follows:

P_1: In the combined use of levers of control by cooperatives with defender strategic behavior, diagnostic control systems stand out more than belief and boundary systems.

Although organizations that follow the defender strategy focus on measures that emphasize cost control (Bedford et al., 2016), they engage in little scanning of the environment for new areas of opportunity and are able to develop mechanisms to prevent competitors from entering their territory (Miles et al., 1978). Interactive control systems can be used in addition to diagnostic control systems. The use of interactive control systems is based on subjectivity and informality, experiences, perceptions, discussions (Heinicke et al., 2016), meetings, and the review of action plans (Simons, 1995). Thus, the second proposition is formulated as follows:

P_2: In the combined use of levers of control by cooperatives with defender strategic behavior, diagnostic control systems stand out more than interactive control systems.

Prospectors respond to their environments in almost the opposite way to defenders. Their main capacity is to find and explore new products and market opportunities. The systematic addition of new products or markets is often combined with strict control to ensure efficiency (Miles et al., 1978). Henri (2006) explains that the diagnostic and interactive control systems work simultaneously, but for different purposes. Their strength resides in the tension generated by their balanced use, which simultaneously reflects a notion of competition and complementarity. Thus, the third proposition is formulated as follows:

P_3: In the combined use of levers of control by cooperatives with prospector strategic behavior, the diagnostic and interactive control systems compete with each other and complement each other.

Prospectors develop and maintain the ability to research a wide range of environmental conditions, trends, and events (Miles et al., 1978). Once the company's strategy has been clarified and communicated by the mission and vision contained in its belief system, top managers will realize where potential threats and opportunities may reside. The organization can therefore implement interactive control systems to involve subordinates in decision-making activities and stimulate debate, learning, and the search for opportunities (Heinicke et al., 2016).

However, boundary systems can restrict exploitation motivated by belief systems (Widener, 2007). Thus, the fourth proposition is formulated as follows:

P_4: In the combined use of levers of control by cooperatives with prospector strategic behavior, interactive control systems stand out more than belief and boundary systems.

3 METHODOLOGICAL PROCEDURES

A survey was conducted on 234 managers of agro-industrial cooperatives in the dairy sector in southern Brazil. This sector combines agricultural and livestock production, which is interdependent with various branches of industry, as it depends on technologies from supplier sectors. Data on the cooperatives were obtained from the website of the Union of the Dairy and Derivative Products Industry (Sindileite) of each state.

The survey instrument was applied by three interviewers by telephone, from June to August of 2019. A total of 100 (42.73%) valid questionnaires were obtained. The average response time for the questionnaire was eight minutes. Table 1 lists the profile of the respondents and the size of the cooperatives.

Of the 100 respondents, the data reveal that 58% were male and 49% were between 31 and 40 years old. The majority (54%) had an undergraduate education (22% in Administration, 16% in Accounting, and 14% in Agronomy) and held the position of manager (55%) or director (45%).

Regarding the time of operation of the cooperatives in the market, most had been operating from 5 to 10 years or from 21 to 30 years, representing 17 and 13 cooperatives, respectively. Regarding the size of the cooperatives, 21 had between 50 and 99 employees and 19 had between 10 and 49 employees, and are thus classed as medium-sized ones.

3.1 Research instrument

In the research instrument (Appendix A), the statements were presented together with a seven-point Likert scale. For the belief and boundary systems, the questions elaborated by Widener (2007) were used. For the belief systems, four questions assessed the use of an organizational mission statement and the communication of essential values. For the boundary systems, four questions investigated the use of codes of business conduct and systems that communicate areas/actions that should be avoided. For the diagnostic and interactive control systems, the questions elaborated by Henri (2006) were used. For the diagnostic control systems, five questions captured information about the main measures and progress towards goals. The interactive control systems were assessed through seven questions related to the use of planning and control mechanisms involving managers and employees.

The research instrument focusing on the strategic behaviors of Miles and Snow was based on Conant, Mokwa, and Varadarajan (1990), and involved a multi-item scale, with eleven questions reproducing the dimensions that describe the strategic choices of the Miles and Snow model. For each question, there were four statements associated with each strategy type (prospector, defender, analyzer, and reactive), where the respondents were asked to choose the situation that represented their organization. As a classification criterion,

Table 1. **Profile of respondents and size of cooperatives**

Sample		**Manager's gender**		
	Total		Female	Male
Fi	100	Fi	42	58
Fi%	100	Fi%	42	58
Time of operation of the cooperative in the market				
From 5 to 10 years	From 11 to 15 years	From 16 to 20 years	From 21 to 30 years	Over 31 years
34	10	18	26	12
Number of employees of the cooperative				
Up to 9	From 10 to 49	From 50 to 99	From 100 to 299	
18	38	42	2	
Size of the cooperative				
Micro	Small	Medium	Large	
10	18	60	12	

Source: Research data

the highest number of times that any of the typologies was selected was used as the answer. In the case of a tie involving the reactive characteristic, the company was considered to have this strategy, and in the case of a tie not involving this option, it was considered to be an analyzer. These decision rules are supported by Miles et al. (1978).

3.2 Data analysis procedures

The data were subjected to the fuzzy technique for classifying the use of MCSs by the cooperatives into the two types of strategic behavior (defender and prospector), based on the Miles and Snow model. This delimitation was used because the other strategic behaviors are not always consistent, falling into residual categories (Miles et al., 1978). This argument is in line with that of Bedford et al. (2016), who chose to explore only the strategic behaviors of the defender and the prospector.

Fuzzy logic was adopted, since, unlike conventional statistical methods that consider associations in terms of variables and correlations, it describes associations in terms of sets and set relations, where a set refers to an attribute or combination of attributes expressed in terms of logical statements (Thiem, Baumgartner, & Bol, 2016).

Although the set-theoretic method called qualitative comparative analysis (QCA) has been developed as a way to extract inferences from a small number of cases, it is applied more to theory building, which uses larger data sets. In this study, QCA is used because it has a series of advantages over the most common methods in the literature (Fiss, 2011). QCA examines the relative importance of MCSs when identifying whether they are central or peripheral (Bedford et al., 2016).

The particular variant of the QCA applied in this study is the fuzzy-set QCA (fsQCA). This method is appropriate when attributes are measured as continuous values (Ragin, 2009). Its purpose is to determine which sets culminate in a result of interest. This is achieved by calculating the degree of participation in a given set of attributes, that is, an MCS package is compared with the degree of participation in the result (Bedford et al., 2016). fsQCA is often adopted in research in the area of management, given its ability to identify in-depth causal relationships using an asymmetric approach (Crespo, Rogridues, Samagaio & Silva, 2019; Kaya, Abubakar, Behravesh, Yildiz, & Mert, 2020).

To execute fsQCA, the first step is to calibrate the constructs (Ragin, 2009; Fiss, 2011). To this end, we calculated the means of the constructs of belief and boundary systems and diagnostic and interactive control systems. After that, we defined the degree of affiliation that a cooperative has with the sets under analysis. This process, known as calibration, requires the specification of threshold values for each variable. Thus, variables are rescaled from raw scores to fuzzy set association values of between 0 (non-total association) and 1 (total association).

To calibrate the MCSs, this study followed the recent literature and coded the cooperatives as showing high effectiveness in using MCSs if they had raw scores in the 75th percentile or higher, being at the crossover point if they were in the 50th percentile, and showing low effectiveness if they were in the 25th percentile (Erkens & Stede, 2015; Bedford et al., 2016). For each strategy group, the cooperatives in the 25th percentile were coded as low effectiveness. The crossover point was defined at the 50th percentile and those in the 75th percentile were coded as highly effective.

The final step, also known as evaluating the truth table, involved the application of an algorithm based on Boolean algebra to determine the similarities between MCS packages that have consistently achieved high effectiveness. This allows MCS practices to be identified as central or peripheral, through the combination of parsimonious and intermediate solutions (Ragin, 2009; Fiss, 2011; Bedford et al., 2016). Central practices are those that are integrated and connected to other practices. These are surrounded by peripheral practices that support the nucleus, but are linked to each other (Ragin, 2009). Central and peripheral practices emphasize the relative importance of the MCSs within a given combination.

Although a central practice is a necessary part of a combination to achieve a result, it may not be sufficient on its own, unless combined with certain peripheral practices. As peripheral practices are weakly connected, cooperatives can be replaced and exchanged, resulting in multiple combinations that are potentially effective (Bedford et al., 2016).

4 ANALYSIS AND DISCUSSION OF RESULTS

4.1 Data analysis

Necessary conditions analysis was carried out and then the truth table was elaborated. The results of the fsQCA for defender and prospector cooperatives

are listed in Table 2, with the purpose of showing the combined use of levers of control by those cooperatives.

The association values of the fuzzy sets were rescaled to between 0 (total non-effectiveness) and 1 (total effectiveness). In the first proposition, the first fsQCA solution for defender strategic behavior indicated the presence of diagnostic and boundary control systems, while belief systems are absent and the use of interactive control systems is indifferent. This first solution is shared by more than 21% and has a high level of consistency (0.843).

Thus, P_1, which predicted that in the combined use of levers of control by cooperatives with defender strategic behavior, diagnostic control systems stand out more than belief and boundary systems, was partially supported, because the use of diagnostic control systems was greater than that of belief systems, but equal to that of boundary systems. Therefore, in these cooperatives the use of strict control systems prevails in order to ensure greater efficiency (Miles et al., 1978). Therefore, the interest is in establishing a code of conduct that predicts possible behavioral risks (Kruis et al., 2016) and that disseminates their values to achieve their objectives (Simons, 1995). In the second fsQCA solution, the use of diagnostic control systems is indifferent, interactive control systems are absent, and belief and boundary systems are present. The solution showed a consistency level of 0.859.

In the second proposition, we identified in the first fsQCA solution for defender strategic behavior that diagnostic control systems are present in the first solution and their use is indifferent in the second solution, whereas the use of interactive control systems is indifferent in the first solution and they are absent in the second solution. Therefore, P_2, which predicted that in the combined use of levers of control by cooperatives with defender strategic behavior, diagnostic control systems stand out more than interactive control systems, was supported. The overall consistency of the defender strategic field was above the 0.80 threshold, which indicates high consistency. These results are consistent with those described by Miles et al. (1978), with the presence of rigid controls based on mechanistic structures. The evidence indicates that cooperatives simultaneously seek to monitor their activities and encourage the involvement of managers in the decision-making process (Simons, 1995). Pletsch and Lavarda (2016) also found that cooperatives use diagnostic control systems.

In the third proposition, we identified in the first and only fsQCA solution for prospector strategic behavior that diagnostic control systems and belief systems are absent, whereas interactive control systems and boundary systems are present. Thus, P_3, which predicted that in the combined use of levers of control by cooperatives with prospector strategic behavior, diagnostic and interactive control systems compete with and complement each other, was not supported. These results indicate that the prospector strategic behavior requires the development of new products (Miles et al., 1978), which is consistent with Simons (1995).

In the fourth proposition, we identified in the fsQCA solution for prospector strategic behavior that interactive control systems are present and central, while boundary systems are present but peripheral. The consistency of this solution was the highest (0.875). Thus, P_4, which

Table 2. **Use of MCSs in defender and prospector cooperatives**

MCSs	Defenders = 61		Prospectors = 39
	1	2	1
Diagnostic Control Systems	●		⊗
Interactive Control Systems		⊗	●
Belief Systems	⊗	●	⊗
Boundary Systems	●	●	●
Consistency	0.843	0.859	0.875
Raw coverage	0.279	0.178	0.118
Unique coverage	0.216	0.113	0.118
Overall solution coverage	0.392		0.118
Overall solution consistency	0.832		0.875

Solid circles (●) indicate the presence of the MCSs; circles with a cross (⊗) indicate the absence of the MCSs; and no symbol indicates non-presence. Smaller circles indicate peripheral practices and bigger ones indicate central practices.

Source: Research data.

predicted that in the combined use of levers of control by cooperatives with prospector strategic behavior, interactive control systems stand out more than belief and boundary systems, was supported. This evidence suggests greater use of interactive control systems and, as pointed out by Pletsch and Lavarda (2016), belief and boundary systems are not regularly used by cooperatives. Prospector cooperatives require regular debate on decisions, while searching for opportunities (Heinicke et al., 2016).

4.2 Discussion of results

The research findings suggest that defender and prospector cooperatives have a diversity of practices in their MCS package, as illustrated in Figure 1.

The results of the fsQCA revealed that cooperatives with defender strategic behavior use in their MCS package the main practices of diagnostic control systems, which comprise accounting and mechanistic controls, combined with boundary systems, which involve concern with the strategy and behavioral risks to be recognized and addressed in their codes of conduct (Kruis et al., 2016), and belief systems, which inform the set of organizational definitions to provide the objectives and direction (Simons, 1995).

When considering central and peripheral practices in the use of levers of control, the pattern of practices suggests a bureaucratic package (Bedford & Malmi, 2015), which is consistent with the general expectations of the literature that deals with organizations with defender behavior. This evidence also agrees with that of Beber, Theuvsen, and Otter (2018), in which cooperatives tend to have a culture of resistance to change, suggesting that bureaucratic forms of control are more widely used in this strategic context. This indicates that the defender cooperatives inform employees of the organization's values, set limits to behavior (Widener, 2007), monitor the established goals, evaluate performance in achieving those goals, and make adjustments by comparing the recommended and accomplished goals (Henri, 2006). This result is in agreement with the findings of Bedford et al. (2016) in Australian companies. It is argued that control of the defender strategy is achieved by balancing the strengths of the levers of control (Simons, 1995), in particular, diagnostic control systems, belief systems, and boundary systems, which are central to defender cooperatives.

For agro-industrial cooperatives with prospector behavior, the fsQCA results indicated that they predominantly use (peripheral) boundary system practices, which implies rigid controls to ensure efficiency, and (central) interactive control system practices, which seek to explore new products and opportunities. These are often combined with other practices, so that they scan the environment to identify new areas and develop mechanisms to prevent

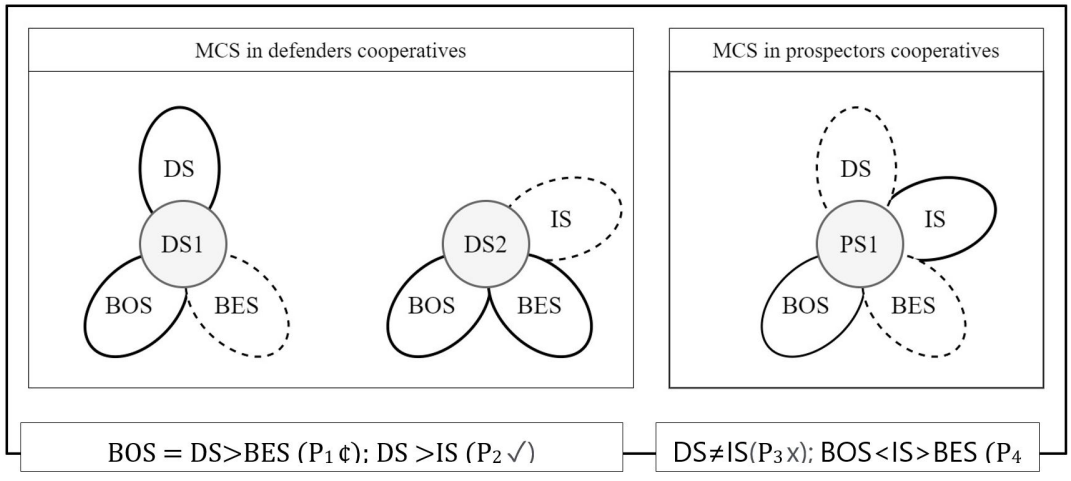

Figure 1. Causal configurations regarding the use of MCS.

Note: Ellipse with dashed line indicates absence of the condition; ellipse with black line indicates presence of the solution; and space without an ellipse indicates non-presence. Legend: x = no confirmation; ¢ = partial confirmation; and ✓ = full confirmation of the propositions. DS = diagnostic systems; IS = interactive systems; BES = belief systems; BOS = boundary systems. Source: elaborated by the authors

competitors from entering their territory (Miles et al., 1978). This suggests that in these cooperatives, managers debate assumptions about improvements in products and processes, focus on critical issues for success, and create a common language, in order to unify the organization's vision with a view to solving problems and achieving objectives (Henri, 2006). This author also explains that the power generated between both controls (for different purposes) causes balance. In the package there are also peripheral practices of boundary systems, which tend to restrict the exploration motivated by the strategy and communicated by the mission and vision (Widener, 2007).

The findings do not suggest a similar use of diagnostic and interactive control systems in the prospector context, which is explained by the fact that the dairy agro-industrial sector has its own particular characteristics, such as high quality standards, technological innovation, and competitiveness, which demand proactivity on the part of the managers of these cooperatives, leading to greater use of interactive control systems. This evidence advances what has been previously exposed in the literature, because it proposes a new MCS configuration, with a central presence of flexible controls and peripheral presence of rigid controls, which are particular to the cooperatives of the agro-industrial dairy sector.

The practices of diagnostic control systems communicate the goals that employees need to achieve, but allow autonomy in how to achieve them (Muller-Stewens et al., 2019). Information from diagnostic control systems is necessary and complementary and supports decision-making for innovation (Henri & Wourtes, 2020). These central practices are combined with peripheral practices from belief systems, which communicate essential values to inspire and motivate employees to research, explore, create, and expend efforts engaging in appropriate actions (Widener, 2007). These results indicate that the choice of accounting and structural controls is determined not only by its suitability for the strategic context, but also by the way in which they complement each other (Bedford et al., 2016).

These findings are consistent with the prospector configuration discussed in the literature, which is characterized by its exploratory and decentralized nature (Bedford & Malmi, 2015). Both rigid and more flexible controls can be combined to achieve effective control results in cooperatives with a prospector strategy. Due to the role of cooperatives in spreading new technologies to the sector, this evidence implies that the use of more flexible controls is decisive, encouraging innovation and improvements in products that lead the competition in a highly competitive market. Likewise, quality control and production standards on an adequate scale in the dairy chain demand stricter controls. This implies that the combined use of rigid and flexible controls allows cooperatives to simultaneously target the efficiency of operations and the pursuit of innovation.

5 FINAL CONSIDERATIONS

In conclusion, agro-industrial cooperatives in the dairy sector use different combinations of controls according to the strategic behavior adopted. The research results revealed the use of combinations of levers of control in two different strategic contexts. MCSs need to be simultaneously present to obtain satisfactory performance, and differ depending on the strategy adopted by the cooperative, which in this study were the prospector and defender strategies. Cooperative strategy control is achieved by integrating the four levers proposed by Simons (1995), whose strength does not lie in their individual use, but in their joint use and complementarity. In the case of the prospector strategy, they are responsible for the intensive search for market and product and process innovation; while in the case of the defender strategy, they are responsible for the restricted market and product domains, and the greater attention paid to efficiency.

In terms of theoretical implications, it was observed that not all MCSs are necessarily relevant in achieving effective results when used individually. The study provides evidence regarding the presence of equifinality in combinations, as suggested by Erkens and Stede (2015) and found in a similar way by Bedford et al. (2016). The research makes advances by presenting evidence of another MCS structure within the scope of the strategic behaviors adopted by cooperatives. Contingency-based research assumes a direct relationship between the context and the levers of control, ignoring the possibility of a range of viable responses to specific contingencies (Dent, 1990). It was found that for cooperatives with prospector and defender strategies, there are several combinations of MCSs that are equally effective, which suggests that the choices are not entirely determined by the strategy.

In terms of practical implications, the study provides relevant information about the management process with a view to business continuity, since the levers of control provide information that allows for the coordination of

activities (Muller-Stewens, Widener, Moller, & Steinmann, 2019). The agro-industrial cooperatives studied need to be competitive in order to face any challenges that arise and respond to changes in structure and competition in order to maintain their position in the market, as pointed out by Beber et al. (2018). Evidence from empirical research can help managers understand which MCS combination is best suited to the strategic behavior adopted by the cooperative.

The limitations of this study represent opportunities for new research. In this regard, the reliability of the data obtained from the subjective evaluations of the managers may be a problem, so for future research we recommend the use of other methodologies, such as case studies. Another limitation is the sample size, which may be poor in capturing the effects of the multiple uses of MCSs, but this could be made more robust with an investigation of other forms of cooperative organization. Another limitation arises from the set of levers examined, since, although the choice of the levers of control proposed by Simons (1995) is anchored in previous empirical findings, there are other MCSs in the theoretical-empirical field.

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APPENDIX A

Diagnostic Control Systems (Henri, 2006)

For each of the statements that follow, indicate the extent to which your organization uses information about the main measures and progress towards goals (management planning and control mechanisms). Scale: 1 (never used) to 7 (used extensively).

1. Compares the results with what was planned.
2. Forecasts the expected results.
3. Makes small adjustments, when comparing goals and results.
4. Analyzes only the significant variations between the budget and actual results.
5. Reviews the main performance goals.

Interactive Control Systems (Henri, 2006)

Indicate, in each of the situations below, the extent to which your organization involves managers and employees in the use of management planning and control mechanisms. Scale: 1 (never used) to 7 (used extensively).

1. Opportunities for improvement are discussed among superiors, subordinates, and peers.
2. Discusses premises and new action plans.
3. Focuses on the issues that are critical to the organization's success.
4. Unifies the organization's view of the problems that affect organizational performance.
5. Creates a common language for all managers and directors.
6. Develops new strategies and action plans.
7. Reviews the main goals.

Belief systems (Widener, 2007)

Indicate the extent to which each of the statements below describes your organization's situation regarding the use of a mission statement and the communication of essential values. Scale: 1 (does not describe it) to 7 (highly descriptive).

1. The mission statement clearly communicates the organization's central values to the employees.
2. Top level managers communicate essential values to the employees.
3. The employees are aware of the organization's central values.
4. The mission inspires the employees.

Boundary systems (Widener, 2007)

For each of the statements below, indicate the extent to which you agree or disagree that your organization makes use of a code of business conduct and systems that communicate areas/actions that should be avoided. Scale: 1 (strongly disagree) to 7 (strongly agree).

1. The organization has a code of conduct to establish appropriate behavior for employees.
2. The code of business conduct informs the employees about off-limits behavior.
3. The organization communicates the risks that employees must avoid.
4. The employees are aware of the organization's code of conduct.

Strategic behavior (Conant et al., 1990)

Mark in each of the questions that follow the alternative that best expresses the reality of your cooperative.

1. The products and services that are offered to our customers are best characterized as:

a. They are more innovative and are constantly changing and expanding their area of application.
b. Some are quite stable on the market while others are innovative.
c. They are well focused, relatively stable, and well defined in the organization and in the market.
d. They are in a state of transition and are based on responses to market or environmental opportunities or threats.

2. Our cooperative has an image in the market of an organization that:

a. Offers few products/services, but that are selective and high quality.
b. Adopts new ideas and innovations, but only after careful analysis.
c. Reacts to market opportunities or threats to maintain and strengthen its position.
d. Has a reputation for being innovative and creative.

3. The time invested by the cooperative in monitoring changes and trends in the market can best be described as:

a. Extensive, as the cooperative is constantly monitoring the market.

b. Minimal, as the cooperative does not really spend a lot of time monitoring the market.

c. Average, as the cooperative spends some time monitoring the market.

d. Sporadic, because sometimes the cooperative spends a lot of time and other times it spends little time monitoring the market.

4. The growth or decrease in our demand is most likely due to:

a. Our practice of focusing on developing the markets we already serve.

b. Our practice of responding to market pressures, taking few risks.

c. Our practice of aggressively entering new markets with new types of services/products.

d. Our practice of penetrating deeper into the markets we already serve, while adopting new services/products only after a careful analysis of their potential.

5. One of the cooperative's most important goals is dedication and commitment to:

a. Keeping costs under control.

b. Carefully analyzing our costs and revenues to keep costs under control, selectively generating new services/products, and entering new markets.

c. Ensuring that people, resources, and equipment required to develop new services/products and new markets are available and accessible.

d. Protecting the cooperative against critical threats by taking the necessary actions.

6. The skills and abilities that the cooperative's employees have can best be characterized as:

a. Analytical, as their skills enable them to identify trends and develop new services/products and new markets.

b. Specialized, as their skills are concentrated in a few specific areas.

c. Broad and enterprising, as their skills are diverse, flexible, and enable them to change creatively.

d. Flexible, as their skills are related to the short-term demands of the market.

7. One of the things that protect our cooperative from other competitors is that:

a. We are able to carefully analyze emerging trends and adopt those that have proven potential.

b. We are able to do a limited number of things exceptionally well.

c. We are able to respond to new trends, even if, when they arise, they have only moderate potential.

d. We are able to develop new services/products and new markets consistently.

8. The management of the cooperative tends to focus on:

a. Maintaining a safe situation through quality and cost control measures.

b. Analyzing opportunities in the market and choosing only those that have potential, and, at the same time, keeping the financial situation protected.

c. Activities or businesses that most need attention in view of the opportunities or problems that are being faced.

d. Developing new services or expanding into new markets or new market segments.

9. The organization prepares for the future as follows:

a. By identifying the best possible solutions to those problems or challenges that require immediate attention.

b. By identifying trends and opportunities in the market that may result in the creation of innovative services or products in the cooperative's business sector or that may serve new markets.

c. By identifying those problems that, if resolved, will maintain and improve our services or products and our market position.

d. By identifying business trends whose long-term potential has already been demonstrated by other cooperatives and can help solve problems related to our products/services.

10. The structure of our cooperative is:

a. Functional in nature (that is, organized into departments).

b. Oriented by the service/product or the market.

c. Essentially functional, however, it also has a service or market-oriented structure in areas that are newer.

d. Continuously changing to allow better use of opportunities or to solve problems as soon as they arise.

11. The procedures that the organization uses to assess its performance are best described as:
a. Decentralized and participatory, encouraging all members of the organization to get involved.
b. Oriented to reporting issues that require immediate attention.
c. Centralized and basically the responsibility of top management.
d. Centralized in more stable service/product areas, and more participatory in newer or emerging areas.

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