



Different ways of using the budget affect the empowerment and creativity of managers

Diferentes formas de usar el presupuesto afectan el empoderamiento y la creatividad de los gerentes

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Abstract

The aimed to verify the influence of different ways of using the budget on the empowerment and creativity of 100 managers in Brazilian organizations in the area of information technology. A descriptive and quantitative. Data were tested by factor analysis and multiple linear regression. The use of the budget, in a diagnostic form, increases managers' sense of empowerment and creativity. The use of the budget, in interactive form, has to be associated with the creativity of managers to generate a sense of empowerment, and the opposite also occurs. As a theoretical implication, it provides evidence that the diagnostic use is essential to the creativity and empowerment of employees even when pursuing a defined strategy/goal. Interactive use of the budget can compromise employees' sense of empowerment about work. In the practical field, it is unnecessary to make a choice between having an environment that encourages creativity or having proper control.

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Resumen

El objetivo fue verificar la influencia de diferentes formas de utilizar el presupuesto en el empoderamiento y la creatividad de 100 gerentes en organizaciones brasileñas en el área de tecnología de la información. Una descripción descriptiva y cuantitativa. Los datos se probaron mediante análisis factorial y regresión lineal múltiple. El uso del presupuesto, en forma de diagnóstico, aumenta el sentido de empoderamiento y creatividad de los gerentes. El uso del presupuesto, en forma interactiva, tiene que estar asociado a la creatividad de los gestores para generar una sensación de empoderamiento, y también ocurre lo contrario. Como implicación teórica, proporciona evidencia de que el uso del diagnóstico es esencial para la creatividad y el empoderamiento de los empleados, incluso cuando persiguen una estrategia/meta definida. El uso interactivo del presupuesto puede comprometer el sentido de empoderamiento de los empleados sobre el trabajo. En el campo práctico, no es necesario elegir entre tener un entorno que fomente la creatividad o tener un control adecuado.

Código JEL: M21, M4, M49

Palabras clave: presupuesto; empoderamiento; creatividad

Introduction

For many organizations, the creativity of their employees is a critical factor for long-term success (Amabile, Conti, Coon, Lazenby & Herron, 1996). Thus, they face a dilemma in which the specific nature of creative production requires a substantial use of formal control, but this control can undermine creativity (Grabner & Speckbacher, 2016). However, dysfunctional behavior requires formal control to effectively coordinate and regulate employee behavior (Adler & Chen, 2011).

In this context, budget, as a central figure in the Management Control System (MCS), allows goals to be aligned with employee behavior and supports efficiency (Speklé, Elten & Widener, 2017), as well as facilitates creativity, leads the organization to achieve expected competitiveness. In particular, understanding how an organization can use MCS to support creativity has emerged as an important research issue.

The literature on organizational behavior and social psychology indicates that freedom at work allows individuals to be creative and, on the other hand, rigid controls can become an impediment to creative thinking (Amabile, Conti, Coon, Lazenby & Herron, 1996). The accounting literature suggests that the way control is perceived by individuals may affect their actions, i.e., how they communicate constraints and limits, and whether employees believe they have the power to determine their choices in the development of activities (Silva & Lavarda, 2020).

In this sense, MCS provides employees with a sense of empowerment, tends to provide a sense that their choices and expectations can guide their efforts. Thus, it determines that self-regulated behaviors need support for empowerment, as discussed by the Self-Determination Theory (Sierens, Vansteenkiste,

Goossens, Soenens & Dochy, 2009). It is important to understand the effects of diagnostic and interactive use of budgeting on their influence on empowerment and creativity separately.

Recent evidence indicates that MCS can favor empowerment and creativity (Adler & Chen, 2011; Marginson, McAulay, Roush & Zijl, 2014; Grabner & Speckbacher, 2016; Cools, Stouthuysen & Van den Abbeele, 2017). Information from the Management Control System (MCS) can be used in diagnostic form to ensure that the organization is on the right track to achieve its intended objectives, but can also be used in an interactive way to ensure that the information and concerns of top management are shared vertically (Müller-Stewens, Widener, Moller & Steinmann, 2019).

Speklé, Elten and Widener (2017) found that the diagnostic system does not provide support and autonomy structure that allows employees freedom of choice in selecting their courses of action (Simons, 1995). However, Cools, Stouthuysen and Van den Abbeele (2017) argue that this type of control, characteristic of this system, stimulates creativity. Thus, this study understands that the diagnostic control system may not be perceived as negative constraints by employees, but rather as a challenge that presents an interesting problem that motivates thinking of unusual solutions within its course of action (Silva & Lavarda, 2020).

In this context, this study had the following research problem: What is the influence of different ways of using the budget on the empowerment and creativity of managers? The study aims to check the influence of ways of using the budget on the empowerment and creativity of managers.

The study is justified by expanding the theoretical discussions on the subject, presented by Grabner and Speckbacher (2016), about the effect of the diagnostic and interactive use of budgeting on creativity and empowerment. The results indicate that the diagnostic use of budgeting is important for creativity and empowerment of employees even in pursuit of pre-established goals. On the other hand, it has been found that interactive use can compromise the sense of empowerment and creativity.

In the practical field, the study is justified by discussing the uses of interactive control and diagnosis in the context of information technology organizations regarding employee empowerment and creativity. The results show that it is not useful to make a choice between having an environment that encourages creativity or having adequate control. Both can coexist.

Theoretical foundation

Self-determination theory, empowerment and creativity

Self-determination theory explains how individuals' perceptions of action stimuli and decision contexts influence intentional behavior and, in particular, their intrinsic involvement and commitment to their

actions and efforts (Ryan & Deci, 2000). Positive involvement with a task depends on a sense of self-determination, which in turn depends on the fulfillment of three fundamental human needs (autonomy, competence, and relationship), as Deci and Ryan (1987) explain.

Autonomy refers to the belief that one's actions are one's own, that is, one's actions emanate from oneself. In competence there is people's confidence in the ability to perform their tasks and in the degree of control they think they have over the results of their actions. The relationship denotes the presence of a social environment that brings a sense of security and support (Ryan & Deci, 2000).

In the field of workplace behavior, the concept of self-determination is related to the notion of empowerment, that is, the extent to which employees believe they can perform their tasks autonomously (Speklé, Elten & Widener, 2017). Thus, the theory positively associates various behavioral outcomes with self-determined motivation, including social development and the general well-being of people (Ryan & Deci, 2000). In this sense, the way budget is used can change the sense of social development and well-being of people in an organization, motivating self-determination for different behaviors.

In the purpose of this investigation, we also emanate the connection with creativity, which refers to the production of new and useful ideas in any domain, being essential for any organization (Amabile, Conti, Coon, Lazenby & Herron, 1996). In previous studies, creativity tends to be induced by empowerment and the associated feelings of ownership and control over one's own work (Amabile, Conti, Coon, Lazenby & Herron, 1996). Sun, Zhang, Qi and Chen (2012) suggest that the perception of empowerment motivates employees to experience new ways of doing their work, which can result in different creative behaviors.

Diagnostic and interactive management control system of Simons (1995)

Simons (1987) defines management control systems as formalized procedures and systems that use information to maintain or change patterns in organizational activity. Simons (1995) states that the Levers Control (LOC) are strongly linked to strategic objectives. Thus, in an exemplified way, organizations that care about strategy as a plan to be achieved use the diagnostic control system to monitor the scope and achievement of the planned strategy and the need for changes in the intended strategic path (Kruis, Speklé & Widener, 2016). On the other hand, companies that use the strategy focus on the interactive control system in identifying opportunities to make the strategy emerge (Henri, 2006).

In this sense, the concept of balance between the interactive and diagnostic use of control systems has begun to attract attention in the empirical literature. The focus has been on examining the opposing forces created by the interactive and diagnostic use together (Kruis, Speklé & Widener, 2016). The use of the diagnostic control system is adequate to monitor employees in the delivery of tasks that are

aligned with organizational objectives (Rehman, Mohammad & Ayoup, 2019). Simons (1995) explains that this system restricts the pursuit of opportunities and innovation to ensure the predictable achievement of the goals needed for the intended strategies. Diagnostic use of budgeting is recognized as a negative force that imposes constraints and emphasizes compliance with requests (Henri, 2006).

The diagnostic and interactive levers of control provide an information-rich organizational work environment that provides incentive and opportunity for the development of new ideas, but within a clearly defined space (Zarzycka, Dobroszek, Lepistö & Moilanen, 2019). Thus, the use of the interactive control system is more likely to encourage the implementation of creative ideas and future-oriented strategic initiatives, as well as maintain interactive relationships among employees (Widener, 2007). This system plays a key role in minimizing strategic uncertainties associated with strategy and promotes creativity and inspiration (Simons, 1995).

Relationships between positive (interactive system) and negative (diagnostic system) levers foster open discussions, allowing employees to group their ideas and activities, and to integrate theoretically opposing concepts (Henri, 2006). For Mundy (2010), consistency in the use of control systems collectively and simultaneously activates creativity and provides constraints. Given the above, we can understand that the use of management control systems can shape managers' self-determination, causing their behaviors to change, in this case, the sense of empowerment, and promoting more creative individuals.

Development of research hypotheses

Earlier research supports the argument that employees become more creative when they feel empowered and realize that they have freedom to perform tasks (Cools, Stouthuysen & Van den Abbeele, 2017). The consequence of this is that if the organization is interested in stimulating creativity, the work environment must be based on perceptions of empowerment. Su, Baird and Tung (2022) state that creativity results from employees' belief that they have the freedom to generate new ideas and the confidence that their ideas are valued, being a sign of employee empowerment.

Thus, if external regulation is imposed, which makes part of behavior self-regulated, employees will not have their sense of command impaired (Ryan & Deci, 2000). Consequently, the management control system is designed and presented in such a way that it is internalized and assimilated, which supports and enhances self-determination and thus perceptions of empowerment. In this way, it requires the management control framework to support autonomy (Deci & Ryan, 1987) and provide an adequate framework for the decision problems that individuals face (Sierens, Vansteenkiste, Goossens, Soenens & Dochy, 2009). Thus, this study raises the following hypothesis:

H1: Managers' sense of empowerment positively influences their creativity.

The study argues that the use of the budget will create an environment that is characterized by self-management and freedom within the stipulated limits, which promotes empowerment (Simons, 1994). Mundy (2010) supports this argument by presenting that the levers of control are important to direct and train managers and employees simultaneously. Using budgeting in a diagnostic and interactive way provides clarity and understanding of the work environment. Thus, the management control system that makes use of the same levers can facilitate creativity while restricting employee behavior (Mundy, 2010).

Recent studies have provided empirical evidence that when different controls have different weights in the management control system, their combinations support creativity (Kruis, Speklé & Widener, 2016; Bedford, 2015). Recent research has focused on how combinations of different levers of control can help creativity and innovation (Henri, 2006; Widener, 2007; Mundy, 2010; Bedford, 2015; Kruis, Speklé & Widener, 2016; Curtis & Sweeney, 2017; Janka & Guenther, 2018; Müller-Stewens, Widener, Moller & Steinmann, 2019). Thus, the following hypothesis is proposed:

H2: The use of the budget in diagnostic or interactive ways increases the creativity of managers.

This study proposes that the use of the budget in a diagnostic and interactive way supports autonomy. Diagnostic use communicates the goal in critical performance measures that guide behavior and provides feedback to facilitate employee learning (Simons, 1995). This control emphasizes responsibility for results, which can motivate employees to act and promote know-how. Interactive use communicates the concerns of key managers across all organizational units. These employees are aware of the potential opportunities and threats that may arise from meeting their goals (Speklé, Elten & Widener, 2017).

Research in social psychology and organizational behavior has addressed various vectors of creativity (Amabile, Conti, Coon, Lazenby & Herron, 1996). These studies concluded that senses of autonomy are important, but the work environment itself also plays a significant role (Amabile & Pillemer, 2012). In addition to providing opportunities for employees to believe that they can make choices about their actions within defined boundaries (as presented in empowerment), organizational and supervisory incentives were considered an indispensable stimulant for creativity in organizational environments (Su, Baird & Tung, 2022).

Thus, giving explicit instructions, recognizing creative thinking, encouraging discourse that supports creativity, idea generation, valuing creativity are all aspects of the organizational incentive needed to stimulate creativity (Amabile, Conti, Coon, Lazenby & Herron, 1996). In this sense, organizational empowerment can provide a creative thinking environment, which makes the diagnostic

use of budgeting positively associated with creativity, that is, even in companies that use the restrictive budget, but managers have a sense of empowerment, creativity continues to prevail.

H3: The use of the budget in diagnostic or interactive ways, moderated by empowerment, increases managers' creativity.

In the interactive use, budgeting allows for the exchange of information in an environment where individuals are encouraged to challenge the status quo, participate in debates and dialogues, and find creative and innovative solutions. Thus, it communicates strategic uncertainties vertically throughout the organization and provides focus for employee creativity (Speklé, Elten & Widener, 2017). In the diagnostic use, there is not only a limiting influence regarding the behavior of managers, since the monitoring process highlights problems that motivate them to achieve their goals (Mundy, 2010).

Sierens, Vansteenkiste, Goossens, Soenens and Dochy (2009) elucidate that support for autonomy includes the provision of choice in conducting work activities, while the provision of structure includes the establishment of constraints and expectations. These factors can have a positive effect on organizations if employees understand that their actions and tasks help the organization with decision-making information that affects overall business results (Amabile, Conti, Coon, Lazenby & Herron, 1996). In the meantime, employees generally realize that diagnostic use of the budget increases freedom, not only imposes constraints.

Su, Baird and Tung (2022) clarify that goal setting can encourage problem solving and experimentation. Moreover, Grabner and Speckbacher (2016) show that predefined goals are used for performance evaluation in creative environments. Thus, working toward the predefined goal gives the creative team the autonomy to use all of their creative ideas to evaluate required inputs, desirable behaviors, and input-output relationships (Cools, Stouthuysen & Van den Abbeele, 2017).

It is proposed that this is a consequence of the creation of an environment that provides support and structure for the autonomy necessary to promote intrinsic motivation and self-regulating behaviors, as opposed to an environment characterized as "controlling", associated with empowerment (Simons, 1995). Employees may have the opportunity to make choices about their actions with defined limits (Amabile, Conti, Coon, Lazenby & Herron, 1996).

H4: The use of the budget in diagnostic or interactive ways increases the empowerment of managers.

In an enabling (interactive) work environment, it is easy to promote creative behavior, also emerging the understanding that freedom can affect the level of empowerment of managers. Hall (2008) indicates that the use of a diverse set of performance measures in the various business units, makes managers experience greater freedom, autonomy and opportunity to perform their tasks.

Marginson, McAulay, Roush & Zijl (2014) found a positive result between the interactive use of non-financial performance measures and self-determination, suggesting that an interactive use of the budget may enhance the sense of empowerment. Empowerment is associated with intrinsic and self-determined motivation.

Using budgeting in a diagnostic and interactive way creates the work environment that employees need to be creative. The diagnostic use, goals, objectives and performance limits need not be viewed as negative constraints to its achievement, but can, in the presence of interactive supportive control, be perceived as challenges that only make thought-provoking problems, stimulating individuals to think of unusual solutions and non-standard approaches (Burroughs, Dahl, Moreau, Chattopadhyay & Gorn 2011; Cools, Stouthuysen & Van den Abbeele, 2017).

Cools, Stouthuysen and Van den Abbeele (2017) concluded that diagnostic use does not stifle creativity but, in contrast, can stimulate creativity. Goals, objectives, and constraints lead to structuring the decision problem so that creative thinking is precise, because standard solutions will not fit all decision parameters (Speklé, Elten & Widener, 2017). For the authors, they can also serve to provide guidance and improve individuals' understanding of action-outcome relationships, which further guides creative behavior.

Organizations seeking to facilitate creativity should create an information exchange process that encourages and supports creativity. The empirical evidence found by Gong, Cheung, Wang and Huang (2012) suggests that information exchange is necessary for teams to be more creative. Simons (1994) argues that the diagnostic and interactive levers of control create the work environment that employees need to be creative, which can provide a sense of empowerment (Marginson, McAulay, Roush & Zijl, 2014). In this sense, the following hypothesis is proposed:

H5: The use of the budget in diagnostic or interactive ways, moderated by creativity, increases the empowerment of managers.

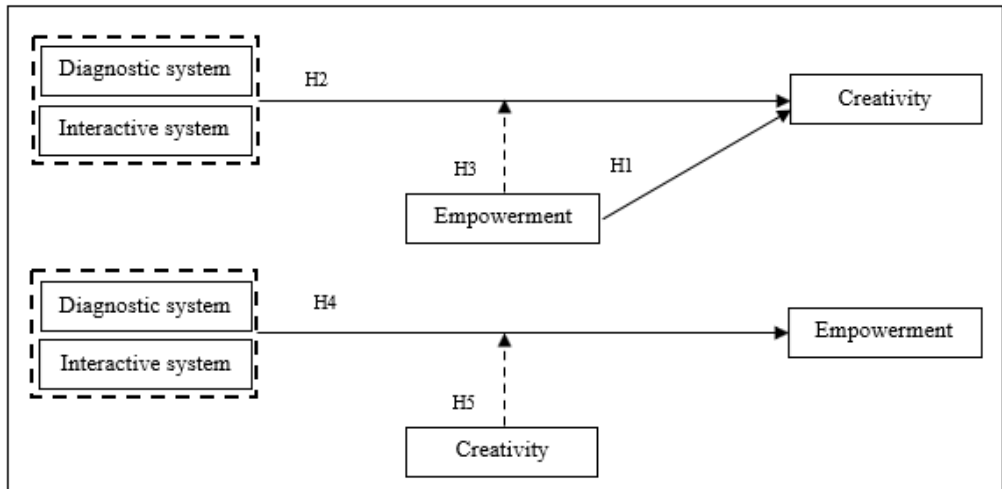


Figure 1. Theoretical model of the study.
Source: Prepared by the authors (2022)

It is observed that the use of the budget, in a diagnostic and interactive way, has an impact on creativity as well as on empowerment and, subsequently, on creativity.

Methodological path

To analyze the relationship between the use of the budget and empowerment and creativity, we adopted a descriptive research on the objective, survey on procedures and quantitative on the research problem.

This study applied a questionnaire to managers of 638 organizations belonging to the Association of Brazilian Information Technology Companies - ASSESPRO. Therefore, the research population is the managers of the companies associated the ASSESPRO. Data from these companies were found through the website of each regional ASSESPRO (São Paulo, Bahia, Sergipe, Pernambuco, Paraíba, Sergipe, Rio Grande do Sul, Brasília). It used a non-probability accessibility sample of the 100 responses received.

The choice of the information technology sector is due to the need for constant creativity in management that stimulates the innovation required in the market that changes at an incredible speed. It is a sector that also requires managers with a sense of empowerment to deal with the pressures from competition and market dynamics. Finally, this sector is linked to research and development projects that require high investments and a very dynamic and efficient budget control. In this sense, the information technology sector becomes prominent in establishing a relationship between the ways in which the budget

control system is used and the enactment of incentives for creativity, as well as the empowerment of managers.

Data collection for this investigation was performed by the Center for Studies and Research in Administration (CEPA), an agency linked to the School of Administration of the Federal University of Rio Grande do Sul (EA/UFRGS). The survey instrument was applied by three interviewers, by telephone, during the months of December 2018 and February 2019. This data collection strategy by a company specialized in survey is widespread in management research in the accounting area.

Table 1 lists the characterization of respondents (age, time in the function, time in the company, number of supervised employees, number of employees and category of responsibility).

Table 1
 Characterization of respondents

Variables	N	Min	Max	Mean	Standard-deviation
Age	100	25	67	39.393	11.389
Time in the function	100	0.2	40	7.517	6.414
Time in the company	100	1.0	25	7.355	5.702
Number of supervised employees	100	0	76	10.061	1.661
Total number of employees	100	2.0	2500	95.191	288.893
Company operating time	100	1.5	55	19.755	9.912

Source: Research data (2022).

Table 2 shows that the mean time in the function of managers was 7.5 and the mean number of supervised employees was 10.06. Additionally, it is noteworthy that most companies are small and medium-sized, respectively 52.04% and 30.61% study sample. Respondents are responsible for profit and loss, of revenue, of costs and for budget, respectively, 16.04%, 19.13%, 33.09% and 30.86%.

The research instrument consists of four blocks with 20 questions. These constructs are listed in Table 2, which presents each variable.

Table 2

Characterization of the variables adopted in the investigation, regarding measurement and theoretical foundation.

Variables		Measurement	Theoretical foundation
Use of the budget	Interactive	Questions (10) 1-7 point Likert scale (Nothing used - Very used)	Henri (2006)
	Diagnosis		
Empowerment		Questions (5) 1-7 point Likert scale (Do not agree - Fully agree)	Spreitzer (1995); Hartline and Ferrell (1996); Hall (2008); Lambe, Webb and Ishida (2009); Speklé, Elten and Widener (2017)
Creativity		Questions (5) 1-7 point Likert scale (N Do not agree - Fully agree)	Farmer, Tierney and Kung-McIntyre (2003)

Source: Research data (2022).

The first block includes the construct of the diagnostic and interactive use of the budget, with 10 questions, based on Henri (2006) and tested by Widener (2007), Speklé, Elten and Widener (2017). The second block covers the empowerment construct with 5 questions. The first three questions were developed by Spreitzer (1995) and based on Hartline and Ferrel (1996) and Lambe, Webb and Ishida (2009), Speklé, Elten and Widener (2017) included two additional questions. In the third block, there were 5 questions about creativity created by Farmer, Tierney and Kung-McIntyre (2003) and tested by Speklé, Elten and Widener (2017). These questions are described in Table 3. The fourth block consisted of respondent characterization questions.

The constructs were treated using factor analysis to delimit the formation of the dimensions of empowerment, creativity, diagnostic use of budgeting and interactive use of budgeting. With the established dimensions, multiple linear regression was applied to set the relationships between the dimensions as outlined in the research design. SPSS software was used for all statistical models.

Results analysis and discussion

First, we present the descriptive statistics of the variables used in the research to delineate the object of study, as listed in Table 3.

Table 3
 Descriptive statistics of the researched variables.

Block A – Descriptive Statistics of metric variables					
Variables	N	Minimum	Maximum	Mean	Standard deviation
Diagn.	100	2.20	7.00	6.010	0.9631
Interact.	100	2.20	7.00	5.909	0.8267
Empow.	100	1.20	7.00	5.780	1.1243
Creativ.	100	1.00	7.00	6.123	0.8851
Block B – Frequency statistics of categorical variables					
Variables		Frequency	Percentage		
Gender	Female (1)	56	56%		
	Male (0)	44	44%		
Schooling	Graduate (1)	86	86%		
	Higher Education (0)	14	14%		

Source: Research data.

The mean age of respondents is approximately 39 years, with mean time in the function and also in the company of 7 years. These managers supervise a mean value of 10 people. Regarding the dimensions, the results indicate that the diagnostic use of the budget is greater than the interactive use and that managers have more creativity than the sense of empowerment.

To proceed with the results, we have the factor analysis of all sets of the variables searched. Thus, four factor analysis models were elaborated, one for each dimension (research variable), seeking to confirm if there are different factor groupings. The KMO and Bartlett tests evidence the validity of the factor analysis models, as listed in Table 4.

Table 4
 KMO and Bartlett tests of the variables of the research constructs

Factor Analysis Reliability Tests	Empowerment	Creativity	Diagnostic use	Interactive use
Kaiser measure of sampling adequacy	0.835	0.816	0.736	0.632
Bartlett test	0.000*	0.000*	0.000*	0.000*

Source: Research data.

Table 4 evidences the validity of factor analysis in all studied dimensions. It is concluded that there is validity in the groups of empowerment, creativity, diagnostic use the of budget and interactive use of the budget by Kaiser measure greater than 0.600 and Bartlett test presented significance at 5% level in all models. Subsequently, the result of the principal component analysis of the four dimensions of the research is listed in Table 5.

Table 5
 Principal component analysis of the variables of the research construct.

Principal Component of Empowerment						
Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% variance	% cumulative	Total	% variance	% cumulative
1	3.090	61.800	61.800	3.090	61.800	61.800
2	0.726	14.526	76.327			
3	0.498	9.958	86.285			
4	0.352	7.042	93.327			
5	0.334	6.673	100.000			

Principal Component of Creativity						
Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% variance	% cumulative	Total	% variance	% cumulative
1	2.866	57.325	57.325	2.866	57.325	57.325
2	0.712	14.244	71.569			
3	0.579	11.577	83.146			
4	0.507	10.144	93.290			
5	0.336	6.710	100.000			

Principal Component of Diagnostic Use						
Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% variance	% cumulative	Total	% variance	% cumulative
1	2.668	53.358	53.358	2.668	53.358	53.358
2	0.953	19.060	72.419			
3	0.607	12.142	84.561			
4	0.466	9.311	93.871			
5	0.306	6.129	100.000			

Principal Component of Interactive Use						
Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% variance	% cumulative	Total	% variance	% cumulative
1	1.883	37.666	37.666	1.883	37.666	37.666
2	1.038	20.754	58.419			
3	0.872	17.440	75.860			
4	0.704	14.074	89.934			
5	0.503	10.066	100.000			

Source: Research data.

The results of the factor analysis indicate that the five questions that initially form the empowerment dimension were grouped into a single factor, with information percentage of 61.80%. In the creativity dimension, the five questions used for its measurement were grouped into one component, with information percentage of 57.33%. Regarding the diagnostic use of the budget, it is concluded that the five questions of this grouping are consolidated in a single component with information percentage of 53.36%. Finally, the interactive use of the budget is consistent, presenting in the factor analysis the formation of a single component with an information percentage of 37.67%.

Table 6 lists the results of the factorial groupings by the Varimax rotated component matrix.

Table 6
 Result of factorial groupings by varimax rotated component matrix

Questions	Empowerment	Creativity	Diagnostic Use	Interactive Use
1	0.846	0.750	0.570	0.605
2	0.644	0.678	0.820	0.413
3	0.829	0.722	0.830	0.809
4	0.774	0.854	0.797	0.453
5	0.822	0.771	0.588	0.697

Source: Research data.

Table 5 indicates that the empowerment component confirms the existence of only one factor with grouping of five questions. The same is true for the component of creativity, diagnostic use, and interactive use. From the confirmation of the research dimensions, we sought to confirm the research hypotheses. For that, we used multiple linear regression models. Table 7 lists the results of the influence of the use of the budget and empowerment on managers' creativity.

Table 7
 Influence of the use of the budget and empowerment on managers' creativity

Independent variables	Creativity							
	Coef.	Sig.	Coef.	Sig.	Coef.	Sig.	Coef.	Sig.
Diagn.	0.441	0.000*						
Interact.	0.100	0.446						
Empow.			0.416	0.000*				
Empow.*Diagn					0.446	0.000*		
Empow.*Interact							0.440	0.00*
Gender	0.227	0.193	0.044	0.784	0.143	0.380	0.440	0.345
Schooling	-0.464	0.070**	-0.286	0.221	-0.423	0.078**	0.155	0.205
Age	-0.005	0.606	0.000	0.980	-0.004	0.629	-0.303	0.342
Time in the function	0.023	0.159	0.014	0.363	0.017	0.270	-0.008	0.270
Time in the company	-0.020	0.278	-0.017	0.314	-0.015	0.388	0.017	0.419
Number of supervised employees	-0.007	0.175	-0.004	0.404	-0.006	0.228	-0.014	0.338
_Constant	4.590	0.000*	3.999	0.000*	6.621	0.000*	6.649	0.00*
Adjusted R ²	19.00%		29.40%		27.20%		26.20%	
Anova Sig.	0.001*		0.000*		0.000*		0.000*	
Durbin-Watson	2.144		2.169		2.215		2.276	
VIF	1.084 to 1.791		1.068 to 1.741		1.052 to 1.725		1.066 to 1.908	

* Significance at 5% ** Significance at 10%.

Source: Research data.

The results indicate that the diagnostic use of the budget increases the creativity of the managers, confirming hypothesis 2. In this sense, the budget used to diagnose and correct distortions makes the managers find creative alternatives to improve the performance and reach the organizational goals, as already stated by Sierens, Vansteenkiste, Goossens, Soenens and Dochy (2009). On the other hand, the interactive use of budgeting, in isolation, did not influence managers' creativity, contrary to the evidence exposed in part of hypothesis 2. It is concluded that the freedom and dialogue promoted by the interactive use of budgeting does not have generated increased creativity of managers, contrary to the arguments of Marginson, McAulay, Roush and Zijl (2014).

Moreover, the findings suggest that empowerment is reflected in increased manager creativity. This proves that individuals become more creative when they feel important within the organization and when they have autonomy in performing their tasks (Sun, Zhang, Qi & Chen, 2012). It is concluded that the work environment can stimulate the creativity of individuals, supported by the consolidation of managers with empowerment capacity, which confirms hypothesis 1

Besides that, evidence indicates that empowerment has a moderating effect on the relationship between budget use in diagnostic and interactive ways on managers' creativity, which confirms hypothesis 3. In diagnostic use, the pre-set goal can encourage problem solving through the use of creative ideas (Cools, Stouthuysen & Van den Abbeele, 2017). In interactive use, budgeting can enable information sharing in an environment where employees are motivated to challenge the status quo, participate in discussions and dialogues, and find creative and innovative solutions (Speklé, Elten & Widener, 2017).

Finally, additionally, there was evidence that managers with less education have greater creativity. Therefore, it is considered that schooling can make managers more critical about daily attitudes, also makes them less susceptible to creativity because they fear the failure of their idea.

Table 8 lists the results of the influence of the use of the budget and creativity on the empowerment of managers.

Table 8
 Influence of the use of the budget and creativity on the empowerment of managers

Independent variables	Empowerment							
	Coef.	Sig.	Coef.	Sig.	Coef.	Sig.	Coef.	Sig.
Diagn.	0.368	0.007*						
Interact.	0.040	0.825						
Creativ.			0.639	0.000*				
Creativ.*Diagn					0.059	0.000*		
Creativ.*Interact							0.061	0.000*
Gender	0.415	0.096**	0.223	0.000*	0.373	0.116	0.340	0.157
Schooling	-0.152	0.469	-0.028	0.334	-0.114	0.567	-0.088	0.665
Age	-0.017	0.215	0.000	0.886	-0.013	0.287	-0.005	0.671
Time in the function	0.023	0.360	0.011	0.993	0.018	0.449	0.013	0.587
Time in the company	-0.006	0.831	-0.012	0.633	0.000	0.991	-0.015	0.585
Number of supervised employees	-0.001	0.939						
			0.003	0.631	0.001	0.937	0.000	0.973
_Constant	3.959	0.000*	1.766	0.074**	3.998	0.000*	3.775	0.000*
R ²		16.90%		27.10%		23.10%		20.70%
Anova Sig.		0.003*		0.000*		0.001*		0.004*
Durbin-Watson		2.036		2.146		1.989		2.159
VIF		1.068 to 2.013		1.074 to 1.903		1.066 to 1.995		1.066 to 1.908

* Significance at 5% ** Significance at 10%.

Source: Research data.

The results indicate that the diagnostic use of budgeting increases the empowerment of managers, which corroborates hypothesis 4. It is proved that the constraints caused by little dialogue and budget imposition make managers more empowered in the organization. In addition, constant monitoring of budget activities can centralize important information to managers of organizations, bringing greater empowerment to decision making.

The results suggest that the diagnostic use of the budget positively influences the empowerment of managers. On the other hand, the interactive use of the budget had no influence on the increase in managers' empowerment. This result indicates that using the budget to achieve the set goals can provide empowerment for managers and, on the other hand, managers cannot have the same power if the budget is used to promote organizational dialogue. This can be because dialogue and interaction cause other ideas to be implemented and power not to be centralized in a single individual, who is usually the own sector/organization manager. Further, interactive use can distract employees from their immediate goals and allow them to lose focus on overall goals (Müller-Stewens, Widener, Moller & Steinmann, 2019).

Moreover, the results indicate that creativity generates new ideas and attitudes of trust that enable the sense of empowerment in managers, which confirms the evidence of Alge, Ballinger, Tangirala and Oakley (2006) and Ryan and Deci (2000). In this sense, it is also proven that the diagnostic or

interactive use of the budget, moderated by creativity, enhances the empowerment of managers. This result confirms hypothesis 5, which meets the statements of Marginson, McAulay, Roush and Zijl (2014). Thus, it is concluded that managers' creativity can overlap even the way budget is used over management empowerment.

Additionally, regarding the control variables, the findings indicate that only gender had a positive influence on organizational empowerment. Thus, the female gender has greater organizational empowerment.

Final considerations and recommendations

From the study, it is concluded that the ways of using the budget influence the empowerment and creativity of managers. The feeling of empowerment increases the managers' creativity (Hypothesis 1). In this circumstance, creativity becomes an empowerment function that is also explained by the managers' own creativity.

From the theory of self-determination, it is possible to conclude that the ways of using the diagnostic and interactive budget can exert action stimuli to influence the intentional behavior of individuals within organizations (Hypotheses 2, 3 and 4). This finding is confirmed by the fact that the diagnostic use of the budget increases the feeling of empowerment and also the creativity of managers.

This also applies to the stimulus for a given behavior, sometimes depending on the purpose and interaction with other behavioral aspects (Hypothesis 5). Thus, the interactive use of the budget needs to be associated with the managers' creativity to generate a feeling of empowerment, and the opposite also occurs, where the interactive use of the budget has to be associated with the feeling of empowerment to increase the managers' creativity.

Theoretical discussions on the subject have been expanded, which provides empirical support to the suggestions of previous investigations, such as Grabner and Speckbacher (2016) and Cools, Stouthuysen and Van den Abbeele (2017), regarding the role of the diagnostic use of budgeting in creativity and empowerment. The study also provides an alternative view of the influence of the interactive use on empowerment and creativity, which was different from that proposed by Sun, Zhang, Qi and Chen (2012) and Gong, Cheung, Wang and Huang (2012).

The research provides evidence of the influence of different ways of using budget on managers' empowerment and creativity. In this respect, it offers evidence that diagnostic use is essential for employees' creativity and empowerment even when pursuing a defined strategy/goal. Also, it has been shown that the interactive use of budgeting can compromise employees' sense of empowerment.

This study emphasizes the importance of using interactive and diagnostic control in the context of information technology organizations to facilitate employees' empowerment and creativity. It was concluded that simultaneous use boosts empowerment and creativity to achieve organizational strategy and, consequently, develops the sense of empowerment and creative ideas for problem solving and experimentation.

From this perspective, it is unnecessary to make a choice between having an environment that encourages creativity and having adequate control. Managers can implement MCS that creates an information-rich environment conducive to creative thinking while maintaining organizational control.

The work has limitations. The relationship between the diagnostic and interactive use of the budget, empowerment and creativity was elaborated, in which the research strategy was based on the perception of the respondents to the questions that were presented. There is the limitation of only involving organizations from a particular sector.

As a suggestion for further studies, a case study can be done in these organizations so that data triangulation can ensure the results discussed in this study that was based on the respondents' perception of the research instrument. It is also suggested to investigate the influence of the diagnostic and interactive use on the different types of creativity (expected and responsive) and the empowerment of employees/managers.

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