

THE INFLUENCE OF THE RELATIONAL HETEROGENEITY OF CREDIT COOPERATIVES ON INNOVATION

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ABSTRACT

This research aimed to evaluate the influence of relationships with central cooperatives on fostering innovation in individual cooperatives. An exploratory-descriptive study was conducted, operationalized through a quantitative approach and based on a positivist epistemological paradigm. Data were collected from 213 cooperatives and analyzed using analysis of variance and linear regression. Furthermore, the validity and reliability of the investigated constructs were evaluated through factor analysis. Based on these methodological procedures, it was observed that, although innovation is a significantly relevant element in cooperativism, there are gaps in scientific knowledge about fostering innovation in the context of cooperatives. It was identified that central cooperatives influence the innovation of individual cooperatives, especially if they maintain significant relational ties, as observed more broadly in credit cooperatives. The central cooperative can act in the centralization of innovation activities, as well as enable the formation of closed networks, to minimize opportunistic behavior and favor the transfer of knowledge and resources among the cooperatives linked to it. From a practical/managerial point of view, the results of the study shed light on the implementation of processes that promote innovation by cooperatives.

Keywords: Innovation; Cooperatives; Central cooperative; Credit cooperatives; Network.

A INFLUÊNCIA DA HETEROGENEIDADE RELACIONAL DAS COOPERATIVAS DE CRÉDITO NA INOVAÇÃO

RESUMO

A presente pesquisa teve como objetivo avaliar a influência das relações com cooperativas centrais no fomento da inovação em cooperativas individuais. Foi realizado um estudo exploratório-descritivo, operacionalizado por meio de uma abordagem quantitativa e a partir de um paradigma epistemológico positivista. Os dados foram coletados de 213 cooperativas e analisados por meio de análise de variância e regressão linear. Além disso, por meio de análise fatorial, foram avaliadas a validade e a confiabilidade dos construtos investigados. A partir de tais procedimentos metodológicos, observou-se que, embora a inovação seja um elemento expressivamente relevante no cooperativismo, existem lacunas no conhecimento científico sobre o fomento da inovação no contexto das cooperativas. Identificou-se que as cooperativas centrais influenciam a inovação das cooperativas individuais, especialmente se mantiverem laços relacionais expressivos, como observado mais amplamente em cooperativas de crédito. A cooperativa central pode atuar na centralização das atividades de inovação, bem como possibilitar a formação de redes fechadas, para minimizar o comportamento oportunista e favorecer a transferência de conhecimento e recursos entre as cooperativas a ela vinculadas. De um ponto de vista prático/gerencial, os resultados do estudo lançam luz sobre a execução de processos que favorecem a inovação por parte das cooperativas.

Palavras-chave: Inovação; Cooperativas; Cooperativa central; Cooperativas de crédito; Rede.

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INTRODUCTION

In parallel to the fact that cooperatives exercise a social function, they are characterized as economic organizations, inserted in a competitive environment where efficiency and economic-financial results are fundamental for their sustainability. Thus, innovation becomes a necessary aspect for cooperatives that seek to maximize their performance and develop sustainable competitive advantages (LUO; GUO; JIA, 2017; MILOVANOVIC; SMUTKA, 2018).

In this sense, the level of dependency on resources and their criticality can affect the development of innovation. It should be noted, however, that the scope of the markets and the specific characteristics of the assets can lead cooperatives to demand external resources and to establish interorganizational relationships, which can contribute significantly to expanding their capacity for innovation.

Among the main motivators for the execution of relationships between cooperatives and their respective centrals, productive capacities and the complementarity of objectives stand out. The centralization of activities carried out by the centrals, in addition to enabling economies of scale for the development of innovation activities, can favor joint articulation on operational processes and strategic matters.

Although innovation is an expressively relevant element in cooperativism (ALI; SENY KAN; SARSTEDT, 2016; VIEIRA; BONIFÁCIO-DA-SILVA, 2016), especially in credit cooperatives, as observed by Chen et al (2025), researchers such as Reed and Hickey (2016) and Gallego-Bono and Chaves-Avila (2015) emphasized that there are gaps regarding the broad knowledge about fostering innovation in the context of cooperatives. In addition, although previous research has investigated the influences of interorganizational relationships on innovation (CUI et al., 2018; RADZIOW; BOGERS, 2018; XIE; WANG, 2020), such considerations are inexpressive in the cooperative environment. Finally, it should be noted that Kanda et al. (2020) emphasized that the assessment of the influence of intermediary innovation actors has been mostly based on assumptions or descriptive statistics.

Faced with such gaps, this research aimed to evaluate the influence of relationships with central cooperatives in fostering innovation in individual cooperatives.

For this, exploratory-descriptive research was carried out, using a quantitative approach, involving data collected from 213 cooperatives and analyzed through analysis of variance (ANOVA) and linear regression.

In this article, firstly, a theoretical review of interorganizational relationships and their influence on innovation. Then, the methodological procedures for operationalizing the empirical research, which involves cooperatives from seven different segments, are detailed. Subsequently, the results are presented and discussed. Finally, the study's conclusions are presented.

Interorganizational Relationships And Their Influence On Innovation

Interorganizational relationships, which can integrate network structures, are important for fostering innovations (CUI et al., 2018; XIE; WANG, 2020). These networks are valuable sources of knowledge, which are generated because of organizational interactions (SINGH et al., 2019; MÜLLER; BULIGA; VOIGT, 2020).

Such relationships can favor access to external assets (SCHILLING, 2017; (KANDA et al., 2019) and reflect the reputation of certain partners (GÓRRIZ-MIFSUD; SECCO; PISANI, 2016), as well as promote the complementarity of functions (VANHAVERBEKE;

CLOODT, 2017) and foster a stock of social capital for future collaborations in innovation activities.

It should be emphasized that opportunistic behaviors limit the achievement of interorganizational relationships, as well as the transfer of resources for innovation (LAVIE, 2006; BALESTRIN; VERSCHOORE, 2016). Therefore, the more effective the mechanisms that restrict them, the lower the monitoring costs and the more expressive the sharing of resources and the integrated innovation activities (TREMBLAY; HUPPER; WARING, 2019).

Bourdieu (1986) emphasized that the social world is accumulated history. Social capital reflects investments in social relationships over time. Trust, for example, is built over long periods of successful transactions. Thus, the stability of a network of relationships requires trust and relevant norms of cooperation (NAHAPIET; GHOSHAL, 1998; YU; LIAO; LIN, 2006), which can be made possible by the central cooperative through the promotion of strong ties, long-term relationships term and the development of closed relational structures.

That said, innovations can be derived both from the links between singular and central cooperatives, as well as through transfers of resources and joint activities developed between different cooperatives.

Granovetter (1985) emphasized that complex and recurrent transactions demand long-term relationships for trust to increase. They will promote greater security for cooperatives to implement shared innovation activities. When partner cooperatives engage in long-term relationships, they develop bonds that enhance the advantages of carrying out joint activities.

Furthermore, through the closed network made possible by the centrals, individual cooperatives can develop a stock of social capital, which can be fostered, as advocated by Walker et al. (1997), Coleman (1990) and Putnam (2006), new partnerships for cooperative actions, since there will be greater clarity regarding the trust of the actors and reduction of transaction costs.

It should be noted that for cooperatives to be able to appropriate the benefits derived from the relationships fostered by the centrals and sustain a position of competitive advantage, it is necessary to consider some aspects, mainly about the characteristic of heterogeneity and imperfect mobility of relationships.

Lavie (2006), Dyer and Singh (1998) pointed to the existence of isolation mechanisms that favor the appropriation of relational income generated through partnerships, alliances and different interorganizational relationships, which include social complexity, time compression diseconomies and complementarities between resources.

Social complexity, as advocated by Barney (1991), is related to social phenomena that develop in a complex way, such as interpersonal relationships between managers and the reputation established with other actors. This condition is strictly related to the historical conditions of cooperatives, that is, to relationships that generate relational ties, trust and reputation.

In continuity, the positive and historical results of successful transactions will create reputations not only with those directly related actors, but also with the other network participants (PUTNAM, 2006; GÓRRIZ-MIFSUD et al., 2016), minimizing the risks for transactions futures between cooperatives and encouraging new relationships through the sharing of information between cooperatives linked to the central.

This history of relationships can be characterized as a heterogeneous resource, difficult to imitate. This is because the norms, sanctions and social 'credits' that favor relationships and that control opportunistic behavior are not perfectly replicable. Trust and

reputation with other actors, for example, depend on long periods of relationship to consolidate and, thus, are subject to the diseconomy of time compression.

Research on path dependency emphasizes that history is important to organizational performance (DAVID, 2001; ARTHUR, 1994). Furthermore, as defended by Peteraf, (1993), if an organization implements a strategy based on its history of activities, this strategy will be difficult to imitate, since, without this specific path of history, other organizations will not be able to access the necessary resources to implement the strategy, which depend on previous levels of learning and specific activities to develop.

In continuity, for the proper development of shared innovation activities, it is necessary to develop absorption capacity (MÜLLER; BULIGA; VOIGT, 2020). In this sense, Shipilov (2009) emphasizes that one of the factors that favor such capacity is the similarity of knowledge between partners. Dyer and Singh (1998) and Górriz-Mifsud et al. (2016) point out that this ability increases when there is a significant base of information about the partner to obtain information about relevant knowledge and when there is a mutual willingness to share it, which is developed through interactions over time.

Furthermore, the focal cooperative will only appropriate the benefits derived from the innovation if there is a combination of resources. Thus, if the partner cooperatives provide complementary resources and these are combined with the resources of the focal cooperatives, there will be a synergistic effect as a result and, as defended by Lavie (2006), Dyer and Singh (1998), the resources will be more difficult to be imitated than before the combination.

Thus, it is essential that the heterogeneity characteristics of the innovation are relatively durable. For this, it is necessary that cooperatives have ex post isolation mechanisms from competition, to appropriate the values created by innovation and take advantage of a position of sustainable competitive advantage.

It is emphasized that the relationships fostered for the implementation of innovation activities are social phenomena that are difficult to imitate, since they demand a history of relationships and trust. Such historical conditions of relations, as advocated by Barney (1991), are characterized as heterogeneous resources that are difficult to imitate and, therefore, favor the capture of value created by innovation and the maintenance of competitive advantage.

METHOD

The study is classified as an exploratory-descriptive research, carried out through a quantitative approach and from a positivist epistemological paradigm, seeking, therefore, explanations and predictions of the reality of cooperatives in the face of regularities between the elements that constitute them, and, thus, as argued by Johnson and Duberley (2000), scientific knowledge based on empirical investigation is seen as essentially cumulative, objective and proposes to predict social phenomena.

In this way, it was decided to investigate seven different sectors of cooperativism, which is justified by the possibility of analyzing the existence of similarities and/or significant differences in the constructs “innovation” and “relationship with central cooperative”, as well as in the relations between them.

Data were collected through a questionnaire applied to 213 cooperatives. Of these, 59 are part of the credit segment, 58, the agricultural sector and 96, other sectors of activity. The questionnaire was answered by presidents, directors, or managers who play a representative role in strategic and/or innovative decision-making within cooperatives.

For data analysis, descriptive statistics were first presented, as well as comparisons between groups using the Analysis of Variance (ANOVA) technique and post hoc tests,

specifically the Tukey test. Furthermore, linear regression tests were performed to assess relationships between variables. Statistical tests were performed with a 95% confidence interval.

It is noteworthy that from a literature review, the variables that integrate the constructs were specified. In addition, the validity and reliability of the constructs were verified using the factorial analysis technique, which enabled the assessment of factorial, convergent and discriminant validity, as well as individual and construct reliability. The values that were used as references for such evaluations, and that are based on Hair et al. (2009), are presented in Table 1, below.

Table 1. Reference Values - Validity and Reliability Assessment

	Reference values*
Factor Validity	Factor loadings greater than 0.5
Convergent Validity	Extracted Mean Variance (EMV) greater than 0.5
Discriminant Validity	EMV greater than the square of the correlation between constructs
Individual Reliability	Squares of factorial loads greater than 0.25
Construct Reliability	Composite Reliability and Cronbach's Alpha greater than 0.7

Source: Hair et al. (2009)

RESULTS AND DISCUSSION

Initially, Table 2 presents the descriptive statistics and the mean comparison tests between the segments of the cooperatives in relation to the variables that make up the “innovation” construct.

To compare means between groups, ANOVA was used.

Table 2. Descriptive Statistics and ANOVA – Innovation

Construct	Variables	Variable Labels	Mean	Standard deviation	ANOVA	
					Estimate	Sig.
Innovation	Innov1	New products/services	5,17	1,90	10,467	,000
	Innov2	New production methods	5,40	1,75	4,787	,009
	Innov3	New internal procedures	5,75	1,45	6,029	,003
	Innov4	New logistic methods	5,32	1,60	4,025	,019
	Innov5	New methods of managing external	5,29	1,60	1,063	,347
	Innov6	New knowledge management methods	5,37	1,50	6,935	,001
	Innov7	New sales channels	5,59	1,55	6,378	,002
	Innov8	New pricing methods	5,22	1,63	,218	,804

Source: Research data

Considering that the answers were given on a 7-point scale, mean greater than 4 (which represents an intermediate value between 1 and 7) may indicate expressive innovations, and those less than 3 may indicate inexpressiveness of innovations.

The results of the descriptive statistics of the innovation construct shown in Table 2 reveal means greater than 5 and significant differences (Sig.<0.05) were identified in six of the eight variables that made up the construct.

To identify which segment(s) of cooperativism differs in terms of these variables, the post hoc test was performed, which is shown in Table 3. It should be noted that, for reasons of parsimony and limited space, only the results of the post hoc test involving the difference in the mean of the cooperatives in the credit segment were presented, which showed significant differences.

Table 3. Post hoc Test – Innovation

Variables	(I) Field of Activity of the Cooperative	(J) Field of Activity of the Cooperative	Mean difference (I-J)	Standard model	Sig.
Innov1	Credit	Agricultural	0,896	0,334	0,109
		Transport	1,738*	0,42	0,001
		Work/Production	0,846	0,397	0,338
		Health	1,807*	0,452	0,002
		Consumption	0,659	0,681	0,960
		Infrastructure	1,891	0,723	0,127
Innov2	Credit	Agricultural	0,639	0,314	0,398
		Transport	1,077	0,395	0,097
		Work/Production	0,279	0,373	0,989
		Health	1,512*	0,425	0,008
		Consumption	0,466	0,64	0,991
		Infrastructure	1,252	0,679	0,521
Innov3	Credit	Agricultural	,805*	0,261	0,037
		Transport	1,103*	0,329	0,016
		Work/Production	0,413	0,31	0,837
		Health	0,515	0,353	0,769
		Consumption	0,663	0,533	0,876
		Infrastructure	1,288	0,565	0,259
Innov4	Credit	Agricultural	0,676	0,288	0,226
		Transport	1,332*	0,361	0,005
		Work/Production	0,22	0,342	0,995
		Health	0,45	0,389	0,909
		Consumption	0,564	0,586	0,962
		Infrastructure	1,242	0,622	0,420
Innov6	Credit	Agricultural	,984*	0,273	0,007
		Transport	0,71	0,343	0,374
		Work/Production	0,651	0,324	0,412
		Health	0,569	0,369	0,719
		Consumption	0,432	0,556	0,987
		Infrastructure	0,932	0,59	0,695
Innov7	Credit	Agricultural	0,429	0,277	0,716
		Transport	0,991	0,349	0,072
		Work/Production	0,352	0,329	0,937
		Health	1,329*	0,375	0,009
		Consumption	1,227	0,565	0,316
		Infrastructure	1,102	0,6	0,525

Source: Research data

The results show that credit cooperatives have higher innovation means; moreover, based on the post hoc test, significant differences (Sig.<0.05) were verified in the cooperatives of this segment. This complements the findings by Tulus and Nerang (2020), Duarte et al. (2016) and Mckillop and Wilson (2011), who highlighted the influence of innovation on the results of credit unions.

The hypothesis is that such differences are linked to the significant participation of cooperatives in the credit segment in central cooperatives, and that these play a significant role in innovation.

In view of this, initially, it was verified whether credit unions maintain, in a more expressive way, relationships with central cooperatives. Thus, eleven variables were measured and, using ANOVA, it was verified whether there is a significant difference in the different branches of cooperativism. The results are shown in Table 4.

Table 4. Descriptive Statistics and ANOVA - Central Cooperative Relationship

Construct	Variables	Variable Labels	Means	Standard deviation	ANOVA	
					Estimate	Sig.
Central Cooperative Relationship	Central.C.R.1	Provision of products/services	3,79	2,60	5,735	,004
	Central.C.R.2	Purchase of products/services	3,43	2,48	11,229	,000
	Central.C.R.3	Joint sales	2,66	2,35	10,039	,000
	Central.C.R.4	Joint purchases	2,80	2,36	27,236	,000
	Central.C.R.5	Joint work	3,69	2,54	17,324	,000
	Central.C.R.6	Joint disclosure	3,46	2,49	22,271	,000
	Central.C.R.7	Machine/equipment sharing	2,47	2,25	16,266	,000
	Central.C.R.8	Knowledge sharing	4,19	2,51	16,072	,000
	Central.C.R.9	contact sharing	4,05	2,45	17,545	,000
	Central.C.R.10	Altruistic support among	4,01	2,54	22,026	,000
	Central.C.R.11	Shared Brand(s)	3,57	2,65	36,748	,000

Source: Research data

Based on the results of the ANOVA test shown in Table 4, there were significant differences (< 0.05) in relation to all the variables that make up the “coop relationship” construct. central”. In this way, the post hoc test was carried out with the purpose of identifying which segment(s) of cooperativism differs. Test results are shown in Table 5.

Table 5. Post hoc Test – Central Cooperative Relationship

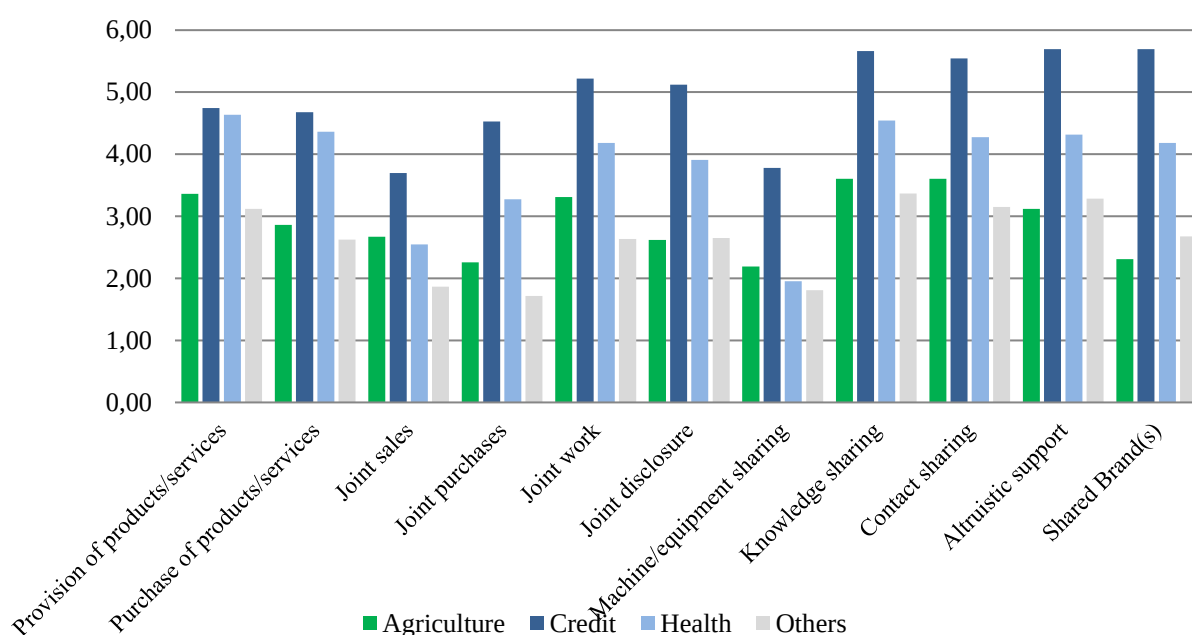
Variables	(I) Field of Activity of the Cooperative	(J) Field of Activity of the Cooperative	Mean difference (I-J)	Standard model	Sig.
Central.C.R.1	Credit	Agricultural	1,384	0,468	0,053
		Transport	1,635	0,589	0,085
		Work/Production	1,746*	0,556	0,031
		Health	0,109	0,633	1,000
		Consumption	1,496	0,954	0,703
		Infrastructure	1,174	1,013	0,908
Central.C.R.2	Credit	Agricultural	1,808*	0,431	0,001
		Transport	2,040*	0,542	0,004
		Work/Production	2,014*	0,512	0,002
		Health	0,306	0,582	0,998
		Consumption	1,795	0,878	0,391
		Infrastructure	2,527	0,932	0,101
Central.C.R.3	Credit	Agricultural	1,023	0,418	0,186
		Transport	1,769*	0,526	0,016
		Work/Production	1,914*	0,497	0,003
		Health	1,149	0,565	0,397
		Consumption	1,07	0,853	0,871
		Infrastructure	2,552	0,905	0,076
Central.C.R.4	Credit	Agricultural	2,267*	0,385	0,000
		Transport	2,674*	0,484	0,000
		Work/Production	2,900*	0,457	0,000
		Health	1,253	0,52	0,200
		Consumption	2,400*	0,784	0,040
		Infrastructure	3,383*	0,832	0,001
Central.C.R.5	Credit	Agricultural	1,910*	0,432	0,000
		Transport	2,480*	0,543	0,000
		Work/Production	2,533*	0,513	0,000
		Health	1,039	0,584	0,564

		Consumption	2,345	0,881	0,113
		Infrastructure	3,506*	0,935	0,004
Central.C.R.6	Credit	Agricultural	2,498*	0,418	0,000
		Transport	2,489*	0,525	0,000
		Work/Production	2,494*	0,496	0,000
		Health	1,21	0,565	0,333
		Consumption	2,619*	0,852	0,038
		Infrastructure	2,119	0,904	0,229
Central.C.R.7	Credit	Agricultural	1,590*	0,391	0,001
		Transport	1,780*	0,491	0,007
		Work/Production	1,936*	0,464	0,001
		Health	1,825*	0,528	0,012
		Consumption	2,155	0,797	0,102
		Infrastructure	2,637*	0,845	0,033
Central.C.R.8	Credit	Agricultural	2,058*	0,433	0,000
		Transport	1,994*	0,544	0,006
		Work/Production	2,380*	0,514	0,000
		Health	1,116	0,585	0,478
		Consumption	2,661*	0,882	0,045
		Infrastructure	2,661	0,936	0,072
Central.C.R.9	Credit	Agricultural	1,939*	0,421	0,000
		Transport	2,542*	0,53	0,000
		Work/Production	2,199*	0,5	0,000
		Health	1,27	0,569	0,284
		Consumption	2,667*	0,859	0,035
		Infrastructure	2,4	0,911	0,121
Central.C.R.10	Credit	Agricultural	2,574*	0,429	0,000
		Transport	2,362*	0,539	0,000
		Work/Production	2,445*	0,509	0,000
		Health	1,377	0,579	0,214
		Consumption	2,57	0,874	0,055
		Infrastructure	2,266	0,927	0,186
Central.C.R.11	Credit	Agricultural	3,385*	0,421	0,000
		Transport	2,954*	0,529	0,000
		Work/Production	3,132*	0,499	0,000
		Health	1,513	0,568	0,113
		Consumption	3,195*	0,857	0,005
		Infrastructure	2,552	0,909	0,079

Source: Research data

Based on the results of the post hoc test, significant differences (Sig.<0.05) were identified in the credit segment cooperatives. It was observed that the relations between singular cooperatives and central cooperatives occur, in a more expressive way, in this branch of cooperativism. This result corroborates the findings by Martins et al. (2017), who emphasized the significant relationships between credit unions and their centrals. Figure 1 shows the averages of the variables that make up the “Central Cooperative Relationship” construct.

Figure 1. Descriptive Statistics Graph - Central Cooperative Relationship



Source: Prepared by the authors

It is possible to observe in Figure 1 that the relationships between singular and central cooperatives in the credit segment are extensive. Such relationships between singular and central were identified in the other segments of cooperativism, but more expressively in the credit branch.

This distinction is perceived in the vast participation of cooperatives in this sector in central, 2nd degree cooperatives and cooperative systems, such as Sicredi and Sicoob.

It is suggested, therefore, that there is a greater influence of the central cooperative on innovation in the context of credit unions. To test this hypothesis, a regression test was performed to assess the relationship between these constructs.

For this, the validity and reliability of the constructs “innovation” and “central cooperative relationship” were analyzed previously. Thus, the factor loadings were obtained and analyzed, as well as the Composite Reliability, Cronbach's Alpha and the Mean Variance Extracted (EMV). It should be noted that such analyzes were made both for the context of the cooperatives of the segments in general, and specifically for the cooperatives of the credit branch. The results are presented in Table 6, below.

Table 6. Factor Loadings, Composite Reliability, Cronbach's Alpha and EMV

Factors	Variables	Cooperatives – General				Cooperatives - Credit			
		Factorial Loads	Composite Reliability	Cronbach's Alpha	EMV	Factorial Loads	Composite Reliability	Cronbach's Alpha	EMV
Innovation	Innov1	0,65	0,925	0,921	0,607	0,62	0,931	0,926	0,629
	Innov2	0,75				0,81			
	Innov3	0,84				0,81			
	Innov4	0,82				0,89			
	Innov5	0,81				0,74			
	Innov6	0,78				0,90			
	Innov7	0,83				0,77			
	Innov8	0,75				0,77			

Central Cooperative Relationship	Central.C.R.1	0,72				0,63			
	Central.C.R.2	0,71				0,70			
	Central.C.R.3	0,76				0,64			
	Central.C.R.4	0,75				0,75			
	Central.C.R.5	0,92				0,92			
	Central.C.R.6	0,87	0,953	0,952	0,649	0,86	0,955	0,953	0,663
	Central.C.R.7	0,69				0,65			
	Central.C.R.8	0,91				0,95			
	Central.C.R.9	0,89				0,90			
	Central.C.R.10	0,87				0,95			
	Central.C.R.11	0,72				0,91			

Source: Research data

Based on the results shown in Table 6, it was observed that all the variables that made up the constructs had factor loadings greater than 0.5, therefore expressing factorial validity. Furthermore, it was found that the constructs showed EMV results greater than 0.5, demonstrating convergent validity. Regarding the discriminant validity, it was verified that all constructs presented EMV results greater than the square of the correlation between them, which were, respectively, 0.07 (cooperatives in general) and 0.38 (credit cooperatives), thus demonstrating discriminant validity.

In continuity, factorial loads squared are greater than 0.25 and therefore have individual reliability. Finally, all constructs showed Composite Reliability and Cronbach's Alpha results greater than 0.7, expressing that the constructs are reliable.

That said, the constructs “innovation” and “central cooperative relationship” can be considered valid and reliable for the regression tests, which are presented in Table 7.

Table 7. Regression Test – Central Cooperative Relationship and Innovation

	Independent Variable	Dependent Variable	Regression Coefficient	Standard Error	T	Sig.
Cooperatives - General	Central Cooperative Relationship	Innovation	0,26	0,066	3,049	0,002
Cooperatives - Credit	Central Cooperative Relationship	Innovation	0,62	0,085	3,783	***

Source: Research data

According to the results of the regression, relationships with credit centers – the segment that presents the highest intensity of relationships between cooperatives and centrals – has contributed more significantly to the innovation of individual cooperatives ($R^2=0.62$) than the other branches of activity ($R^2=0.26$). It should be noted that both regression results were statistically significant ($\text{Sig.}<0.01$).

It is inferred, therefore, that central cooperatives can exert a greater influence on innovation when singular cooperatives maintain strong relational ties with them, as was more widely observed in the context of credit cooperatives.

This, however, does not refer to the undoubted contribution of central credit cooperatives to innovation, nor to the non-existent contribution of centrals in other segments, it only shows that these activities are influenced by the intensity of relations between centrals and individual cooperatives, as more significantly observed in the credit segment.

As Granovetter (1985) points out, complex and recurrent transactions require long-term relationships and, consequently, maximize trust. Arruda et al. (2017) identified a greater participation of credit unions in centrals as a way for them to engage in more complex and riskier transactions. Therefore, regardless of the segment, the centrals exert a greater direct influence on innovations when the singular cooperatives maintain expressive relational ties with them.

It was identified that central cooperatives can influence the innovation of singular cooperatives, mainly in the context of the credit segment.

In this sense, innovation can be made possible through joint action promoted by central cooperatives. Furthermore, for carrying out innovation activities that demand greater integration (for example, linking technologies and resources), central cooperatives can represent a central point in the network of relationships between cooperatives; in this position, they can safeguard strategic assets derived from innovation activities.

As emphasized by Del-Corte-Lora et al. (2016), knowledge is one of the main drivers of innovation, and, therefore, sharing such a resource can significantly influence innovation. It should be noted, however, that external access to knowledge and other resources relevant to innovation requires a certain proximity and trust between the actors involved in such sharing.

In this perspective, the central cooperative can play two important roles in promoting innovation: it can act in the centralization of innovation activities, as well as it can facilitate the formation of intercooperative networks, to favor the transfer of knowledge and resources between cooperatives that are linked to it.

It is noteworthy, however, that the joint performance of innovation activities often demands long-term ties and they can reflect positively or negatively on the cooperative's image. This is because it may involve significant complexity for future dissolution, as well as large investments made jointly.

It is emphasized that innovation activities shared between cooperatives and centrals will generally demand formal control mechanisms, such as explicit contracts. It should be noted, however, that, due to limited rationality, there are aspects that may not be expressed in contracts.

In this sense, the greater the degree of integration and complexity of dissolution of shared innovation activities, the more significant will be the need for informal control mechanisms, such as trust, as well as previous long-term relationships, which, according to Dyer and Singh (1998) and Arruda et al. (2017), minimizes transaction costs and influences the willingness of partners to share knowledge and resources.

Therefore, even though the relationship between cooperatives and centrals makes it possible to expand the scale for the development of innovation activities, according to Górriz-Mifsud et al. (2016), it will require a high level of confidence to partially minimize the risks derived from the complexity of dissolution and future decisions.

As it was identified in the present study that credit unions maintain frequent relationships with their centrals, trust for the transfer of resources and the execution of joint innovation activities will increase, since, according to Sartorelli et al. (2019) and Yu et al. (2006), such transactions favor a safer assessment for achieving and maintaining relationships.

In this sense, opportunistic behavior, both by individual and central cooperatives, will tend to be minimized because, as advocated by Ring and Ven (1992) and Shipilov (2009), the more frequent the transactions with a given actor, the more expressive the stock will be. of information and, thus, there will be greater predictability of their actions. Furthermore, according to Putnam (2006), such behavior would jeopardize the benefits of possible future transactions, which discourages inappropriate practices.

Furthermore, the reputation of central cooperatives, in addition to minimizing the risks involved in establishing and maintaining relationships (Putnam, 2006; Walker et al., 1997), can maximize the reputation of the focal cooperative itself (Lavie, 2007; Górriz-Mifsud et al., 2016). Thus, the status or prestige generated by the relationship with highly reputable central cooperatives is as important as the quality and characteristics of a product.

In continuity, the central cooperative plays an important role in the formation of a closed network involving the singular cooperatives that are integrated to it, because, firstly, there is a greater proximity between the cooperatives due to the decisions that are taken in a shared way, as well as by the need for managerial alignment, integrated operations and joint marketing.

The closed network made possible by the central cooperatives influences the dissemination of positive or negative information among the cooperatives that make up the network, discourages practices considered inappropriate, favors the emergence and expansion of social capital – a valuable resource – and enables the maintenance of a position of competitive advantage.

This characteristic enables the transfer of knowledge and resources necessary for innovation. This happens, as defended by Coleman (1988, 1990) and Tremblay et al. (2019), because social relationships are governed by rules, norms and social obligations. In this way, a closed relational structure favors trust and enables collective sanctions (or even ostracism in case of inappropriate actions). Cooperatives that, for example, act based on the free-rider effect will suffer collective sanctions, since the closed network, formed through the central, will increase the possibility of diffusion of these behaviors among the other cooperatives, which will minimize the incentive for such practices.

In addition, the frequent relationships fostered by closed networks favor reciprocity actions, since this, as defended by Rivera et al. (2010), is associated with relationship stability. Therefore, a cooperative can, for example, provide privileged access to certain knowledge and resources necessary for innovation in the expectation of being rewarded in the future.

In this sense, individual cooperatives can maintain cooperative and non-opportunistic behavior not because they have internalized such social norms, but to the detriment of collective sanctions to which they may be subject, and in order not to risk the benefits derived from their good conduct, such as reciprocity in the transfer of rights. resources for innovation.

It should be noted that for the appropriation of the benefits of innovation activities developed jointly between cooperatives and centrals, it is necessary that there be complementarity between internal resources and resources derived from relationships. Otherwise, the benefits of innovation will be appropriated by other cooperatives or even by the central.

This condition is in line with what Kogut and Zander (1992) called “combinative capacity” and the emphasis given by Penrose (1959) to combinations of resources. That is, the resources accessed by cooperatives through the relationships undertaken must be combined with existing assets so that they are difficult to imitate; otherwise, such cooperatives will not benefit from their trajectory of already consolidated competences.

The need for complementarity of resources in the formation of the cooperative's stock of knowledge is also highlighted, since researchers such as Shipilov (2009) and Nahapiet and Ghoshal (1998) identified that the learning process must be linked to the organization's previous trajectory. Thus, as the cooperative moves away from its core capabilities, the probability of obtaining significant returns decreases.

Such complementarity favors the absorption capacity of external knowledge necessary for innovation, which, according to Cohen and Levinthal (1990), depends on prior

related knowledge. Therefore, for the appropriability of external knowledge derived from the relations between cooperatives and centrals, a balance between external and internal knowledge is necessary.

CONCLUSION

It was identified that central cooperatives exert influence on the innovation of individual cooperatives, especially if they maintain expressive relational ties, as more widely observed in credit cooperatives.

Previous studies have identified that interorganizational relationships influence the promotion of innovation (Cui et al., 2018, Radziwon & Bogers, 2018, Xie & Wang, 2020). However, even though the literature has emphasized such relationships, the context of cooperativism was little explored.

Understanding how these relationships are made possible and what results they generate for cooperatives are important elements to be investigated.

Understanding that interorganizational relationships are important for the development of innovation, an analysis of relationships with central cooperatives and the aspects influenced by them was appropriate.

Furthermore, the investigation of the social capital fostered by cooperatives presents itself as an important theoretical implication from the point of view of authors such as Putnam (2006) and Coleman (1988, 1990), who emphasized that social relationships are governed by rules, norms and social obligations. These aspects are observed in cooperativism, especially with cooperatives that are part of credit centers, since there is the development of strong ties, long-term relationships and closed networks, which influence actions of reciprocity and trust.

In this sense, it will be possible to make a more secure assessment for the achievement and maintenance of relationships, and opportunistic behaviors will tend to be minimized, since the significant frequency of transactions will increase the volume of information, which, according to Ring and Ven (1992) and Shipilov (2009), will promote greater predictability of the actions of the actors involved and such behaviors, as emphasized by Putnam (2006), would jeopardize the benefits of future transactions.

The study contributes with an approach to social capital, both through research on cooperativism and on the role of central cooperatives in the formation of social capital. Cooperatives are characterized similarly to other organizations that operate in networks, however, their configuration provides an institutional, or even social, framework that restricts opportunism, and relationships for the pursuit of common benefits are framed as the only or restricted possibility of helping organizational performance. From a practical/managerial point of view, firstly, the results of the study shed light on the execution of processes that favor innovation on the part of cooperatives.

Many cooperatives may require external investments and/or resources for their innovation activities. Although the government can still be one of the sources of resources for the innovation process (mainly financial, physical/technological and knowledge), central cooperatives can favor access to such resources.

In this sense, it is suggested that individual cooperatives expand their links with central cooperatives and develop strong relational ties with them, thus enabling the development of their innovation capabilities, especially about access to external resources and knowledge.

It should be noted that the study had some limitations. Regarding the role of central cooperatives in the development of closed networks, the study was based on a limited

amount of empirical evidence. Thus, studies that use social network measures could complement the investigation and favor the generalization of such findings.

Furthermore, it is suggested that studies with a qualitative approach expand the investigation on the role of central cooperatives in the development of innovation. It is also suggested that studies on Blockchain technology and open finance be pursued as future research related to the centralization of innovation. Finally, it is suggested that they investigate the moderation of internal R&D activity on the influence of the relationship with a central cooperative on innovation.

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