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Influence of using the budget and heuristic biases on the professional competencies of bean counters and business partners

La influencia del uso del presupuesto y de los sesgos heurísticos sobre las competencias profesionales de los *bean counters* y *business partners*

A influência do uso do orçamento e dos vieses heurísticos sobre as competências profissionais dos *bean counters* e *business partners*

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Abstract

Objective: The objective of this research is to verify if the use of diagnostic or interactive budgets, moderated by heuristic behaviors, influences the controllers' professional competencies.

Methodology: This is a descriptive research study carried out by means of a survey with 109 individuals who work as controllers. In order to meet the research objective, in addition to diagnosing the data by counting the answers, a logistic regression model was used, chosen by means of the Wald Backward Stepwise method.

Results: The results found in the research indicate that there is predominance of competencies linked to the bean counter profile in the controllers' work functions. Regarding use of the budget, it was found that using the interactive budget to communicate goals to their work teams is characteristic of controllers whose professional competencies belong to the business partner profile and present behaviors influenced by heuristics and who, regardless of such influence, use the interactive budget for discussion of actions; whereas use of the diagnostic budget for managerial planning is characteristic of bean counters. It was also found that heuristic components are present in the controllers' behaviors, especially those of Anchoring and Availability, although it was not possible to directly link them to these individuals' professional competencies.

Contributions of the study: The theoretical contributions of the study clarify the relationship between the specific uses of diagnostic or interactive budgets influenced by heuristic behaviors and the controllers' professional competencies. The research expands the debate on the controller's role that prevails in Brazil.

Keywords: Controllers; Bean Counters; Business Partners; Budget Use; Behavioral Accounting.

Resumen

Objetivo: El objetivo de esta investigación es verificar si el uso del presupuesto diagnóstico o interactivo, moderado por conductas heurísticas, influye en las competencias profesionales de los *controllers*.

Metodología: Se trata de una investigación cuantitativa, realizada mediante una encuesta a 109 personas que desempeñan el rol de *controller*. Para cumplir con el objetivo de la investigación, además de diagnosticar los datos mediante el conteo de las respuestas, se utilizó un modelo de regresión logística, elegido por el método *Backward Stepwise* de Wald.

Resultados: Los resultados encontrados en la investigación indican que existe cierto predominio de las competencias vinculadas al perfil de *bean counter* en las funciones laborales de los *controllers*. En cuanto al uso del presupuesto, se descubrió emplear el presupuesto interactivo para comunicar metas a sus equipos de trabajo es una característica de los *controllers* cuyas competencias profesionales pertenecen al perfil de *business partner* y presentan conductas influenciadas por heurísticas, e, independientemente de sufrir dicha influencia, utilizan el presupuesto interactivo para la discusión de acciones; mientras que el uso del presupuesto de diagnóstico para la planificación de la gestión es característico de los *bean counters*. También se constató la presencia de heurísticas en el comportamiento de los *controllers*, en especial las de Anclaje y Disponibilidad, aunque pueden no estar directamente vinculadas a las competencias profesionales de estos individuos.

Aportes del estudio: Los aportes teóricos del estudio esclarecen la relación entre los usos específicos de los presupuestos diagnósticos o interactivos influenciados por el comportamiento heurístico y las competencias de los profesionales de la gestión de control. La investigación amplia el debate del rol de *controller* que predomina en Brasil.

Palabras clave: *Controllers*; *Bean Counters*; Socios de Negocios; Uso del Presupuesto; Contabilidad del Comportamiento.

Resumo

Objetivo: O objetivo desta pesquisa é averiguar se o uso do orçamento diagnóstico ou interativo, moderado por comportamentos heurísticos, influencia às competências profissionais dos *controllers*.

Metodologia: Trata-se de uma pesquisa de cunho quantitativo, realizada por meio de levantamento com 109 indivíduos que exercem a função de *controller*. Para atender ao objetivo de pesquisa, além do diagnóstico dos dados por meio de contagem das respostas, foi utilizado um modelo de regressão logística, escolhido pelo método Retroceder de Wald.

Resultados: Os resultados encontrados na pesquisa, indicam que há predominância das competências atreladas ao perfil *bean counter* nas funções laborais dos *controllers*. Quanto ao uso do orçamento verificou-se que o uso do orçamento interativo para comunicar metas às suas equipes de trabalho é característico de *controllers* cujas competências profissionais pertencem ao perfil *business partner* e apresentam comportamento influenciado por heurísticas, e independentemente de serem influenciados por heurísticas, utilizam o orçamento interativo para discussão de ações; enquanto o uso do orçamento diagnóstico para o planejamento gerencial é característico dos *bean counters*. Constatou-se também que há presença de heurísticas no comportamento dos *controllers*, com destaque para as de Ancoragem e Disponibilidade, porém não puderam ser atreladas diretamente às competências profissionais destes indivíduos.

Contribuições do estudo: As contribuições teóricas do estudo esclarecem a respeito da relação entre os usos específicos dos orçamentos diagnóstico ou interativo influenciados por comportamento heurístico e as competências profissionais da Controladoria. A pesquisa amplia o debate da função do *controller* que predomina no Brasil.

Palavras-chave: *Controllers*; *Bean Counters; Business Partners;* Uso do Orçamento; Contabilidade Comportamental.

1 Introduction

The relevance of the role of Controllership professionals, also called controllers, focuses mainly on their main functions, which are those linked to control, planning and the accounting information system, indispensable when it comes to offering support to organizational managers in decision making (Borinelli, 2006; Lunkes, Schnorrenberger & Rosa, 2013, Weißenberger, Wehner & Kabst, 2015). Accounting operators, among which are controllers, recognize the need for more non-quantifiable economic information, generated by accounting systems or disclosed in financial statements. It is believed that this type of information, not necessarily of a financial nature, would provide significant support for decision-making (Martin, 2002; Lucena, Fernandes & Silva, 2011).

Although in Brazilian companies, controllers are still required, in most cases to exercise functions related to the bean counter profile and aimed at meeting technical requirements and carrying out bookkeeping and measurement accounting procedures, the international literature points out that the controllers' participation in the decision-making process grows as companies require them to combine their managerial competencies and skills with the organizations' strategic directions and even become their business partners (Wolf et al., 2015; Wiggers, Lunkes & Souza, 2015; Lindqvist & Matson, 2019; Souza, Wanderley & Horton, 2020). Business partners actively participate in strategic decisions, a profile that is also present in Brazilian companies, although in more modest proportions (Wiggers, Lunkes & Souza, 2015; Souza, Wanderley & Horton, 2020).

As they are influenced by managers to support the decision-making process and also participate in it, as in the case of business partners (Karlsson, Hersinger & Kurkkio, 2019), controllers may be prone to behavioral biases that affect the way in which they process diverse information to carry out their duties. There are non-financial data of all the information that are part of an area which researchers call Behavioral Accounting. This new Accounting field integrates the dimension of human behavior applied to accounting practices (Lucena et al., 2011). Generally, people have clear boundaries when it comes to cognitive processes, as they are easily induced by behavioral biases when faced with decision-making, especially in situations marked by uncertainty or complexity (Haley & Stumpf, 1989).

The use of budgetary participation can contribute positive results with regard to the decision-making process and in encouraging the managerial performance of controllership professionals (controllers). Already in 1952, Argyris related the budget definition process and human behavior, as strongly attributed to people' attitudes and this relationship has been explored in several studies since then (Goddard, 1997; Silva, 2018).

According to Zonatto, Nascimento, Lunardi, and Degenhart (2020), by actively participating in budget processes and recognizing the importance of their role in this process, controllers become more committed to the organization, developing proactivity, management attitudes, and starting to believe that the budget can turn them into better managers. In addition, the starting point is the fact that participation in the budget, especially in the diagnostic or interactive uses, influences organizational commitment, such as managerial performance (Kaveski, Beuren, Gomes & Lavarda, 2021), directly and indirectly Yuliansyah, Adha Inapty, Dahlan & Oktri Agtia, 2018; Zonatto et al., 2020), as it minimizes potential negative effects that information asymmetry might have on performance (Degenhart, Lunardi & Zonatto, 2019).

The budgetary effects were researched based on diverse psychological knowledge about some types of behavior such as motivation, stress, satisfaction, commitment, relationships with superiors and managerial performance, as it is recognized that people's responses to the environment in which they operate are complex (Kaveski et al., 2021). There is also the fact that the budget is a process which is difficult to rationalize, as evidenced in the study by Hijal-Moghrabi (2019), which exposes the need for the budget to serve the interests of different stakeholders, as it is not free from the context where it is inserted, which affects the decision-making of those who participate in it.

Therefore, it becomes necessary to understand the aspects related to the activities performed by controllers, budget use and the influence of behavioral biases to anchor decisions: Hartmann and Maas (2011) investigated how contextual uncertainty and use of the budget system explain transversal variations in the controllers' organizational function, based on the argument that there is complementarity between the role of the budget and the function of the controller. Beuren, Santos and Hein (2015) identified the organizational slack level of controllers regarding their participation in budget preparation and their autonomy in decisions in the process of accounting changes. Lunardi, Zonatto and Nascimento (2018) evaluated the intervening effects of work involvement, managerial attitudes and information sharing on the relationship between the controllers' budgetary participation and managerial performance.

However, although studies such as these on organizational behavior and its relationship with the budget have been conducted, this research differs by taking into account that controllers can assume business partner or bean counter stereotypes and that these professional profiles can influence the controllers in decision-making and in the use of diagnostic or interactive budgets, also considering the possible influence of heuristics (mental shortcuts) in this process. **Therefore, the objective of this study is to investigate whether the use of diagnostic or interactive budgets, moderated by heuristic behaviors, influences the controllers' professional competencies.**

This research contributes by showing specific uses of diagnostic and interactive budgets that are linked to the professional competencies of bean counters and business partners, as well as the influence of heuristic biases in the relationship between these budget uses and the controllers' professional competencies. It also shows that in Brazil, Controllership professionals are still required to perform usual Accounting functions. The practical contributions are intended for organizations, especially the individuals who participate in them, as they allow them to be aware of the behavioral influences to which they are subjected when participating in budget processes linked to the attribution of their functions and, therefore, they can optimize their ability to make managerial decisions in line with their professional competencies.

It is noted that there is a need for studies that analyze the relationship between the controllers' professional competencies and their behavioral biases when using diagnostic or interactive budgets, as this relationship is still little explored in the national and international literature. In view of this, this study intends to contribute to enhancing the knowledge about the interrelation of these themes.

2 Literature review

2.1 Controllers' Professional Competencies and Use of the Budget

The literature relates the role of a controllership professional to two different stereotypes formed from sub-stereotypes characterized by professional competencies, namely: bean counters and business partners (Wiggers et al., 2015; Arenales, 2016; Souza et al, 2020). The bean counters' professional competencies are focused on functions such as reporting, financial

analysis and internal control, basic accounting activities (Wiggers et al., 2015; Arenales, 2016). Whereas the business partners' competencies are directed towards active participation in senior management and making relevant decisions, in addition to team building, communication ability, conflict resolution and negotiation skills and motivation of others (Karlsson et al., 2019).

The predominance of the bean counter profile is gradually disappearing and gives space to business partners in organizations, which requires controllership professionals to combine their competencies with business objectives and actively participate in the decision-making process focused on strategy, control and performance evaluation (Wolf et al., 2015, Karlsson et al., 2019). Graham, Davey-Evans and Toon (2012) and Rieg (2018) advocate that the role of a controller has not necessarily changed in recent years but, instead, has incorporated elements more focused on the concern with the management of the entire business. These authors also mention that these developments have not replaced traditional tasks such as reporting and management control, but are complementary to them.

This study assumes that professional competencies adapt according to the needs of task development. Thus, the use of diagnostic and/or interactive budgets was treated as a task to be performed by the controllers, who can use the professional competencies of bean counters and/or business partners.

According to Kaveski et al. (2021) the budget used diagnostically or interactively is able to influence organizational commitment. Although the interactive and diagnostic uses of budgets can be associated with a high frequency of budget preparation, the more frequent use of the budget is of particular importance for the interactive ones, as budget data would be more timely for this use (Laitinen, Länsiluoto & Salonen, 2016).

Abernethy and Brownell (1999) highlight the interactive use, which refers to the continuous exchange of information between the top management and lower management levels, as well as actions between functions at various managerial levels. Neitzke (2005) states that the budget used in this way is characterized as a means of debating managers' decisions and actions. The interactive use of the budget is directly related to the effectiveness of work teams, both directly and indirectly, as it increases the budget participants' perception about the effectiveness of working collectively (Chong & Mahama, 2014). As it integrates the different management levels in organizations, and therefore is more linked to optimizing the decision-making process through the mobilization of human capital, this use of a budget would be more likely to be employed by business partners, due to the fact that they actively participate in organizational decisions.

In turn, and as indicated by Hofmann et al. (2012), diagnostic use of a budget comprises the budget in its traditional form, whose purpose is to carry out managerial planning and provide feedback for the management of pre-established goals. This way of using the budget promotes the achievement of goals through operational planning aimed at directing control efforts in order to monitor and correct deviations and shift the focus to coordinating the implementation of strategies and performance improvement, mapping the critical performance variables and factors for budgetary success (Bisbe & Otley, 2004; Hansen & Van der Stede, 2004; Hofmann et al., 2012).

Cools, Stouthuysen and Van den Abbeele (2017) mention that this budget use modality is widely applied in organizations where the work teams need to use their creativity in response to emerging problems. As it aims at reaching pre-established goals and solutions for emerging problems, this type of budget would be more identified with the profile of a bean counter, as this professional profile deals with functions linked to the provision of diverse information necessary to achieve this type of goals.

Based on the literature review on Behavioral Accounting, the controllers' professional competencies and use of the budget, the following hypothesis was developed:

H_1 – Interactive budget use is a characteristic of the business partner profile.

2.2 Presence of Heuristics in use of the Budget and Professional Competencies

In its early days, the term "heuristics" referred to the proposal that people rely on their previous perceptions and experiences to reduce the complex tasks of assessing probabilities and predicting values, in order to simplify judgments (Kahneman & Tversky, 1974).

The literature establishes some types of heuristics: Representativeness, Availability and Anchoring/Relativity (Lima Filho, 2010). Each of them can contribute to decision-making (either correct or not), as they are linked to cognitive biases, in this case, those related to the anchoring heuristic, such as anchoring in the past and anchoring confirmation (Anache & Laurencel, 2008). Therefore, the use of heuristics is present in management of a company, when employing historical data, figures and statistics, among others (Roberts & Wernstedt, 2019).

Representativeness is one of the heuristics discovered by Kahneman and Tversky (1972) and was defined as the "subjective probability of an event, or a sample, which is determined by the degree to which: (I) it is similar in essential characteristics to its original population; and (II) it reflects the outstanding characteristics of the process by which it was generated." (p. 430). This mental shortcut leads to judging an event, person or object without having complete information, considering "probability" as a relevant basis for decision-making (Taffler, 2002).

The characteristic of Representativeness is that the individual is based on a small sample and driven to find trends and rely on them to predict future events. When turning to accounting users, especially to a controller, the heuristic of representativeness can occur when making a decision through historical results and balance sheets, as if they were a guide for predicting future movements, instead of assimilating reality and being based on present data that reflect the actual situation (Arévalo, 2014).

The Availability heuristic is the shortcut that helps reach conclusions which are judged as correct through memories or experiences, whether their own or other people's (Kahneman & Tversky, 1972). Kliger and Kudryaursev (2010) explain Availability as a rule of thumb that occurs when a person estimates the probability of an event based on the ease of imagining it. In this way, emotionally charged probabilities are perceived as likely as opposed to those that are harder to imagine (Taffler, 2002; Kliger & Kudryaursev, 2010). It is understood that it is easier to make decisions when information is present; however, this information is not necessarily correct and sufficient, but rather generated by memories and examples that are "available" (Hodgkinson & Sadler-Smith, 2018).

Kahneman (2012) describes the Anchor effect as the one that occurs when people consider a given value to estimate an unknown quantity. In this case, the individual's judgment can be influenced by numbers that are not informative. The Anchoring and Adjustment heuristics, also known as the Relativity heuristic, occurs when, at the moment of performing evaluations, decision-makers rely on an initial value and adjust it accordingly. In the context of a controller's actions, an example would be when anchoring and adjustment are used in the budgeting process where the current numbers are used to anchor the budget for the year (Taffler, 2002).

When present in the management of an organization, heuristics can result in poor decisions or in business performance losses, as the decision can be affected by a non-rational effect that does not favor the future decision (Lima Filho, 2010; Peters, Wieder & Sutton, 2018). Therefore, based on the Kahneman and Tversky's findings in the 70s and 80s, where it is explained that, during the decision process, people use mental shortcuts, or heuristics, to simplify the choice task, which sometimes produces reasonable judgments but in others lead to

systematic errors (Vranas, 2000), it is assumed that Heuristics can moderate the effect between budget use and professional competencies.

Based on the literature review on Behavioral Accounting, heuristics and the controllers' professional profile, the following research hypothesis was developed: **H_2 – The presence of heuristics moderates the relationship between use of the budget and the controllers' professional competencies.**

3 Methodological Procedures

In order to reach the objective proposed by this study, a questionnaire was used as a research instrument (survey), subdivided into five blocks (questions related to use of the budget, controllers' professional competencies, heuristics and behavioral biases), which was sent to the respondents via email and LinkedIn®, from December 5th, 2021, to January 28th, 2022. To check clarity and understanding of the questions, the pilot questionnaire was sent to a controller and to graduate students.

The population is comprised by controllers from Brazil and the sample consists in controllers chosen due to accessibility through contacts made via the LinkedIn® platform. The questionnaire was sent to 1,641 controllers and 109 answers were obtained, which is therefore the number of people included in the sample (109). The instrument is validated by the following literary sources highlighted in Table 1.

Table 1
Research questionnaire and its foundations

Constructs	Latent Construct	Source/Authors
Budget use	Diagnostic use	Hansen and van der Stede (2004); Neitzke (2015)
	Interactive use	Abernethy and Brownell (1999); Neitzke (2015)
Controllers' professional competencies	Bean Counter	Burns and Baldvinsdottir (2005, 2007); Emsley (2005); Morgeson and Humphrey (2006); Souza et al. (2020)
	Business Partner	
Heuristics	Representativeness	Tversky and Kahneman (1974; 1981), Hendriksen and Van Breda (1999); Ariely (2008)
	Availability	
	Anchoring	

Source: *Research data (2022).*

The questions directed to the research participants, with the exception of the questions in blocks 4 and 5, which are related to qualification of the respondents and the organization in which they work, included in blocks 1, 2 and 3 of the collection instrument had specific measurements and interpretations for the answers. The content of the questions and the way of measuring and interpreting the answers were as it is shown in Figure 1 below:

Questionnaire block	Question	Measuring method	Interpretation of the answers
01 - Professional	a) Involvement: with the	5-point Likert scale:	1-3: business partner

competencies	traditional accounting function	from **1 - No involvement** to **5 - Full involvement**	profile 4-5: bean counter profile
01 - Professional competencies	b) Autonomy: in relation to decisions at work	5-point Likert scale: from **1 - No autonomy** to **5 - Full autonomy**	1-3: bean counter profile 4-5: business partner profile
01 - Professional competencies	c) Decentralization: present in the organization in which they operate in relation to specific decisions	5-point Likert scale: From **1 - No decentralization** to **5 - Full decentralization**	1-3: bean counter profile 4-5: business partner profile
01 - Professional competencies	d) Words that correspond to the tasks and activities developed at work	Wordcount	0: Predominance of words that refer to the bean counter role 1: Predominance of words that refer to the business partner role
02 - Business budget	a) Use of the budget as a way of controlling the operational activities	5-point Likert scale	Diagnostic use of the budget
02 - Business budget	b) The budget as a form of performance evaluation	5-point Likert scale	Diagnostic use of the budget
02 - Business budget	c) The budget used for managerial planning	5-point Likert scale	Interactive use of the budget
02 - Business budget	d) The budget used to communicate goals	5-point Likert scale	Diagnostic use of the budget
02 - Business budget	e) The budget used for strategy devising	5-point Likert scale	Interactive use of the budget
02 - Business budget	f) The budget used to report whether the work teams' actions and results are in accordance with what was planned	5-point Likert scale	Diagnostic use of the budget
02 - Business budget	g) The budget information is used to discuss with engagement team members about actions to be taken by the organization	5-point Likert scale	Interactive use of the budget
02 - Business budget	h) The information generated by the budget is frequently discussed in meetings with the work team	5-point Likert scale	Interactive use of the budget
03 - Cognitive Aspects of the Accounting Professional	a) Question 1: Availability effect: Hypothetical scenario - Judgment based on readily available information.	Dichotomous variable (absence or presence of heuristics)	Alternative 1: Presence of heuristics Alternative 2: Absence of heuristics.
03 - Cognitive	b) Question 2: Representativeness	Dichotomous variable	Alternative 1: Presence of

Aspects of the Accounting Professional	heuristic: Hypothetical scenario - Judgment about events based on stereotypes.	(absence or presence of heuristics)	heuristics Alternative 2: Absence of heuristics.
03 - Cognitive Aspects of the Accounting Professional	c) Question 3: Availability effect: Hypothetical scenario - Judgment based on readily available information.	Dichotomous variable (absence or presence of heuristics)	Alternative 1: Presence of heuristics Alternative 2 Absence of heuristics.
03 - Cognitive Aspects of the Accounting Professional	d) Question 4: Anchoring heuristic (Relativity): Hypothetical scenario - Judgment of situations with probabilistic weights.	Dichotomous variable (absence or presence of heuristics)	Alternatives 1 and 2: Presence of heuristics. Alternatives 3 and 4: Absence of heuristics
03 - Cognitive Aspects of the Accounting Professional	e) Question 5: Anchoring heuristic (Relativity): Hypothetical scenario - Judgment based on a reference value that anchors the perception.	Dichotomous variable (absence or presence of heuristics)	Alternatives 1 and 3: Absence of heuristics. Alternative 2: Presence of heuristics.

Figure 1 – *Research questionnaire and interpretation of the answers*
Source: *Research data (2022).*

Calculation of the values related to the controllers' professional competencies was calculated by the mean of the answers to the questions in block 1 of the research instrument. Block 2 addressed the diagnostic or interactive use of the budget. In the case of the presence of heuristics (block 3 of the questionnaire), the count was carried out so that each alternative with presence of heuristics selected by the respondents added up to 1 (one) point, with the possibility of reaching a maximum of 5 points (5 questions) for the presence of heuristics. Based on this count, the answers were segregated in order to generate a dummy variable for the 'heuristics', whose value of "0" denotes 'absence of heuristics' and "1" corresponds to 'presence of heuristics'.

The questions in block 4 - Qualification of the Respondent referred to: a) Age; b) Time working in the company; c) Academic training; d) Training area with highest schooling level; and i) Gender. Finally we have those in block 5 - Qualification of the Organization, namely: a) The state in which the company where the controllers work is located; b) The annual turnover of these companies; and c) The number of employees who work there.

In order to meet the main objective of this research and test the hypotheses raised, a logistic regression model was developed (Hair Jr., Tatham, Anderson & Black, 2005). The explanatory (independent) variables in logistic regression can be metric or non-metric (Fávero & Belfiore, 2017).

In the case of this study, the dependent variable is 'Professional competencies' and the independent variables were those related to diagnostic use of the budget ('goals', 'performance', 'communication of goals' and 'actions x results') and to interactive use of the budget ('managerial planning', 'strategy devising', 'discussion of actions' and 'discussion of information'). The 'BIN heuristics' dummy variable, which represents presence or absence of heuristics, was used as a moderating variable for the budget variables and also as an independent one. The moderator effect is formed by multiplying independent variables, in this case those related to the diagnostic or interactive uses of the budget, by the moderating variable ('BIN heuristics'). This effect has the function of changing the relationship between a pair of dependent/independent variables according to the value of the moderating variable (Hair Jr. et al., 2005).

4 Discussion and Research Results

4.1 - Qualification of the respondents and of the organization

Regarding the qualification of the respondents, in terms of gender, 74% of the controllers stated being male. The mean age was 40 years old, which may mean that most of the respondents are not in their early professional lives. They were also asked about their training and schooling level, where 80% of the respondents indicated that they had graduate studies, some by *stricto sensu* or others by *lato sensu*, and most of them trained in Accounting. The mean number of years working in the company reported by the controllers was 5.

Regarding qualification of the organization, in terms of the state where the company is located, it was found that 52% are headquartered in the state of São Paulo, followed by those located in Paraná (18%). With regard to the annual revenue of the companies where the controllers work, 71.5% earn up to 1 billion reais per year and, among these, 76.90% invoice up to 500 million reais per year. In relation to the number of employees in the companies where the controllers work, 80.7% of them have up to 2,000 employees and, among these, 68.7% have up to 500 employees.

4.2 - Controllers' professional competencies

In the questionnaire, the controllers' professional competencies were identified by the degree of involvement, autonomy and decentralization presented in their activities, as well as by the main functions they perform.

According to the research by Souza et al. (2020), the most intense involvement with the accounting function denotes predominance of the bean counter profile. The mean of 4.42, median of 5.00 and standard deviation of 0.785 obtained in the “involvement” item supports outlining this profile, a result similarly found in the authors' research, which explains the possible relationship with the company size. The studies by Kaplan and Waelter (2017) corroborate the findings by asserting that controllers still spend 70% to 80% of their time doing bean counter activities.

For autonomy, the mean was 3.97, with a median of 4.00 and a standard deviation of 0.810. The items presented were as follows: “my job allows me to make my own decisions about the schedule for carrying out my work”; “my job allows me to make many decisions on my own”; and “my job provides decision-making autonomy”. According to the paper by Wolf et al. (2015), due to the responsibility inherent to the autonomy in their role, controllers contribute significantly to strategic planning and organizational performance. In the case of this research, characteristics of the business partner profile competencies are demonstrated.

Decentralization sought to identify diverse information about the level of freedom, influence and delegation present in the controllers' duties. The questions presented referred to hiring, dismissal, investment and pricing decisions. On the Likert scale, 1 meant “No autonomy” and 5 “Full autonomy” for such decisions. There is a mean of 2.93, a median of 3.00 and a standard deviation of 0.910 for decentralization. The mean obtained provides an indication for the bean counter profile, as it is below 3 points. However, in this question, a division is perceived between the controllers in relation to the answers evidenced by the median and standard deviation.

Based on the answers to the questions related to involvement, autonomy and decentralization, values were calculated for the ‘professional competencies’ binary variable, which resulted in 84 cases for bean counters and 25 cases for business partners, calculated from the individual mean values between the answers to the three questions.

Byrne and Pierce (2018) indicate that being a controller business partner is more diffuse and vague when compared to a bean counter that has clear job descriptions, such as accounting and financial reporting. The authors' case study reports that a decentralized function promotes a business partner role, although companies tend to be more oriented towards closed control. The findings show that there is a correlation between strict budget control and the controller bean counter role.

The Atlas Ti 9 software was used to generate a word cloud in order to ease visualization of the answers related to the tasks and activities corresponding to the controllers' performance (question d) from block 1. Subsequently, they were classified between bean counter and business partner. Figure 2 below shows the word cloud obtained:

Figure 2 *Word cloud for the controllers' activities*
Source: *Research data (2022).*

When observing the word cloud, the expressions "*contabilidade*" ("accounting"), "*orçamento*" ("budget"), "*cálculos*" ("calculations"), "*análise*" ("analysis"), "*cobrança*" ("collection"), "*consultoria*" ("consulting") and "*gestão*" ("management") stand out. Words that refer to the accounting routines are called "financial" and suggest that the controllers' professional competencies remain predominantly linked to the bean counter duties (Souza et al., 2020).

Bearing in mind the count corresponding to occurrence of these expressions (for example, "analysis", mentioned 36 times), which is related to the professional competence characteristic of this profile, the mean categorization of answers was 0.39 with a median 0, where "0" refers to the bean counter profile and "1" to the business partner profile. In their research, Lindqvist and Matson (2019) also found that controllers devote most of their time to verifications, corrections to reports and preparation of accounting entries.

4.3 Business Budget

The Business Budget block consisted of eight questions divided into two latent constructs. Four questions referred to the diagnostic use construct and the other four, to interactive use. Table 2 shows the results of the descriptive statistics:

Table 2
Descriptive Statistics - Business Budget

	D. B. Goals	D. B. Performance	D. B. Communication of goals	D. B. Actions x results	I. B. Managerial planning	I. B. Strategy devising	I. B. Discussion of actions	I. B. Discussion of information
Mean	4.14	3.88	4.02	4.04	4.15	4.17	4.05	3.99
Median	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
Standard Deviation	.907	1.069	.962	.932	.837	.921	.947	1.041

Source: *Research data (2022).*

Table 2 shows certain similarity between the mean values. This indicates that the controllers make use of the diagnostic or interactive budgets in their functions. Simons (1995) explains that the different uses can complement each other and create a dynamic tension state. A different view was found in the study by Bisbe, Bastita-Foguet and Chenhall (2007), where they proposed that the interactive concept is ambiguous and found that the separation between interactive and diagnostic uses may not be clear to managers.

In interactive use, the mean of 4.17 stands out for the “Interactive Budget - Strategy devising” item. This question deals with whether the diverse information produced by the budget is used to report whether the actions and/or results of the controlling area and the work team are in accordance with the plans. Laitinen et al. (2016) showed that interactive use of the budget can direct managers' attention to uncertainties and, thus, improve their strategies. The authors found a positive association between interactive use of the budget and product innovation.

Controllers who make use of interactive budgeting may be better prepared for risk management. According to Braumann, Grabner and Posch (2020), interactive use strengthens risk awareness raising, whereas its diagnostic counterpart is not empirically related. To support the conditions of the interdependencies proposed, the authors identified whether they were foreseen and sensitive to the environmental uncertainty level perceived by the managers.

As for diagnostic use of the budget, the “Diagnostic Budget - Goals” item stands out with a mean of 4.14 and a standard deviation of 0.907. The question dealt with the budget as a way of controlling the operational activities. According to Hofmann, Wald and Gleich (2012), in diagnostic use of the budget, the subordinates receive a significant level of authority and autonomy, which, according to the findings by authors Chong and Mahama (2014), can lead to increased organizational commitment.

According to the research studies by Fu and Deshpande (2014) and by Swalhi, Zgoulli and Hofaidhllaoui (2017), it is verified that managers committed to their work environment identify with the company as well as with its objectives, so that they develop a loyalty stance and seek to improve their performance for the benefit of the organization. Thus, controllers who make use of diagnostic budgets tend to have a sense of belonging and loyalty to the organization.

In view of this, the research by Kaveski et al. (2020) showed that the ways in which the budget is used influence organizational commitment and managerial performance. There are

also findings that relate the budget to the goals that are often applied to control, encourage participation and involvement in activities by subordinates (Hansen & Van der Stede, 2004; Merchant, 2007; Neitzke, 2015; Lunardi et al., 2019; Zonatto et al., 2020), which confers aspects that are similar to those found in the current study.

4.4 Heuristics

To verify the controller's cognitive aspects in relation to presence of heuristics, 5 questions were applied in this block. Two of them referred to the Availability effect, another two to the Anchoring heuristic, and one question to the Representativeness heuristic.

The questions concerning the Availability effect (numbers 1 and 3) sought to identify whether the way in which a company's results were placed influenced the controller's decision. In turn, the question (number 2) referring to the Representativeness heuristic verified if the respondents were averse to the risk of gains or losses decisions. Finally, in the last two questions (numbers 4 and 5), presence of the Anchoring heuristic was verified through situations with probabilistic bases and reference values.

By counting the answers with inclusion of heuristics, it was verified that all research participants answered at least one alternative with heuristics included. 1.8% of the participants chose an alternative with heuristics included in (1) one of the five questions they answered. 11.9% chose alternatives with heuristics included in (2) two questions. 29.4% chose alternatives with heuristics included in (3) three questions. 45.9% chose alternatives with heuristics included in (4) four questions. 11% chose alternatives with heuristics included in (5) five questions.

In relation to the binary variable of the heuristics, where “0” represents ‘absence of heuristics’ and “1” means ‘presence of heuristics’, of the 5 questions, up to 2 answers given with heuristics included were classified as “absence” and 3 or more answers with heuristics were classified as “presence”. The percentage obtained indicates that there are 86.3% of heuristics presence in the answers. Thus, controllers tend to use them in their decisions, mainly the Anchoring and Availability heuristics. This result reinforces the findings of the theories presented by Simon (1955) and by Tversky and Kahneman (1974), who assert that choices are permeated with biases that can lead to the use of heuristics.

The results found by Lucena et al. (2011) indicate that managers are affected by the Anchoring heuristic because they attribute different weights to facts that they deem inconsistent when manipulating the conception of certainty. Abubakar et al. (2019) mention that the Availability effect can make individuals abstain from having logical thoughts and calculations and cause them to make a decision based on what quickly comes to their mind, as they aim at getting rid of the pressure of the complexity of a task to be performed, so that they are free to use their cognitive ability in the next one. The Availability heuristic affects the decision-making process in two different ways. In the first place, controllers can make their decisions based on aspects they already knows, instead of choosing something completely new and unknown (despite its advantages). Secondly, they are tricked into thinking that the readily available information is more relevant; in other words, they are influenced by events that are easy to remember or by recent events.

Busenitz and Barney (1997) and Fernández León and Cortés (2017) examined the differences in terms of choices between entrepreneurs and managers of large-sized organizations, in relation to two heuristics: Representativeness and Availability; and their results show that more than 60% of both professional profiles use these heuristics in their decisions, corroborating with the results presented in the current research. However, the authors explain that entrepreneurs tend to resort to the Availability Heuristic due to environmental complexity and pressure, which is not present in the same proportion in the routine of internal managers, as is the case of a controller.

4.5 Discussion of the research hypotheses and other evidence linked to the study objective

To answer the research hypotheses and finally meet the objective proposed by the study, a logistic regression model was employed using Wald's Backward Stepwise method, which selects the statistically significant variables for the model and removes the non-significant ones throughout the exclusion stages. This method allows identifying the independent variables with the highest predictive value (Hair Jr. et al., 2005).

The model had 'Professional competencies' as its dependent variable and explanatory variables related to the diagnostic or interactive uses of the budget, in addition to the 'BIN Heuristics' binary variable. The moderation relation of the 'BIN Heuristics' variable on the diagnostic or interactive uses of the budget was also included as an explanatory variable in the model by multiplying the 'BIN Heuristics' binary variable by each of the variables of the budget uses, incorporated into the model as a new set of moderated variables.

A total of 15 logistic regression stages were run using Wald's Backward method to arrive at the model with the independent variables that best explain it. The model chosen was the one resulting from the 15th stage, as it validated all explanatory variables at least at a 10% significance level using Wald's statistics, which verifies whether each parameter estimated by the regression is different from 0 at the significance level chosen (Fávero & Belfiore, 2017). The success percentage of the model chosen was 76.10%. This measure compares the prediction of the dependent variable value performed by the model in relation to the original value of this variable.

The Omnibus test verifies that the regression coefficients together are significant for the model through the Chi-square distribution (Fávero & Belfiore, 2017). The significance value for the model chosen was 0.021; therefore, it has a statistically significant coefficient at the 5% level. Using the Hosmer and Lemeshow test, it was observed that there was no significant difference at the 5% level between the frequencies of expected and observed events for all verified models, which attests to the goodness of fit of the models. The significance value for the model chosen was 0.081.

The Cox & Snell and Nagelkerke R^2 measures refer to the explanatory power of the model, that is, the percentage of explanation of the occurrence probability of the events related to the dependent variable reached by the model, with the second measure usually considered as a preferred reference for use (Fávero and Belfiore, 2017). In the case of the model chosen, Cox & Snell R^2 was 0.085 (8.5%) and Nagelkerke R^2 was 0.129 (12.9% explanatory power). The model chosen is shown in Table 3.

Table 3
Logistic regression model used

Variables in the Equation

	ß	Standard Deviation	Wald	Sig.	Exp(ß)
BIN Heuristics * Diagnostic Budget (Goals)	0.352	0.147	5.713	0.017	1.422
Interactive Budget (Managerial planning)	-0.544	0.326	2.784	0.095	0.580
Interactive Budget (Discussion of actions)	0.614	0.348	3.106	0.078	1.847

Source: *Research data (2022).*

The model listed includes the following as significant variables: 'Diagnostic Budget (Goals)' moderated by presence of heuristics ('BIN Heuristics(1)') at the 5% level, and the 'Interactive Budget (Managerial planning)' and 'Diagnostic Budget (Discussion of actions)' variables at a 10% significance level Even with the low explanatory power of the model (12.9% by Nagelkerke R^2) which can be understood by the fact that several variables were excluded from the analysis throughout the logistic regression stages for not presenting statistical significance. The results found allowed meeting the central objective of the research and accepting or rejecting the hypotheses raised.

4.5.1 - Professional competencies and diagnostic or interactive use of the budget

A negative and significant relationship is found between 'Interactive Budget (Managerial planning)' and business partner professional competence, in the order of -0.544. Based on this result, it can be inferred that the probability of bean counters using the interactive budget to carry out managerial planning increases. This can be considered a positive point for the effectiveness of the work teams of which these professionals are part (Chong & Mahama, 2014) and a more effective form of communication used by the top management in situations of significant uncertainties (Braumann et al., 2020).

There was a positive and significant relationship between the dependent variable and the 'Interactive Budget (Discussion of actions)' explanatory variable, evidenced by the beta coefficient value of this variable: 0.614. Thus, this allows inferring that using the interactive budget to discuss with the work team members about the actions to be taken by the organization is a characteristic of controllers with professional competencies focused on the business partner profile. In this case, it was possible to accept **H_1 – Interactive budget use is a characteristic of the business partner profile**.

Interactive use of the budget can perform other functions related to influencing behaviors, as well as to motivating and improving organizational processes (Simons, 1995); whereas diagnostic use allows quantifying phenomena, signaling goals to be achieved, analyzing deviations and making corrections (Neitzke, 2015). In addition, both uses tend to elicit greater organizational commitment for the professionals who use them (Zonatto et al., 2020; Kaveski et al., 2021).

4.5.2 - Professional competencies and diagnostic or interactive uses of the budget moderated by heuristics

The beta coefficient (β) value of the 'Diagnostic Budget (Goals)' variable moderated by presence of heuristics ('BIN Heuristics') was 0.352 and indicates that there is a positive and significant relationship between the 'Professional competencies' of the business partner profile and diagnostic use of the budget mediated by the presence of behaviors influenced by heuristics.

When taking into account the **H_2 – The presence of heuristics moderates the relationship between use of the budget and the controllers' professional competencies** hypothesis, it was possible to infer that there is a moderation relationship in presence of heuristics on diagnostic use of the budget to communicate goals to the work teams, and that this type of use budget use characterizes the business partner profile. It was then possible to confirm the hypothesis for this specific situation.

The presence of heuristics in most of the answers obtained by the research instrument reinforces the findings of Simon's (1955) and Tversky and Kahneman's (1974) theories, which show that choices are permeated with behavioral biases capable of culminating in the use of heuristics. Even when using the budget as a way to more successfully achieve the organization's

goals, controllers are influenced by heuristic biases, which can affect the way and motivation with which they make decisions in these circumstances.

4.5.3 - Relationship between presence of heuristics and professional competencies

It should also be noted that the separate inclusion of the 'BIN Heuristics' variable in the model, without the moderating effect, did not present statistical significance. This shows that, despite the fact that most of the respondents show heuristic behaviors, it was not possible to link them directly to the professional competencies of bean counters or business partners.

5 Final Considerations

The objective of this study was to find out whether diagnostic or interactive use of budgets, moderated by the behavioral biases (heuristics) to which controllership professionals may be subjected, influences the controllers' (bean counters and business partners) professional competencies. For this purpose, a research study was conducted with data collection through a survey with 109 respondents and a quantitative approach. The method used to test the research hypotheses and other relationships between the variables was logistic regression.

Based on data analysis, the responding controllers were categorized into the bean counter or business partner profiles. There was predominance of bean counters, a result similar to the one found in the studies by Wanderley et al. (2020). It was also observed that, among the words mentioned by the respondents to describe their functions, expressions such as "accounting", "budget", "calculations", "analysis", "collection", "consulting" and "management" stand out. This indicates that, despite having incorporated new perspectives on organizational management as a whole in recent years (Graham. et al., 2012; Rieg, 2018), the controllers' function remains more linked to the support accounting function than to participation in the organizations' decision-making process, as the business partner profile is not yet consolidated in the Brazilian business scenario, as shown in previous research studies such as those by Lunkes et al. (2013), Wiggers et al. (2015) and Wanderley et al. (2020). This study contributes to the literature on the controllers' professional competencies by clarifying the types of functions they perform and the professional profile they fit into, showing that such activities are still linked to traditional accounting ones.

In relation to the diagnostic or interactive uses of the budget, this study found that use of the diagnostic budget to communicate goals to their work teams is characteristic of controllers whose professional competencies belong to the business partner profile and whose behavior is influenced by heuristics. Regardless of being influenced by heuristics, business partners also use the interactive budget to discuss actions, while bean counters make use of the diagnostic budget for managerial planning, whether or not they are under the influence of heuristics. In this way, the current study contributes to the literature on the use of budgets by showing the purposes for which controllership professionals use diagnostic or interactive budgets. When resorting to diagnostic or interactive budgets, these controllers can achieve greater individual success and of their work teams in the performance of their functions, as these ways of using budgets tend to produce greater engagement of those involved.

Presence of heuristics was detected in the controllers' decisions, with higher incidence of Anchoring and Availability. These results are similar to the study by Lucena et al, (2011), carried out with accountants and auditors. However, from the result of the logistic model, it was possible to notice that heuristics in general do not explain the respondents' professional competencies, except when present in the behavior of business partners who use diagnostic budgets to communicate goals to their work teams; this result similar to the study by Lima Filho (2010), who found presence of heuristics in controllership professionals involved

with budgeting practices. As for the presence of heuristics detected in the way in which business partners act when they use diagnostic budgets to communicate goals to the work teams, such behavioral effects can compromise these individuals' judgment when making decisions about what information they will communicate or how they will communicate it, which can exert a direct impact on the work teams' behavior and on their concomitant effectiveness.

The results found in this research assist in the development of new studies that seek to map the presence and impact of heuristics on the controllers' activities, especially based on diverse information that involves practices related to controllership professionals with their different professional profiles, given the scarcity of research studies aimed at this target audience. In this way, it contributes to the literature on Behavioral Accounting.

As a research limitation, the reduced number of variables aimed at mapping the controllers' professional competencies and their heuristic behaviors can be mentioned. In view of this, for future research studies, it is recommended to develop of a collection instrument that can capture more factors capable of explaining these variables or to use simulations of hypothetical scenarios in an experiment.

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