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Antecedents of the Management Control System in Credit Cooperatives in Southern Brazil

ABSTRACT

Objective: Considering the turbulent economic environment as well as the peculiarities of the operations conducted by cooperative entities, this study sought to analyze the connections between strategic risks and uncertainties and the use of the Management Control System (MCS) by credit cooperatives in Brazil's South region.

Method: This is a quantitative study, conducted as a survey with a sample of 57 credit cooperatives. The data was analyzed through Structural equation modeling, with partial least square estimation on SmartPLS 3.0 software. The strategic risk and strategic uncertainty constructs were analyzed in relation to their connection with Simons' Levers of Control (1995), which contemplates the beliefs and boundary controls and interactive and diagnostic control systems. Furthermore, the connections between the four Levers of Control are also analyzed.

Originality/Relevance: The study covers the antecedents (strategic risks and uncertainties) of MCS use, contemplating different compositions of type and class in credit cooperatives, taking previous studies into consideration, as well as covering a singular and pertinent region in the context of Brazilian credit cooperatives.

Results: Strategic risk is not associated with the use of the Management Control System. Strategic uncertainty was proven to be the element that receives the most importance from managers in the process of using the four Levers of Control. Regarding the beliefs system construct, its importance is positively linked to the interactive control system, as also occurs with the connection between the interactive control system and the diagnostic control system.

Theoretical/Methodological contributions: The study demonstrates the pertinence of the Levers of Control for credit cooperatives, inserted in the context of strategic risks and uncertainties.

Social/management contributions: The findings bring about relevant contributions by proving that the balanced use of the four Levers of Control is relevant for promoting the strategic renovation of credit cooperatives, especially regarding strategic uncertainty.

Keywords: Management Control System; Credit Cooperatives; Strategic Uncertainty; Strategic Risk; Simons' Levers of Control.

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1 INTRODUCTION

The economic environment's turbulence affects organizations and imposes the need for a permanent search for updating and redesigning their financial control models (Grant, 2015; Miculescu, 2012; Tse, Zhang, Tan, Pawar & Fernandes, 2019). This business dynamic follows most organizations in various segments, which find in the Management Control System (MCS) an important tool that is capable of providing useful and relevant information intending to help with the development and standardization of control mechanisms (Otley, 1999). The need for organizations to search for management tools, such as the help provided by the MCS in promoting adaptation to technological, social and financial changes (Caplan, 1971; Ferreira & Otley, 2009; Simons, 1995) has shown itself to be increasingly relevant to the perpetuation of business.

Management challenges are also relevant to credit cooperative entities, which are financial institutions formed by an autonomous association of voluntarily associated people with the purpose of providing services to their associates (BACEN, 2018b). The cooperatives must adapt to improve business management (Almehdawe, Khan, Lamsal & Poirier, 2020). The modifications in the corporate scenario require the managers to be professionalized and qualified to make complex decisions in a short period of time (McKillop, French, Quinn, Sobiech & Wilson, 2020; Meinen, 2016; Chatterji, Luo & Seamans, 2021). Just as with other types of organizations, the cooperatives are also subjected to strategic uncertainties and risks and they are created with the objective of providing types of credit and services to their associates (Almehdawe, Khan, Lamsal & Poirier, 2020; Amaral, Neves, Freitas & Braga, 2009).

Starting from the assumption that changes are permanently occurring in organizations and there is a need to adapt to new contexts, Simons (1995) developed a model known as Levers of Control, with the objective of leading organizations to achieve goals and objectives, promoting strategic renovation. This model is comprised of four control fronts: diagnostic control system, interactive control system, beliefs system and boundary system. Besides the relevance of the Levers of Control to management literature (Martyn, Sweeney & Curtis, 2016), the four levers help to analyze and comprehend the operation of the MCS, even in times of uncertainty (Harlez & Malagueño, 2016; Oro & Lavarda, 2020). According to Simons (1995), the model promotes a constant renewal of the organization's strategy and the balanced use of the four levers of control facilitates the structuring and monitoring of strategies as a whole.

The framework constructed by Simons (1995) is widely used in Management Control literature (Degenhart & Beuren, 2020; Johansson, 2018; Martyn et al., 2016) and is normally investigated in conventional market organizations. Alternatively, as per the proposal from Malmi and Granlund (2009), who suggest investigating the Levers of Control in different contexts and organizations in order to expand the discussions and debates on the subject, Sant'Ana, Padilha and Lavarda (2015) and Pletsch and Lavarda (2016) explore the use of the MCS based on Simons' theoretical model (1995) applied to Brazilian cooperativism.

Silva and Mucci (2020) maintain that credit cooperatives have a particular business model and use formal controls to monitor their activities. Thus, considering the peculiarities of the operations promoted by cooperative entities, which basically have to do with the fact that they are not for-profit institutions and they do not formalize transactions with clients but with associates, the present study has the objective of analyzing the associations between strategic risks and uncertainties and the use of the Levers of Control, as well as the correlations among these, in credit cooperatives from Brazil's southern region.

It is relevant to highlight how the MCS used in credit cooperatives from the southern region is associated with business's strategic risks and uncertainties due to the representativity that credit cooperatives have nationally and internationally in the financial scenario. Furthermore, cooperativism has grown in Brazil as an essential tool for the financial development of associates and communities and the support of small businesses (Maia et al., 2019; Oliveira, Bressan & Bressan, 2014; Severgnini, Galdamez, Vieira & Baiocchi, 2017; Vieira, Bressan & Bressan, 2019). The credit cooperative system in Brazil includes approximately 10.8 million Brazilians and this number gradually increases every year (Organização Cooperativa Brasileira [OCB], 2020). Credit cooperatives are ranked the 6th largest financial institution in the country, with a market representativity of approximately 4.00% of the total assets in the financial market (OCB, 2020). This data reinforces the fact that cooperative activity plays a relevant role in the economic and social transformation process (Tavares & Soares, 2020).

Thus, the representativity of credit cooperatives in the national market, along with the economic crisis that, in turn, increases the needs of credit borrowers, brings attention to the importance of using management controls in this type of organization, since, in the current scenario, the increase in the number of Brazilians that are involved in credit cooperatives also represents more risks and uncertainties for business as a whole. With this in mind, to understand how the MCS operates in cooperatives that need to deal not only with operational growth but also with larger risks and uncertainties may provide evidence that is relevant to maintaining this type of organization.

2 LITERATURE REVIEW

2.1 Management Control System and Strategic Risks and Uncertainties

Management control is the medium through which those who are responsible for management guarantee that business goals will be achieved (Anthony, 1965) and, with the MCS, conditions are created that motivate the organization to reach the desired results (Fisher, 1995). Management control is not related solely to the accounting perspective; there are various factors linked to this concept, such as behavioral matters pertaining to an organization's collaborators and factors that are exogenous to the company (Berry, Coad, Harris, Otley & Stringer, 2009; Martin, 2020).

In this study, the usage dimension is explored with the theoretical model developed by Simons (1995), known as Levers of Control. The use of MCS has been the focus of a large number of studies with subjects related to management control (Cruz et al., 2020; Su, Baird & Schoch, 2015; Widener, 2007). According to Harlez and Malagueño (2016), Simons' Levers of Control model (1995) is important to help comprehend the MCS in moments of uncertainty and risk and, according to Simons (1995), the balanced use of all four levers may lead to obtaining a higher strategic control in companies.

A highly used framework in studies from the management control field consists of Simons' Levers of Control (Abernethy & Brownell, 1999; Bisbe & Malagueño, 2016; Johansson, 2018; Marie-Kruis, Speklé & Widener, 2007), which is comprised of four systems: i) Beliefs; ii) Boundary; iii) Diagnostic; and iv) Interactive (Simons, 1995).

The beliefs system is the control lever that seeks to transmit values and direction to the organization (Simons, 1995). Aside from communicating the values upon which the organization is built, the beliefs system acts on motivation so that the collaborators work more intensely, even in the search for new opportunities that are aligned with the organization's purposes (Widener, 2007).

The boundary system establish limits for collaborator behavior, helping to enact strategies as planned (Simons, 1995, 2000). This lever acts through codes of conduct and ethics, as well as through rules and guidelines (Diehl, 2006). With the boundary system, Simons (1995) argues that the limits that were previously proposed by the administrators are established and disseminated in an attempt to reduce the risks for the organization.

The diagnostic control system are used to guarantee that the expected results are achieved, allowing errors committed during the normal process to be corrected with the help of regular feedback (Simons, 1995). Simons (2000) adds that the role of diagnostic control is to communicate critical flaws in performance, using constant feedback and monitoring to repair them so that the objective is fulfilled.

The interactive control system covers various structures and systems that the managers used to promote higher incentives to those who collaborate with the company as a way of promoting adjustments and improvements in the strategy (Simons, 1995). In dynamic markets that are constantly changing, interactive control is useful for reformulating strategies (Widener, 2007). This lever's main role is to promote organizational learning and corrections and adjustments to strategy in order to help control strategic uncertainties (Simons, 1995).

According to Simons (2000), strategic uncertainties are the possible risks and possibilities that may appear, invalidating the assumptions that are being considered in the development of the organization's strategy. In this context, Merchant and Van der Stede (2007) point out that environmental uncertainty, whether singular or collective, makes it very difficult or even impossible to predict the behavior of many variables pertaining to the organization. The external environment, for instance, is a very important variable and must be analyzed by the managers (Chenhall, 2003) as it is with the help of the levers of control that the managers are able to readjust the strategy (Merchant & Otley, 2006).

Strategic risk is represented by the unexpected events or conditions that can minimize the managers' capability for strategically leading the organization (Simons, 2000) and is also considered a potential source of damage (Widener, 2007). According to Simons (2000), there are three main types of risks: i) operational, (ii) asset recoverability and iii) competitive. The first type refers to operational transaction security, the second has to do with the recoverability of the company's assets and the last one touches upon factors that are external to the organization, such as the market (Simons, 2000).

2.2 Hypothesis development

Upon investigating how the interactive and diagnostic controls use of the budget can help with strategic implementation and change, Abernethy and Brownell (1999) concluded that in 63 Australian public hospitals, the control systems are used according to the context of strategic uncertainties in which the organization is inserted so as to help with the interpretation and implementation of strategic changes.

Bisbe and Otley (2004) analyzed the effects of interactive use in product innovation and manager performance in 40 Spanish companies. The authors concluded that using the interactive control system is useful for strategic repositioning when faced with strategic uncertainties and changes incurred within competitive markets. This finding reinforces the idea that strategic uncertainties represent a relevant antecedent for using the interactive control system.

Widener (2007) investigated the influence of strategic risks and uncertainties on the use of Simons' four Levers of Control (1995), as well as said levers' influence on attention and learning and, in the end, on performance in 122 American companies. The author also studied the relationship between the levers of control. The findings demonstrated that strategic

risks and uncertainties are antecedents for using the levers of control and also showed the influence that some levers exert on others, which proves the importance of using them in a balanced manner.

Sant'Ana et al. (2015) analyzed how strategic risks and uncertainties influenced the use of the levers of control in 44 Brazilian credit cooperatives. Their findings clarified that the strategic risks were not associated with the use of MCS, while the strategic uncertainties boosted the beliefs system and the interactive control system. The interactive control system also influenced the diagnostic control system.

Jacomossi and Silva (2016) investigated the perceptions of managers in a higher education institution (HEI) on environmental uncertainty and its influence on MCS. The authors found that there are three categories of uncertainty (state, effect and response) that influence the use of MCS. A relevant result is that the needs presented by the investigated organization in terms of management control mechanisms vary according to the aforementioned categories of uncertainty; that is, the influence that the state uncertainty provokes in MCS use is different from that caused by effect uncertainty and, similarly, different to that brought on by response uncertainty. The findings from Jacomossi and Silva (2016) expand the previous empirical evidence (Bisbe & Otely, 2004); Widener, 2007) by demonstrating that the role played by strategic uncertainties is relevant and, in fact, dynamic as a antecedent for the use of the management control system.

Pletsch and Lavarda (2016) conducted a case study with an agroindustrial cooperative, with the intent to analyze the role played by the Levers of Control in management. The authors found that the cooperative mainly uses the diagnostic and interactive control systems, that the beliefs are disseminated in daily life and that the boundary system are only used when necessary. Pletsch, Lavarda, Dallabona and Oliveira (2019) investigated the environment and strategy contingency factors and their respective influences on the MCS in an agricultural cooperative. They identified factors that influence the MCS as well as strategic approaches that lead to different effects on MCS.

Silva, Quiraque, Cruz and Barbosa (2020) analyzed the uncertainties and risks that influence MCS in financial institutions from three Portuguese-speaking countries (Brazil, Mozambique and Portugal). Among their findings, they demonstrated that there are signs of the association between risks and uncertainties and the MCS in the analyzed financial institutions, thus reinforcing the role of these elements as being relevant to the use of the MCS.

The discussion suggests that the levels at which the credit cooperatives face the strategic risks (H_{1A} , H_{1B} , H_{1C} , H_{1D}) and strategic uncertainties (H_{2A} , H_{2B} , H_{2C} , H_{2D}) are positively associated with the use of MCS. Thus, this study suggests an adaptation to the theoretical model proposed by Widener (2007), taking into consideration the strategic elements (strategic risks and uncertainties) and MCS (four levers of control), ignoring costs and benefits (attention and learning), as well as performance, since these factors are not included in this investigation's objective.

Simons (1995) proposes the balanced use of the levers of control in order to promote strategic renovation. The proposal for the balanced use of the different types of control by no means suggests that the levers are interrelated, which leads to the expectation that the emphasis placed on a type of control system is positively related to the emphasis placed on the other levers, as per the third class of hypotheses. According to Widener (2007), the more a company uses the beliefs system to communicate its strategy and inspire its collaborators, the more it tends to use the other levers of control – with the boundary system and diagnostic control system serving to guide and monitor behaviors and the interactive control system functioning to keep the company alert regarding threats and opportunities. According to the

author, when the strategy is clarified and communicated through the mission and vision that are disseminated through the beliefs system, the managers have the conditions to notice potential threats and opportunities and, thus, implement an interactive control system.

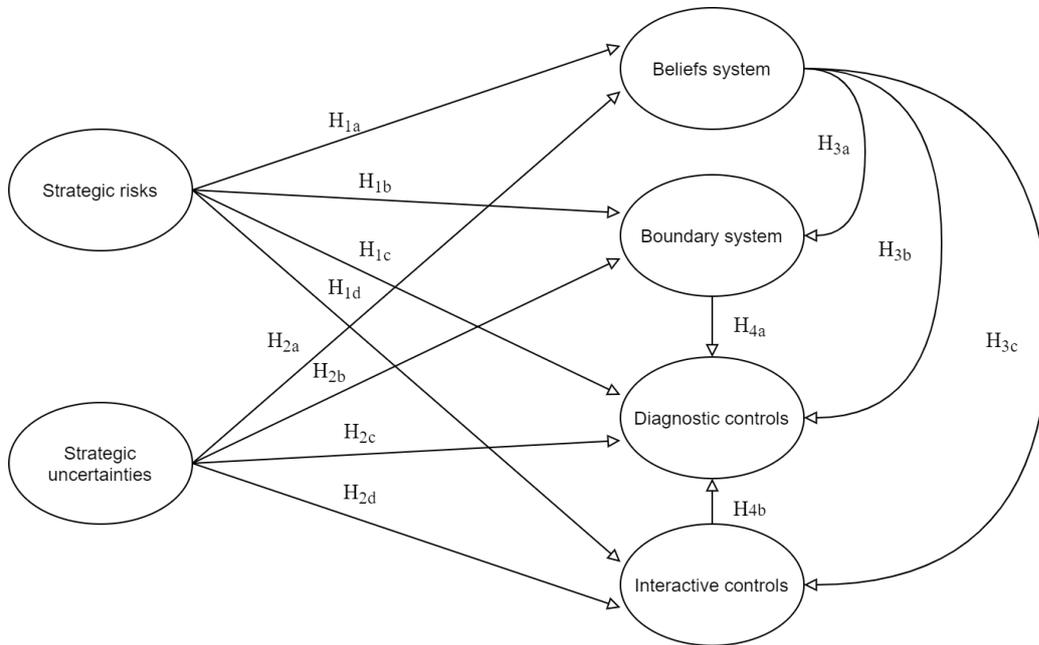


Figure 1. Theoretical research model

Note: Adapted from “An empirical analysis of the levers of control framework”, by S.K. Widener, 2007, *Accounting, Organizations and Society*, 32, p. 758.

Table 1
Construction of the Hypotheses

Hypotheses	Theoretical bases
The level at which credit cooperatives face strategic risks is positively associated with the emphasis placed on (H _{1A}) the use of the beliefs system; (H _{1B}) the use of the boundary system; (H _{1C}) the use of the diagnostic control system; and (H _{1D}) the use of the interactive control system.	Simons (2000); Bisbe & Otley (2004); Widener (2007); Sant’Ana et al. (2015); Silva et al. (2020).
The level at which credit cooperatives face strategic uncertainties is positively associated with the emphasis placed on (H _{2A}) the use of the beliefs system; (H _{2B}) the use of the boundary system; (H _{2C}) the use of the diagnostic control system; and (H _{2D}) the use of the interactive control system.	Merchant (1990); Abernethy & Brownell (1999); Simons (2000); Bisbe & Otley (2004); Widener (2007); Sant’Ana et al. (2015); Silva et al. (2020).
The emphasis placed by the credit cooperatives on the use of the beliefs system is positively associated with the emphasis placed on (H _{3A}) the use of the boundary system; (H _{3B}) the use of the diagnostic control system; and (H _{3C}), the use of the interactive control system.	
The emphasis placed by the credit cooperatives on the use of the boundary system is positively associated with the emphasis placed on (H _{4A}) the use of the diagnostic control system.	Sa Widener (2007); Sant’Ana et al. (2015).
The emphasis placed by the credit cooperatives on the use of the interactive control system is positively associated with the emphasis placed on (H _{4B}) the use of the diagnostic control system.	

Figure 1 illustrates the study’s theoretical model, indicating the hypotheses that were tested. It is expected that the strategic risks and uncertainties that are imposed upon credit

cooperatives would impact said organizations' MCS. It is also expected that the levers of control are connected. Specifically, the study only intends to analyze Brazil's southern region, due to its pertinence in the Brazilian credit cooperative environment. Furthermore, the study contemplates different compositions related to the type and class of credit cooperative, unlike the study conducted by Sant'Ana et al. (2015).

Since the aforementioned MCS is explored in this study based on the model proposed by Simons (1995), said model is divided into the four levers of control proposed by the author, which implicates in the deployment of four hypotheses (H_{1A} , H_{1B} , H_{1C} , H_{1D}) to explore the association between strategic risks and MCS. Similarly, four more hypotheses (H_{2A} , H_{2B} , H_{2C} , H_{2D}) explore the associations between strategic uncertainties and MCS. The description of the hypotheses and the sources upon which they are based are presented in Table 1.

3 METHODOLOGICAL PROCEDURES

3.1 Population Context

The Brazilian Cooperatives Organization (OCB, 2015) defines a cooperative as an autonomous association of people who voluntarily join forces to satisfy common social and cultural needs and aspirations through a collective property organization that is democratically managed. In this context, a quantitative study of descriptive nature was conducted through an electronic questionnaire. Approximately 30% of the cooperatives are located in the country's South region and of the five states with the highest number of cooperatives, three are from the South (Brazil Central Bank [BACEN], 2018a). Thus, the population included 307 credit cooperatives located in southern Brazil (BACEN, 2018a). For each credit cooperative, a manager was contacted by e-mail in accordance with the information that was available in the BACEN registry database (2018a).

A total of 60 managers responded, representing different cooperatives and, from these, three were discarded due to incomplete information, leading to a sample of 57 credit cooperatives that represent approximately 19% of the population. Despite the reasonably small sample size, some points can be made. Firstly, in various surveys in the Management Control field that were electronically conducted, the response rate that was reached represented up to 15% of the population (Widener, 2007; Heinicke, Guenther & Widener, 2016; Feder & Weißenberger, 2021). Secondly, in the context of studies in the Management Control field that use Structural Equation Modeling, many of them show similar sample sizes (n) (Oyadomari, Pedrique, Bido & Rezende, 2014; Sant'Ana et al., 2015; Theiss & Beuren, 2020).

3.2 Data Collection Instrument and Procedure

The data collection instrument was a questionnaire adapted from Sant'Ana et al. (2015) and Widener (2007), containing questions designed to show the respondents' profiles as well as those of the credit cooperatives and also two other blocks comprised of 37 statements contemplating the following constructs: (i) strategic uncertainties (9 items), operational and competitive risks (6 items), and (ii) the use of MCS, comprised of the beliefs system (4 items), boundary system (4 items), diagnostic control system (11 items) and the interactive control system (3 items). To measure the variables, the choice was a Likert-type scale with seven points, going from (1) fully disagree to (7) fully agree.

During the questionnaire's creation and application, certain precautions were taken to minimize possible effects of the Common Method Bias (CMB), which is a bias that is

associated with this method. These precautions were: (i) the construction of clear and concise statements; and (ii) guaranteeing the respondent's anonymity. Despite these precautions, there is no assurance that the CMB was completely eliminated (Podsakoff, MacKenzie, Lee & Podsakoff, 2003).

The data collection was conducted by sending an invitation to participate in the investigation to the email addresses of the credit cooperative managers. The questionnaire itself was electronic and operated by the QuestionPro platform, accompanied by an introduction letter. The data collection lasted approximately two months and was conducted in the first semester of 2018.

3.3 Analysis Technique

For the data analysis, the chosen software was SmartPLS 3.0 and the method that was employed was Structural Equation Modeling with Partial Least Square estimation (SEM-PLS), to obtain the structural coefficients and their respective significance values, thus supporting the acceptance or the rejection of the hypotheses. It is important to note that the use of SmartPLS is justified through the low number of respondents ($n < 100$), the non-normality of the data, proven significantly through the Kolmogorov-Smirnov test and also the complexity of the model, containing various external and internal constructs (Bido & Silva, 2019; Guide & Ketokivi, 2015). Additionally, the Importance Performance Map Analysis (IPMA) was also conducted on the SmartPLS software, permitting the graphic visualization of the total effects of certain independent variables on the dependent ones (Ringle & Sarstedt, 2016).

4 RESULT ANALYSIS

4.1 Sample Profile

The sample included 57 cooperatives from the southern region, representing approximately 19% of the population. Rio Grande do Sul was the state with the highest quantitative expression of respondents with a total of 27, which equals almost 48% of the sample. The total of respondents from the states of Paraná and Santa Catarina was 15 per state.

The cooperatives are divided by class (Singular or Central) and by type (Mutual Credit, Rural Credit or Free Admission) (BACEN, 2018b). The central cooperatives must be comprised of at least three singular ones, thus contributing to the service management for the affiliated cooperatives on a larger scale, leading to cost reduction. The type of credit cooperative is determined according to the participant admission system (BACEN, 2018b).

The class of cooperatives participating in the study is predominantly central (65%). Regarding the type, about 51% are rural credit, followed by mutual credit (38.60%) and finally by free admission (10.53%). The sample profile is different from that exhibited by Sant'Ana et al. (2015), who analyzed 44 credit cooperatives in the national scenario, with 95% of the cooperatives being singular and 70% of them dealing in mutual credit.

The average age of the respondents was 41 years, varying between ages 21 and 61. Most of them were contained in the age group between 30 and 39 years, followed by those from the 40 to 49 year age group. At least 70% of the respondents have been in their current position for more than 4 years and about 14% of them have done so for more than 12 years, which demonstrates a proximity with cooperativism. Approximately 14% of the respondents are involved in the presidency. The majority (18) work in Administrative Management,

followed by Business Management (8) and Credit Management (5). The other respondents were mostly Accountants, Financial Analysts, Accounting Analysts, Financial Managers and Directors of Operations.

4.2 Measurement Model

After the sample profile description, the measurement model was analyzed in order to promote the best possible adjustment regarding the constructs and their respective indicators. In the meantime, five indicators (DiaC1, DiaC2, BouS1, SR5 and SR6) were excluded through confirmatory factor analysis to adjust the model. After this adjustment, all of the loadings were higher than 0.7 in their respective constructs, which demonstrates their adaptation to the measurement model (Hair, Black, Babib, Anderson & Tatham, 2009).

To address the concerns about CMB, the Pearson Correlation test was conducted on SPSS 23 software to investigate the possible existence of this issue (Podsakoff et al., 2003). According to Pavlou, Liang and Xue (2007), CMB may exist when the constructs are strongly correlated ($r > 0.90$). From this perspective, for this test, it was proven that all of the values are under the limit, thus indicating that CMB is not an issue for this study.

As for reliability, Cronbach’s Alpha (α) and Composite Reliability (CR) were observed. For both criteria, the values that were found were over 0.70, which indicates the presence of reliability (Bido & Silva, 2019; Hair et al., 2009). The shared variance, the correlations and reliability values are shown in Table 2.

Table 2

Measurements of Reliability and Validity

	Mean	α	CR	AVE	SU	SR	DiaC	IntC	BelS	BouS
SU	6.09	0.949	0.957	0.713	0.844					
SR	6.67	0.966	0.975	0.906	0.576	0.952				
DiaC	5.59	0.966	0.971	0.789	0.769	0.369	0.888			
IntC	5.67	0.903	0.940	0.839	0.666	0.354	0.840	0.916		
BelS	5.81	0.871	0.910	0.718	0.721	0.492	0.694	0.665	0.847	
BouS	5.30	0.894	0.933	0.823	0.754	0.564	0.644	0.672	0.661	0.907

Note. α = Cronbach's Alpha. CR = Composite Reliability. AVE = Average Variance Extracted. SU = Strategic uncertainties. SR = Strategic risks. DiaC = Diagnostic controls. IntC = Interactive controls. BelS = Beliefs system. BouS = Boundary system.

The convergent validity, which is represented by the construct’s ability to serve as a metric for that which must be measured, was verified through the Average Variance Extracted (AVE). All of the values were above 0.50, which, alongside the loadings, expresses the model’s convergent validity (Fornell & Larcker, 1981; Hair et al., 2016).

In the context of discriminant validity, regarding the degree of distinction between one construct and its respective items and the others, the cross loads were evaluated (Hair et al., 2016). This criterion is based on whether the loadings of each item are higher than all of its cross loads, as well as whether the square root of each construct’s AVE is higher than the correlational coefficients from the column/ line in question (Fornell & Larcker, 1981; Hair et al., 2016).

4.3 Structural Model

Once the measurement model evaluation process was finished, the structural model, which is used to conduct the path analysis, was created (Table 3). Other assumptions related to this analysis are also presented. The t test and significance were calculated, with the latter occurring through 10,000 resamples, as suggested by Streukens & Leroi-Werelds (2016).

Table 3
Path Analysis

H	Relationship	VIF	f ²	β	t-statistic	p-value	Accepted
H _{1A}	SR → BelS	1.496	0.019	0.115	0.758	0.448	x
H _{1B}	SR → BouS	1.524	0.049	0.169	1.097	0.273	x
H _{1C}	SR → DiaC	1.650	0.019	-0.080	0.817	0.817	x
H _{1D}	SR → IntC	1.524	0.011	-0.090	0.678	0.678	x
H _{2A}	SU → BelS	1.496	0.609	0.655	4.804	0.000*	✓
H _{2B}	SU → BouS	2.407	0.270	0.500	2.825	0.005*	✓
H _{2C}	SU → DiaC	3.205	0.267	0.419	2.333	0.020**	✓
H _{2D}	SU → IntC	2.407	0.159	0.429	2.396	0.017**	✓
H _{3A}	BelS → BouS	2.123	0.058	0.218	1.339	0.181	x
H _{3B}	BelS → DiaC	2.487	0.021	0.103	0.875	0.382	x
H _{3C}	BelS → IntC	2.123	0.156	0.400	3.208	0.001*	✓
H _{4A}	BouS → DiaC	2.890	0.011	-0.082	0.527	0.598	x
H _{4B}	IntC → DiaC	2.310	0.699	0.576	4.332	0.000*	✓

Note: H = Hypothesis. VIF = Variance Inflation Factor. f² = Effect Size. β = Beta coefficient. * Sig. accepted < 0.01. ** Sig. accepted < 0.05. SU = Strategic uncertainties. SR = Strategic risks. DiaC = Diagnostic controls. IntC = Interactive controls. BelS = Beliefs system. BouS = Boundary system

Regarding the predictive validity, the values of the coefficient of determination (R²) of the latent endogenous variables were: beliefs system (0.529); boundary system (0.616); diagnostic system (0.795) and interactive control system (0.519). These values were used to measure the explanation power of the constructs that were exposed in the structural model (Hair et al., 2009). According to Cohen’s classification (1988) for the explanation power of R², in which values over 26% are considered high for social sciences, it is possible to observe that the endogenous constructs have a high explanation power.

Still regarding predictive power, the effect size (f²) was evaluated, which went from medium to large for all of the accepted hypotheses, as per Cohen’s criteria (1988) (f² = 0.15 are medium and f² = 0.35 are high). The predictive relevance values (Q²) must be higher than zero. In this context, the endogenous constructs reached: diagnostic control (0.537); interactive control system (0.371); beliefs system (0.291); and boundary system (0.417). This index evaluates the model’s accuracy; that is, how much it reflects the reality (Hair et al., 2016).

Another aspect that was analyzed was the multicollinearity, which deals with possible elevated correlations in the latent constructs (Hair et al., 2016). To conduct this evaluation, the chosen method was the Variance Inflation Factor (VIF). The analysis encountered values between 1.496 and 3.205, which are under the 3.3 limit, proving the absence of multicollinearity (Diamantopoulos & Sigauw, 2006).

4.4 Importance-Performance Map Analysis

The Importance-Performance Map Analysis was conducted in order to present the practical contributions, which have to do with management decision-making (Streukens, Leroi-Werelds & Willems, 2017). Figure 2 illustrates the total effects of the four levers of control that were explored in the investigation (dependent variables).

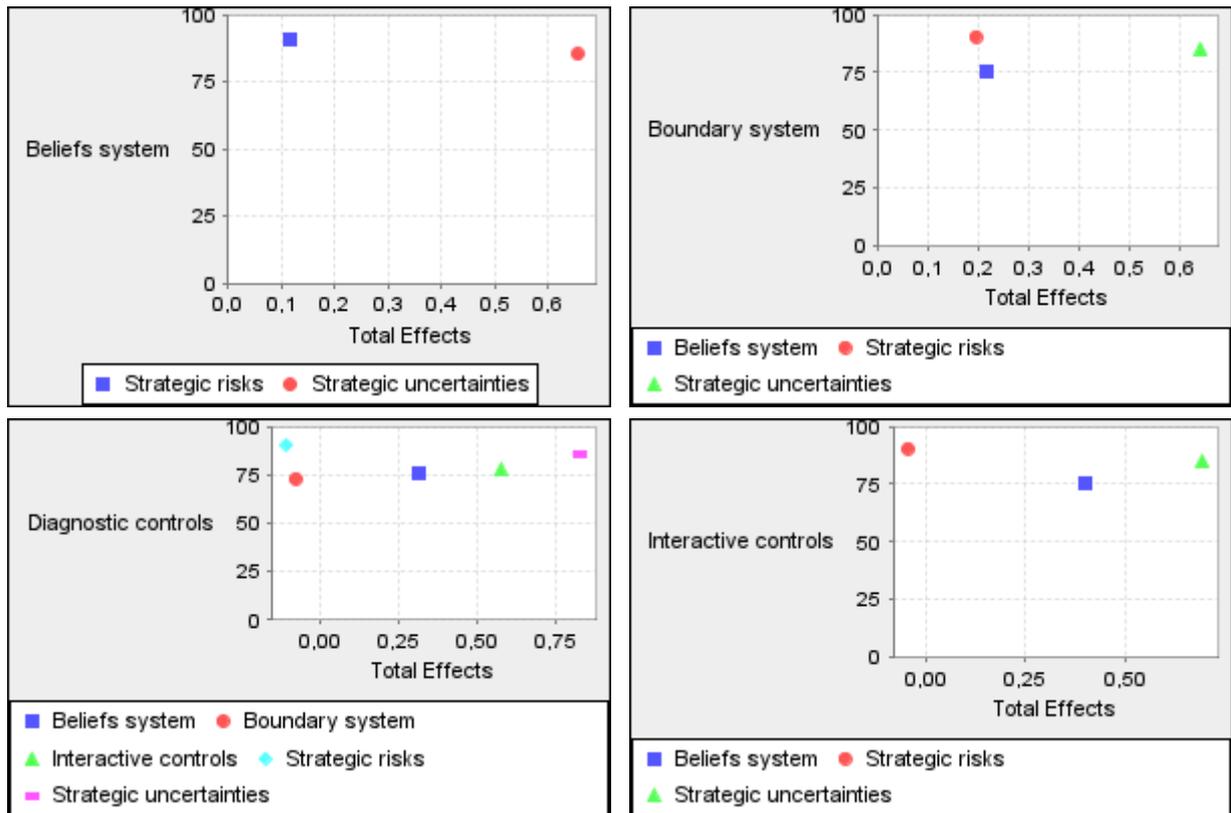


Figure 2. Importance-Performance Maps Analysis.

It is necessary to highlight that the restructuring requirements for the average construct scores in the 0-100 interval, codifications with the same direction in the scale and the estimates of the positive external weights were fulfilled (Ringle & Sarstedt, 2016). Also, the y axis represents the standardization of the constructs’ average scores (performance) and the x axis represents the total effects (total β) of the independent variable on the dependent one (importance) (Ringle & Sarstedt, 2016).

Generally speaking, the maps demonstrate that for the use of each Lever of Control, strategic uncertainty is the element that received the most importance from the managers. On the other hand, for each Lever of Control, strategic risk is the element with the least importance, which is coherent with the managers’ perceptions on the use of MCS. The performances are similar, with a small high portion attributed to strategic risk, which means that this element, according to the managers, has potential to influence the use of the MCS, but in fact, is not given much importance. Furthermore, it is also necessary to consider the importance that is attributed to the use of interactive control system in order to balance it with the diagnostic use.

4.5 Discussion of the Findings

Through the information available in Table 3, it was possible to analyze the developed hypotheses. The first class of hypotheses refers to strategic risks. H_{1A} investigates whether the level at which the credit cooperatives confront strategic risks is positively associated with the emphasis that is placed on the use of the beliefs system. It presented a positive structural coefficient, but no significance. The result shown by H_{1A} shows a different perspective than the one shown by the studies conducted by Simons (2000) and Widener (2007), who found positive correlations between the organizations that face higher degrees of operational risk

and the use of the beliefs system. Despite not agreeing with the literature, this study's findings are aligned with the results found by Sant'Ana et al. (2015), who also rejected this hypothesis in national credit cooperatives. This result may also disagree with the literature due to the sample's specificity or even due to the management model present in the studied cooperatives.

Hypothesis H_{1B} touches upon whether the level at which the credit cooperatives confront strategic risks is positively associated with the emphasis placed on the use of the boundary system, resulting in a positive but non-significant coefficient and thus being rejected. Similar results were also found by Widener (2007) and Sant'Ana et al. (2015), who did not find a positive relationship between risks and the emphasis placed on the use of the boundary system. Despite the lack of a significant result, the association between the boundary system and the strategic risks was expected, since the control system in question is one that is frequently used by organizations in general. The definition of boundaries and demarcations relative to the risks is even more common in credit concession.

Hypothesis H_{1C} discusses whether the level at which credit cooperatives confront strategic risks is positively associated with the emphasis placed on the use of the diagnostic control system and the findings do not support it, since the coefficient that was obtained is negative and has no significance. The findings pertaining to H_{1C} did not show the same results as the studies from Bisbe and Otley (2004) and Widener (2007), who found a positive association between larger propensities to take strategic risks and the importance given to the diagnostic control system. It is necessary to highlight that just as in the present study, Sant'Ana et al. (2015) were also unable to find a positive association between the constructs covered in H_{1C}. Thus, it is possible that the divergence from the results found by Bisbe and Otley (2004) and Widener (2007) can be explained by peculiarities pertaining to the analyzed organizations, whether due to the type of activity or due to cultural matters. Even so, this finding should represent a warning to the cooperatives, because diagnostic control system is the most traditional among the control systems.

As for hypothesis H_{1D}, which deals with the possibility of the level at which the credit cooperatives confront the strategic risks being positively associated with the emphasis placed on the use of the interactive control system, a negative path coefficient was obtained and no significance was found, thus rejecting the hypothesis. In the study conducted by Widener (2007), the findings suggested a positive relationship between strategic risks and the use of the interactive control system. The results of this study are in accordance with those found by Sant'Ana et al. (2015), who did not find a positive connection between the two constructs involved in the hypothesis.

In the sequence, the second group of hypotheses uses strategic uncertainties as a dependent construct. Hypothesis H_{2A}, which investigates whether the level at which credit cooperatives confront the strategic uncertainties is positively associated with the emphasis placed on the use of the beliefs system, was supported, obtaining the highest structural coefficient in the path analysis and a reliability level over 99%. The results from Bisbe and Otley (2004), Sant'Ana et al. (2015), Simons (2000) and Widener (2007) reinforce the positive association between the emphasis that the managers give to strategic uncertainties regarding the use of the beliefs system. Thus, it is notable that as external scenarios change, appearing as uncertainties in the management of credit cooperatives, the managers use organizational values (reinforcing the mission role, vision and values) to direct the readaptation of the management processes (Simons, 1995; Widener, 2007).

Hypothesis H_{2B}, which discusses whether the level at which credit cooperatives confront strategic uncertainties is positively associated with the emphasis placed on the use of the boundary system was accepted, with a positive path coefficient (sig. 0.01). The results

from Merchant (1990), Sant'Ana et al. (2015 and Widener (2007) are different from this study's findings, which demonstrated that in the credit cooperatives from the southern region there is a positive connection between strategic uncertainties and the degree of importance attributed to the boundary system. Through this finding, it is possible to note that the credit cooperatives, unlike other types of organizations, use resources such as the code of conduct, code of ethics and other such restriction factors as the environmental level of strategic uncertainties increases (Simons, 1995). This result may be explained due to the peculiarities of the business model followed by the credit cooperatives (Silva & Mucci, 2020), which may lead them to impose more rigid restrictive measures in order to guarantee the achievement of organizational purposes and the business's preservation as a whole.

As for Hypothesis H_{2C}, which explores whether the level at which the credit cooperatives confront strategic uncertainties is positively associated with the emphasis placed on the use of the diagnostic control system, this study obtained a positive structural coefficient with a reliability level over 95%. This result is in agreement with the studies conducted by Bisbe and Otley (2004) and Widener (2007), confirming that there is a positive correlation between the level of association imposed on the diagnostic control system regarding strategic uncertainties. As such, it appears that credit cooperatives tend to increase the level of monitoring and readaptation during eventual deviations from the expected pattern as strategic uncertainties appear (Simons, 1995).

Hypothesis H_{2D} touches upon whether the level at which credit cooperatives confront strategic uncertainties is positively associated with the emphasis placed on the use of the interactive control system. The hypothesis was accepted and an expressive association was shown regarding the importance given to the use of the interactive control system when faced with strategic uncertainties. This finding agrees with the evidence from previous studies (Abernethy & Brownell, 1999; Sant'Ana et al., 2015; Simons, 1991; Widener, 2007), indicating that the studied organizations have managers that use formal information systems to bring about a higher subordinate involvement regarding performance, especially when the company is dealing with strong strategic uncertainties (Simons, 1995).

In the third class of hypotheses, the beliefs system was used as a independent construct. Hypothesis H_{3A} investigates whether the emphasis that credit cooperatives place on using the beliefs system is positively associated with the emphasis placed on using the boundary system. This hypothesis was not supported. This finding disagrees with the studies from Sant'Ana et al. (2015) and Widener (2007), who state that the beliefs system complements the other levers of control.

As for hypothesis H_{3B}, which discusses whether the emphasis credit cooperatives place on using the beliefs system is positively associated with the emphasis placed on using the diagnostic control system, it was rejected due to presenting a positive coefficient, but no significance. This finding corroborates those from Widener (2007), who demonstrated a positive correlation between the beliefs system and the focus on the diagnostic control system, but disagrees with those from Sant'Ana et al. (2015), who demonstrated the existence of a positive correlation between the constructs present in H_{3B} in credit cooperatives.

As for hypothesis H_{3C}, touching upon whether the level of importance attributed by credit cooperatives to the beliefs system is the same placed on the interactive control system, the hypothesis was accepted as it obtained a positive structural coefficient and a reliability level higher than 99%. This finding is in agreement with the study from Widener (2007) and disagrees with the results from Sant'Ana et al. (2015), just as in hypothesis H_{3B}. The findings suggest that the higher the alignment present in a credit cooperative's values, the more the managers will seek to interact with the subordinates in order to reach the expected performance level (Simons, 1995).

Hypothesis H_{4A} explores whether the emphasis that credit cooperatives place on the use of the boundary system is positively associated with the emphasis placed on using the diagnostic control system. This hypothesis was not supported as it showed a negative and non-significant coefficient. This same result was found by Sant'Ana et al. (2015) and Widener (2007), who were also unable to find a positive correlation between the way managers attribute importance to the beliefs system and, simultaneously, on the diagnostic control system.

The last hypothesis, H_{4B}, investigates whether the emphasis placed by the credit cooperatives on the use of the interactive control system is positively associated with the emphasis they place on using the diagnostic control system and was accepted with a positive path coefficient and 1% significance. This result agrees with those from Sant'Ana et al. (2015) and Widener (2007), who both found a positive correlation between the interactive control system and the importance given to the diagnostic control system. Thus, it is observed that as the managers promote more interaction with their subordinates in order to align the organization regarding the expected performance level, more corrective measures are taken to readjust the strategy (Simons, 1995).

5 FINAL CONSIDERATIONS

This study aimed to analyze the associations between strategic risks and uncertainties and the use of the Levers of Control, as well as the correlations between the beliefs system, boundary system and the diagnostic and interactive controls systems within a sample of 57 credit cooperatives from Brazil's southern region.

The hypotheses that establish strategic risk as a precedent for the use of MCS (H_{1A}, H_{1B}, H_{1C}, H_{1D}) were rejected. This finding may indicate that strategic risk is not being considered relevant to the use of the MCS in the investigated organizations, which is a practice that should be carefully examined by the cooperatives. According to Figure 2, this element is considered the least important by the managers from the aforementioned cooperatives. To neglect unexpected events or conditions that hamper the implementation of the intended strategy when using a management control system is a foolhardy practice, since risk is a potential source of damage to the organization (Widener, 2007). According to the author, by considering strategic risk as a antecedent for using control measures, the organizations increase the magnitude of the information that is considered in decision-making, thus expanding their chances of enabling the accomplishment of the intended strategies.

Strategic uncertainty was verified as the element that received the highest level of importance from the managers in the process of using MCS. The four hypotheses (H_{2A}, H_{2B}, H_{2C}, H_{2D}) dealing with the association between the confrontation level for strategic uncertainties and the emphasis placed on the beliefs system, boundary system and diagnostic and interactive control systems were accepted. This evidence suggests that the cooperatives use the diagnostic control system to manage strategic uncertainty and that for the controls to be used in a diagnostic manner, it is not enough to simply have goals and objectives to achieve; it is vital that the results be measured, followed and that any deviations be understood (Simons, 1995; Widener, 2007). Additionally, the other levers of control have specific roles so that uncertainties may be taken into consideration without the cooperatives distancing themselves from their values and purposes (beliefs system), guaranteeing that communication and learning are present (interactive control system) and reinforcing the limits of action (boundary system).

As for the third class of hypotheses, which has to do with the association between the belief system and the other levers of control (H_{3A}, H_{3B} and H_{3C}), only H_{3C} was accepted, which demonstrates that the beliefs system is positively associated with the degree of importance given to the interactive control system. This finding demonstrates that the beliefs system is being underused by credit cooperatives, considering that it is a potentially useful resource for inspiring the employees in the search for directed opportunities; that is, ones in line with the intended strategy (Widener, 2007). As for the last group of hypotheses (H_{4A} and H_{4B}), the first one was rejected and the second was accepted, indicating that in the investigated credit cooperatives, the interactive control system has a positive correlation with the importance given to the diagnostic control system.

Through these findings, it is possible to state that the credit cooperatives use the four types of control proposed by Simons (1995) to guard themselves from strategic uncertainties, passing on their organizational values, imposing restrictions, using feedback to promote strategy readjustment, as well as the managers seeking to interact with the subordinates in order to align the objectives and promote organizational learning. It was also observed that the alignment of a company's values brings about a higher level of proactivity regarding the managers' communication with subordinates and this interaction between the managers unleashes corrective processes in the cooperative's activities so that it can adapt to the strategic uncertainties.

The findings contribute theoretically by demonstrating that the balanced use of the four Levers of Control (Simons, 1995) is useful for the strategic renovation of credit cooperatives when faced with strategic uncertainties. The findings advance towards the study conducted by Sant'Ana et al. (2015) upon exploring a sample with a different composition in a more recent context. Furthermore, they bring a new perspective to the study conducted by Silva et al. (2020) by exploring a specific type of financial institution, credit cooperatives. The peculiarities of credit cooperatives, which set them apart from other conventional organizations in the market in which Simons' framework is normally investigated, is a differential in this investigation, since the model's use becomes pertinent and relevant, capable of generating opportune evidence both academically and professionally.

It is also possible to list contributions to organizational and management practices pertaining to this sample. It is visible that on using MCS in credit cooperatives, whether diagnostically, interactively, through beliefs or boundaries, one point that receives considerable attention is strategic uncertainty. This means that uncertainties and changes throughout strategy application and conduction are relevant factors in the managers' perceptions regarding how they conduct the means to manage the cooperatives, aside from the balanced use of the four Levers of Control.

A limitation of this study is the reduced sample size, which may compromise the use of Structural Equation Modeling (Hair et al., 2009) and the possible representativity of the study's target population. Furthermore, the non-use of control variables is another limiting factor. For future research, the suggestion is to replicate this study with credit cooperatives from other parts of the country, as well as with other types of cooperatives, such as agricultural ones. Also, the inclusion of control, moderating or mediating variables is appropriate.

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Antecedentes do Sistema de Controle Gerencial em Cooperativas de Crédito da Região Sul do Brasil

Objetivo: Considerando-se o turbulento ambiente econômico, assim como as especificidades das operações promovidas por entidades cooperativas, este estudo buscou analisar as associações entre os riscos e incertezas estratégicas com o uso Sistema de Controle Gerencial (SCG) nas cooperativas de crédito da região Sul do Brasil.

Método: Pesquisa quantitativa, do tipo survey, composta por 57 cooperativas de crédito. Os dados foram analisados mediante Modelagem de Equações Estruturais com estimação por mínimos quadrados parciais, no software SmartPLS 3.0. Os construtos de risco estratégico e incerteza estratégica foram analisados em relação a associação com as Alavancas de Controle de Simons (1995), que contempla os controles de crenças e restrições, e sistemas de controle interativo e diagnóstico. Ademais, faz-se a análise das associações entre as quatro Alavancas de Controle.

Originalidade/Relevância: O estudo abarca antecedentes (riscos e incertezas estratégicas) do uso do SCG, contemplando diferentes composições em relação ao tipo e classe das cooperativas de crédito, na comparação aos estudos pregressos, além de abranger uma região singular e pertinente no contexto do cooperativo de crédito brasileiro.

Resultados: O risco estratégico não está associado ao uso do Sistema de Controle Gerencial. A incerteza estratégica foi comprovada como o elemento que recebe maior importância por parte dos gestores no processo de uso das quatro Alavancas de Controle. No construto Sistema de Crenças, a importância imposta está positivamente interligada com o Sistema de Controle Interativo, assim como no Sistema de Controle Interativo com o Sistema de Controle Diagnóstico.

Contribuições teóricas/metodológicas: O estudo demonstra a pertinência das Alavancas de Controle para o âmbito do cooperativismo de crédito, sob contextos de riscos e incertezas estratégicas.

Contribuições sociais/para a gestão: Os achados contribuem ao evidenciar que o uso balanceado das quatro Alavancas de Controle é relevante para promover a renovação estratégica das cooperativas de créditos, especialmente no que diz respeito a incerteza estratégica.

Palavras-chave: Sistema de Controle Gerencial; Cooperativas de Crédito; Incerteza Estratégica; Risco Estratégico; Alavancas de Controle de Simons.

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