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Performance Measurement System and Team Effectiveness: The Mediating Role of Perceived Collective Efficacy in a Credit Cooperative

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Abstract

Objective: To analyze the influence of the Diagnostic and Interactive Use of the Performance Measurement System (PMS) on team effectiveness.
Method: The study was quantitative, conducted through a survey applied in a credit cooperative. For data analysis, Structural Equation Modeling (PLS-SEM) was used. Two samples were identified: the first with 174 employees and the second with 77 teams from Service Points (SPs).
Results: The results indicated that the use of the PMS alone did not show a significant direct relationship with team effectiveness. However, perceived collective efficacy was positively related to effectiveness, acting as a mediating variable.
Contributions: This research contributes by demonstrating that the emphasis managers place on the PMS, more than the system itself, influences collective beliefs and indirectly impacts team results. The study highlights theoretical and practical implications for people management, leadership, and managerial control in cooperative organizational environments.

Keywords: Performance Measurement System; Team effectiveness; Perceived collective effectiveness; Social Cognitive Theory; Control Levers.

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Introduction

In the competitive and dynamic scenario of organizations, the ability to achieve superior results increasingly depends on the effective performance of work teams (Lewis, Sutton & Brown, 2024). Teams are central to solving organizational problems and contribute directly to productivity and goal achievement (Reis & Puente-Palacios, 2019).

In recent years, credit unions have stood out as a growing sector in Brazil. According to data from the Central Bank, these institutions have shown accelerated growth in the number of members, assets and regional relevance. This context makes it urgent to understand the mechanisms that favor team effectiveness in this type of organization, especially considering its collective structure and focus on shared goals.

According to Mahama and Wang (2023), teams have been gaining prominence in the accounting literature because they are directly influenced by management control systems. Employee motivation, in this sense, becomes a relevant factor for organizational performance. Authors such as Wibbeke and Lachmann (2020) reinforce the importance of integrating accounting studies with psychological approaches, with a view to gaining a broader understanding of organizational behavior.

Among the psychological theories with the greatest explanatory potential in this field, the Social Cognitive Theory (SCT) proposed by Bandura (1997) stands out. At the collective level, SCT works with two central constructs: (i) perceived collective efficacy, i.e. the belief shared by team members in their ability to achieve the desired results; and (ii) team effectiveness, understood as the degree of success in achieving goals, considering both the quantity and quality of performance (Schunk & DiBenedetto, 2020).

Previous studies have shown that formal control mechanisms can influence these constructs, especially by providing direction, feedback and performance criteria (Simons & Dávila, 2021). Within this scope, the Performance Measurement System (PMS) stands out, which is responsible for assessing the achievement of results in an organization (Neely, Gregory & Platts, 1995). Simons' model (1994) categorizes the use of the PMS in two ways: diagnostic use, which monitors results and goals in a structured way; and interactive use, which promotes informal exchanges between managers and employees, stimulating learning and innovation (Chong & Mahama, 2014; Simons, 1994).

In view of this, this study aims to analyze the influence of the Diagnostic and Interactive Use of the Performance Measurement System (PMS) on team effectiveness mediated by perceived collective efficacy, in a credit cooperative located in the southern region of Brazil. The choice of a single cooperative is justified by the need for in-depth access to data, methodological control and contextualized analysis of a real case with a strong team structure and declared use of PMS.

The proposal of mediation by collective efficacy is based on the premise of SCT that belief in collective capabilities precedes group performance (Bandura, 1997), which therefore represents a fundamental explanatory link between the use of PMS and team results.

This research contributes to the literature on teams by applying the constructs of Social Cognitive Theory (Bandura, 1997; Schunk & DiBenedetto, 2020) in conjunction with management control mechanisms, an articulation that is still incipient in management accounting (Henri, 2006; Wibbeke & Lachmann, 2020), especially in cooperative environments, where the literature lacks in-depth empirical studies (Pilonato & Monfardini, 2020).

In addition, it advances the management accounting literature by exploring the effects of the emphasis on PMS on behavioral variables, such as collective belief, motivation and leadership - topics that have been recognized as essential, but still under-explored in quantitative research in the area (Caglio & Ditillo, 2021; Mahama & Wang, 2023).

Finally, the study presents relevant implications for organizations with unique characteristics, such as credit unions, whose participatory governance and decentralized structure require specific approaches in the analysis of management control and performance (Reis & Puente-Palacios, 2019; Tuomela, 2005).

The article is structured in five sections, in addition to this introduction. Section 2 presents the theoretical framework and the research hypotheses, relating the use of PMS to the constructs of SCT. Section 3 describes the methodological procedures. Section 4 deals with the analysis and discussion of the results. Finally, section 5 presents the conclusions and suggestions for future studies.

2 Theoretical Framework and Hypotheses

2.1 Social Cognitive Theory and the Use of PMS

Social cognitive theory emerged in the mid-1970s, formulated by psychologist Albert Bandura. Among the various facets of the theory, the focus on positive psychology stands out, with the area of human agency being the focus of study. This area refers to knowledge of individual characteristics (motivation, cognition, affect and the external environment) and how the interaction

between these characteristics influences human behavior (Schunk & DiBenedetto, 2021). The study of human agency is divided into three areas: individual agency, delegated agency and collective agency. The interest in this study is in collective agency, which analyzes individual characteristics in a collective way, as Bandura (1997) points out.

Collective agency presents the concept of perceived collective efficacy, defined as people's shared beliefs in their collective power to produce desired results (Bandura, 1997). In this way, perceived collective efficacy influences the future effectiveness of teams, due to the concern of group members in the use of resources offered and the level of team effort (Schunk & DiBenedetto, 2020). Team effectiveness, on the other hand, is conceptualized as the achievement of organizational results, stemming from the team's collective belief, which translates into the achievement of strategic objectives (Bandura, 1997).

Cognitive social theory meets the need for specific studies of collective agency to assess perceived collective efficacy and how this motivates the group towards greater signs of team performance. Chong and Mahama (2014), when analyzing the constructs of perceived collective efficacy and team effectiveness related to aspects of the corporate budget, showed how the interactive use of the budget influences perceived collective efficacy and team effectiveness. In this context, PMS can also be analyzed with the constructs of social cognitive theory. In Brazil, studies such as Beuren, Santos and Bernd (2020) and Santos et al. (2022) have also adopted SCT as a theoretical basis for investigating organizational phenomena, reinforcing its relevance for understanding collective behavior and the influence of control practices.

In organizations, PMS is responsible for encouraging behavior and thus influences the achievement of results and the implementation of strategies. PMS can also be seen from the perspective of controlling results, and is used by management in a diagnostic and interactive way, according to Simons' model (1994). The diversified use of PMS generates interaction and feedback between team members, positively influencing team effectiveness (Lewis, Sutton & Brown, 2024). The use of PMS can be studied under the theoretical lens of social cognitive theory.

In addition, PMS is expressed through performance indicators that aim to compare results in relation to established goals and is defined by its function of measuring, i.e. quantifying how well the organization is achieving results in relation to what has been pre-established (Neely et al., 1995). The use of the PMS can affect, for example, the efficiency of performance measures and, in this way, diagnostic use and interactive use, which are part of the CG literature through the "Simons Levers of Control" model, become important for understanding the diversity of use that the PMS has in organizations (Simons, 1994).

Simons (1994) proposes four types of control mechanisms: belief system, limit system, diagnostic control system and interactive control system. The so-called control levers function as "forces" in organizations, being positive (belief and interactive) and negative (limit and diagnostic). For Simons (1994), the use of diagnostic and interactive control systems can occur in the same organization in an interdependent way. More recent studies have reinforced the importance of the combined use of these levers as a way of balancing control and flexibility, amplifying the effects on organizational behavior and collective performance (Mahama & Wang, 2023; Tessier & Otley, 2012; Widener, 2007).

2.2 PMS Use and Team Effectiveness

Because it is a formal control, the use of diagnostics allows managers to monitor the effectiveness of teams, which can help them achieve their objectives (Simons, 1994). This monitoring seeks to compare the team's results with what was planned and favors the exchange of information between peers about the performance achieved, one of the main characteristics of diagnostic use (Simons, 1994). Thus, according to Tessier and Otley (2012), the diagnostic use of PMS tends to increase performance levels, as it performs this monitoring function. These issues are also taken into account for the effectiveness of teams, increasing the results achieved by the group (Bandura, 1997). For Capiola et al. (2019), one factor that tends to increase team effectiveness is the group's focus on the activities carried out, which is consistent with the role of the diagnostic use of PMS. National studies, such as Beuren, Santos and Bernd (2020), have also identified positive correlations between the diagnostic use of management systems and team performance indicators, especially when applied with a focus on operational objectives and goals.

However, in the study by Chong and Mahama (2014), the diagnostic use of the budget had a negative effect on team effectiveness. The results of the study show how the sector of companies can influence management, as the study deals with companies in the biotechnology sector, which tend to be constantly innovative. Diagnostic use is characterized as a rigid control, as it may not influence the effectiveness of teams, but rather the context of the business. The assumption of a positive relationship between the diagnostic use of PMS and team effectiveness is based on the direction and focus that diagnostic use brings to teams, leading to greater effectiveness in achieving results. Even so, some authors argue that diagnostic use, when isolated, can limit strategic flexibility and adaptation, and is more effective when used in a complementary way to

interactive use (Ferreira & Otley, 2009; Widener, 2007).

Based on the discussion of the previous research, the following hypothesis is formulated: **H1a: The diagnostic use of PMS directly and positively influences the effectiveness of teams.**

The interactive use of the PMS generates new perspectives for teams in relation to performance, which favors communication and interaction between managers and other employees (Henri, 2006). For Pilonato and Monfardini (2020), interactive use must be clearly understood in organizations and by researchers, as its main function is interaction between the parties in order to bring benefits to the organization. The characteristics of the interactive use of PMS influence the organization's strategic capabilities, promoting competitive advantage (Henri, 2006). For the author, competitive advantage can occur through the influence of this use of PMS on teams, including between teams (Henri, 2006). The interactive use of PMS can improve the achievement of goals and facilitate team effectiveness, which is related to emerging strategies and strategic business uncertainties (Mahama & Wang, 2020).

Through the interactive use of PMS, teams can achieve better than expected results, as the interaction between peers ultimately influences the quality, agility and timeliness of business decisions and team performance (Chong & Mahama, 2014; Simons, 1994). This view is reinforced by Beuren, Santos and Bernd (2020), who show that interactive use is related to strengthening collective effectiveness and improving strategic communication. In addition, studies such as that by Tessier and Otley (2012) point out that diagnostic and interactive systems can coexist in the same organization, being used in a complementary and strategic way.

Based on these discussions, we propose: **H1b: The interactive use of the Performance Measurement System directly and positively influences the effectiveness of teams.**

2.3 Use of the PMS and Perceived Collective Effectiveness

Perceived collective efficacy was analyzed in studies dealing with the budget, psychology and transformational leadership (Capiola et al., 2019; Chong & Mahama, 2014; Lin et al., 2019), in which external factors were tested that could increase the teams' beliefs. In this study, it is argued that one of the factors that can increase the teams' level of belief is also the diagnostic use of PMS, which is discussed below. National studies such as those by Beuren, Santos and Bernd (2020) also highlight collective efficacy as a relevant mediating variable between control practices and collective performance, which reinforces its applicability in the Brazilian context.

Another important element that influences perceived collective efficacy is role clarity, a result found by Capiola et al. (2019). Diagnostic use can influence perceived collective efficacy in terms of making the roles of each team member clear, both in terms of function and the general role of the group (Tuomela, 2005). Role clarity is an element that helps increase perceived collective efficacy and decreases team inefficiency (Winsborough & Chamorro-Premuzic, 2017). This relationship is also supported in recent national literature, such as Santos et al. (2022), who highlighted the importance of role structuring in strengthening collective beliefs.

According to Simons (1994), diagnostic use is considered a formal control, deepening the responsibility of the members of an organization in relation to its goals. In this way, the diagnostic use of PMS is considered beneficial for perceived collective efficacy, as teams need direction in relation to goals, monitoring of results, exchange of information in meetings and clarity of roles. Based on the above, the following hypothesis was established:

H2a: The diagnostic use of PMS is directly and positively related to perceived collective efficacy.

When team members have good guidance from their superiors, with interaction between the parties facilitating the bond of dialog and task learning, teams tend to increase their belief in the potential they can achieve (Simons, 1994). The interactive use of PMS leads to the search for new opportunities, the improvement of learning and the implementation of strategies (Henri, 2006), in order to influence the search for the achievement of the goals that have been set for the team.

Perceived collective effectiveness is associated with the degree of individual and group effort in accomplishing tasks (Schunk & Usher, 2019). Communication is considered valuable for the perceived collective efficacy of teams. As communication occurs, teams feel motivated and, as a result, levels of trust and belief increase (Bandura, 1997). In this way, the face-to-face discussion that interactive use makes possible for managers will facilitate the search for problem-solving between teams, which could increase the group's communication levels. Mahama and Wang (2023) reinforce this understanding by showing that interactive use favors collective engagement and contributes to strengthening perceived collective efficacy, especially in cooperative and collaborative environments.

Considering the arguments used, the following hypothesis is presented: **H2b: The interactive use of the Performance Measurement System has a direct and**

positive relationship with perceived collective efficacy.

2.4 Use of the PMS, Perceived Collective Effectiveness and Team Effectiveness

Social Cognitive Theory presents the understanding that perceived collective efficacy precedes team effectiveness, which consists of achieving the organizational objectives that have been proposed to a group (Schunk & DiBenedetto, 2020). As such, perceived collective efficacy can be strengthened by four characteristics.

The first refers to the group's past experiences, focusing on challenging experiences in which the team was successful. The second element consists of a team's comparison factors with others. The third is social persuasion, which increases belief levels, as the group is motivated to reach higher levels than they are being challenged. Finally, the fourth element covers individual emotional states, such as tension, which can lead to poor performance or hinder the exchange of information between team members (Bandura, 1997).

Under these conditions, it is possible to observe the influence of diagnostic use and interactive use. Interactive use supports organizational learning, while diagnostic use supports monitoring and the exchange of information through formal meetings (Widener, 2007). It can be seen that the diagnostic use of the PMS can influence the construct of perceived collective efficacy due to its role in providing feedback and monitoring teams (Simons, 1994), while the interactive use of the PMS stimulates debate between managers and helps to propose new strategies (Chong & Mahama, 2014). National studies reinforce this relationship, such as Santos et al. (2022), who point to the mediation of collective efficacy between management practices and team performance, especially in contexts with a participatory focus.

Perceived collective efficacy, on the other hand, is the basis for good performance, under the lens of Social Cognitive Theory. Teams in an organization can be affected when collective efficacy is low, due to members not being motivated to achieve proposed goals (Capiola et al., 2019). Since team effectiveness is influenced by collective efficacy, factors such as the use of PMS can improve team beliefs. This includes diagnostic and interactive use (Chong & Mahama, 2014; Henri, 2006). More recent empirical studies confirm this mediating effect of collective efficacy, including its application in cooperative sectors (Mahama & Wang, 2023; Beuren et al., 2020).

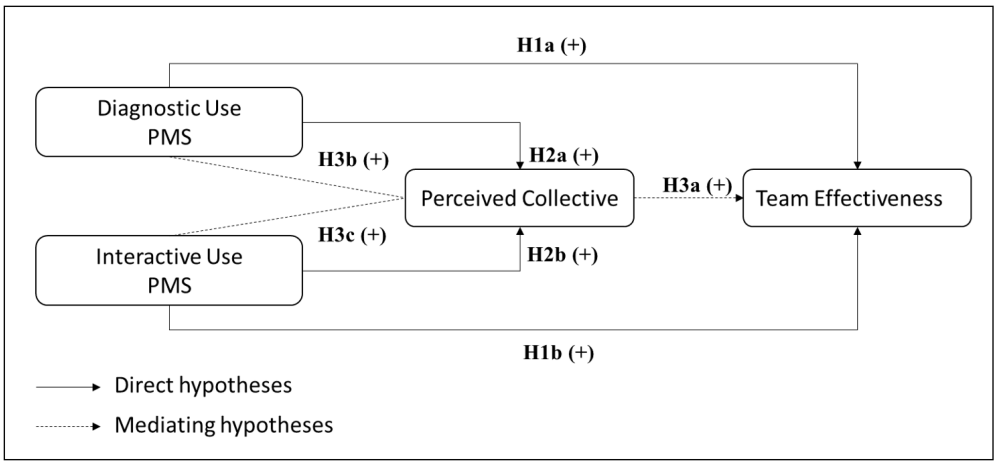
In this sense, the following hypotheses are formulated: H3a: Perceived collective efficacy is directly and positively related to team effectiveness.

H3b: The relationship between the diagnostic use of PMS and team effectiveness is positively mediated by perceived collective efficacy.

H3c: The relationship between the interactive use of the PMS and team effectiveness is positively mediated by perceived collective efficacy.

Figure 1 shows the theoretical model with the expected relationships discussed in the research hypotheses.

Figure 1 - Theoretical model



Source: Prepared by the author based on the literature review.

3 Methodological Procedures

A survey was carried out with employees of a credit cooperative in the southern region of Brazil. This type of business bears witness to factors that are essential for the purpose of this study, as pointed out by Simons (1994) and Bandura (1997): (i) organizational structure and the use of management control mechanisms; (ii) use of a performance measurement system, with financial and non-financial measures; (iii) teams that work together to achieve goals.

It should be noted that in this cooperative, results are promoted and monitored in teams, and the Profit Sharing Plan is also passed on collectively, making it possible to assess the influence of the use of the PMS on teams. In the cooperative, diagnostic use takes place by monitoring results, meetings, goals and performance indicators. Interactive use, on the other hand, takes place on a day-to-day basis, through informal controls that involve discussing strategies and improving services in order to achieve targets.

A questionnaire was administered to 1,528 employees in 102 teams. In total, 271 questionnaires were accessed, of which 11 did not complete the survey, making 260 valid questionnaires. However, some procedures were adopted to delimit the study sample and eliminate response bias. Firstly, only respondents who worked at the Service Points (SPs) were considered, excluding participants linked to the cooperative's administrative headquarters. Next, questionnaires from respondents who had been working at the institution for less than a year were eliminated, as they were not yet sufficiently integrated into their work teams. In addition, questionnaires with a uniform response pattern (same alternative in all questions), which indicated potential inattention or response bias, were disregarded. Finally, responses from participants who did not identify which team they belonged to were excluded, making it impossible to include them in the aggregate analysis by team.

Table 1. Study sample

Sample description	Number of responses
Questionnaires sent	1528
Respondents	271
(-) Unauthorized	11
Valid answers	260
Total number of teams	86
(-) Administrative headquarters	37
(-) Less than 1 year in the cooperative	18
(-) Answered the same alternative for all questions	17
(-) Did not identify the team	14
Total number of participants	174
Total number of teams	**77**

Source: Prepared by the author based on material provided by the Cooperative.

After these exclusion criteria - which totaled 86 disregarded questionnaires - the final sample consisted of 174 respondents, i.e. approximately 11% of the total population. These participants were distributed among 77 teams, which represents 86% of the 89 teams active in the SPs. Table 1 shows the details of the sample after exclusions. This number of responses makes it possible to carry out the planned statistical procedures, since it meets the criteria of effect size (average effect of 0.15); significance level of $\alpha = 5\%$; and sample power of ($1- \beta = 0.8$), as attested to by G*power (Faul et al., 2009).

3.1 Research instrument

The survey instrument consists of two blocks. In the first block (Appendix A), the statements were presented on a seven-point Likert scale. For the diagnostic and interactive control systems, the questions prepared by Henri (2006) were used. In the diagnostic control systems, five questions captured information on key measures and progress towards targets. Interactive control systems were measured using seven questions related to the use of planning and control mechanisms involving managers and employees.

Perceived collective efficacy and team effectiveness were measured according to the questions developed by Chong and Mahama (2014). In the case of perceived collective efficacy, there were four questions that captured the phenomenon. In the case of team effectiveness, there were six questions relating to how employees are affected by the proposed goal. The research construct is shown in Table 2.

Table 2. Information on the study's research instrument

Construct	Assertion items	References	Number of items	Scale
Use Diagnosis of PMS	Follow up; monitor; compare results; review established goals.	Henri (2006)	4	Likert type 7 points
Interactive use of PMS	Face-to-face discussion; support for new challenges; Debates and organizational learning; Problem solving; Critical success factors		7	
Perceived Collective Effectiveness	Ability to perform tasks as a team; Team problem solving; Belief in team competence	Chong and Mahama (2014)	4	Likert type 7 points
Team effectiveness	Achievement; Quantity; Quality; Operational efficiency; Member satisfaction; Meeting deadlines		6	

Source: Prepared by the author

The second block consisted of questions characterizing the respondent and the cooperative. The instrument sought information on current position, length of time in the cooperative, number of team members, age, gender and education.

3.2 Data analysis procedures

To test the proposed hypotheses, Structural Equation Modeling (SEM) was used, as discussed by Hair Jr Black et al. (2009), which helps to understand the complex relationships between variables. It is important to note that the relationship parameters indicate the impact of the independent variables on the dependent variables, according to Marôco (2014). In addition, we checked the reliability of our data using three methods: Cronbach's Alpha (CA.), Composite Reliability (CR) and Average Variance Extracted (AVE).

Cronbach's Alpha considers values close to 1 to mean greater reliability, accepting values above 0.7 as adequate (Cronbach, 1951). Hair et al. (2009) points out that Cronbach's Alpha does not take into account errors in the indicators, making Composite Reliability necessary. Composite Reliability also accepts values above 0.7 and assesses the internal consistency of the items. Average Variance Extracted measures the overall variance of the indicators and suggests values above 0.5. We carried out the Discriminant Validity Test (HTMT) to ensure that a construct is distinct and captures aspects not covered by other measures.

The HTMT criterion is that each item measured is related to only one latent construct (Hair et al., 2009). For our analysis, we adopted the method recommended by Fornell and Larcker (1981), which involves comparing the variance extracted for any two constructs with the estimated squared correlation between these constructs. As our data comes from a survey with data (exogenous and endogenous) from the same source (same respondent, response format, collection method and at the same time), we performed the Harman test, as considered by Mackenzie and Podsakoff (2012).

The method does not consider the structural model (relationships of latent variables) and the measurement model (relationships of indicators and latent variables), in which it estimates the Exploratory Factor Analysis (EFA) with the total of items from the same analysis and which uses the method of unrotated principal components (Bido, Mantovani & Cohen, 2018). Thus, the method considers the existence of bias when the solution results in a single extracted factor or a single factor extracts most of the variance of the set of variables (Podsakoff, Mackenzie, Lee & Podsakoff, 2003).

4 Presentation and Analysis of Results

4.1 Descriptive analysis

The survey sample showed that of the 174 respondents, 97 were female, which represents around 55.75% of the total public. There were 77 male respondents, equivalent to 44.25%. In terms of age group, the survey participants were predominantly young. There were 26 respondents aged up to 25 (14.94%). The most representative was those aged 26 to 30, with 48 respondents (27.59%), and those aged 31 to 35, with 58 representatives (29.31%).

The cooperative has several positions. The most frequent position, with 45.40% of the sample, is that of business and relationship agent. Business and relationship managers account for 20.11% of the sample. As the study has two samples, it should be noted that the 174 participants were divided into 77 teams. These teams were characterized in order to identify how many people took part per team, at first from 1 to 6 participants per service desk, checking which positions were taking part, the number of participants per position, the overall size of the team and finally the sample that these teams represent in the study, considering the size of the team divided by the participation.

The teams in the sample were identified by their SP codes, so it was possible to assess, for example, that of the 77 teams in the study, 26 were represented by just 1 respondent. Next, 26 SPs had 2 respondents per team, 11 SPs had 3 respondents per team, 8 SPs had 4 respondents per team, 5 SPs had 5 respondents per team and 1 SP had 6 respondents per team. Table 3 shows the study's descriptive statistics.

Table 3. Descriptive statistics of the constructs of interest to the samples

Assertions	Individual (n=174)				Teams (n=77)			
Block 1 - diagnostic and interactive use of the PMS	**Minimum**	**Maximum**	**Mean**	**SD**	**Minimum**	**Maximum**	**Mean**	**SD**
USD1_Tracking performance against pre-established targets.	2	7	6,44	1,05	3	7	6,68	0,71
USD2_Monitor the results obtained.	2	7	6,48	0,92	4	7	6,66	0,71
USD3_Compare the results obtained with those planned.	1	7	6,50	0,94	4	7	6,63	0,70
USD4_Review key performance measures	1	7	6,19	1,28	1	7	6,36	1,15
USI5_Facilitate face-to-face discussion in meetings between superiors, other employees and peers in your team.	2	7	6,20	1,08	4	7	6,35	0,95
USI6_Possibility of new challenges and continuous debates on information, assumptions and action plans of your team in relation to performance indicators.	2	7	6,29	1,08	2	7	6,42	1,01
USI7_Facilitate a common vision for all members of your team.	2	7	6,37	1,03	3	7	6,51	0,89
USI8_Promote team unity.	2	7	6,33	1,05	3	7	6,35	0,95
USI9_Encourage your team to focus on solving problems.	1	7	6,05	1,24	1	7	6,07	1,17
USI10_Estimulate your team to focus on critical business success factors.	2	7	6,26	0,96	4	7	6,36	0,85
USI11_Develop a common language in your team.	2	7	6,33	0,96	4	7	6,37	0,93
Block 2 - Perceived collective efficacy	**Minimum**	**Maximum**	**Mean**	**SD**	**Minimum**	**Maximum**	**Mean**	**SD**
ECP_01_ I feel confident about my team's ability to carry out their tasks.	2	7	6,23	0,95	4,50	7	6,29	0,61
ECP_02_ My team is capable of solving difficult tasks if we invest the necessary effort.	1	7	6,20	1,02	4	7	6,28	0,65
ECP_03_ I feel confident that my team will be able to solve unexpected problems.	2	7	6,05	1,03	5	7	6,13	0,66
ECP_04_ My team is fully competent to solve the tasks assigned to them.	3	7	6,14	0,91	5	7	6,23	0,59
Block 3 - Team effectiveness	**Minimum**	**Maximum**	**Mean**	**SD**	**Minimum**	**Maximum**	**Mean**	**SD**
EF-01_ Accuracy of teamwork.	2	7	5,78	0,90	3	7	5,77	0,78
EF-02_Quantity of work carried out in a team.	2	7	5,82	0,83	4	7	5,88	0,68
EF-03_Quality of teamwork.	2	7	5,89	0,93	3	7	5,90	0,83
EF-04_Team operational efficiency.	3	7	5,78	0,88	3	7	5,68	0,83
EF-05_Satisfaction of cooperative members.	3	7	6,15	0,69	4	7	6,18	0,57
EF-06_Ability to comply with delivery schedules set by superiors.	1	7	5,83	0,89	4	7	5,81	0,70

Note: 7-point likert scale.

Source: Survey data.

In general, diagnostic use and interactive use have the highest averages, with diagnostic use being even higher than interactive use, with lower agreement. This can be explained and is a consequence of the cooperative organizational context in which it was analyzed. Block 2 then deals with the indicators of the perceived collective efficacy construct, showing in its questions how people believe in the team's potential. It is important to note that for the sample of teams, the average number of respondents per team was used, following studies which state that collective efficacy can be analyzed by the average number of participants in each team evaluated (Capiola et al., 2019; Lin et al., 2019), with teams ranging from 1 to 6 respondents.

Block 3 deals with indicators of team effectiveness. The aim was to check whether the team was really capable of doing what was proposed, and here they were asked how satisfied they were with the team. This construct had a more dispersed average than the constructs analyzed previously, and had the lowest average in both samples. After presenting the descriptive statistics, we move on to analyze the measurement model.

4.2 Analysis of the measurement model

Initially, the measurement model of the 174 respondents and 77 teams is presented. After this initial analysis, we move on to the research's structural model. The measurement model is analyzed using confirmatory factor analysis, a technique for measuring the model's latent variables (Hair, Black, Babin, Anderson, & Tatham, 2009). After this stage, the model is validated.

The parameters for validating the measurement model were extracted from the SmartPLS software itself, looking at the composite reliability (CC) and the average variance extracted (AVE). All the latent variables showed reliability, as the calculated value was higher than 0.7 and all reached 0.9, indicating reliable constructs for the model. With regard to AVE, the latent variable with the lowest value was interactive use, with 0.66. However, it is considered valid, as the parameter for AVE is greater than 0.50, as can be seen in Table 4.

Table 4. Reliability and variance of the model

	(n = 174)		(n = 77)	
Latent variable	CC	AVE	CC	AVE
Diagnostic use	0,94	0,81	0,91	0,73
Interactive use	0,93	0,67	0,93	0,66
Perceived collective effectiveness	0,94	0,80	0,94	0,80
Team effectiveness	0,93	0,72	0,93	0,68
Minimum value (parameter)	>0,70	>0,50	>0,70	>0,50

Source: Research data.

Next, Table 5 shows the discriminant validity of the constructs. As indicated by Fornell and Larcker (1981), the square root of the AVE, highlighted in the table, is higher than the other correlations between the research variables, indicating that there is discriminant validity. The constructs with the highest correlation are team effectiveness and perceived collective efficacy.

Table 5. Discriminant validity of latent variables

	(n = 174)				(n = 77)			
	ECP	EFET	USD	USI	ECP	EFET	USD	USI
ECP	0,899				0,895			
EFET	0,716	0,848			0,416	0,822		
SMD	0,195	0,158	0,898		0,043	-0,107	0,852	
USI	0,194	0,189	0,548	0,821	0,08	0,032	0,636	0,813

Key: ECP - Perceived collective effectiveness; EF - Team effectiveness; PMS - Diagnostic use of PMS; USI - Interactive use of PMS.

Source: Research data.

Thus, after analyzing the Measurement Model, which was considered valid and reliable, we move on to the second stage, which is the analysis of the Structural Model. Table 6 shows the Structural Model data for the sample of 174 respondents and the representatives of the 77 teams, which shows the model with the variables of interest (Model 01). Then, in the same table, we present the data with the control variables (Model 02) and the R^2 of the two relationships.

Table 6. Structural Model (n = 174) and (n = 77)

	Model 01 (n = 174)		**Model 02 (n = 174)**		**Model 01 (n = 77)**		**Model 02 (n = 77)**	
Direct relationships	β	P-value	β	P-value	β	P-value	β	P-value
H1a (+) USD → EFET	-0,01	0,83	-0,01	0,82	-0,30	0,16	-0,26	0,02*
H1b (+) USI → EFET	0,07	0,22	0,02	0,69	0,22	0,30	0,16	0,33
H2a (+) USD → ECP	0,12	0,43	0,10	0,53	-0,20	0,51	-0,09	0,58
H2b (+) USD → ECP	0,16	0,15	0,03	0,77	0,21	0,31	0,11	0,48
H3a (+) ECP → EFET	0,71	0,00***	0,65	0,00***	0,35	0,001**	0,18	0,15
COMP → EFET			0,07	0,31			0,28	0,08
LID → EFET			0,10	0,30			0,29	0,01**
COMP → ECP			0,25	0,02*			0,20	0,05*
LID → ECP			0,19	0,08			0,26	0,03*
Adjusted R^2	Model 01		Model 02		Model 01		Model 02	
EFET	51%		52%		23%		39%	
ECP	5%		17%		2%		15%	

Note: p-value <0.001**; 0.001 to 0.01** and 0.01 to 0.05.
Key: Ecp - Perceived collective effectiveness; Efet - Team effectiveness; Usd - Diagnostic use of PMS; Usi - Interactive use of PMS.
Source: Research data.

Bootstrapping was calculated in the SmartPLS software, which calculates the significance level of the variables in the model, considering the parameter of 5,000 sub-samples. According to Hair Jr. et al. (2017), the closer the structural coefficient (β) is to 0, the weaker the relationship between the latent variables, while when it is close to 1, the greater the relationship. In Table 6, the relationship that was closest to 1 was the influence of perceived collective efficacy on team effectiveness, with a β of 0.65.

As for the R^2, which indicates the explanation of the dependent variable by the independent variables, in Model 01 (n=174), the R^2 was 51% for EFET. When the ECP was analyzed, the R^2 was 5%, which indicates a low level of explanation of the estimated models, in line with the literature. When Model 02 was analyzed with the control variables, the R^2 for EFET was 52% and for ECP 17%. The variation between model 01 and model 02 was in the ECP variable, with 17% in model 02.

As presented in the hypothesis development stage, a positive sign of the structural coefficient was expected for all the relationships. The association between the diagnostic and interactive use of PMS with perceived collective efficacy and team effectiveness was not significant. Only the relationship between perceived collective efficacy and team effectiveness showed statistical significance. In the model with the variables of interest and control, the adjusted R^2 was 52%.

The second part of the table shows the results for the 77 teams, following the analysis structure of the model with the variables of interest (Model 1) and the model with the control variables (Model 2). It can be seen that the association between perceived collective efficacy and team effectiveness is the only significant relationship in the model (p-value of 0.001***). In model 01 (n=77), the adjusted R^2 for EFET was 23% and for ECP 2%, thus considering the model's explanatory power for the second variable to be lower. When relating the variables of interest to the control variables in model 02, the adjusted R^2 for EFET was 39% and the ECP was 15%, indicating the model's explanatory power. The results indicate that the diagnostic use and interactive use of the PMS do not directly and positively influence team effectiveness. These factors can be observed in the context of the study, the population studied and given that there are other factors in an organization that can explain the influence on collective efficacy and team effectiveness.

In developing the research, one of the specific objectives was to verify the mediation of collective efficacy in the relationship between diagnostic use and interactive use of the PMS in team effectiveness. In both samples, the study did not reach statistical significance of the data, thus not confirming the hypotheses of the indirect effect of the research.

Based on the results, an additional analysis was developed considering the emphasis of the Performance Measurement System on perceived collective efficacy and team effectiveness, rather than the diagnostic and interactive use of the PMS. The emphasis on the PMS has been treated as a relevant antecedent of the PMS, making it possible to assess whether the PMS can in fact influence some of the aspects of social cognitive theory.

In this case, the PMS emphasis can be seen as managers emphasizing the use of PMS functions, which directs the teams' focus towards planning operations, evaluating results, communicating objectives and strategic implementation, following the logic of the budget emphasis (Hansen & Van der Stede, 2004). The criteria relating to the measurement model were then adopted to check the parameters of the structural model, as shown in Table 7.

Table 7. Additional analysis (n = 174) and (n = 77)

	Model 01 (n = 174)		Model 01 (n = 77)	
Direct relationships	B	P-value	β	P-value
ENF → EFET	0,01	0,81	0,20	0,04**
ENF → ECP	0,27	0,00***	0,19	0,08
ECP → EFET	0,71	0,00***	0,38	0,00***
Indirect relationship				
ENF → ECP → EFET	0,19	0,00***	0,19	0,00***
	Adjusted R^2 (n = 174)		Adjusted R^2 (n = 77)	
EFET	51%		EFET	19%
ECP	7%		ECP	2%

Caption: ECP - Perceived collective effectiveness; EF - Team effectiveness; ENF - PMS emphasis
Source: Research data.

The relationship between perceived collective efficacy and team effectiveness for the sample of 174 respondents was statistically significant (β=0.71; p-value= 0.000***), which had been suggested in the results of the structural model. When testing the additional variable without the diagnostic and interactive use of PMS, the independent variable of the model becomes the emphasis of PMS.

When related to perceived collective efficacy, it has β = 0.26, which is statistically significant (0.000***). The data allows us to infer that the Performance Measurement System directly influences perceived collective efficacy and there is an indirect relationship between the emphasis of the PMS on team effectiveness, with a β of 0.18 (0.000***). As this is a smaller sample, the emphasis of PMS in relation to team effectiveness has a β of 0.19, which is statistically significant (0.04**).

4.3 Discussion of the results

It is worth noting that the result achieved in this study differs from the findings of Chong and Mahama (2014), who researched budgeting. The interactive use of the budget was found to be statistically significant in relation to team effectiveness and perceived collective effectiveness, with direct and indirect effects. Factors for the difference in results regarding the relationships found can be attributed to the target audience investigated by the authors, made up of participants from various teams in the biotechnology sector - a context that is naturally more dynamic, unstable and geared towards constant innovation.

In contrast, this study was carried out in a single organization in the financial sector, which may confer greater cultural homogeneity, standardization of practices and stability in the work environment. These characteristics may have an impact on the role played by PMS in team behavior. This approach is in line with studies such as Lin et al. (2019) and dos Reis and Puente-Palacios (2019), which also investigate collective behavior in more stable and formal goal-oriented organizational structures, such as credit unions.

The results of the research must therefore be understood in the light of this specific context. The credit union analyzed uses the PMS at all its service points - with indicators, team performance panels, targets and valuing collective performance. Although these organizational elements are present, the data indicates that it is not the formal mechanisms alone that guarantee the perceived collective efficacy or effectiveness of the teams, but the underlying behavioral factors - such as shared beliefs, motivation, role clarity and social interactions.

This understanding is reinforced when it is observed that the control variables, when introduced into the model, had a significant influence on the results. This finding may be related to the profile of the organization studied, which values collective work right from the selection process - collaborative behavior being one of the criteria used for hiring. This practice contributes to the formation of more cohesive teams predisposed to sharing objectives, which in turn strengthens the perceived collective effectiveness.

Consistent with the literature (Mahama & Wang, 2020), this study found that perceived collective efficacy has a direct and positive statistical significance on team effectiveness. This indicates that, in the credit union teams analyzed, collective belief is a strong predictor of group performance. The higher the level of perceived collective efficacy, the higher the effectiveness of the teams tends to be - a finding that empirically validates the central principle of Social Cognitive Theory in the organizational context.

The additional analysis, integrated into the discussion, sought to verify whether, in fact, the emphasis on PMS influences team behavior. Based on the first sample (n = 174), it was observed that the emphasis on PMS directly and positively influences perceived collective efficacy ($\beta = 0.27$; $p < 0.001$). This finding suggests that employees perceive the emphasis on PMS as stimulating confidence in the potential of their teams, possibly because the performance indicators and targets act as a reference for cooperation and collective alignment.

However, this emphasis on PMS did not directly influence team effectiveness, which reinforces the argument that the effects of PMS are mediated by behavioral constructs. In this case, it was identified that perceived collective efficacy significantly influences team effectiveness ($\beta = 0.71$; $p < 0.001$), acting as a mediating variable in the relationship between PMS and performance. Mediation was statistically confirmed, with a positive and significant indirect effect ($\beta = 0.19$; $p < 0.001$).

Therefore, the results show that the emphasis on PMS, although relevant, does not act autonomously on team performance, but depends on the presence of strengthened collective beliefs. The role of the leader, in this sense, becomes central to interpreting, reinforcing and translating the PMS indicators into stimuli that promote team self-confidence. Thus, it is through collective efficacy that the PMS achieves its impact on effectiveness, which offers relevant insights for the management accounting literature and for practice in cooperative contexts.

5 Conclusions

This research aimed to analyze the influence of the Diagnostic and Interactive Use of the Performance Measurement System (PMS) on team effectiveness

mediated by perceived collective efficacy in a credit cooperative. As a theoretical foundation, we used Social Cognitive Theory, which deals with collective agency and perceived collective efficacy as predictive elements of group performance. At the same time, the use of the PMS was approached based on the control levers proposed by Simons (1994), with a focus on diagnostic use and interactive use. Seven hypotheses were then formulated to analyze the possible relationships between these variables.

The results indicate that, in the two samples evaluated, the diagnostic use and interactive use of the PMS did not directly influence the effectiveness of the teams, nor the perceived collective effectiveness. Of all the hypotheses tested, only the relationship between perceived collective efficacy and team effectiveness proved to be statistically significant, which corroborates the foundations of Social Cognitive Theory in highlighting the role of collective beliefs in organizational performance.

Additionally, it was observed that the emphasis placed on PMS - understood as the manager's involvement in communicating goals, operational planning and strategic implementation - has a positive impact on perceived collective efficacy and, indirectly, on team effectiveness. This result shows that the way in which the system is conducted and valued internally is more decisive than the mere presence of the system as a control tool.

In general, the findings indicate that team effectiveness and perceived collective efficacy are more strongly influenced by behavioral and social factors, such as affective commitment and transformational leadership, than by formal control instruments. This highlights the importance of people management policies aimed at strengthening the culture of belonging, developing leadership and encouraging trust between team members.

The research makes a theoretical contribution by integrating Social Cognitive Theory with management accounting literature, exploring a model that has not yet been empirically tested in the context of credit unions. Practically, it offers support for managers to understand that the effectiveness of measurement systems depends on how they are used and incorporated into organizational dynamics. The study suggests that the emphasis and quality of interaction between leaders and teams are key variables in translating control instruments into collective results.

Despite the contributions, some limitations should be considered. The study was applied to a single credit union, which limits the generalizability of the results to other organizational contexts. In addition, all the data was collected through self-reported questionnaires, with possible influences of common method bias, despite the tests applied.

As suggestions for future research, we recommend: a) Conducting comparative studies between different organizations and sectors; b) Including other types of respondents per team (e.g. leaders and subordinates), to capture multiple perceptions; c) Testing moderating variables such as leadership style, organizational climate or work engagement; and d) Qualitatively investigating the design and practical application of the PMS in different organizational units, focusing on the influence of leaders on its emphasis and use.

Such advances could broaden the understanding of the relationship between control systems, collective behavior and organizational performance, especially in environments where teamwork is central to achieving results.

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